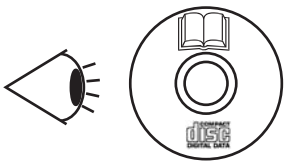
HITACHI

EN INSTRUCTION MANUAL
ES MANUAL DE INSTRUCCIONES
DE BEDIENUNGSANLEITUNG
FR MANUEL D'UTILISATION
IT MANUALE DI ISTRUZIONI
PT MANUAL DE INSTRUÇÕES
DA BRUGSANVISNING
NL INSTALLATIEHANDLEIDING
SV INSTALLATIONSHANDBOK
EL ΕΓΧΕΙΡΊΔΙΟ ΟΔΗΓΙΏΝ

YUTAKI M SERIES
RASM-(3-6)(V)NE



English

Specifications in this manual are subject to change without notice in order that HITACHI may bring the latest innovations to their customers.

Whilst every effort is made to ensure that all specifications are correct, printing errors are beyond HITACHI's control; HITACHI cannot be held responsible for these errors.

Español

Las especificaciones de este manual están sujetas a cambios sin previo aviso a fin de que HITACHI pueda ofrecer las últimas innovaciones a sus clientes.

A pesar de que se hacen todos los esfuerzos posibles para asegurarse de que las especificaciones sean correctas, los errores de impresión están fuera del control de HITACHI, a quien no se hará responsable de ellos.

Deutsch

Bei den technischen Angaben in diesem Handbuch sind Änderungen vorbehalten, damit HITACHI seinen Kunden die jeweils neuesten Innovationen präsentieren kann.
Sämtliche Anstrengungen wurden unternommen, um sicherzustellen, dass alle technischen Informationen ohne Fehler veröffentlicht worden sind. Für Druckfehler kann HITACHI jedoch keine Verantwortung übernehmen, da sie außerhalb ihrer Kontrolle liegen.

Français

Les caractéristiques publiées dans ce manuel peuvent être modifiées sans préavis, HITACHI souhaitant pouvoir toujours offrir à ses clients les dernières innovations.
Bien que tous les efforts sont faits pour assurer l'exactitude des caractéristiques, les erreurs d'impression sont hors du contrôle de HITACHI qui ne pourrait en être tenu responsable.

Italiano

Le specifiche di questo manuale sono soggette a modifica senza preavviso affinché HITACHI possa offrire ai propri clienti le ultime novità.
Sebbene sia stata posta la massima cura nel garantire la correttezza dei dati, HITACHI non è responsabile per eventuali errori di stampa che esulano dal proprio controllo.

Português

As especificações apresentadas neste manual estão sujeitas a alterações sem aviso prévio, de modo a que a HITACHI possa oferecer aos seus clientes, da forma mais expedita possível, as inovações mais recentes.
Apesar de serem feitos todos os esforços para assegurar que todas as especificações apresentadas são correctas, quaisquer erros de impressão estão fora do controlo da HITACHI, que não pode ser responsabilizada por estes erros eventuais.

Dansk

Specifikationerne i denne vejledning kan ændres uden varsel, for at HITACHI kan bringe de nyeste innovationer ud til kunderne.
På trods af alle anstrengelser for at sikre at alle specifikationerne er korrekte, har HITACHI ikke kontrol over trykfejl, og HITACHI kan ikke holdes ansvarlig herfor.

Nederlands

De specificaties in deze handleiding kunnen worden gewijzigd zonder verdere kennisgeving zodat HITACHI zijn klanten kan voorzien van de nieuwste innovaties.
Iedere poging wordt ondernomen om te zorgen dat alle specificaties juist zijn. Voorkomende drukfouten kunnen echter niet door HITACHI worden gecontroleerd, waardoor HITACHI niet aansprakelijk kan worden gesteld voor deze fouten.

Svenska

Specifikationerna i den här handboken kan ändras utan föregående meddelande för att HITACHI ska kunna leverera de senaste innovationerna till kunderna.
Vi på HITACHI gör allt vi kan för att se till att alla specifikationer stämmer, men vi har ingen kontroll över tryckfel och kan därför inte hållas ansvariga för den typen av fel.

Ελληnika

Οι προδιαγραφές του εγχειριδίου μπορούν να αλλάξουν χωρίς προειδοποίηση, προκειμένου η HITACHI να παρέχει τις τελευταίες καινοτομίες στους πελάτες της.
Αν και έχει γίνει κάθε προσπάθεια προκειμένου να εξασφαλιστεί ότι οι προδιαγραφές είναι σωστές, η HITACHI δεν μπορεί να ελέγξει τα τυπογραφικά λάθη και, ως εκ τούτου, δεν φέρει καμία ευθύνη για αυτά τα λάθη.

⚠ CAUTION

This product shall not be mixed with general house waste at the end of its life and it shall be retired according to the appropriated local or national regulations in a environmentally correct way.
Due to the refrigerant, oil and other components contained in heat pump, its dismantling must be done by a professional installer according to the applicable regulations. Contact to the corresponding authorities for more information.

⚠ PRECAUCIÓN

Éste producto no se debe eliminar con la basura doméstica al final de su vida útil y se debe desechar de manera respetuosa con el medio ambiente de acuerdo con los reglamentos locales o nacionales aplicables.
Debido al refrigerante, el aceite y otros componentes contenidos en la bomba de calor, su desmontaje debe realizarlo un instalador profesional de acuerdo con la normativa aplicable. Para obtener más información, póngase en contacto con las autoridades competentes.

⚠ VORSICHT

Dass Ihr Produkt am Ende seiner Betriebsdauer nicht in den allgemeinen Hausmüll geworfen werden darf, sondern entsprechend den geltenden örtlichen und nationalen Bestimmungen auf umweltfreundliche Weise entsorgt werden muss.
Aufgrund des Kältemittels, Öls und anderer Komponenten in der Wärmepumpe muss ihr Ausbau von einem professionellen Installateur entsprechend der anwendbaren Vorschriften durchgeführt werden. Für weitere Informationen setzen Sie sich bitte mit den entsprechenden Behörden in Verbindung.

⚠ ADVERTISSEMENT

Ne doit pas être mélangé aux ordures ménagères ordinaires à la fin de sa vie utile et qu'il doit être éliminé conformément à la réglementation locale ou nationale, dans le plus strict respect de l'environnement.
En raison du frigorigène, de l'huile et des autres composants que contient la pompe à chaleur, son démontage doit être effectué par un installateur professionnel conformément aux règlementations en vigueur.

⚠ AVVERTENZE

Indicazioni per il corretto smaltimento del prodotto ai sensi della Direttiva Europea 2002/96/EC e Dlgs 25 luglio 2005 n.151
Il simbolo del cassonetto barrato riportato sull' apparecchiatura indica che il prodotto alla fine della propria vita utile deve essere raccolto separatamente dagli altri rifiuti.
L'utente dovrà, pertanto, conferire l'apparecchiatura giunta a fine vita agli idonei centri di raccolta differenziata dei rifiuti elettronici ed elettrotecnici, oppure riconsegnarla al rivenditore al momento dell' acquisto di una nuova apparecchiatura di tipo equivalente.
L'adeguata raccolta differenziata delle apparecchiature dismesse, per il loro avvio al riciclaggio, al trattamento ed allo smaltimento ambientalmente compatibile, contribuisce ad evitare possibili effetti negativi sull' ambiente e sulla salute e favorisce il riciclo dei materiali di cui è composta l' apparecchiatura.
Non tentate di smontare il sistema o l'unità da soli poichè ciò potrebbe causare effetti dannosi sulla vostra salute o sull' ambiente.
Vogliate contattare l' installatore, il rivenditore, o le autorità locali per ulteriori informazioni.
Lo smaltimento abusivo del prodotto da parte dell'utente può comportare l'applicazione delle sanzioni amministrative di cui all'articolo 50 e seguenti del D.Lgs. n. 22/1997.

⚠ CUIDADO

O seu produto não deve ser misturado com os desperdícios domésticos de carácter geral no final da sua duração e que deve ser eliminado de acordo com os regulamentos locais ou nacionais adequados de uma forma correcta para o meio ambiente.
Por causa do refrigerante, do óleo e de outros componentes na bomba de calor, o desmantelamento deve ser realizado por um instalador profissional em conformidade com os regulamentos aplicáveis. Contacte as autoridades correspondentes para obter mais informações.

⚠ ADVASEL!

At produktet ikke må smides ud sammen med almindeligt husholdningsaffald, men skal bortskaffes i overensstemmelse med de gældende lokale eller nationale regler på en miljømæssig korrekt måde.
Da varmepumpen indeholder kølemiddel, olie samt andre komponenter, skal afmontering foretages af en fagmand i overensstemmelse med de gældende bestemmelser. Kontakt de pågældende myndigheder for at få yderligere oplysninger.

⚠ VOORZICHTIG

Dit houdt in dat uw product niet wordt gemengd met gewoon huisvuil wanneer u het weg doet en dat het wordt gescheiden op een milieuvriendelijke manier volgens de geldige plaatselijke en landelijke reguleringen.
Wegens de aanwezigheid van koelmiddel, olie en andere componenten in de warmtepomp moet het apparaat volgens de toepasselijke regelgeving door een professionele installateur worden gedemonteerd. Neem contact op met de betreffende overheidsdienst voor meer informatie.

⚠ FÖRSIKTIGHET

Det innebär att produkten inte ska slängas tillsammans med vanligt hushållsavfall utan kasseras på ett miljövänligt sätt i enlighet med gällande lokal eller nationell lagstiftning.
Eftersom värmepumpen innehåller kylmedel, oljor och andra komponenter, måste den demonteras av en behörig installatör i enlighet med gällande föreskrifter. Ta kontakt med ansvarig myndighet om du vill ha mer information.

⚠ ΠΡΟΣΟΧΗ

Σημαίνει ότι το προϊόν δεν θα πρέπει να αναμιχθεί με τα διάφορα οικιακά απορρίμματα στο τέλος του κύκλου ζωής του και θα πρέπει να αποσυρθεί σύμφωνα με τους κατάλληλους τοπικούς ή εθνικούς κανονισμούς και με τρόπο φιλικό προς το περιβάλλον.
Λόγω του ψυκτικού, του λαδιού και άλλων εξαρτημάτων που περιλαμβάνονται στην αντλία θέρμανσης, η αποσυναρμολόγησή του πρέπει να γίνει από εξουσιοδοτημένο επαγγελματία τεχνικό, σύμφωνα με τους ισχύοντες κανονισμούς. Για περισσότερες λεπτομέρειες, επικοινωνήστε με τις αντίστοιχες αρχές.

English
Following Regulation EU No. 517/2014 on Certain Fluorinated Greenhouse gases, it is mandatory to fill in the label attached to the unit with the total amount of refrigerant charged on the installation.
Do not vent R410A into the atmosphere: R410A are fluorinated greenhouse gases covered by the Kyoto protocol global warming potential (GWP) R410A: = 2088.
Tn of CO2 equivalent of fluorinated greenhouse gases contained is calculated by indicated GWP * Total Charge (in kg) indicated in the product label and divided by 1000.

Español
De acuerdo con el reglamento UE Nº 517/2014 sobre determinados gases fluorados de efecto invernadero, es obligatorio rellenar la etiqueta suministrada con la unidad con la cantidad total de refrigerante con que se ha cargado la instalación.
No descargue el R410A en la atmósfera: R410A son gases fluorados cubiertos por el protocolo de Kyoto con un potencial de calentamiento global (GWP): = 2088.
Las Tn de CO2 equivalente de gases fluorados de efecto invernadero contenidos se calcula por el PCA indicado * Carga Total (en kg) indicada en la etiqueta del producto y dividida por 1000.

Deutsch
Folgende Verordnung EG Nr. 517/2014 Bestimmte fluorierte Treibhausgase, auf dem Schild, das sich am Gerät befindet, muss die Gesamtkältemittelmenge verzeichnet sein, die bei der Installation eingefüll wird.
Lassen sie R410A nicht in die luft entweichen: R410A sind fluorierte treibhausgase, die durch das Kyoto-protokoll erfasst sind. Sie besitzen folgendes treibhauspotential (GWP) R410A: = 2088.
Die Menge an CO2-Äquivalent fluorierte Treibhausgase enthalten (in Tn) wird von GWP * die auf dem Produktetikett angegebenen Gesamtfüllmenge (in kg) und durch 1000 geteilt berechnet.

Français
En fonction de la Réglementation CE Nº 517/2014 concernant certains gaz à effet de serre fluorés, il est obligatoire de remplir l'étiquette attachée à l'unité en indiquant la quantité de fluide frigorigène qui a été chargée à l'installation.
Ne laissez pas le R410A se répandre dans l'atmosphère: le R410A sont des gaz à effet de serre fluorés, couverts par le protocole de Kyoto avec un potentiel de rechauffement global (PRG) R410A: = 2088.
Les Tn d'équivalent-CO2 de gaz à effet de serre fluorés contenus est calculé par le PRG * Charge Totale (en kg) indiquée dans l'étiquette du produit et divisé par 1,000.

Italiano
In base alla Normativa EC Nº 517/2014 su determinati gas fluorurati ad effetto serra, è obbligatorio compilare l'etichetta che si trova sull'unità inserendo la quantità totale di refrigerante caricato nell'installazione.
Non scaricare R410A nell'atmosfera: R410A sono gas fluorurati ad effetto serra che in base al protocollo di Kyoto presentano un potenziale riscaldamento globale (GWP) R410A: = 2088.
Le Tn di CO2 equivalente di gas fluorurati ad effetto serra contenuti si calcola dal GWP indicato * Carica Totale (in kg) indicato nella etichetta del prodotto e diviso per 1000.

Português
Em conformidade com a Regulamentação da UE Nº 517/2014 sobre determinados gases fluorados com efeito de estufa, é obrigatório preencher a etiqueta afixada na unidade com a quantidade total de refrigerante carregada na instalação.
Não ventilar R410A para a atmosfera: o R410A são gases fluorados com efeito de estufa abrangidos pelo potencial de aquecimiento global (GWP) do protocolo de Quioto: = 2088.
Tn de CO2 equivalente de gases fluorados com efeito de estufa é calculado pelo GWP indicado * Carga Total (em kg) indicado no rótulo de produto e dividido por 1000.

Dansk
Henhold til Rådets forordning (EF) nr. 517/2014 om visse fluorholdige drivhusgasser, skal installationens samlede mængde kølevæske fremgå at den etiket, der er klæbet fast på enheden.
Slip ikke R410A ud i atmosfæren: R410A er fluorholdige drivhus-gasser, der er omfattet af Kyoto-protokollens globale opvarmningspotentiale (GWP) R410A: = 2088.
Tn af CO2-ækvivalent af fluorholdige drivhusgasser er beregnet ved angivet GWP * Samlet Charge (i kg) er angivet i produktets etiket og divideret med 1000.

Nederlands
Conform richtlijn EC Nº 517/2014 voor bepaalde fluorbroeikasgassen, dient u de tabel in te vullen op de unit met het totale koelmiddelvolume in de installatie.
Laat geen R410A ontsnappen in de atmosfeer: R410A zijn fluorbroeikasgassen die vallen onder het protocol van Kyoto inzake klimaatverandering global warming potential (GWP) R410A: = 2088.
Tn van CO2-equivalent van fluorbroeikasgassen wordt berekend door het aangegeven GWP * Totale Hoeveelheid (in kg) aangegeven in het product label en gedeeld door 1000.

Svenska
Enligt reglering EC Nº 517/2014 om vissa fluorhaltiga växthusgaser, måste etiketten som sitter på enheten fyllas i med sammanlagd mängd kylmedium som fyllts på under installationen.
Släpp inte ur R410A i atmosfären: R410A är fluorhaltiga växthus-gaser som omfattas av Kyotoprotokollet om global uppvärmnings-potential (GWP) R410A: = 2088.
Tn av CO2-ekvivalenter fluorhaltiga växthusgaser beräknas genom indikeras GWP * Total Påfyllning (i kg) som anges i produktetiketten och divideras med 1000.

Ελλhnika
Σύμφωνα με τον Κανονισμό 517/2014/ΕΚ για για ορισμένα φθοριούχα αέρια θερμοκηπίου, είναι υποχρεωτική η συμπλήρωση της επισήμανσης που επισυνάπτεται στη μονάδα με το συνολικό ποσό ψυκτικού που εισήχθη κατά την εγκατάσταση.
Μην απελευθερωνετε R410A στην ατμοσφαιρα. Τα R410A ειναι φθοριουχα αερια του θερμοκηπιου που εμπιπτουν στο πρωτοκολλο του κυοτο δυναμικο θερμανσησ του πλανητη (GWP) R410A/R407C: = 2088
Τη ισοδύναμου CO2 φθοριούχων αερίων θερμοκηπίου που περιέχονται υπολογίζεται από υποδεικνύεται GWP * Συνολική πλήρωση (σε kg) που αναφέρεται στην ετικέτα του προϊόντος και χωρίζονται από το 1000.

MODELS CODIFICATION	**Important note:** Please, check, according to the model name, which is your heat pump type, how it is abbreviated and referred to in this instruction manual. This Installation and Operation Manual is only related to RASM-(V)NE Outdoor Units.
CODIFICACIÓN DE MODELOS	**Nota importante:** compruebe, de acuerdo con el nombre del modelo, el tipo de bomba de calor, su abreviatura y su referencia en el presente manual de instrucciones. Este Manual de instalación y funcionamiento sólo está relacionado con unidades externas RASM-(V)NE.
MODELLCODES	**Wichtiger Hinweis:** Bitte stellen Sie anhand der Modellbezeichnung den Typ der Wärmepumpe und das entsprechende, in diesem Technischen Handbuch verwendete Kürzel fest. Dieses Installations- und Betriebshandbuch bezieht sich nur auf RASM-(V)NE Außengeräten.
CODIFICATION DES MODÈLES	**Note importante :** veuillez déterminer, d'après le nom du modèle, quel est votre type de pompe à chaleur et quelle est son abréviation et référence dans ce manuel d'instruction. Ce manuel d'installation et de fonctionnement ne concernent que les unités intérieures groupes extérieurs RASM-(V)NE.
CODIFICAZIONE DEI MODELLI	**Nota importante:** controllare in base al modello il tipo di pompa di calore, la descrizione e il tipo di abbreviazione utilizzati nel manuale di istruzioni. Questo manuale di installazione e di funzionamento fa riferimento alla unità esterne RASM-(V)NE.
CODIFICAÇÃO DE MODELOS	**Nota Importante:** de acordo com o nome do modelo, verifique o tipo da sua bomba de calor e a respetiva abreviatura e menção neste manual de instruções. Este manual de instalação e de funcionamento só está relacionado com a unidades exteriores RASM-(V)NE.
MODELKODIFICERING	**Vigtig information:** Kontrollér venligst din varmepumpetype i henhold til modelnavnet, hvordan den forkortes, og hvilken reference den har i denne vejledning. Denne bruger- og monteringsvejledning gælder kun RASM-(V)NE-udendørsenheder.
CODERING VAN DE MODELLEN	**Belangrijke opmerking:** Controleer aan de hand van de modelnaam welk type warmtepomp u heeft, hoe de naam wordt afgekort en hoe ernaar wordt verwezen in deze instructiehandleiding. Deze Installatie- en bedieningshandleiding heeft alleen betrekking op buitenunits RASM-(V)NE.
MODELLER	**Viktigt!** Kontrollera med modellnamnet vilken typ av värmepump du har, hur den förkortas och hur den anges i den här handboken. Denna handbok för installation och användning gäller endast för utomhusenheter RASM-(V)NE.
ΚΩΔΙΚΟΠΟΙΗΣΗ ΜΟΝΤΕΛΩΝ	**Σημαντική σημείωση:** Ελέγξτε, σύμφωνα με το όνομα μοντέλου, τον τύπο της δικής σας αντλίας θέρμανσης και με ποια σύντμηση δηλώνεται και αναφέρεται σε αυτό το εγχειρίδιο. Αυτό το εγχειρίδιο εγκατάστασης και λειτουργίας αφορά μόνο τις Εξωτερικές Μονάδες RASM-(V)NE.

MONOBLOC AIR TO WATER HEAT PUMP MODELS		
(☀) (▦) (🔥) (🚿) (▤) (❄)		
1~ 230V 50Hz		3N~ 400V 50Hz
Unit	Unit	Unit
RASM-3VNE	-	-
-	RASM-4VNE	RASM-4NE
-	RASM-5VNE	RASM-5NE
-	RASM-6VNE	RASM-6NE
		

NOTE

Icons between brackets mean possible extra operations to the factory-supplied operations. For cooling operation, refer to the Cooling kit accessory for YUTAKI M units.

NOTA

Los iconos entre paréntesis representan posibles operaciones adicionales con respecto a las operaciones suministradas de fábrica. Para el funcionamiento en enfriamiento, consulte el accesorio de kit de enfriamiento para unidades YUTAKI M.

HINWEIS

Die Symbole in Klammern stellen mögliche zusätzliche Betrieben in Bezug auf die gelieferten Fabrikbetrieb. Für den Kühlbetrieb, beziehen Sie sich auf das Cooling Kit Zubehör für YUTAKI M-Einheiten.

REMARQUE

Les icônes entre parenthèses représentent des opérations supplémentaires possibles en ce qui concerne les opérations fourni. Pour l'opération de refroidissement, reportez-vous à l'accessoire de kit de refroidissement pour les unités YUTAKI M.

NOTA

Icone in parentesi rappresentano possibili operazioni aggiuntive rispetto alle operazioni in dotazione di fabbrica. Per il funzionamento di raffreddamento, fare riferimento al kit di raffreddamento accessorio per unità YUTAKI M.

NOTA

Ícones entre parênteses representam possíveis operações adicionais no que diz respeito às operações fornecidas de fábrica. Para a operação de arrefecimento, consulte o kit de acessório de arrefecimento para unidades YUTAKI M.

BEMÆRK

Ikoner i parentes repræsenterer eventuelle yderligere operationer i forhold til de medfølgende fabrikken operationer. Para a operação de refrigeração, consulte o resfriamento acessório de kit para unidades YUTAKI M.

OPMERKING

Pictogrammen tussen haakjes betekenen mogelijk extra behandelingen om de fabriek geleverde operaties. Voor koeling, wordt verwezen naar de accessoire kit voor koeling voor YUTAKI M units.

OBS!

Ikoner inom parentes betyder eventuella extra operationer till fabrikslevererad verksamhet. För kyldrift, se Cooling sats tillbehör till YUTAKI M-enheter.

ΣΗΜΕΙΩΣΗ

Εικόνες στις παρενθέσεις αντιπροσωπεύουν πιθανές πρόσθετες λειτουργίες σε σχέση με τις παρεχόμενες εργασίες του εργοστασίου. Για τη λειτουργία ψύξης, ανατρέξτε στο Ψύξη εξάρτημα κιτ για τις μονάδες YUTAKI M.

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6 INSTALLATIE VAN DE UNIT
7 KOUDEMIDDEL- EN WATERLEIDINGEN
8 AFVOERLEIDING
9 ELEKTRISCHE EN BESTURINGSINSTELLINGEN
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EN	English	Original version
ES	Español	Versión traducida
DE	Deutsch	Übersetzte Version
FR	Français	Version traduite
IT	Italiano	Versione tradotta
PT	Português	Versão traduzidal
DA	Dansk	Oversat version
NL	Nederlands	Vertaalde versie
SV	Svenska	Översatt version
EL	Ελληνικα	Μεταφρασμένη έκδοση

1 GENERAL INFORMATION

No part of this publication may be reproduced, copied, filed or transmitted in any shape or form without the permission of Johnson Controls-Hitachi Air Conditioning Spain, S.A.U.

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2 SAFETY

2.1 APPLIED SYMBOLS

During normal heat pump system design work or unit installation, greater attention must be paid in certain situations requiring particular care in order to avoid injuries an damage to the unit, the installation or the building or property.

Situations that jeopardise the safety of those in the surrounding area or that put the unit itself a risk will be clearly indicated in this manual.

To indicate these situations, a series of special symbols will be used to clearly identify these situations.

Pay close attention to these symbols and to the messages following them, as your safety and that of others depends on it.

⚠ DANGER

- ***The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.***
- ***Not taking these instructions into account could lead to serious, very serious or even fatal injuries to you and others in the proximities of the unit.***

In the text following the danger symbol you can also find information on safe procedures during unit installation.

⚠ CAUTION

- *The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.*
- *Not taking these instructions into account could lead to minor injuries to you and others in the proximities of the unit.*
- *Not taking these instructions into account could lead to unit damage.*

In the text following the caution symbol you can also find information on safe procedures during unit installation.

NOTE

- *The text following this symbol contains information or instructions that may be of use or that require a more thorough explanation.*
- *Instructions regarding inspections to be made on unit parts or systems may also be included.*

2.2 ADDITIONAL INFORMATION ABOUT SAFETY

⚠ DANGER

- ***DO NOT CONNECT THE POWER SUPPLY TO THE UNIT PRIOR TO FILLING THE SPACE HEATING CIRCUIT (AND DHW CIRCUIT IF IT WERE THE CASE) WITH WATER AND CHECKING WATER PRESSURE AND THE TOTAL ABSENCE OF ANY WATER LEAKAGE.***
- ***Do not pour water over the unit electrical parts. If the electrical components are in contact with water a serious electrical shock will take place.***
- ***Do not touch or adjust the safety devices inside the air to water heat pump. If these devices are touched or adjusted, a serious accident can take place.***
- ***Do not open the service cover or access inside the air to water heat pump without disconnecting the main power supply.***
- ***In case of fire Turn OFF the main switch, put out the fire at once and contact your service contractor.***
- ***It must ensure that the air to water heat pump cannot operate accidentally without water neither with air inside hydraulic system.***

⚠ CAUTION

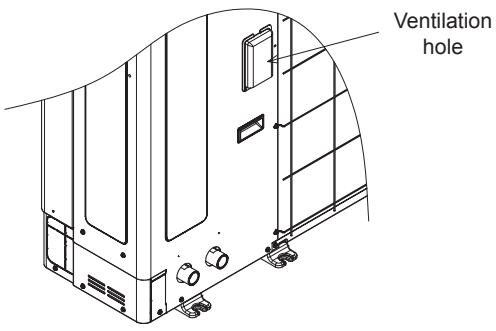
- *Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately one meter from the system.*
- *If installation circuit breaker or the unit fuse is often activated, stop the system and contact your service contractor.*
- *Do not make service or inspections tasks by yourself. This work must be performed by a qualified service person.*
- *This appliance must be used only by adult and capable people, having received the technical information or instructions to handle this appliance properly and safely.*
- *Children should be supervised to ensure that they do not play with the appliance.*
- *Do not let any foreign body into the water inlet and outlet piping of the air to water heat pump.*

2.3 IMPORTANT NOTICE

- The supplementary information about the purchased products is supplied in a CD-ROM, which can be found bundled with the unit. In case that the CD-ROM is missing or it is not readable, please contact your HITACHI dealer or distributor.
- **PLEASE READ THE MANUAL AND THE FILES ON THE CD-ROM CAREFULLY BEFORE STARTING TO WORK ON THE INSTALLATION OF THE AIR TO WATER HEAT PUMP SYSTEM.** Failure to observe the instructions for installation, use and operation described in this documentation may result in operating failure including potentially serious faults, or even the destruction of the air to water heat pump system.
- Verify, in accordance with the manuals which appear in the unit, that all the information required for the correct installation of the system is included. If this is not the case, contact your distributor.
- HITACHI pursues a policy of continuous improvement in product design and performance. The right is therefore reserved to vary specifications without notice.
- HITACHI cannot anticipate every possible circumstance that might involve a potential hazard.
- This air to water heat pump has been designed for standard water heating for human beings only. Do not use this for other purposes such as for drying clothes, heating foods or for any other heating process (except swimming pool).
- No part of this manual may be reproduced without written permission.
- If you have any questions, contact your service contractor of HITACHI.
- Check and make sure that the explanations of each part of this manual correspond to your air to water heat pump model.
- Refer to the models codification to confirm the main characteristics of your system.
- Signal words (NOTE, DANGER and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided in initial pages of this document.
- The operation modes of these units are controlled by the unit controller.
- This manual should be considered as a permanent part of the air to water heat pump. It gives a common description of and information for this air to water heat pump which you operate as well as for other models.
- Keep the water temperature of the system above the freezing temperature.

⚠ CAUTION

Do not pass cables through the ventilation hole.



⚠ DANGER

Pressure Vessel and Safety Device: This heat pump is equipped with a high pressure vessel under PED (Pressure Equipment Directive). The pressure vessel has been designed and tested before shipment according to PED. Also, in order to prevent the system from an abnormal pressure, a high pressure switch, which needs no field adjustment, is utilized in the refrigeration system. Therefore, this heat pump is protected from abnormal pressures. However, if abnormally high pressure is applied to the refrigeration cycle including the high pressure vessel(s), it will result in serious injury or death due to explosion of the pressure vessel. Do not apply a pressure higher than the following pressure to the system, by modifying or changing the high pressure switch.

⚠ CAUTION

This unit is designed for commercial and light industrial application. If installed in house hold appliance, it could cause electromagnetic interference.

Start-up and Operation: *Check to ensure that all the stop valves are fully opened and no obstacle exists at the inlet/outlet sides before start-up and during the operation.*

Maintenance: *Periodically check the high pressure side pressure. If the pressure is higher than the maximum allowable pressure, stop the system and clean the heat exchanger or remove the cause.*

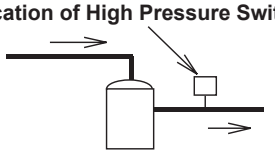
Maximum Allowable Pressure and High Pressure Cut-out Value:

Refrigerant	Maximum Allowable Pressure (MPa)	High Pressure Switch Cut-out Value (MPa)
R410A	4.15	4.00 ~ 4.10

NOTE

The label for the vessel under PED are attached on the high pressure vessel. The pressure vessel capacity and vessel category are indicated on the vessel.

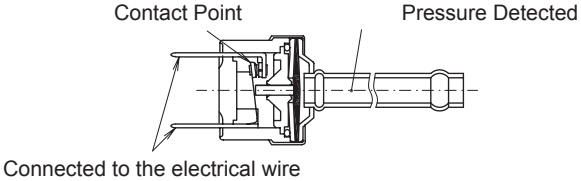
Location of High Pressure Switch



NOTE

The high pressure switch is indicated on the electrical wiring diagram in the outdoor unit as PSH connected to printed circuit board (PCB1) in the outdoor unit

Structure of High Pressure Switch



⚠ DANGER

- ***Do not change the high-pressure switch locally or change the high pressure cut-out set value locally. If changed, it will cause serious injury or death due to explosion.***
- ***Do not attempt to turn service valve rod beyond its stop.***

3 TRANSPORTATION AND HANDLING

When hanging the unit, ensure a balance of the unit, check safety and lift it up smoothly

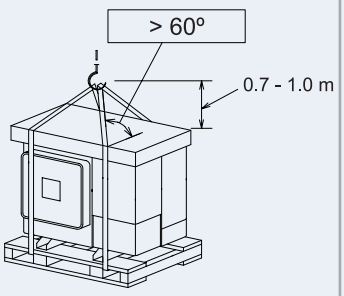
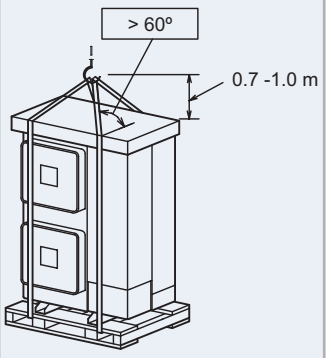
Do not remove any packing materials.

Hang the unit under packing condition with two ropes.

For safety reasons ensure that the outdoor unit is lifted smoothly and does not lean

Model	Gross Weight (kg)
RASM-3VNE	105
RASM-4VNE	151
RASM-5VNE	153
RASM-6VNE	153

Model	Gross Weight (kg)
RASM-4NE	150
RASM-5NE	152
RASM-6NE	152

RASM-3VNE	RASM-(4-6)(V)NE
	

4 BEFORE OPERATION

⚠ CAUTION

- *Supply electrical power to the system for approximately 12 hours before start-up or a long shut-off. Do not start the system immediately after power supply, it may cause a compressor failure because the compressor is not heated well.*
- *When the system is started after a shut-off longer that approximately 3 months, it is recommended to check the system by your service contractor.*
- *Turn OFF the main switch when the system is to be stopped for a long period of time: If the main switch is not turned OFF, electricity will be used, because the oil heater is always energised during compressor stopping.*
- *Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it by using hot water (approximately 50°C). If the water temperature is higher that 50 °C, it will cause damage to plastic parts.*

4.1 FACTORY-SUPPLIED UNIT COMPONENTS

Accessory	Image	Qty.	Purpose
Gasket		4	Two gaskets for each space heating connections (inlet/outlet)
CD-ROM		1	With the detailed Installation and operation manual
Instruction manual		1	Basic instructions for the installation of the device.
Declaration of conformity	-	1	-

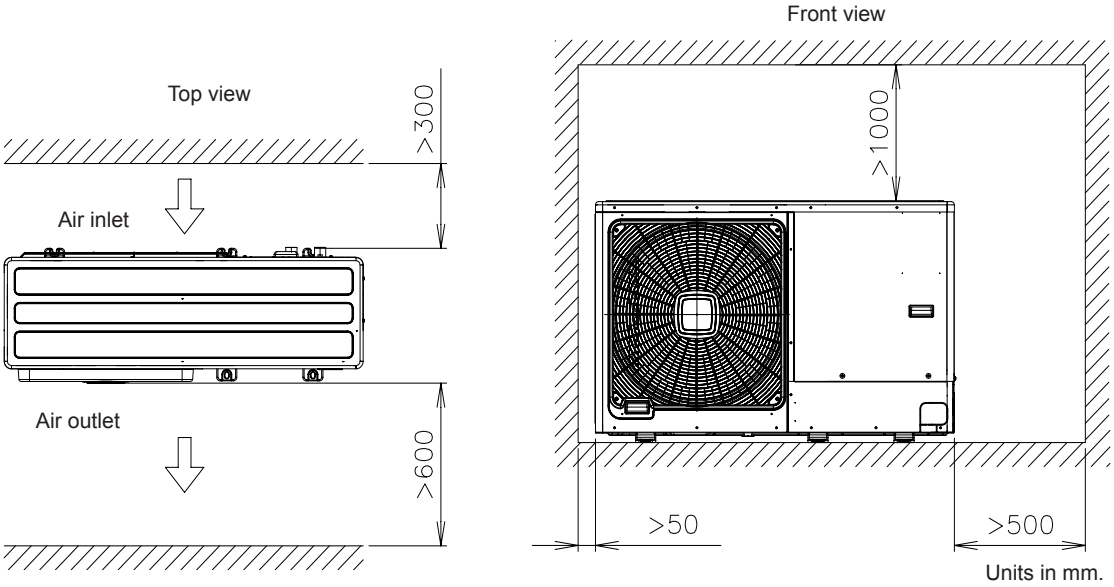
NOTE

- *The previous accessories are supplied inside the unit.*
- *If some of these accessories are not packed with the unit or any damage to the unit is detected, please contact your dealer.*

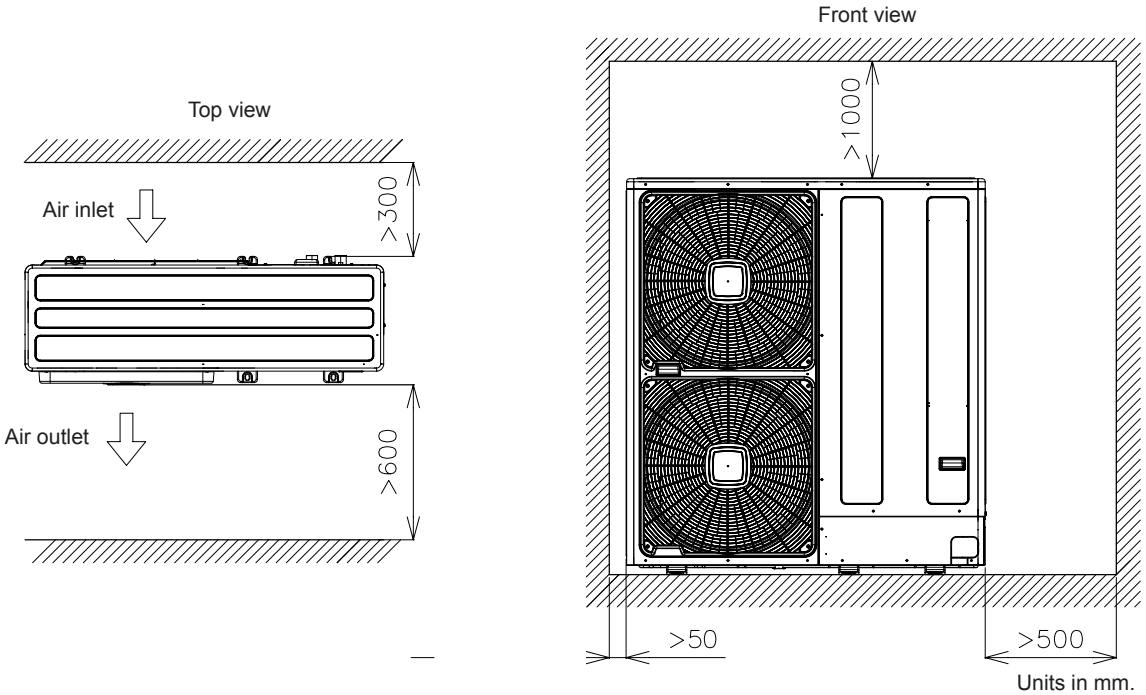
5 GENERAL DIMENSIONS

5.1 SERVICE SPACE

RASM-3VNE

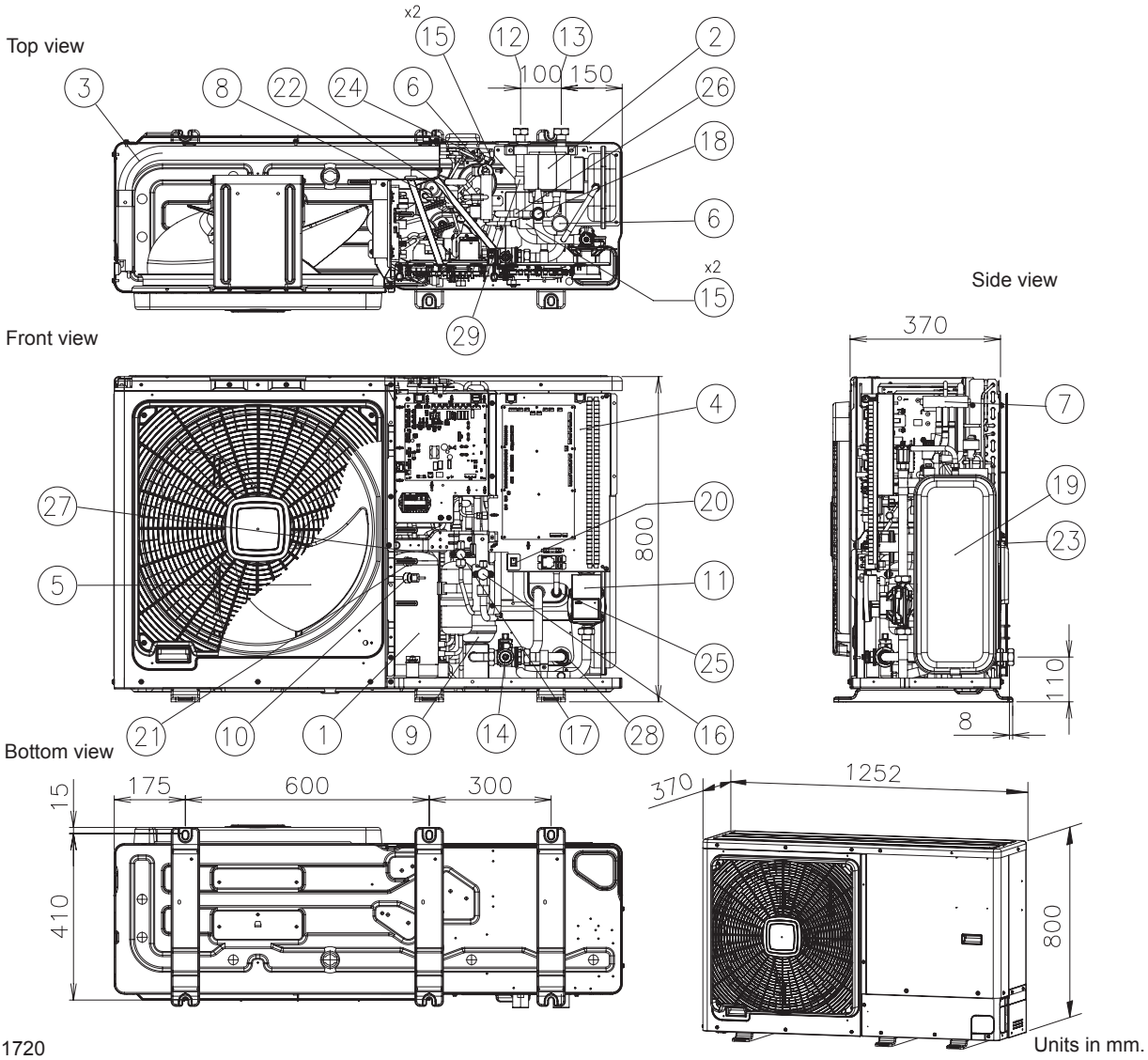


RASM-(4-6)(V)NE



5.2 NAME OF PARTS AND DIMENSIONAL DATA

RASM-3VNE

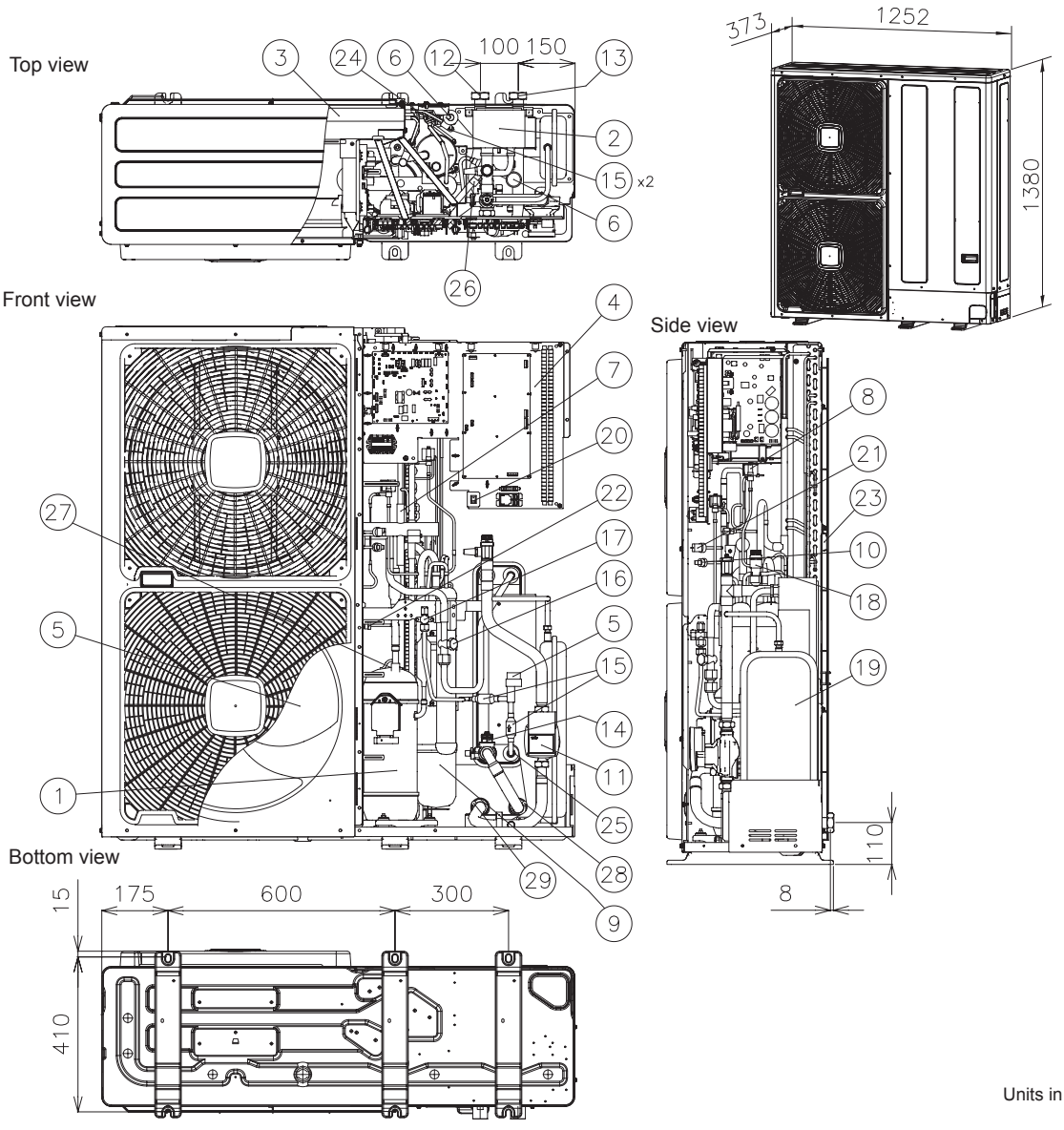


XEKS 1720

Units in mm.

Number	Part name	Number	Part name
1	Compressor	15	Refrigerant strainer (x4)
2	Water side heat exchanger	16	Stop valve for gas line - Ø15.88 (5/8”)
3	Air side heat exchanger	17	Stop valve for liquid line - Ø9.52 (3/8”)
4	Electrical box	18	Safety valve
5	Fan (x1)	19	Expansion vessel 6L
6	Expansion valve (x2)	20	Switch for DHW “emergency” operation
7	Reversing valve	21	Sensor for refrigerant pressure
8	Solenoid valve	22	Pressure switch for control (Pd)
9	Accumulator	23	Ambient thermistor
10	High pressure switch (PSH)	24	Evaporating temperature thermistor
11	Water pump	25	Refrigerant liquid pipe thermistor
12	Water outlet - G 1”	26	Refrigerant gas pipe thermistor
13	Water inlet - G 1”	27	Compressor discharge thermistor
14	Water strainer	28	Water inlet thermistor
		29	Water outlet thermistor

RASM-(4-6)(V)NE



XEKS 1721

Units in mm.

Number	Part name	Number	Part name
1	Compressor	15	Refrigerant strainer (x4)
2	Water side heat exchanger	16	Stop valve for gas line - Ø25.4 (1”)
3	Air side heat exchanger	17	Stop valve for liquid line - Ø9.52 (3/8”)
4	Electrical box	18	Safety valve
5	Fan (x2)	19	Expansion vessel 6L
6	Expansion valve (x2)	20	Switch for DHW “emergency” operation
7	Reversing valve	21	Sensor for refrigerant pressure
8	Solenoid valve	22	Pressure switch for control (Pd)
9	Accumulator	23	Ambient thermistor
10	High pressure switch (PSH)	24	Evaporating temperature thermistor
11	Water pump	25	Refrigerant liquid pipe thermistor
12	Water outlet - G 1 1/4”	26	Refrigerant gas pipe thermistor
13	Water inlet - G 1 1/4”	27	Compressor discharge thermistor
14	Water strainer	28	Water inlet thermistor
		29	Water outlet thermistor

6 UNIT INSTALLATION

⚠ CAUTION

- *Transport the products as close to the installation location as possible before unpacking.*
- *Do not put any material on the products.*

⚠ DANGER

- *Install the unit with sufficient clearance around it for operation and maintenance as shown in the next figures. Install the unit where good ventilation is available*
- *Do not install the unit where there is a high level of oil mist, salty air or sulphurous atmosphere.*
- *Install the unit as far as practical (being at least 3 meters) from electromagnetic wave radiator (such as medical equipment).*
- *For cleaning, use noninflammable and nontoxic cleaning liquid. Use of inflammable agent should cause explosion or fire.*
- *Work with sufficient ventilation, for working in an enclosed space should cause oxygen deficiency. Toxic gas should be produced when cleaning agent is heated to high temperature by, e.g., being exposed to fire.*
- *Install the unit in a location where noise emitted by the unit does not disturb neighbours.*
- *Cleaning liquid shall be collected after cleaning.*
- *Pay attention not to clamp cables when attaching the service cover to avoid electric shock or fire.*

⚠ CAUTION

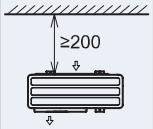
- *When installing more than one units together, keep clearance between the units of more than 500 mm, and avoid obstacles that should hamper air intake.*
- *Install the unit in the shade or not exposed to direct sunshine or direct radiation from high temperature heat source.*
- *Do not install the unit in a space where a seasonal wind directly blows to the Outdoor fan.*
- *Make sure that the foundation is flat, level and sufficiently strong.*
- *This unit has aluminium fins with sharp edges. Pay attention to the fins to avoid injury. Install the unit in a restricted area not accessible by the general public*

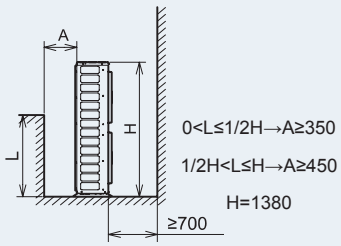
6.1 INSTALLATION SPACE

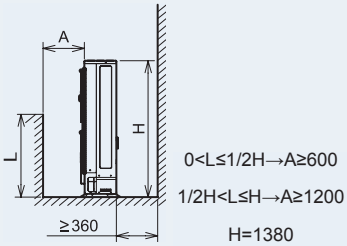
(Unit: mm)

Single installation

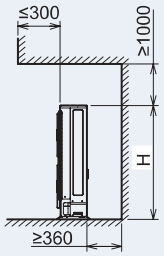
Around sides are open

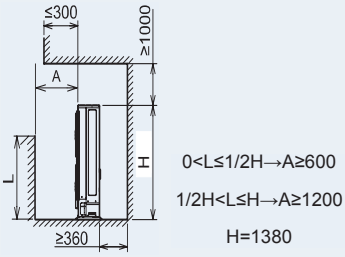




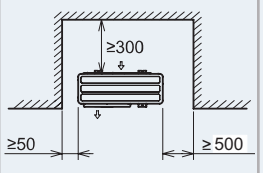


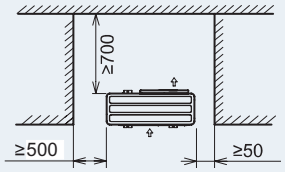
Around sides are open with obstacles above

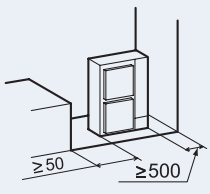


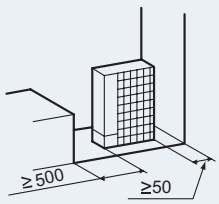


Around sides are closed

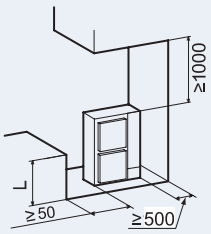


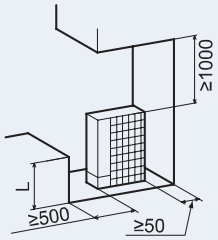




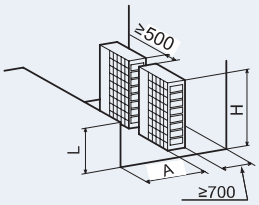
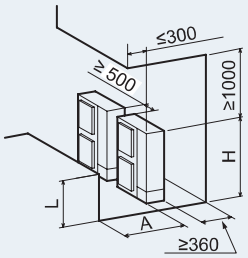


Around sides are open with obstacles above





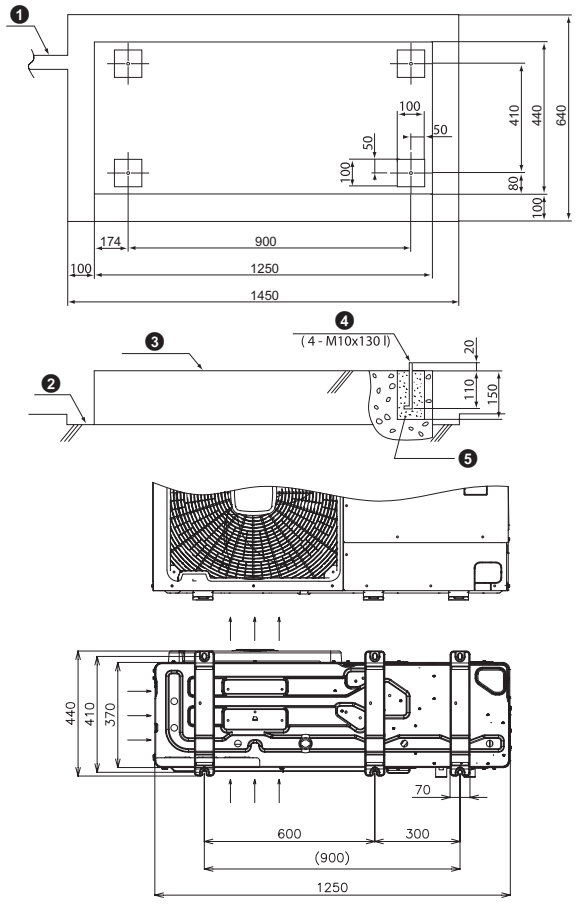
(Unit: mm)

Around sides are open	Around sides are open with obstacles above
 0<L≤1/2H→A≥350 1/2H<L≤H→A≥450 H=1380	 0<L≤1/2H→A≥600 1/2H<L≤H→A≥1200 H=1380

6.2 PLACE PROVISION

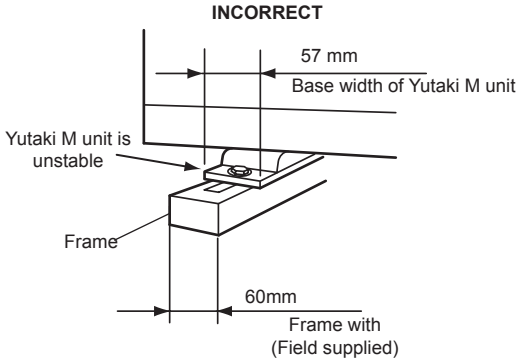
◆ Concrete foundation

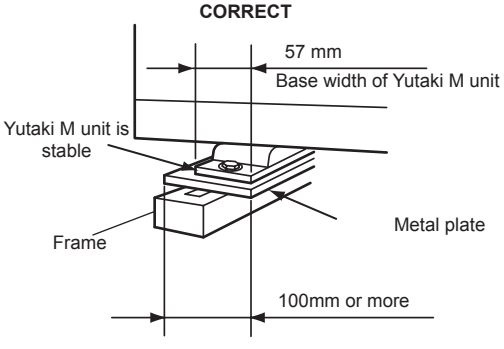
- Foundation shall be on a level surface and it is recommended to be 100-300 mm higher than ground level.
- Use M10 anchor bolts to fix the unit to the foundation. (Foundation bolts, nuts and washers are not included, and must be field supplied).
- Drain water might turn into ice on cold weather areas. Therefore, when installing the unit on a roof or a veranda, avoid the draining on a public area since it may become slippery.



Nº	Description
1	Drain water
2	Drain water place
3	Concrete base
4	Foundation bolt
5	Mortar charge

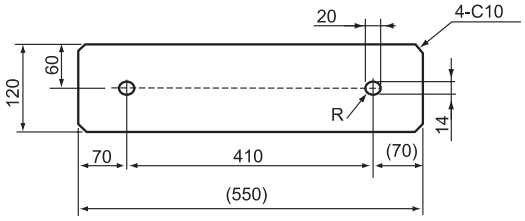
- The whole of the base of the Yutaki M unit should be installed on a foundation. When using vibration-proof mat, it should also be positioned the same way. When installing the Yutaki M unit on a fieldsupplied frame, use metal plates to adjust the frame width for stable installation as shown in below figure.





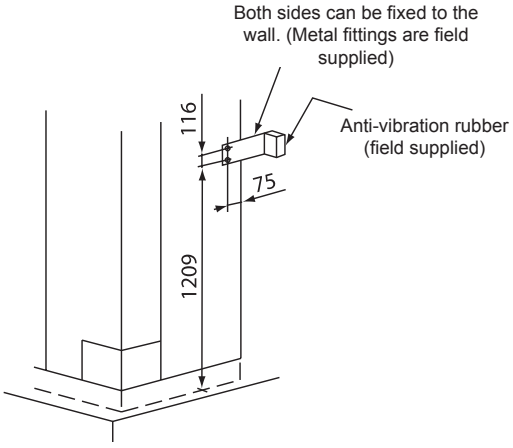
Recommended Metal Plate Size

- (Field-Supplied) Material: Hot-Rolled Mild Steel
- Plate (SPHC) Plate Thickness: 4.5 T



- The foundation drawing shown previously is an example.
- The unit is low-vibration model, but consider using some floor reinforcement or anti-vibration mat/rubber when vibration should occur due to weakness of attached surface.
- The foundation shall be unified with the floor slab. If not, calculate the vibration proof of the installation of Yutaki M Unit as well as of the Yutaki M Unit with the foundation in order to ensure strength against a fall or for when the unit has to be moved.
- Drain water and rainwater are discharged from the bottom of the unit when in operation as well as when stopped.
- Choose a location with good drainage or place a water drain as in the drawing.
- Make the foundation flat and waterproof, as a water pool may appear in case of, for instance, rain.
- This is a low-profile product with a shallow depth. It may also be able to fix on the wall as shown below when fixing only with the foundation bolt does not seem sufficiently stable depending on the conditions of the installation. (Metal fittings must be field supplied).

◆ Fix unit to the wall



1 Fix the unit onto the wall as indicated in the figure. (Stay field supplied)

2 The foundation shall be strong enough to avoid any deformation and vibration.

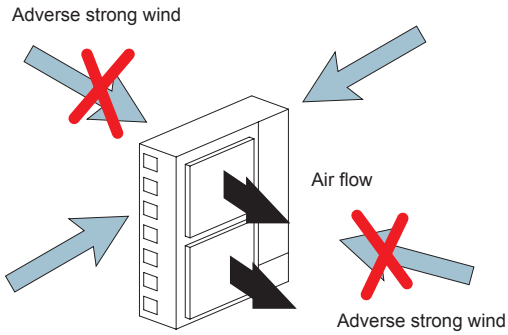
3 In order to prevent vibration transfer to the building, place rubber material between the stay and the wall.

⚠ CAUTION

Pay attention to the following for installation:

- *Installation shall ensure that unit will not incline, vibrate, make noise or fall down by a blast of wind or in an earthquake. Calculate quake-resistance strength to ensure that installation is strong enough against falling. Fix the unit with wires (field supplied) when installing in a location without walls or windbreak and likely exposed to a blast of wind.*
- *Apply vibration-proof material where necessary.*

◆ Installing location where the unit will be exposed to strong wind



Strong winds against the unit's air outlet causes short circuits and these can be the consequences:

- Lack of air flow and adversely affect to normal function.
- Frequent frost acceleration.
- Fan can rotating very fast until it breaks.

Follow the instructions below to install on a rooftop or a location without surrounding buildings, where strong wind is expected against the unit.

1 Choose a location where the outlet or inlet side of the product will not be exposed to strong wind.

2 In case the fulfillment of point 1 is not possible, it is recommended to use the optional parts.

⚠ CAUTION

Excessive strong wind against the unit outlet may cause inverse rotation and damage the fan motor.

7 REFRIGERANT AND WATER PIPING

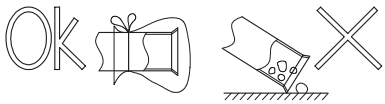
7.1 GENERAL NOTES BEFORE PERFORMING PIPING WORK

- Prepare locally-supplied copper pipes.
- Select the piping size with the correct thickness and correct material able to withstand sufficient pressure.
- Select clean copper pipes. Make sure that there is no dust or moisture inside the pipes. Blow the inside of the pipes with oxygen free nitrogen to remove any dust and foreign materials before connecting them.

NOTE

A system with no moisture or oil contamination will give maximum performance and lifecycle compared to that of a poorly prepared system. Take particular care to ensure that all copper piping is clean and dry internally.

- Cap the end of the pipe when pipe is to be inserted through a wall hole.
- Do not put pipes on the ground directly without a cap or vinyl tape at the end of the pipe.



- If piping installation is not completed until next day or over a longer period of time, braze off the ends of the piping and charge with oxygen free nitrogen through a Schrader valve type access fitting to prevent moisture and particle contamination.
- It is advisable to insulate the water pipes, joints and connections in order to avoid heat loss and dew condensation on the surface of the pipes or accidental injures due to excessive heat on piping surfaces.
- Do not use insulation material that contains NH3, as it can damage copper pipe material and become a source of future leakage.
- It is recommended to use flexible joints for the water piping inlet and outlet in order to avoid vibration transmission.
- Water circuit must be performed and inspected by a licensed technician and must comply with all relevant European and national regulations.
- Proper water pipe inspection should be performed after piping work to assure there is no water leakage in the space heating circuit.

7.2 REFRIGERANT CIRCUIT

7.2.1 Refrigerant charge

The R410A refrigerant is factory charged in the outdoor unit.

7.2.2 Precautions in the event of gas refrigerant leaks

The installers and those responsible for drafting the specifications are obliged to comply with local safety codes and regulations in the case of refrigerant leakage.

⚠ CAUTION

- *Check for refrigerant leakage in detail. If a large refrigerant leakage occurred, it would cause difficulty with breathing or harmful gases would occur if a fire were in the room.*
- *If the flare nut is tightened too hard, it may crack over time and cause refrigerant leakage.*

◆ Maximum permitted concentration of HFCs

The refrigerant R410A (charged in the outdoor unit) is an incombustible and non-toxic gas. However, if leakage occurs and gas fills a room, it may cause suffocation.

The maximum permissible concentration of HFC gas according to EN378-1 is:

Refrigerant	Maximum permissible concentration (kg/m³)
R410A	0.44

8 DRAIN PIPING

8.1 WATER DRAIN DISCHARGE CONNECTION (ACCESSORY)

When the base of the unit is temporarily used as a drain receiver or the drain water in it is discharged, this drain boss is used to connect the drain piping.

Model	Applicable Model
DBS-26	RASM-(3-6)(V)NE

◆ Connecting procedure

1 Insert the rubber cap into the drain boss up to the extruded portions

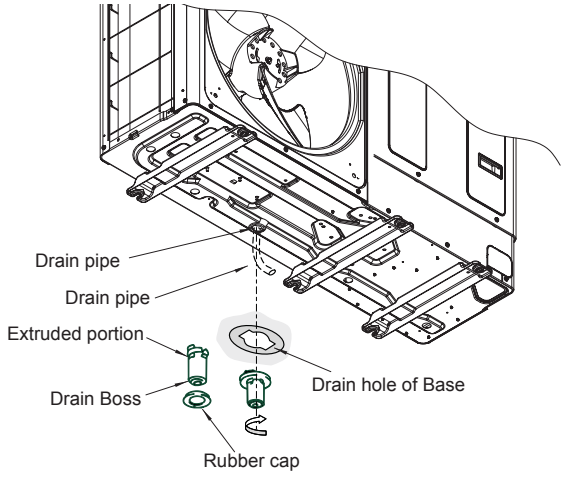
2 Insert the boss into the unit base and turn approximately 40 degree counter-clockwise.

3 Size of the drain boss is 32 mm (O.D.)

4 A drain pipe should be field-supplied

NOTE

Do not use this drain boss set in a cold area because the drain water should freeze. This drain boss is not sufficient to collect all the drain water. If collecting drain water is completely required, provide a drain-pan that is bigger than the unit base and install it under the unit with drainage.

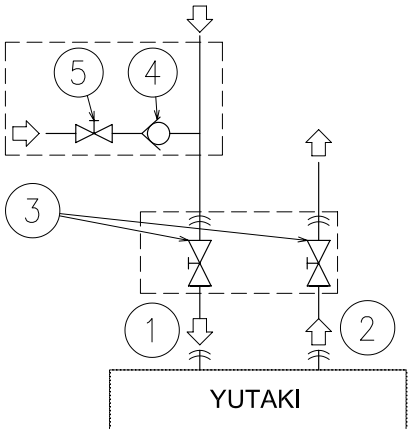


8.2 SPACE HEATING AND DHW

DANGER

Do not connect the power supply to the unit prior to filling the space heating circuit (and DHW circuit if it were the case) with water and checking water pressure and the total absence of any water leakage.

8.2.1 Additional hydraulic necessary elements for space heating

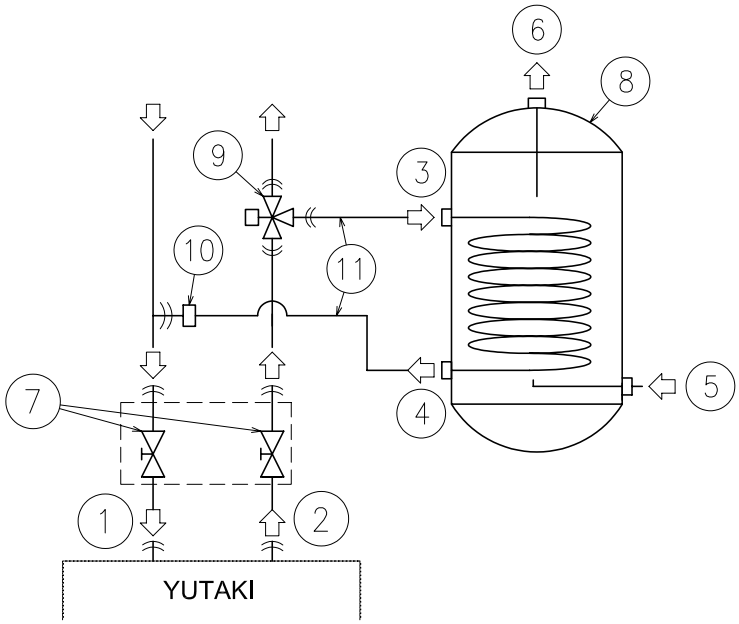


Nature	Nº	Part name
Piping connections	1	Water inlet (Space heating)
	2	Water outlet (Space heating)
Field supplied	3	Shut-off valve (field supplied)
Accessories	4	Water check valve (ATW-WCV-01 accessory)
Field supplied	5	Shut-off valve

The following hydraulic elements are necessary to correctly perform the space heating water circuit:

- **Two shut-off valves (field supplied accessory)** (3) must be installed in the unit. One at the water inlet connection (1) and the other at the water outlet connection (2) in order to make easier any maintenance work.
- **A water check valve (ATW-WCV-01 accessory)** (5) with 1 shut-off valve (field supplied) (4) must be connected to the water filling point when filling the unit. The check valve acts as a safety device to protect the installation against back pressure, back flow and back syphon of non-potable water into drinking water supply net.

8.2.2 Additional hydraulic necessary elements for DHW

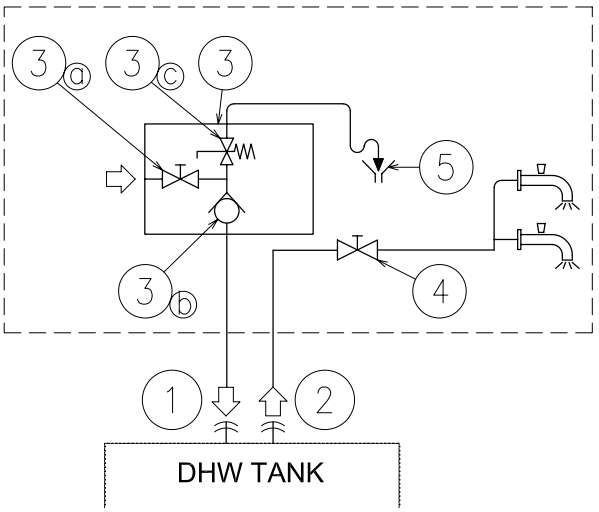


Nature	Nº	Part name
Piping connections	1	Water inlet (Space heating)
	2	Water outlet (Space heating)
	3	Heating coil inlet
	4	Heating coil outlet
	5	Water inlet (DHW)
	6	Water outlet (DHW)
Field supplied	7	Shut-off valve (field supplied)
Accessories	8	Domestic hot water tank (DHWT-(200/300)S-3.0H2E accessory)
	9	3-way valve (ATW-3WV-01 accessory)
Field supplied	10	T-branch
	11	Heating coil pipes

YUTAKI M is not factory-supplied ready for DHW operation, but it can be used for the production of DHW if the following elements are installed:

- **A domestic hot water tank (DHWT-(200/260)S-3.0H2E accessory)** (8) has to be installed in combination with the unit.
- **A 3-way valve (ATW-3WV-01 accessory)** (9) must be connected at one point of the water outlet pipe of the installation.
- **A T-branch (field supplied)** (10) must be connected at one point of the water inlet pipe of the installation.
- **Two water pipes (field supplied)** (11). One pipe between 3-way valve and the heating coil inlet (3) of the DHW tank, the other one between the T-branch and the heating coil outlet (4) of the DHW tank.

Additionally, the following elements are required for the DHW circuit:



Nature	Nº	Part name	
Piping connections	1	Water inlet (DHW)	
	2	Water outlet (DHW)	
Field supplied	3	Pressure and temperature relief valve	
		3a	Shut-off valve
		3b	Water check valve
		3c	Pressure relief valve
	4	Shut-off valve	
	5	Draining	

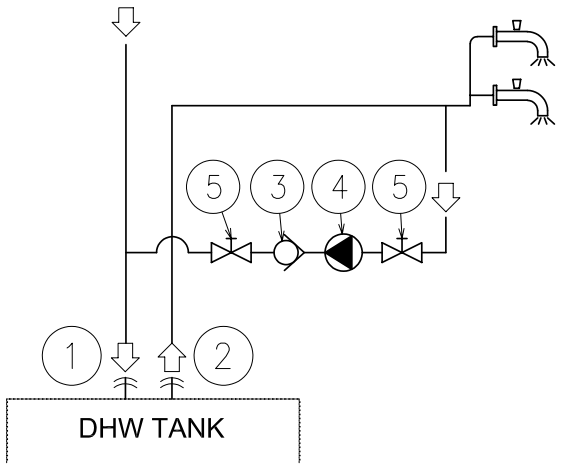
- **1 Shut-off valve (field supplied)**: one shut-off valve (4) must be connected after the DHW outlet connection of the DHW tank (2) in order to make easier any maintenance work.
- **A Security water valve (Field-supplied)**: this accessory (3) is a pressure and temperature relief valve that must be installed as near as possible to the DHW inlet connection of the DHW tank (1). It should ensure a correct draining (5) for the discharge valve of this valve. This security water valve should provide the following:
  - Pressure protection
  - Non-return function
  - Shut-off valve
  - Filling
  - Draining

NOTE

The discharge pipe should always be open to the atmosphere, free of frost and in continuous slope to the down side in case that water leakage exists.

8.2.3 Additional hydraulic optional elements (For DHW)

In case of a recirculation circuit for the DHW circuit:



Nature	Nº	Part name
Piping connections	1	Water inlet (DHW)
	2	Water outlet (DHW)
Accessories	3	Water check valve (ATW-WCV-01 accessory)
Field supplied	4	Water pump
	5	Shut-down valve

- **1 Recirculation water pump (field supplied):** this water pump (3) will help to correctly recirculate the hot water to the DHW inlet.
- **1 Water check valve (ATW-WCV-01 accessory):** this HITACHI accessory (3) is connected after the recirculation water pump (4) in order to ensure the non-return of water.
- **2 Shut-down valves (field supplied) (5):** one before the recirculation water pump (4) and other after the water check valve accessory (3)

8.2.4 Requirements and recommendations for the hydraulic circuit

- The maximum piping length depends on the maximum pressure availability in the water outlet pipe. Please check the pump curves.
- The unit is equipped with an air purger (factory supplied) at the highest location of the unit. If this location is not the highest of the water installation, air might be trapped inside the water pipes, which could cause system malfunction. In that case additional air purgers (field supplied) should be installed to ensure no air enters the water circuit.
- For heating floor system, the air should be purged by means of an external pump and an open circuit to avoid air bags.
- When the unit is stopped during shut-off periods and the ambient temperature is very low, the water inside the pipes and the circulating pump may freeze, thus damaging the pipes and the water pump. In these cases, the installer shall ensure that the water temperature inside the pipes does not fall below the freezing point. In order to prevent this, the unit has a self-protection mechanism which should be activated (refer to the Service manual, *"Optional functions"* chapter).
- Additionally, in cases where water drainage is difficult, an anti freeze mixture of glycol (ethylene or propylene) should be used (content between 10% to 40%). The performance of the unit working with glycol may decrease in proportion to the percentage of glycol used, since the density of glycol is higher than that of the water.
- Check that the water pump of the space heating circuit works within the pump operating range and that the water flow is over the pump's minimum. If the water flow is below 12 litres/minute (6 litres/minute for 3.0HP unit), alarm is displayed on the unit.
- An additional special water filter is highly recommended to be installed on the space heating (field installation), in order to remove possible particles remaining from brazing which cannot be removed by the unit water strainer.
- When selecting a tank for DHW operation, take into consideration the following points:
  - The storage capacity of the tank has to meet with the daily consumption in order to avoid stagnation of water.
  - Fresh water must circulate inside the DHW tank water circuit at least one time per day during the first days after the installation has been performed. Additionally, flush the system with fresh water when there is no consumption of DHW during long periods of time.
  - Try to avoid long runs of water piping between the tank and the DHW installation in order to decrease possible temperature losses.
  - If the domestic cold water entry pressure is higher than the equipment's design pressure (6 bar), a pressure reducer must be fitted with a nominal value of 7 bar.
- When necessary, put insulation on the pipes in order to avoid heat losses.
- Whenever possible, sluice valves should be installed for water piping, in order to minimize flow resistance and to maintain sufficient water flow.
- Ensure that the installation complies with applicable legislation in terms of piping connection and materials, hygienic measures, testing and the possible required use of some specific components like thermostatic mixing valves, Differential pressure overflow valve, etc.
- The maximum water pressure is 3 bar (nominal opening pressure of the safety valve). Provide adequate reduction pressure device in the water circuit to ensure that the maximum pressure is NOT exceeded.
- Ensure that the drain pipes connected to the safety valve and to the air purger are properly driven to avoid water being in contact with unit components.
- Make sure that all field supplied components installed in the piping circuit can withstand the water pressure and the water temperature range in which the unit can operate.
- YUTAKI units are conceived for exclusive use in a closed water circuit.
- The internal air pressure of the expansion vessel tank will be adapted to the water volume of the final installation (factory supplied with 0.1 MPa of internal air pressure).
- Do not add any type of glycol to the water circuit.
- Drain taps must be provided at all low points of the installation to permit complete drainage of the circuit during servicing.

8.2.5 Water filling

1 Check that a water check valve (ATW-WCV-01 accessory) with a shut-off valve (field supplied) is connected to the water filling point (water inlet connection) for filling the space heating hydraulic circuit (see *"8.2 Space heating and DHW"*).

2 Make sure all the valves are open (water inlet/outlet shut-off valves and the rest of valves of the space heating installation components).

3 Ensure that the air purgers of the unit and installation are open (turn the unit air purger twice at least).

4 Check that the drain pipes connected to the safety valve (and to the drain pan in case of installing the "Cooling kit" accessory) are correctly connected to the general draining system. The safety valve is later used as an air purging device during the water filling procedure.

5 Fill the space heating circuit with water until the pressure displayed on the manometer reaches approximately 1.8 bar.

NOTE

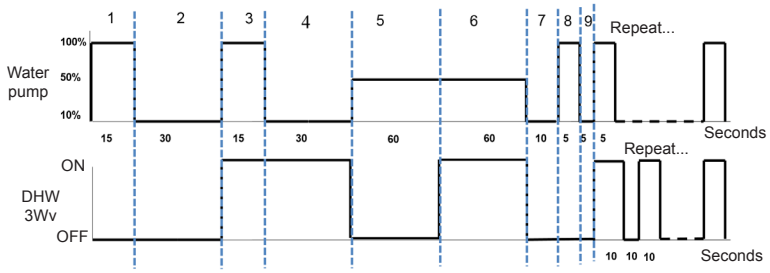
While the system is being filled with water, it is highly recommended to operate the safety valve manually so as to help with the air purging procedure.

6 Remove as much air from inside the water circuit as possible through the air purger and other air vents in the installation (fan coils, radiators...).

7 Start the air purge procedure test. There are two modes (Manual or Automatic) which helps in case of installations with heating and DHW operation:

a. Manual: Start and stop the unit manually using the unit controller (Run/Stop button) and also using the DSW4 pin 2 of the PCB1 (ON: Forced to derive to DHW coil; OFF: Forced to derive to space heating).

b. Automatic: Select the air purge function using the user controller. When the automatic air purge function is running, the pump speed and the position of the 3-way valve (space heating or DHW) are automatically changed:



8 If a little quantity of air is still remaining in the water circuit, it will be removed by the automatic air purger of the unit during the first hours of operation. Once the air in the installation has been removed, a reduction of water pressure in the circuit is very likely to occur. Therefore, additional water should be filled until water pressure returns to an approximate level of 1.8 bar.

NOTE

- *The unit is equipped with an automatic air purger (factory supplied) at the highest location of the unit. Anyway, if there are higher points in the water installation, air might be trapped inside water pipes, which could cause system malfunction. In that case, additional air purgers (field supplied) should be installed to ensure no air enters into the water circuit. The air vents should be located at points which are easily accessible for servicing.*
- *The water pressure indicated on the unit manometer may vary depending on the water temperature (the higher temperature, the higher pressure). Nevertheless, it must remain above 1 bar in order to prevent air from entering the circuit.*
- *Fill in the circuit with tap water. The water in the heating installation must comply with EN directive 98/83 EC. Non-sanitary controlled water is not recommended (for example, water from wells, rivers, lakes, etc.) (See "Water quality" section at the CD-ROM).*
- *The maximum water pressure is 3 bar (nominal opening pressure of the safety valve). Provide adequate reduction pressure device in the water circuit to ensure that the maximum pressure is NOT exceeded.*
- *For heating floor system, air should be purged by means of an external pump and an open circuit to prevent the formation of air pockets.*
- *Check carefully for leaks in the water circuit, connections and circuit elements.*

8.3 MINIMUM WATER VOLUME DESCRIPTION

The following part shows how to calculate the minimum water volume in the system for product protection (anti-hunting) and temperature drop at defrosting.

1 Protective water volume for product

Ensure that the water volume is equal or greater than those shown below, in order to lower ON/OFF frequency of Yutaki M unit at no load or extreme light load. When water volume is less than the volume indicated (minimum water volume), compressor operation frequently stops at light load, which should result in shorter life or failure.

NOTE

The factory default ON/OFF temperature differential is "4 °C". Note that the minimum water volume varies for different setting for each purpose as shown in the next table:

(Unit: ltrs.)

	Model			
ON/OFF Temperature differential	RASM-3VNE	RASM-4(V)NE	RASM-5(V)NE	RASM-6(V)NE
4ºC	28	38	46	56
3ºC	36	48	58	70
2ºC	50	65	80	96
1ºC	80	107	130	156

2 Minimum required water volume during defrosting

- The following formula is used to make the calculation:

Where:

$$V = \frac{360 \times Q_{DEF}}{\Delta T \times 4168.8};\ Q_{DEF} = Q_I + Q_Y$$

V = Required water volume (m^3)

The minimum volume of water needed in the installation to cover the heat loss caused by a reduction in the delivery water temperature during defrosting.

ΔT = Permissible water temperature drop (ºC)

Drop in the delivery water temperature that the client is willing to allow in the installation.

Q_{DEF} = Heat loss during defrosting (kW)

Heat loss caused in the system by reducing the delivery water temperature, which may affect the user's comfort level of warmth. This value is the sum of the two following items:

Q_I = Heat demand from the installation (kW)

While defrosting is taking place, the unit is not providing the heat required to cover the heat demand from the installation. This value can be obtained in 2 ways:

1. By using the value of the energy demand from the installation, if known.
2. If this value is not known, it can be estimated by using the heating capacity of the unit at an air temperature of 0ºC WB and a delivery water temperature at, for example, 45ºC.

Q_Y = Cooling load on the YUTAKI M unit (kW)

In addition to not providing the heat required to cover the heat demanded by the installation during defrosting, the unit is also producing cold. It can be estimated that this value is approximately 85% of the heating capacity on the unit under standard conditions (air temperature: 6/7ºC (WB/DB) and input/output temperature of the water: 40 / 45 ºC)

NOTE

The maximum time for defrosting considered is 6 minutes per hour.

The following table shows the minimum water volume needed in each YUTAKI M unit in case of a permitted drop in temperature of 10ºC.

(Unit: ltrs.)

	Model			
Water temperature drop	RASM-3VNE	RASM-4(V)NE	RASM-5(V)NE	RASM-6(V)NE
5ºC	212	276	342	410
10ºC	106	138	171	205
15ºC	71	92	114	137
20ºC	53	69	86	103
25ºC	42	55	68	82

NOTE

- *The values shown on the table are based on theoretical installation conditions. In addition, Yutaki M unit admits several hydraulic circuits configurations (as shown in the Manual of the system controller), and the value can be different depending on each specific installation.*
- *Therefore, it rests with the client to recalculate these values depending on the real conditions of the installation.*

8.4 WATER CONTROL

It is necessary to analyse the quality of water by checking pH, electrical conductivity, ammonia ion content, sulphur content, and others. The following is the recommended standard water quality.

Item	Chilled Water System		Tendency (1)	
	Circulating Water (20 C Less than)	Supply Water	Corrosion	Deposits of Scales
Standard Quality pH (25 °C)	6.8 ~ 8.0	6.8 ~ 8.0	●	●
Electrical Conductivity (mS/m) (25 °C) {μS/cm} (25 °C) (2)	Less than 40 Less than 400	Less than 30 Less than 300	●	●
Chlorine Ion (mg Cl^-/l)	Less than 50	Less than 50	●	
Sulphur Acid Ion (mg SO_4^{2-}/l)	Less than 50	Less than 50	●	
The Amount of Acid Consumption (pH 4.8) (mg $CaCO_3$/l)	Less than 50	Less than 50		●
Total Hardness (mg $CaCO_3$ /l)	Less than 70	Less than 70		●
Calcium Hardness (mg $CaCO_3$ /l)	Less than 50	Less than 50		●
Silica L (mg SIO_2 /l)	Less than 30	Less than 30		●
Reference Quality Total Iron (mg Fe/l)	Less than 1.0	Less than 0.3	●	●
Total Copper (mg Cu/l)	Less than 1.0	Less than 0.1	●	
Sulphur Ion (mg S^{2-}/l)	It shall not be detected.		●	
Ammonium Ion (mg NH_4^+/l)	Less than 1.0	Less than 0.1	●	
Remaining Chlorine (mg Cl/l)	Less than 0.3	Less than 0.3	●	
Floating Carbonic Acid (mg CO_2/l)	Less than 4.0	Less than 4.0	●	
Index of Stability	6.8 ~ 8.0	-	●	●

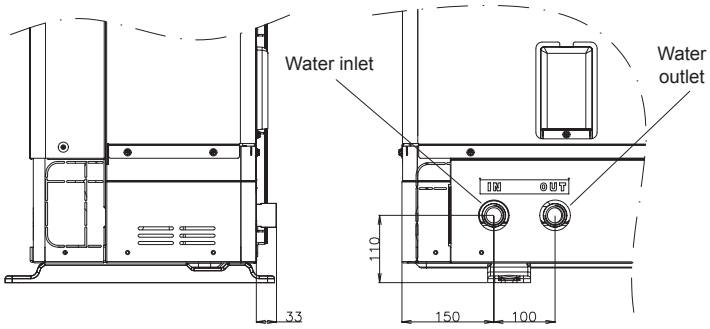
NOTE

- *(1) The mark "● " in the table means the factor concerned with the tendency of corrosion or deposits of scales.*
- *(2) The value showed in "{}" are for reference only according to the former unit.*

8.5 WATER PIPING CONNECTION

◆ Piping location and connection size

The unit is factory supplied with two unions to be connected to the water inlet/outlet pipe. Refer to the next figure detailing the location of the water pipes location, dimensions and connection sizes.



Description	Connection size
Water Inlet	Rp1"
Water Outlet	Rp1"

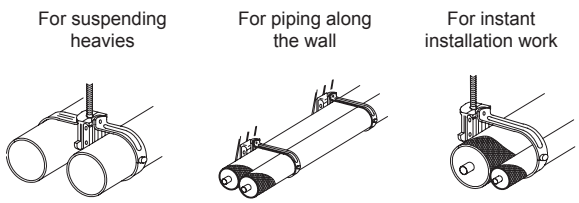
8.6 SUSPENSION OF WATER PIPING

Suspend the refrigerant and water piping at certain points and prevent the refrigerant and water piping from being in direct contact with the building: walls, ceilings, etc…

If there is direct contact between pipes, abnormal sound may occur due to the vibration of the piping. Pay special attention in cases of short piping lengths.

Do not fix the refrigerant and water pipes directly with the metal fittings (refrigerant piping may expand and contract).

Some examples for suspension method are shown below.



9 ELECTRICAL AND CONTROL SETTINGS

9.1 GENERAL CHECK

- Make sure that the following conditions related to power supply installation are satisfied:
  - The power capacity of the electrical installation is large enough to support the power demand of the YUTAKI system (outdoor unit + DHW tank (if apply)).
  - The power supply voltage is within ±10% of the rated voltage.
  - The impedance of the power supply line is low enough to avoid any voltage drop of more than 15% of the rated voltage.
- Following the Council Directive 2004/108/EC, relating to electromagnetic compatibility, the table below indicates the Maximum permitted system impedance Z_{max} at the interface point of the user's supply, in accordance with EN61000-3-11.

Model	Power supply	Operation mode	Z_{max} (Ω)
RASM-3VNE	1~ 230V 50Hz	-	0.35
		With DHW tank heater	0.22
RASM-4VNE		-	0.24
		With DHW tank heater	0.17
RASM-5VNE		-	0.24
		With DHW tank heater	0.17
RASM-6VNE		-	0.24
		With DHW tank heater	0.17
RASM-4NE	3N~ 400V 50Hz	-	-
		With DHW tank heater	0.31
RASM-5NE		-	-
		With DHW tank heater	0.31
RASM-6NE		-	-
		With DHW tank heater	0.30

NOTE

The data corresponding to DHW tank heater is calculated in combination with the domestic hot water tank accessory "DHWT-(200/300)S-3.0H2E".

- The status of Harmonics for each model, regarding compliance with IEC 61000-3-2 and IEC 61000-3-12, is as follows:

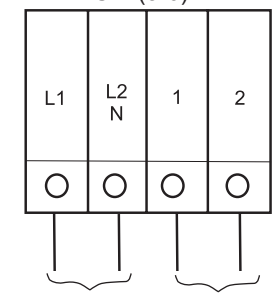
Status regarding compliance with IEC 61000-3-2 and IEC 61000-3-12	Models
Equipment complying with IEC 61000-3-2 (*): Professional use	RASM-3VNE RASM-4VNE RASM-5VNE RASM-6VNE
Equipment complying with IEC 61000-3-12	-
Installation restrictions may be applied by supply authorities in relation to harmonics	-

- Check to ensure that existing installation (mains power switches, circuit breakers, wires, connectors and wire terminals) already complies with the national and local regulations.
- The use of the DHW tank heater is disabled as factory setting. If it is desired to enable the DHW tank heater operation during normal unit operation, adjust the DSW4 pin 3 of the PCB1 to the ON position and use the adequate protections.

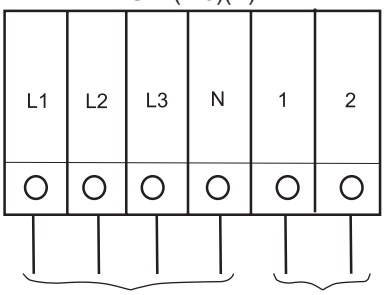
9.2 ELECTRICAL WIRING CONNECTION FOR OUTDOOR UNITS

◆ **The electrical wiring connection for the outdoor unit is shown in figure below**

RASM-(3-6)VNE



RASM-(4-6)(V)NE



9.2.1 Power and transmission wiring connection

◆ **Safety instructions**

NOTE

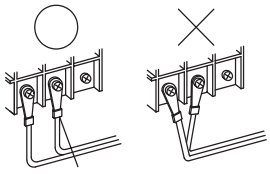
Check the requirements and recommendations in the chapter "9 ELECTRICAL AND CONTROL SETTINGS"

DANGER

- ***Do not connect the power supply to the unit prior to filling the space heating circuit (and DHW circuit if it were the case) with water and checking water pressure and the total absence of any water leakage.***
- ***Do not connect or adjust any wiring or connections unless the main power switch is OFF.***
- ***When using more than one power source, check and ensure that all of them are turned OFF before operating the unit.***
- ***Avoid wiring installation in contact with the refrigerant pipes, water pipes, edges of plates and electrical components inside the unit to prevent damage, which may cause electric shock or short circuit.***

CAUTION

- *Use a dedicated power circuit for the unit. Do not use a power circuit shared with the outdoor unit or any other appliance.*
- *Make sure that all wiring and protection devices are properly selected, connected, identified and fixed to the corresponding terminals of the unit, specially the protection (earth) and power wiring, taking into account the applicable national and local regulations. Establish proper earthing; Incomplete earthing may cause electrical shock.*
- *Protect the unit against the entry of small animals (like rodents) which could damage the drain pipe and any internal wire or any other electrical part, leading to electric shock or short-circuit.*
- *Keep a distance between each wiring terminal and attach insulation tape or sleeve as shown in the figure.*



9.3 WIRING SIZE AND MINIMUM REQUIREMENTS OF THE PROTECTION DEVICES

⚠ CAUTION

- *Check to ensure that the field supplied electrical components (mains power switches, circuit breakers, wires, connectors and wire terminals) have been properly selected according to the electrical data indicated on this chapter and they comply with national and local codes. If it is necessary, contact with your local authority in regards to standards, rules, regulations, etc.*
- *Use a dedicated power circuit for the unit. Do not use a power circuit shared with the outdoor unit or any other appliance.*

Use wires which are not lighter than the polychloroprene sheathed flexible cord (code designation 60245 IEC 57).

Model	Power supply	Operation mode	Max. current (A)	Power supply cables	Transmitting cables	CB (A)	ELB (nº of poles/A/mA)
				EN60335-1	EN60335-1		
RASM-3VNE	1~ 230V 50Hz	-	22	2 x 6.0 mm² + GND	2 x 0.75 mm²	25	2/40/30
		With DHW tank heater	34	2 x 10.0 mm² + GND		40	
RASM-4VNE		-	31	2 x 6.0 mm² + GND		32	
		With DHW tank heater	43	2 x 10.0 mm² + GND		50	2/63/30
RASM-5VNE		-	31	2 x 6.0 mm² + GND		32	2/40/30
		With DHW tank heater	43	2 x 10.0 mm² + GND		50	2/63/30
RASM-6VNE		-	31	2 x 6.0 mm² + GND		32	2/40/30
		With DHW tank heater	43	2 x 10.0 mm² + GND		50	2/63/30
RASM-4NE	3N~ 400V 50Hz	-	14	4 x 4.0 mm² + GND		20	4/40/30
		With DHW tank heater	27	4 x 6.0 mm² + GND		30	
RASM-5NE		-	14	4 x 4.0 mm² + GND		20	
		With DHW tank heater	27	4 x 6.0 mm² + GND		30	
RASM-6NE		-	16	4 x 6.0 mm² + GND		20	
		With DHW tank heater	29	4 x 10.0 mm² + GND		40	

NOTE

The data corresponding to DHW tank heater is calculated in combination with the domestic hot water tank accessory "DHWT-(200/300)S-3.0H2E".

⚠ CAUTION

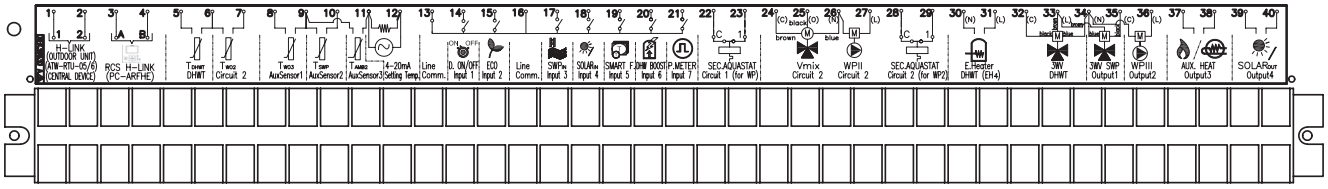
- *Ensure specifically that there is an Earth Leakage Breaker (ELB) installed for the units (outdoor unit).*
- *If the installation is already equipped with an Earth Leakage Breaker (ELB), ensure that its rated current is large enough to hold the current of the units (outdoor unit).*

NOTE

- *Electric fuses can be used instead of magnetic Circuit Breakers (CB). In that case, select fuses with similar rated values as the CB.*
- *The Earth Leakage Breaker (ELB) mentioned on this manual is also commonly known as Residual Current Device (RCD) or Residual Current Circuit Breaker (RCCB).*
- *The Circuit Breakers (CB) are also known as Thermal-Magnetic Circuit Breakers or just Magnetic Circuit Breakers (MCB).*

9.4 OPTIONAL UNIT WIRING (ACCESSORIES)

◆ Summary of the terminal board connections



Mark	Part name	Description
	TERMINAL BOARD 2 (TB2)	
1	H-LINK commutation	The H-LINK transmission has to be done between the unit and the terminals 1-2 of either outdoor unit, ATW-RTU-05 or any other central device.
2		
3	H-LINK communication for remote control switch	Terminals for the connection of the YUTAKI unit controller.
4		
5	DHW tank's thermistor	The DHW sensor is used to control the temperature of the domestic hot water tank.
6	Common thermistor	Common terminal for thermistor.
7	Thermistor for water outlet temperature of second cycle	The sensor is used for the second temperature control and should be positioned after the mixing valve and the circulation pump.
8	Thermistor for water outlet temperature after hydraulic separator	Water sensor for hydraulic separator, buffer tank or boiler combination.
9	Common thermistor	Common terminal for thermistors.
10	Thermistor for swimming pool water temperature	The sensor is used for the swimming pool temperature control and should be positioned inside plate heat exchanger of the swimming pool.
11	Thermistor for second ambient temperature	The sensor is used for the second ambient temperature control and it should be positioned outdoors.
11	4-20 mA application	It is possible to connect an external controller to the connector CN5 to provide a manual water temperature setting. The input current (4-20 mA) will be transformed into voltage by means of a grounded 240 Ω resistor (ATW-MAK-01 accessory) connected to these terminals. The DSW5 pin 3 must be in ON position and the SSW1 has to be in Local mode (Enabled manual operation) to enable this function.
12		
13	Common line	Terminal Line common for input 1 and input 2.
14	Input 1 (Demand ON/OFF) (*)	The air to water heat pump system has been designed to allow the connection of a remote thermostat to effectively control your home's temperature. Depending on the room temperature, the thermostat will turn the split air to water heat pump system ON and OFF.
15	Input 2 (ECO mode) (*)	Available signal which allows to reduce the water setting temperature of circuit 1, circuit 2 or both.
16	Common line	Terminal Line common for inputs 3, 4, 5, 6, 7.
17	Input 3 (Swimming pool) (*)	Only for swimming pool installations: It is necessary to connect an external input to the air to water heat pump to provide signal when the water pump of swimming pool is ON.
18	Input 4 (Solar) (*)	Available input for Solar combination with Domestic Hot Water Tank.
19	Input 5 (Smart function) (*)	For the connection of an external tariff switch device to switch OFF the heat pump during peak electricity demand period. Depending on the setting, the heat pump or DHWT will be blocked when signal is open/closed.
20	Input 6 (DHW boost) (*)	Available input for an instantaneous heating of the domestic hot water of the tank.
21	Input 7 (Power meter)	The measuring of the real power consumption can be done connecting an external power meter. The number of pulses of the power meter is a variable which must be set. By this, every pulse input is added into corresponding operation mode (Heating, Cooling, DHW Operation). Two possible options: - One power meter for all installation (IU+OU). - Two separated power meters (one for IU and one for OU).
22	Aquastat security for circuit 1 (WP1)	Terminals intended for the connection of the Aquastat security accessory (ATW-AQT-01) for controlling water temperature of the circuit 1.
23		
24(C)	Mixing valve close	When a mixing system is required for a second temperature control, these outputs are necessary to control the mixing valve.
25(O)	Mixing valve open	
26(N)	N Common	

Mark	Part name	Description
27(L)	Water Pump 2 (WP2)	When there is a second temperature application, a secondary pump is the circulating pump for the secondary heating circuit.
28 29	Aquastat security for circuit 2 (WP2)	Terminals intended for the connection of the Aquastat security accessory (ATW-AQT-01) for controlling water temperature of the circuit 2.
30(N) 31(L)	Electrical Heater DHW Output	If DHW tank contains an electric heater, the air to water heat pump can activate it if the heat pump cannot achieve the required DHW temperature by itself.
32(C)	Common line	Common terminal for the 3-way valve for DHW tank.
33(L)	3-way valve for DHW tank	The air to water heat pump can be used to heat DHW. This output will be on when DHW is activated.
34(N)	N common	Neutral terminal common for 3-way valve of DHW tank and outputs 1 and 2.
35(L)	Output 1 (3-way valve for swimming pool) (*)	The air to water heat pump can be use to heat swimming pool. This output will be ON when swimming pool is activated.
36(L)	Output 2 (Water pump 3 (WP3)) (*)	When there is a hydraulic separator or buffer tank, additional water pump (WP3) is needed.
37 38	Output 3 (Auxiliary boiler or electric heater) (*)	The boiler can be used to alternate with the heat pump when the heat pump cannot achieve the required temperature by itself. A water electric heater (as accessory) can be used to provide the additional heating required on the coldest days of the year.
39 40	Output 4 (Solar) (*)	Output for solar combination with Domestic Hot Water Tank.

NOTE

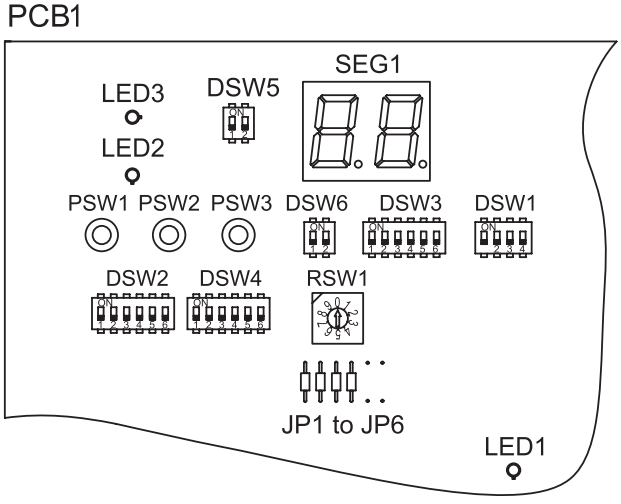
(*): Inputs and outputs explained in the table are the factory-set options. By means of the unit controller, some other inputs and outputs functions can be configured and used. Please, refer to the Service Manual for detailed information.

9.5 SETTING OF DIP SWITCHES AND RSW SWITCHES

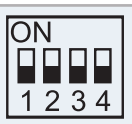
9.5.1 Setting of DIP Switches for IPM-PCB

9.5.2 Setting of DIP Switches for PCB1

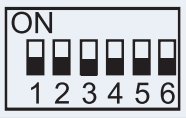
◆ Quantity and Position of DIP Switches



◆ DSW1: For Test Run

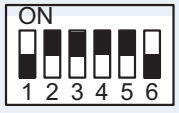
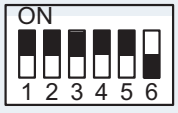
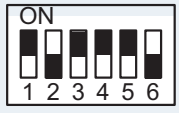
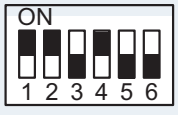
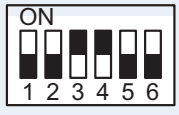
Factory setting	

◆ DSW2

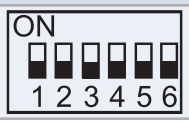
Factory setting	

◆ DSW3: Capacity

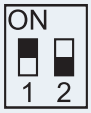
Factory setting

RASM-3VNE		
		
RASM-4VNE	**RASM-5VNE**	**RASM-6VNE**
		
RASM-4NE	**RASM-5NE**	**RASM-6NE**
		

◆ DSW4 / RSW1

DSW4		RSW1
Factory setting		

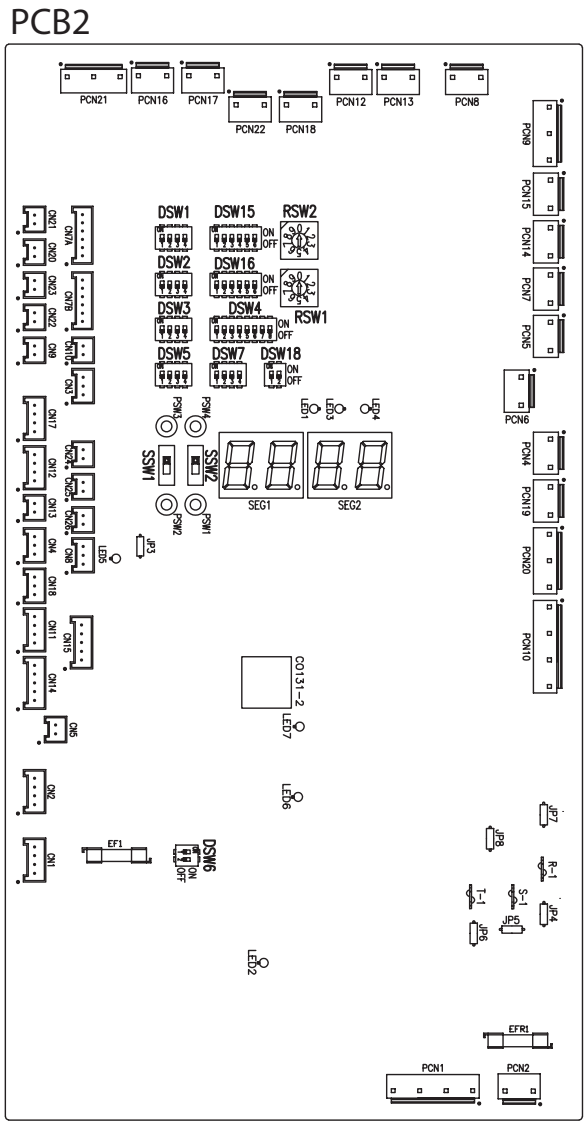
◆ DSW5

Factory setting	

◆ DSW6

Factory setting	

9.5.3 Location of DIP switches and rotary switches



◆ Function of DIP switches and rotary switches

NOTE

- *The mark "■" indicates the dip switches positions.*
- *No mark "■" indicates pin position is not affected.*
- *The figures show the settings before shipment or after selection.*
- *"Not used" means that the pin must not be changed. A malfunction might occur if changed.*

CAUTION

Before setting dip switches, first turn the power supply OFF and then set the position of dip switches. If the switches are set without turning the power supply OFF, the contents of the setting are invalid.

◆ DSW1: Additional setting 0

Factory setting. No setting is required.

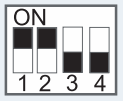
Factory setting	

NOTE

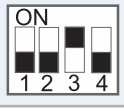
In case of installing the "Cooling kit" accessory, set the pin 4 of DSW1 to ON in order to enable the cooling operation.

◆ DSW2: Unit capacity setting

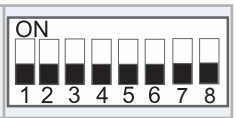
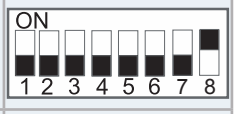
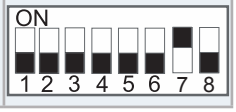
No setting is required.

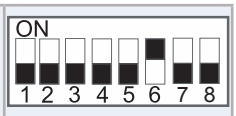
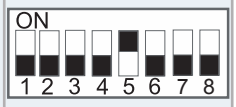
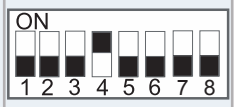
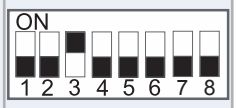
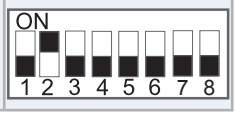
3.0 HP	4.0 HP
	
5.0 HP	**6.0 HP**
	

◆ DSW3: Additional setting 1

Factory setting	
1-step heater for 3-phase unit	

◆ DSW4: Additional setting 2

Factory setting	
DHW defrost	
Heater forced OFF	

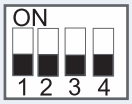
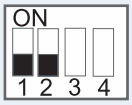
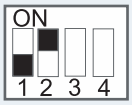
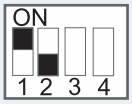
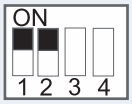
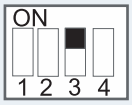
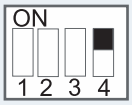
Unit and installation pipes antifreeze protection	
Standard / ECO water pump operation	
Electric heater or boiler emergency mode	
DHW tank's heater operation	
DHW 3-way valve forced ON	

⚠ CAUTION

- *Never turn all DSW4 dip switch pins ON. If this happens, the software of the unit will be removed.*
- *Never activate "Heater Forced OFF" and "Electric heater or boiler emergency mode" at the same time.*

◆ DSW5: Additional setting 3

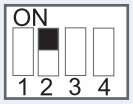
In the cases where the outdoor unit is installed into a location where its own outdoor ambient temperature sensor can not give a suitable temperature measurement to the system, it is available the 2nd outdoor ambient temperature sensor as accessory. By means of DSW1&2 setting, the preferable sensor for each circuit can be selected.

Factory setting	
Outdoor unit sensor for circuits 1 and 2.	
Outdoor unit sensor for circuit 1; Auxiliary sensor for circuit 2.	
Auxiliary sensor for circuit 1; Outdoor unit sensor for circuit 2.	
Auxiliary sensor instead of outdoor unit sensor for both circuits.	
4-20 mA setting temperature (Only manual operation)	
Use the maximum temperature value between Two3 (boiler / heater thermistor) and Two (water outlet thermistor) for water control	

◆ DSW6: Not used

Factory setting (Do not change)	

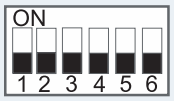
◆ DSW7: Additional setting 4

Factory setting	
Defrost for the water electric heater	

◆ DSW18: Not used

Factory setting (Do not change)	

◆ DSW15 & RSW2/ DSW16 & RSW1: Not used

Factory setting (Do not change)		

◆ SSW1: Remote/Local

Factory setting (Remote operation)	
Local operation	

◆ SSW2: Heat/Cool

Factory setting (Heat operation)	
Cool and Heat operation in case of Local	

9.5.4 LED indication

Name	Colour	Indication
LED1	Green	Power indication
LED2	Red	Power indication
LED3	Red	Heat pump operation (thermo ON/OFF)
LED4	Yellow	Alarm (flickering with 1 sec interval)
LED5	Green	Not used
LED6	Yellow	H-Link transmission
LED7	Yellow	H-Link transmission for unit controller

10 COMMISSIONING

10.1 BEFORE OPERATION

⚠ CAUTION

- *Supply electrical power to the system for approximately 12 hours before start-up after a long shut-off. Do not start the system immediately after power supply, it may cause compressor failure because the compressor is not well-heated.*
- *When the system is started after a shut-off longer than approximately 3 months, it is recommended that the system be checked by your service contractor.*
- *Turn OFF the main switch when the system is to be stopped for a long period of time: as the oil heater is always energized even when the compressor is not working, there will be electricity consumption unless the main switch is turned OFF.*

10.2 PRELIMINARY CHECK

When installation is complete, perform commissioning according to the following procedure, and hand over the system to the customer. Perform the commissioning of the units methodically, and check that the electrical wiring and the piping are correctly connected.

YUTAKI M units must be configured by the installer to get the perfect setting and the unit working.

10.2.1 Checking the unit

- Check external appearance of the unit to look for any damage due to transportation or installation.
- Check that all the covers are totally closed.
- Check that the recommended service space is respected (see *"5.1 Service space"*).
- Check that the unit has been correctly installed.

10.2.2 Electrical checking

⚠ CAUTION

Do not operate the system until all the check points have been cleared:

- *Check to ensure that the electrical resistance is more than 1 MΩ, by measuring the resistance between ground and electrical parts terminal. If not, do not operate the system until the electrical leakage is found and repaired. Do not impress the voltage on the terminals for transmission and sensors .*
- *Check to ensure that the switch on the main power source has been ON for more than 12 hours, in order to give the oil heater time to warm the compressor.*
- *In three-phase unit check phase sequence connection on terminal board.*
- *Check the power supply voltage (±10% of the rated voltage).*
- *Check that field-supplied electrical components (main switches, breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical specifications given in this document, and check that the components comply with national and local standards.*
- *Do not touch any electrical components for more than three minutes after turning OFF the main switch*
- *Check the dip switch settings of the unit are connected as shown in the corresponding chapter.*
- *Check to ensure the electrical wiring of the unit is connected as shown in the chapter.*
- *Check to ensure the external wiring is correctly fixed. To avoid problems with vibrations, noises and cut out wires with the plates.*

10.2.3 Hydraulic circuit checking (space heating and DHW)

- Check that the circuit has been properly flushed and filled with water and that the installation has been drained: the pressure of the heating circuit must be 1.8 bar
- Check for any leakage in water cycle. Pay special attention to the water piping connections.
- Make sure the system's internal water volume is correct.
- Check that the hydraulic circuit's valves are fully open.
- Check to see that electrical heater is completely filled with water by operating pressure of safety valve.
- Check to see that additional water pumps (WP2 or/and WP3) are correctly connected to terminal board.

⚠ CAUTION

- *Operating the system with closed valves will damage the unit.*
- *Check to see that air purge valve is open and that the hydraulic circuit is air purged. The installer is responsible of completely air purging the installation.*
- *Check that the water pump of the space heating circuit works within the pump operating range and that the water flow is over the pump's minimum. If the water flow is under 12 litres/minute (6 litres/minute for 3.0HP unit) (with flow switch tolerance), alarm will be displayed on the unit.*
- *Remember that water connection must be accordance with local regulations.*
- *Water quality must comply with EU directive 98/83 EC.*
- *Electrical heater operation when not completely filled with water will damage the heater.*

10.2.4 Checking the refrigerant circuit

- Check to ensure that the stop valves on the gas and liquid lines are fully open.
- Check the inside of the unit for refrigerant leakage. If there is a refrigerant leak, call your dealer.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 90°C.
- DO NOT PUSH THE BUTTON OF THE MAGNETIC SWITCH(ES), it will cause a serious accident.
- Confirm that the leakage of the refrigerant does not exist. The flare nuts are sometimes loosened by vibration during transportation

10.2.5 Test and check

Finally, test and check the following items:

- Water leakage
- Refrigerant leakage
- Electrical connection

10.3 COMMISSIONING PROCEDURE

This procedure is valid regardless of what options are on the module.

- When installation is complete and all necessary settings (Dip-switches in PCBs and user controller configuration) have been carried out, close the electrical box and place the cabinet as shown in the manual.
- Make the start-up wizard configuration in the user controller.
- Make a test run as shown in item *"10.4 Test run / air purge"*.
- After test run is completed, start the entire unit or the selected circuit by pressing the OK button.

◆ Initial start-up at low outdoor ambient temperatures

During commissioning and when water temperature is very low, it is important for the water to be heated gradually. Additional optional function can be used for starting at low water temperature conditions: Screed drying function:

- The screed function is used exclusively for the process of drying a newly applied screed to the floor heating system. The process is based on EN-1264 par 4.
- When user activates screed function, the water set point follows a predetermined schedule:

1 Water set point is kept constant at 25ºC for 3 days

2 Water set-point is set to the maximum Heating supply temperature (but always limited to ≤ 55ºC) for 4 days.

⚠ CAUTION

- *Heating at lower water temperatures (approximately 10ºC to 15ºC) and lower outdoor ambient temperatures (<10ºC) can be damaging to the heat pump when defrosting.*
- *As a result, Heating up to 15ºC when outdoor temperature is lower than 10ºC is performed by the Electrical Heater.*

NOTE

In case of Heater Forced OFF (by optional dip switch setting) these condition is not performed and heating is performed by Heat Pump. HITACHI is not responsible for its operation.

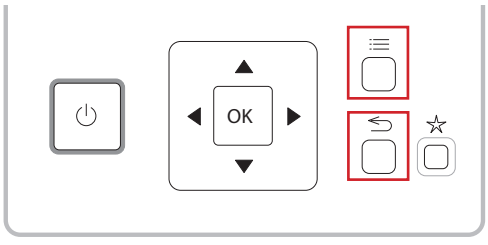
⚠ CAUTION

It is recommended start the unit (first power ON) with heater forced OFF and compressor forced OFF (See "9.5 Setting of DIP switches and RSW switches"). In order to circulate water by water pump and remove possible air into the heater (Check heater completely filled).

10.4 TEST RUN / AIR PURGE

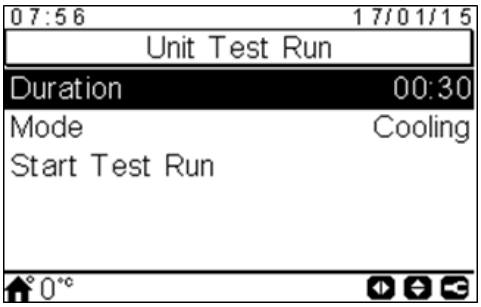
Test run is a working mode used when commissioning the installation. Some settings are made to let the installer an easy job. Air purge function drives the pump in a way for evacuating air bubbles in the installation.

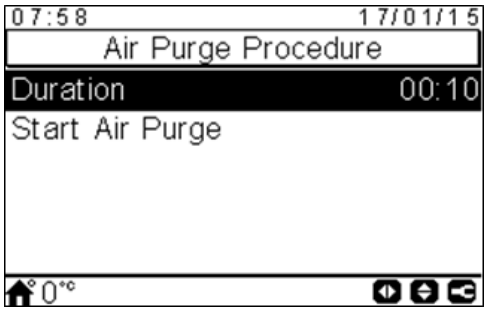
A menu with specific function for commissioning appears by pressing the menu+back buttons for 3 seconds at the installer menu (OK+back buttons).



This menu shows the following test to be launched:

- Unit Test Run
- Air Purge
- Screed Drying



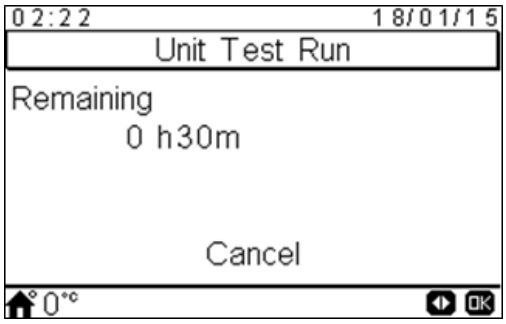


After “Test Run” or “Air Purge” option is selected, the YUTAKI user controller asks for the duration of the test.

In case of test run, user can also select the mode of the test (cooling or heating).

When user confirms the test run or the air purge, the YUTAKI user controller sends the order to the unit.

During the execution of this test, the following screen is shown:



- When the test starts, the user controller will exit from the installer mode.
- If “favourite action button” is pressed during test run, this function will be executed until the user presses the cancel option (this is not-limited by time).
- User can cancel the test run regardless of the time left for test finishing.
- The Test Run icon is shown in the notifications zone, but the notification of this test run is taken from H-LINK.

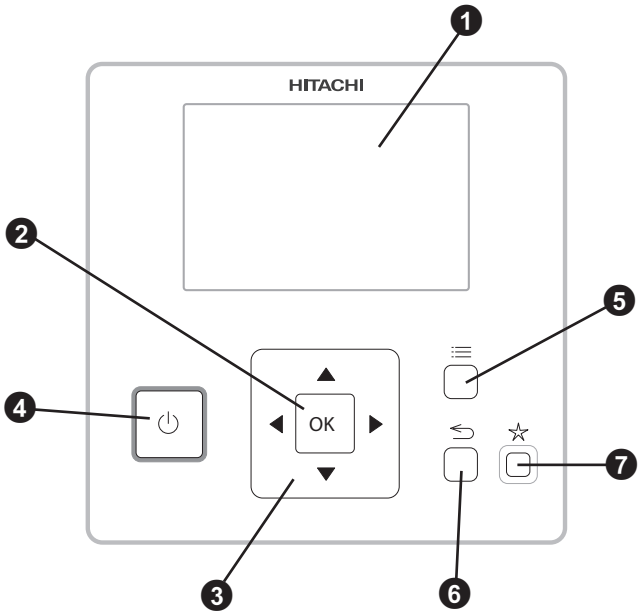
When test run has finished, an information message is displayed in the screen, and pressing accept, the user returns to the global view.

NOTE

- *When commissioning and installing the unit, it is very important to use the “Air purge” function to remove all the air in the water circuit. When the air purge function is running, the water pump starts the automatic air venting routine which consists of regulating the speed and open/close configured 3-way valve to help to evacuate air from the system.*
- *If there is a Heater or a Boiler installed, disable the operation before running the test run.*

11 UNIT CONTROLLER

11.1 DEFINITION OF THE SWITCHES



❶ Liquid Crystal Display

Screen where controller software is displayed.

❷ OK button

To select the variables to be edited and to confirm the selected values.

❸ Arrows key

It helps the user to move through the menus and views.

❹ Run/Stop button

It works for all zones if none of the zones is selected or only for one zone when that zone is selected.

❺ Menu button

It shows the different configuration options of the user controller.

❻ Return button

To return to the previous screen.

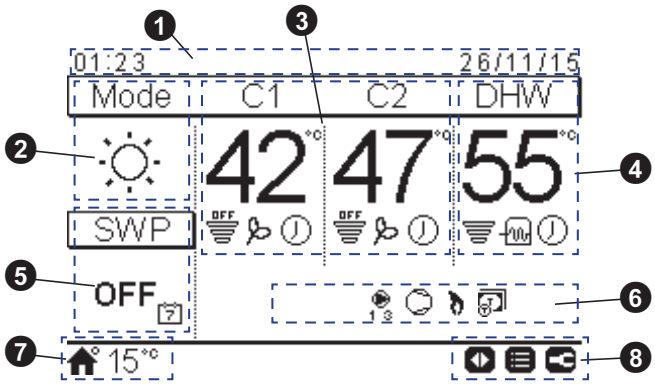
❼ Favourite button

When this button is pressed, the selected favourite action (ECO/Comfort, Holiday, Simple timer or DHW boost) is directly executed.

11.2 MAIN SCREEN

Depending on the working mode of the user controller, the main screen is shown in a different way. When the user controller is working as a master unit controller, a comprehensive view with all the elements is shown, whereas when the user controller is working as a room thermostat (located in one of the controlled zones), the main screen appears with simplified information.

11.2.1 Comprehensive view



❶ Time and date

The current time/date information is displayed. This information can be changed on the configuration menu.

❷ Operation mode (Heating / Cooling / Auto)

This icon shows the unit's mode of operation status. It has to be edited by pressing the OK button, and it can be switched between Heating, Cooling and Auto mode (If enabled option).

❸ Control of circuits 1 and 2

It displays the setting temperature calculated for each circuit and a throughput icon indicating the percentage of the actual temperature with respect to the setting temperature. It can also show the ECO mode and timer activation if they are enabled.

The setting temperature can be modified using the arrows keys over this view (if Water calculation mode is set as "Fix").

Pressing the OK button, the following options are shown:

- Timer: In this menu, simple timer or schedule timer can be selected and configured.
- OTC: OTC Setting temperature (User can only refer to the OTC mode and its setting temperature value)
- Comfort/ECO: Selection between Comfort and ECO mode.
- Status: Some working conditions can be consulted.

❹ DHW control

It displays the setting temperature calculated for DHW and a throughput icon indicating the percentage of the actual temperature with respect to the setting temperature. It can also show the operation of the electrical heater of the DHW, the timer activation and the DHW boost if they are enabled.

The setting temperature can be modified using the arrows keys over this view.

Pressing the OK button, the following options are shown:

- Timer: In this menu, simple timer or schedule timer can be selected and configured.
- DHW boost: It activates the DHW heater for an immediate DHW operation
- Status: Some working conditions can be consulted.

If anti-legionella operation is working, its icon appears below the setting temperature.

❺ Swimming pool control

It gives information about the swimming pool setting temperature and displays a throughput icon indicating the percentage of the actual temperature with respect to the setting temperature.

The setting temperature can be modified using the arrows keys over this view.

Pressing the OK button, the following options are shown:

- Timer: In this menu, simple timer or schedule timer can be selected and configured.
- Status: Some working conditions can be consulted.

❻ Unit status signals

This part of the screen displays all the notification icons that offer general knowledge on the unit's situation

Some of these icons can be: Defrost operation, Water pumps, Compressor/s, Boiler working, Tariff input, Test tun...

❼ Outdoor temperature / Alarm indication

In normal operation, the outdoor temperature is displayed besides the home icon signal.

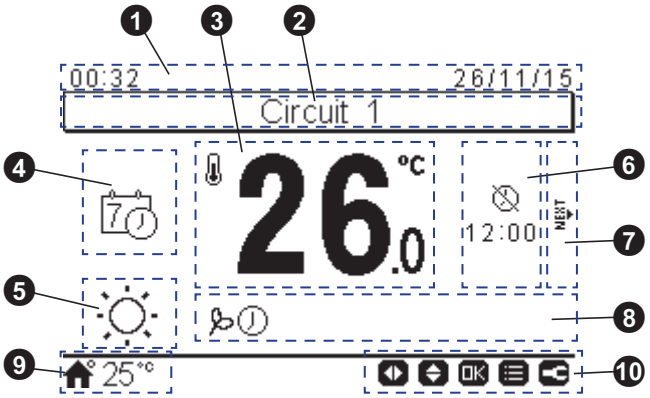
In abnormal operation, the alarm icon is indicated with its corresponding alarm code.

❽ Available buttons / Installer mode

It indicates the buttons of the user controller which can be used in that moment.

When Installer mode is enabled, its icon appears on the right side of this view.

11.2.2 Room thermostat view



❶ Time and date

The current time/date information is displayed. This information can be changed on the configuration menu.

❷ Definition of the circuit

It informs about which circuit is being indicated (1 or 2).

❸ Actual/Setting room temperature

It displays the actual room temperature. The setting temperature can be adjusted using the up/down arrows keys. In this case, while the setting temperature is being modified, the icon of the actual room temperature is indicated below the setting temperature (house icon).

❹ Room thermostat mode

In this part of the screen, the room thermostat mode can be selected between Manual and Auto. If Auto is selected, two possible icons can be displayed: one if a timer period has been selected and the other one if not.

❺ Operation mode (Heating / Cooling / Auto)

The current operation mode is displayed. To configure it, press OK to enter in the quick actions (Auto if enabled option).

❻ End of timer/holiday operation

In this area, the end hour of the simple timer, holiday period or schedule action is indicated below its respective icon.

❼ Next circuit

It informs that there is a room thermostat view for a second circuit and it is possible to access by pressing the right key.

❽ Icons notification

This part of the screen displays all the notification icons that offer general knowledge on the unit's situation

Some of these icons can be: ECO mode, Timer operation...

❾ Outdoor temperature / Alarm indication

In normal operation, the outdoor temperature is displayed besides the home icon signal.

In abnormal operation, the alarm icon is indicated with its corresponding alarm code.

❿ Available buttons / Installer mode

It indicates the buttons of the user controller which can be used in that moment.

When Installer mode is enabled, its icon appears on the right side of this view.

◆ OK button

Pressing the OK button, the quick actions are shown:

- Timer: In this menu, simple timer or schedule timer can be selected and configured.
- Operation mode: It allows to select the unit operation between Heating, Cooling and Auto mode (if enabled option).
- ECO/Comfort: Selection between ECO and Comfort mode.
- Holiday: It allows to start a holiday period until the configured returning date and time.
- Status: Some working conditions can be consulted.

11.3 DESCRIPTION OF THE ICONS

11.3.1 Common icons

Icon	Name	Values	Explanation
OFF	Status for circuit 1, 2, DHW and swimming pool.		Circuit I or II is in Demand-OFF
			Circuit I or II is on Thermo-OFF
			Circuit I or II is working between 0 < X ≤ 33% of the desired water outlet temperature
			Circuit I or II is working between 33 < X ≤ 66% of the desired water outlet temperature
			Circuit I or II is working between 66 < X ≤ 100% of the desired water outlet temperature
	Mode		Heating
			Cooling
			Auto
88	Setting temperatures	Value	Displays the setting temperature of the circuit 1, circuit 2, DHW and swimming pool
		OFF	Circuit 1, Circuit 2, DHW or Swimming Pool are stopped by button or timer
	Alarm		Existing alarm. This icon appears with the alarm code
	Timer		Simple timer
			Weekly timer
	Derogation		When there is a derogation from the configured timer
	Installer mode		Informs that user controller is logged on the installer mode which has special privileges
	Menu lock		It appears when menu is blocked from a central control. When communication is lost, this icon disappears
	Outdoor temperature		The ambient temperature is indicated at the right side of this button

11.3.2 Icons for the comprehensive view

Icon	Name	Values	Explanation
1 2 3	Pump	1 2 3	This icon informs about pump operation. There are three available pumps on the system. Each one is numbered, and its corresponding number is displayed below to the pump icon when it is operating
1-2-3	Heater step	1-2-3	Indicates which of the 3 possible heater steps is applied on space heating
	DHW Heater		Informs about DHW Heater operation. (If it is enabled)
	Solar		Combination with solar energy
	Compressor		Compressor enabled
	Boiler		Auxiliary boiler is working
	Tariff		Tariff signal informs about some cost conditions of the consumption of the system
	Defrost		Defrost function is active
	Central/Local	-	No icon means local mode
			Central mode (Three types of control: Water, Air or Full)
	Forced OFF		When forced off Input is configured and its signal is received, all the configured items on the comprehensive view (C1, C2, DHW, and/or SWP) are shown in OFF, with this small icon below
OFF	Auto ON/OFF	OFF	When daily average is over auto summer switch-off temperature, circuits 1 & 2 are forced to OFF (Only if Auto ON/OFF enabled)
TEST RUN	Test Run	TEST RUN	Informs about the activation of the “Test Run” function
ANTI LEG	Anti-Legionella	ANTI LEG	Activation of the Anti-Legionella operation
	DHW boost		It activates the DHW heater for an immediate DHW operation
	ECO/Comfort mode for circuits 1 & 2	-	No icon means Comfort mode
			ECO mode

11.3.3 Icons for the room thermostat view

Icon	Name	Values	Explanation
	Manual/Auto mode		Manual mode
			Auto mode with timer setting
			Auto mode without timer setting
	Setting/Room temperature		Setting temperature
			Room temperature
	End of timer period		The end hour of the timer period is indicated below this icon
	End of holiday period		The end hour of the holiday period is indicated below this icon
	Setting temperature		This icon appears while the setting temperature is being changed, and indicates the actual temperature
	Next screen		When room thermostat has been configured for both circuit 1 and 2, this icon appears at the right side of the screen to indicated that there is a 2nd room thermostat view

12 MAIN SAFETY DEVICES

◆ Compressor Protection

High Pressure Switch:

This switch cuts out the operation of the compressor when the discharge pressure exceeds the setting.

◆ Fan Motor Protection

When the thermistor temperature is reached to the setting, motor output is decreased.

The other way, when the temperature becomes lower, limitation is cancelled.

Model				RASM-3VNE	RASM-(4-6)VNE	RASM-(4-6)NE
For Compressor						
Pressure Switches			-	Automatic Reset, Non-Adjustable (each one for each compressor)		
High	Cur Out		MPa	4.15		
	Cut-In		MPa	3.20		
Low	Cut-Out		MPa	0.30		
for control	Cut-In		MPa	0.20		
Fuse			-			
1~ 230V 50Hz			A	40	50	--
3N~ 400V 50Hz			A	--	--	2 X 20
CCP Timer			-	Non-Adjustable		
Setting Time			min.	3		
For Condenser Fan Motor Internal Thermostat			-	Automatic Reset, Non-Adjustable (each one for each motor)		
For Control Circuit Fuse on PCB			A	5		

HITACHI

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Johnson Controls-Hitachi Air Conditioning Spain, S.A.U.
Ronda Shimizu, 1 - Políg. Ind. Can Torrella
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