HITACHI

INSTALLATION & OPERATION MANUAL

YUTAKI SERIES
AND YUTAKI CASCADE CONTROLLER



MODELS
RWM-(2-3)R1E
RWM-(4-10)N1E
RWD-(2-3)RW1E-220S(-K)
RWD-(4-6)NW1E-220S(-K)
ATW-YCC-03

EN INSTALLATION AND OPERATION MANUAL
ES MANUAL DE INSTALACIÓN Y FUNCIONAMIENTO
DE INSTALLATIONS- UND BETRIEBSHANDBUCH
FR MANUEL D'INSTALLATION ET DE FONCTIONNEMENT
IT MANUALE DI INSTALLAZIONE E D'USO
PT MANUAL DE INSTALAÇÃO E FUNCIONAMENTO
DA MONTERINGS- OG DRIFTSVEJLEDNING
NL INSTALLATIE- EN BEDIENINGSHANDLEIDING
SV INSTALLATION- OCH DRIFTHANDBOK
EL ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ ΚΑΙ ΛΕΙΤΟΥΡΓΙΑΣ

Cooling & Heating

air

PMML0575 rev.1 - 09/2021

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 2011/65/EU e D.Lgs 4 marzo 2014 n.27
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.

MODELS CODIFICATION	**Important note:** Please, check, according to the model name, which is your heat pump system, how it is abbreviated and referred to in this instruction manual. This Installation and Operation Manual is related to YUTAKI 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 está relacionado con unidades YUTAKI.
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 auf die YUTAKI Geräte
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 concerne les unités YUTAKI.
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 d'uso è relativo alle unità YUTAKI.
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 está relacionado com unidades YUTAKI
MODELKODIFICERING	**Vigtig information:** Kontrollér venligst din varmepumpetype i henhold til modelnavnet, hvordan den forkortes, og hvilken reference den har i denne vejledning. Denne installations- og betjeningsvejledning gælder for YUTAKI-enheder.
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 gebruikshandleiding geldt voor YUTAKI-units.
MODELLER	**Viktigt!** Kontrollera med modellnamnet vilken typ av värmepump du har, hur den förkortas och hur den anges i den här handboken. Denna Installations- och driftshandbok gäller för YUTAKI-enheter.
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. Το παρόν εγχειρίδιο εγκατάστασης και λειτουργίας αναφέρεται στις μονάδες YUTAKI.

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

General Index

1 GENERAL INFORMATION 1

1.1 General information 1

1.1.1 General notes 1

1.1.2 Introduction 1

1.1.2.1 Overview of YUTAKI system 1

1.1.2.2 Summary of operations 2

1.2 Applied symbols 3

1.3 Product guide 4

1.3.1 Classification of the units 4

1.3.1.1 Split system - Outdoor unit 4

1.3.1.2 Split system - Indoor unit 4

1.3.1.3 Complementary system 5

1.3.2 Product list 5

1.3.2.1 Split system - R32 Outdoor unit 5

1.3.2.2 Split system - R410A Outdoor unit 5

1.3.2.3 Split system - Indoor unit 6

1.3.2.4 Complementary system 7

2 GENERAL SAFETY NOTES 8

2.1 Additional information about safety 8

2.2 Important notice 8

3 ELECTRICAL DATA 9

3.1 Considerations 9

3.2 Split system - R410A Outdoor unit 10

3.3 Split system - R32 Outdoor unit 10

3.4 Split system - Indoor unit 11

3.4.1 YUTAKI S 11

3.4.2 YUTAKI S COMBI 12

4 WORKING RANGE 13

4.1 Power supply working range 13

4.2 R410A Temperature working range 13

4.2.1 Space heating 13

4.2.2 DHW 14

4.2.3 Swimming pool heating 15

4.2.4 Space cooling (Necessary cooling kit) 16

4.3 R410A Hydraulic working range 16
4.3.1 Hydraulic data 16
4.4 R32 Hydraulic working range 17
4.4.1 Hydraulic data 17
4.4.2 Pump performance curves 18

5 REFRIGERANT AND WATER PIPING 21

5.1 R32 Refrigerant circuit 21
5.1.1 General notes R32 refrigerant 21
5.1.2 Refrigerant piping 21
5.1.3 Refrigerant charge 23
5.2 R410A Refrigerant circuit 23
5.2.1 Refrigerant piping 23
5.2.2 Precautions in the event of gas refrigerant leaks 25
5.3 Water piping 27
5.3.1 Water piping length 27
5.3.2 Water piping size 27
5.3.3 Water quality 28
5.3.4 Water flow control 28

6 ELECTRICAL AND CONTROL SETTINGS 29

6.1 General check 29
6.2 Electrical connection 31
6.2.1 Wiring size 31
6.2.2 Minimum requirements of the protection devices 34
6.3 Terminal board connections 36
6.3.1 Table board 1 36
6.3.2 Table board 2 36

7 UNIT CONTROLLER 49

7.1 Definition of the switches 49
7.2 Description of the icons 50
7.3 Unit controller contents 52
7.4 Controller configuration 54
7.4.1 Timer Assitant for Room Thermostat 56
7.4.2 Examples of possible configurations 57
7.5 Main VIEW 63
7.5.1 Quick actions function 64
7.6 Home view 66

7.6.1 Next schedule indication 66
7.7 Mode view 67
7.8 Room 1/2 view 67
7.9 Fan coils 1/2 view 68
7.10 Circuit 1/2 view 68
7.11 DHW view 69
7.12 SWP view 69
7.13 Menu 70
7.13.1 OPERATION INFORMATION 70
7.13.1.1 Live view 72
7.13.2 Energy data 76
7.13.3 Timer and schedule configuration 78
7.13.4 System configuration 84
7.13.4.1 Room thermostats configuration 85
7.13.4.2 Water settings configuration 86
7.13.4.3 Space Heating / Space Cooling configuration 87
7.13.4.4 Hot Water Tank configuration 89
7.13.4.5 Swimming Pool configuration 91
7.13.4.6 Complementary Heating configuration 92
7.13.4.7 Heat Pump configuration 94
7.13.4.8 Fan coils 96
7.13.4.9 Optional functions configuration 97
7.13.4.10 Inputs, Outputs and Sensors configuration 101
7.13.5 Holiday mode 103
7.13.6 Controller settings 104
7.13.7 Commissioning 105
7.13.8 About 105
7.13.9 Factory reset 106
7.13.10 Installer access 106
7.13.11 Return to user mode 107
7.13.12 Lock the controller 107

8 YUTAKI CASCADE CONTROLLER 108

8.1 Definition of the switches 108
8.2 Description of the icons 109
8.3 cascade controller contents 111
8.4 CASCADE controller configuration 113
8.5 Main view 115
8.5.1 Quick actions function 116

8.6 Home view....118
8.6.1 Next schedule indication....118
8.7 Mode view....119
8.8 Room 1/2 view....119
8.9 Fan coils 1/2 view....120
8.10 Circuit 1/2 view....120
8.11 DHW view....121
8.12 SWP view....121
8.13 Menu....122
8.13.1 Operation information....122
8.13.2 Timer and schedule configuration....123
8.13.3 System configuration....130
8.13.3.1 Room thermostats configuration....131
8.13.3.2 Water settings configuration....132
8.13.3.3 Cascade configuration....133
8.13.3.4 Space Heating / Space Cooling configuration....134
8.13.3.5 Hot Water Tank configuration....136
8.13.3.6 Swimming Pool configuration....138
8.13.3.7 Complementary Heating configuration....139
8.13.3.8 Heat Pump configuration....141
8.13.3.9 Fan coils....142
8.13.3.10 Optional functions configuration....143
8.13.3.11 Inputs, Outputs and Sensors configuration....147
8.13.4 Holiday mode....149
8.13.5 Controller settings....150
8.13.6 Commissioning....151
8.13.7 About....151
8.13.8 Factory reset....152
8.13.9 Installer access....152
8.13.10 Return to user mode....153
8.13.11 Lock the controller....153

9 TROUBLESHOOTING....154

10 MAINTENANCE....159

10.1 Maintenance work....159
10.1.1 General maintenance procedure for the outdoor unit....159
10.1.2 General maintenance procedure for the indoor unit....160

1 GENERAL INFORMATION

1.1 GENERAL INFORMATION

1.1.1 General notes

© Copyright 2021 Johnson Controls-Hitachi Air Conditioning Spain, S.A.U. – All rights reserved.

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.

Within the policy of continuous improvement of its products, Johnson Controls-Hitachi Air Conditioning Spain, S.A.U. reserves the right to make changes at any time without prior notification and without being compelled to introducing them into previously sold products. This document may therefore have been subject to amendments during the life of the product.

Hitachi makes every effort to offer correct, up-to-date documentation. Despite this, printing errors cannot be controlled by Hitachi and are not its responsibility.

As a result, some of the images or data used to illustrate this document may not refer to specific models. No claims will be accepted based on the data, illustrations and descriptions included in this manual.

No type of modification must be made to the equipment without prior, written authorization from the manufacturer.

1.1.2 Introduction

Hitachi proudly announces the newest complete range of air-to-water heat pumps in its award-winning YUTAKI range.

YUTAKI units produce heating and domestic hot water like any oil or gas boiler, but transforming renewable energy from the outside air into heat. Air to water heat pumps extract the free energy present in the air, which is enough to heat a home up to a comfortable temperature, even on the coldest winter day. Every kW of electricity used to power the heat pump can yield up to more than 5 kW of energy for heating; this provides savings of up to 80% on heating expenses compared to a traditional fossil fuel boiler.

The new YUTAKI series, based on state-of-the-art technology, does not only achieve an outstanding performance in space heating but also provides domestic hot water with high efficiency. Additionally, cooling operation for summer can also be provided installing the dedicated “Cooling kit” accessory of Hitachi.

The system is simple to control; its new user controller (PC-ARFH2E) improves the acclaimed and successful design used with the existing LCD controller and provides a great deal of new functions like: wizard start-up configuration, auto cool/heat, improved timer, etc.

1.1.2.1 Overview of YUTAKI system

◆ Split system - YUTAKI S, YUTAKI S COMBI

It consists of one outdoor unit and one indoor unit. The outdoor unit extracts the heat present in the air, increases its refrigerant temperature and transmits it to the water circuit using the plate heat exchanger of the indoor unit where the heat is taken to radiators (fan-coils), underfloor heating components or both (2nd temperature area).

Two types of indoor unit can be used in heating split systems:

YUTAKI S

The indoor unit of YUTAKI S is designed for space heating, in wall-mounted installation. It is convenient for new installations with low capacity requirements (Well isolated installations, high efficiency radiators...).

YUTAKI S COMBI

The indoor unit of YUTAKI S COMBI is conceived as a floor standing unit. It is prepared for heating operation as well as for domestic hot water production. For this purpose, it has a built-in domestic hot water tank (220 L). In line with YUTAKI S units, it meets the needs of installations with low capacity requirements.

Also, new models of YUTAKI S COMBI have been specially designed for the UK market that meet the requirements referred in the UK Building Regulations.

1.1.2.2 Summary of operations

Space heating

YUTAKI units are factory-supplied ready for space heating operation. Different heating installation configurations can be selected providing a comfortable atmosphere all year long even in the coldest climates:

- ***Mono-valent system***

  The air to water heat pump is sized to provide 100% of the heating requirements on the coldest day the year.

- ***Mono-energy system***

  This is the most popular configuration. The air to water heat pump is sized to provide 80% of the heating requirements on the coldest days of the year. An auxiliary electric heater is used to provide the additional heating required on cold days. This option usually results in an ideal balance between installation costs and future energy consumption, as proven by its popularity in colder climates, such as Sweden and Norway.

- ***Alternating Bi-valent system***

  For installations with an existing heating system by boiler, and when is needed to heat the supplied water temperature to the circuit up to high temperatures (80ºC), the boiler can be configured to alternate with the air to water heat pump.

Selecting the different configuration types it is possible to adapt the system to all customer requirements, providing a wide application range from the simplest configuration to complete configuration: Radiator, heating floor or both (2nd temperature area).

Domestic hot water production

YUTAKI models also give the option of domestic hot water production, allowing the user to benefit from the heat pump's high efficiency and achieve domestic hot water.

This is made possible by a domestic hot water tank. In case of YUTAKI S COMBI, the domestic hot water tank is built in the indoor unit. For YUTAKI S, the Hitachi accessory "DHWT-(200/300)S-3.0H2E" can be used for the production of DHW.

An electric heater is incorporated inside the tank in order to allow an immediate heating of the domestic hot water in accordance with the user's needs.

Space cooling

YUTAKI units can also be operated in cooling operation The dedicated "Cooling kit" accessory has been designed for this purpose. Combining the heating only models with these cooling kits, the reversible models become available. In this case, combination with fan-coils, refreshing floor or both (2nd temperature area) can be applied.

Combination with solar panels

YUTAKI system can be combined with solar panels. The solar combination enables to heat up the DHW by means of the sun. The solar combination is designed to transfer the heat from the solar panels (sun radiation) to the heat exchanger of DHW tank.

Swimming pool water heating operation

For summer session period, YUTAKI system can be used to heat the water temperature of swimming pools up to a value between 24 and 33ºC.

1.2 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 damage the unit, the installation or the building or property.

Situations endangering the safety of those in the surrounding area or to the unit itself are clearly indicated in this manual.

Special symbols are 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.***
- ***Not taking these instructions into account could lead to serious, very serious or even fatal injuries to you and others.***

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

CAUTION

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

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

NOTE

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

1.3 PRODUCT GUIDE

1.3.1 Classification of the units

1.3.1.1 Split system - Outdoor unit

Unit type: Outdoor unit (Split air system)									
	Position-separating hyphen (fixed)								
		Compressor power (HP): 2, 2.5, 3, 4, 5, 6, 8, 10.							
			For water combination						
				Heat pump					
					V: Single phase unit (1~ 230V 50Hz) —: Three phase unit (3N~ 400V 50Hz)				
						N: R410A refrigerant R: R32 refrigerant			
							Premium series		
								1: series	
									E: Made in Europe —: Made in Japan
RAS	-	X	W	H	(V)	(X)	P	(1)	(E)

1.3.1.2 Split system - Indoor unit

◆ YUTAKI S

Unit type: YUTAKI S (Split system - Single water module (Indoor unit) - Medium/Low temperature)						
	Position-separating hyphen (fixed)					
		Compressor power of the combined outdoor unit (HP): 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0.				
			N: R410A refrigerant R: R32 refrigerant			
				1: series		
					Made in Europe	
RWM	-	X.X	(X)	1	E	

◆ YUTAKI S COMBI

Unit type: YUTAKI S COMBI (Split system - Dual water module (Indoor unit + Domestic hot water tank) - Medium/Low temperature)											
	Position-separating hyphen (fixed)										
		Compressor power of the combined outdoor unit (HP): 2.0, 2.5, 3.0, 4.0, 5.0, 6.0.									
			N: R410A refrigerant R: R32 refrigerant								
				Water-to-water DHW heat exchanger							
					1: series						
						Made in Europe					
							Position-separating hyphen (fixed)				
								Tank model: 220 L			
									Tank material: Stainless steel		
										-K: Model for UK market	
RWD	-	X.X	(X)	W	1	E	-	220	S	(-K)	

1.3.1.3 Complementary system

◆ YUTAKI CASCADE CONTROLLER

Air to water	Position-separating hyphen (fixed)	YUTAKI CASCADE CONTROLLER	Position-separating hyphen (fixed)	Language pack
ATW	-	YCC	-	03

1.3.2 Product list

1.3.2.1 Split system - R32 Outdoor unit

1~ 230V 50Hz
RAS-2WHVRP1
RAS-2.5WHVRP1
RAS-3WHVRP1



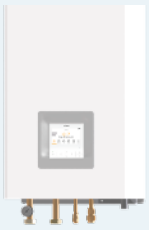
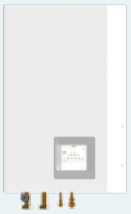
1.3.2.2 Split system - R410A Outdoor unit

1~ 230V 50Hz	3N~ 400V 50Hz
RAS-4WHVNPE	RAS-4WHNPE
RAS-5WHVNPE	RAS-5WHNPE
RAS-6WHVNPE	RAS-6WHNPE
-	RAS-8WHNPE
-	RAS-10WHNPE



1.3.2.3 Split system - Indoor unit

◆ YUTAKI S

1~ 230V 50Hz	3N~ 400V 50Hz	1~ 230V 50Hz	3N~ 400V 50Hz	
RWM-2.0R1E	RWM-2.0R1E	-	-	-
RWM-2.5R1E	RWM-2.5R1E	-	-	-
RWM-3.0R1E	RWM-3.0R1E	-	-	-
-	-	RWM-4.0N1E	RWM-4.0N1E	-
-	-	RWM-5.0N1E	RWM-5.0N1E	-
-	-	RWM-6.0N1E	RWM-6.0N1E	-
-	-	-	-	RWM-8.0N1E
-	-	-	-	RWM-10.0N1E
				

NOTE

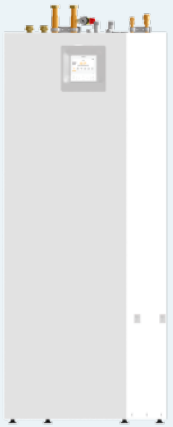
Icons between brackets means possible extra operations to the factory-supplied operations. For cooling operation, refer to the Cooling kit accessory for YUTAKI S units.

◆ YUTAKI S COMBI

NOTE

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

Standard model

1~ 230V 50Hz	3N~ 400V 50Hz
RWD-2.0RW1E-220S	RWD-2.0RW1E-220S
RWD-2.5RW1E-220S	RWD-2.5RW1E-220S
RWD-3.0RW1E-220S	RWD-3.0RW1E-220S
RWD-4.0NW1E-220S	RWD-4.0NW1E-220S
RWD-5.0NW1E-220S	RWD-5.0NW1E-220S
RWD-6.0NW1E-220S	RWD-6.0NW1E-220S
	

Model for UK market

1~ 230V 50Hz	3N~ 400V 50Hz
RWD-2.0RW1E-220S-K	RWD-2.0RW1E-220S-K
RWD-2.5RW1E-220S-K	RWD-2.5RW1E-220S-K
RWD-3.0RW1E-220S-K	RWD-3.0RW1E-220S-K
RWD-4.0NW1E-220S-K	RWD-4.0NW1E-220S-K
RWD-5.0NW1E-220S-K	RWD-5.0NW1E-220S-K
RWD-6.0NW1E-220S-K	RWD-6.0NW1E-220S-K



1.3.2.4 Complementary system

◆ **YUTAKI CASCADE CONTROLLER**

ATW-YCC-03



2 GENERAL SAFETY NOTES

2.1 ADDITIONAL INFORMATION ABOUT SAFETY

⚠ DANGER

- ***DO NOT CONNECT THE POWER SUPPLY TO THE INDOOR UNIT PRIOR TO FILLING THE SPACE HEATING CIRCUIT (AND DHW CIRCUIT IF IT WAS THE CASE) WITH WATER AND CHECKING WATER PRESSURE AND THE TOTAL ABSENCE OF ANY WATER LEAKAGE.***
- ***Do not pour water over the indoor 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.*

2.2 IMPORTANT NOTICE

- PLEASE READ THE INSTRUCTION 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 outdoor and indoor units, 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.

3 ELECTRICAL DATA

3.1 CONSIDERATIONS

Key words:

- U: Power supply.
- PH: Phase.
- IPT: Total input power.
- STC: Starting current: Less than maximum current.
- RNC: Running current.
- MC: Maximum current.

NOTE

- *Heating conditions: Inlet/outlet water temperature: 30/35 ºC ; Outdoor ambient temperature (DB/WB): 7/6 ºC*
- *The compressor data shown in the tables below are based on a combined capacity of 100% of the power supplied.*
- *The "Maximum current" shown in the above table is the maximum total unit running current at the following conditions:*
  - *Supply voltage: 90% of the rated voltage.*
  - *Unit capacity: 100% at maximum operating conditions.*
- *The power supply cables must be sized to cover this maximum current value.*
- *Specifications in these tables are subject to change without notice in order that Hitachi may bring the latest innovations to their customers.*
- *Please refer to the general information, cautions and notes regarding protective devices (CB, ELB) throughout the "6 Electrical and control settings" chapter.*

3.2 SPLIT SYSTEM - R410A OUTDOOR UNIT

RAS-(4-10)WH(V)NP(E) in combination with YUTAKI S, YUTAKI S COMBI

Model	Power supply	Applicable voltage		Compressor and fan motors				MC (A)	Max. IPT (kW)
				Cooling		Heating			
		U max. (V)	U min. (V)	RNC (A)	IPT (KW)	RNC (A)	IPT (KW)		
RAS-4WHVNPE	1~ 230V 50Hz	253	207	9.2	2.11	9.3	2.12	30	6.93
RAS-5WHVNPE				12.6	2.87	12.7	2.90	30	6.93
RAS-6WHVNPE				16.0	3.65	15.0	3.43	30	6.93
RAS-4WHNPE	3N~ 400V 50Hz	440	360	3.4	2.11	3.4	2.12	14	8.70
RAS-5WHNPE				4.6	2.87	4.6	2.90	14	8.70
RAS-6WHNPE				5.8	3.65	5.5	3.43	16	9.95
RAS-8WHNPE				7.1	4.41	7.3	4.58	24	15.00
RAS-10WHNPE				9.8	6.15	8.8	5.51	24	15.00

3.3 SPLIT SYSTEM - R32 OUTDOOR UNIT

RAS-(2-3)WHVRP1 in combination with YUTAKI S, YUTAKI S COMBI

Model	Power supply	Applicable voltage		Compressor and fan motors				MC (A)	Max. IPT (kW)
				Cooling		Heating			
		U max. (V)	U min. (V)	RNC (A)	IPT (KW)	RNC (A)	IPT (KW)		
RAS-2WHVRP1	1~ 230V 50Hz	253	207	4.5	1,00	5.0	1.09	10.4	2.27
RAS-2.5WHVRP1				5.0	1.12	5.5	1.19	12.9	2.82
RAS-3WHVRP1				7.6	1.67	8.1	1.79	15.8	3.49

3.4 SPLIT SYSTEM - INDOOR UNIT

3.4.1 YUTAKI S

RWM-(2.0-10.0)(N/R)1E

Model	Power supply	Applicable voltage		Operation mode	RNC (A)	IPT (kW)	MC (A)	Max. IPT (kW)
		U max. (V)	U min. (V)					
RWM-2.0R1E	1~ 230V 50Hz	253	207	Without electric heater	0.5	0.06	0.63	0.06
				With electric heater	13.7	3.06	13.7	3.06
				With DHW tank heater	13.7	3.06	13.7	3.06
				With electric and DHW tank heaters	26.7	6.06	26.7	6.06
	3N~ 400V 50Hz	440	360	Without electric heater	0.5	0.06	0.6	0.06
				With electric heater	4.8	3.06	5.0	3.06
				With DHW tank heater	4.5	3.06	13.7	3.06
				With electric and DHW tank heaters	8.9	6.06	18.0	6.06
RWM-(2.5-3.0)R1E	1~ 230V 50Hz	253	207	Without electric heater	0.6	0.06	0.6	0.06
				With electric heater	13.7	3.06	13.7	3.06
				With DHW tank heater	13.7	3.06	13.7	3.06
				With electric and DHW tank heaters	26.7	6.06	26.7	6.06
	3N~ 400V 50Hz	440	360	Without electric heater	0.6	0.06	0.6	0.06
				With electric heater	4.8	3.06	5.0	3.06
				With DHW tank heater	4.5	3.06	13.7	3.06
				With electric and DHW tank heaters	8.9	6.06	18.0	6.06
RWM-(4.0-6.0)N1E	1~ 230V 50Hz	253	207	Without electric heater	0.6	0.08	0.7	0.08
				With electric heater	26.7	6.08	26.7	6.08
				With DHW tank heater	13.7	3.08	13.7	3.08
				With electric and DHW tank heaters	39.8	9.08	39.8	9.08
	3N~ 400V 50Hz	440	360	Without electric heater	0.6	0.08	0.7	0.08
				With DHW tank heater	9.1	6.08	9.3	6.08
				With DHW tank heater	4.5	3.08	13.7	3.08
				With electric and DHW tank heaters	13.3	9.08	22.4	9.08
RWM-(8.0-10.0)N1E	3N~ 400V 50Hz	440	360	Without electric heater	0.3	0.08	0.7	0.14
				With DHW tank heater	13.1	9.08	13.7	9.14
				With DHW tank heater	4.5	3.08	13.7	3.14
				With electric and DHW tank heaters	17.5	12.08	26.7	12.14

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".

3.4.2 YUTAKI S COMBI

RWD-(2.0-6.0)(N/R)W1E-220S(-K)

Model	Power supply	Applicable voltage		Operation mode	RNC (A)	IPT (kW)	MC (A)	Max. IPT (kW)
		U max. (V)	U min. (V)					
RWD-2.0RW1E-220S(-K)	1~ 230V 50Hz	253	207	Without electric heater	0.5	0.06	0.63	0.06
				With electric heater	13.7	3.06	13.7	3.06
				With DHW tank heater	12.6	2.81	12.6	2.81
				With electric and DHW tank heaters	25.6	5.81	25.6	5.81
RWD-2.0RW1E-220S(-K)	3N~ 400V 50Hz	440	360	Without electric heater	0.5	0.06	0.63	0.06
				With electric heater	8.7	3.06	9.3	3.06
				With DHW tank heater	12.5	2.81	12.6	2.81
				With electric and DHW tank heaters	12.5	5.81	12.6	5.81
RWD-(2.5-3.0)RW1E-220S(-K)	1~ 230V 50Hz	253	207	Without electric heater	0.6	0.06	0.63	0.06
				With electric heater	13.7	3.06	13.7	3.06
				With DHW tank heater	12.6	2.81	12.6	2.81
				With electric and DHW tank heaters	25.6	5.81	25.6	5.81
RWD-(2.5-3.0)RW1E-220S(-K)	3N~ 400V 50Hz	440	360	Without electric heater	0.6	0.06	0.63	0.06
				With electric heater	8.7	3.06	9.3	3.06
				With DHW tank heater	12.5	2.81	12.6	2.81
				With electric and DHW tank heaters	12.5	5.81	12.6	5.81
RWD-(4.0-6.0)NW1E-220S(-K)	1~ 230V 50Hz	253	207	Without electric heater	0.6	0.08	0.65	0.08
				With electric heater	26.7	6.08	26.7	6.08
				With DHW tank heater	12.6	2.83	12.6	2.83
				With electric and DHW tank heaters	38.7	8.83	38.7	8.83
	3N~ 400V 50Hz	440	360	Without electric heater	0.6	0.08	0.65	0.08
				With electric heater	17.4	6.08	18.0	6.08
				With DHW tank heater	12.6	2.83	12.6	2.83
				With electric and DHW tank heaters	17.4	8.83	18.0	8.83

4 WORKING RANGE

4.1 POWER SUPPLY WORKING RANGE

◆ Nominal power supply

- Single phase: 1~ 230V 50Hz
- Three phase: 3N~ 400V 50Hz

◆ Operating voltage

Between 90 and 110% of the nominal voltage.

◆ Voltage imbalance for nominal power supply 3N~ 400V 50Hz

Up to 3% of each phase, measured at the main terminal of the outdoor unit.

◆ Starting voltage

Always higher than 85% of the nominal voltage.

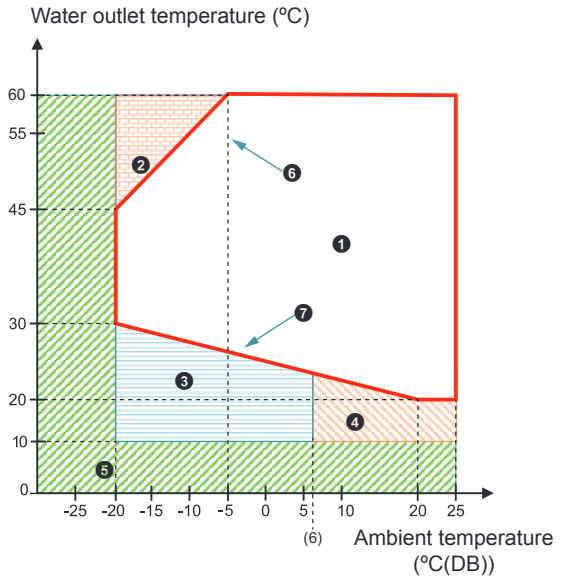
4.2 R410A TEMPERATURE WORKING RANGE

MODEL		2.0HP	2.5HP	3.0HP	4.0HP	5.0HP	6.0HP	8.0HP	10.0HP
Water temperature	ºC	Refer to the graphics for each case							
Indoor ambient temperature		5~30							

4.2.1 Space heating

◆ YUTAKI S / S COMBI

(2.0~3.0)HP

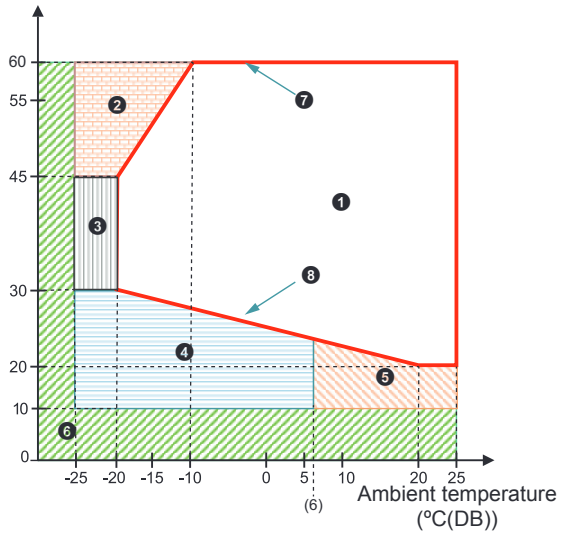


NOTE

Items ❸ and ❺ only available if back-up heater is enabled.

(4.0-10.0)HP

Water outlet temperature (ºC)



❶ Continuous working range.
❷ Operation not possible.
❸ Heat Pump operation possible.
❹ Starting heat pump + Back-up heater.
❺ Starting Heat Pump.
❻ Starting only Back-up Heater operation.
❼ Maximum setting temperature.
❽ Minimum setting temperature.

NOTE

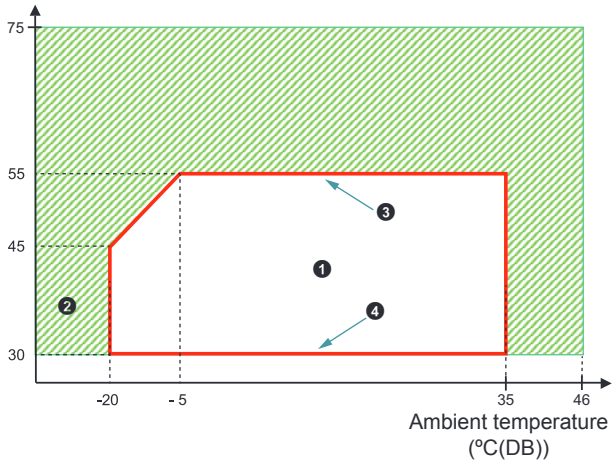
Items ❹ and ❻ only available if back-up heater is enabled.

4.2.2 DHW

◆ For YUTAKI S / S COMBI

(2.0~3.0)HP

Water tank temperature (ºC)

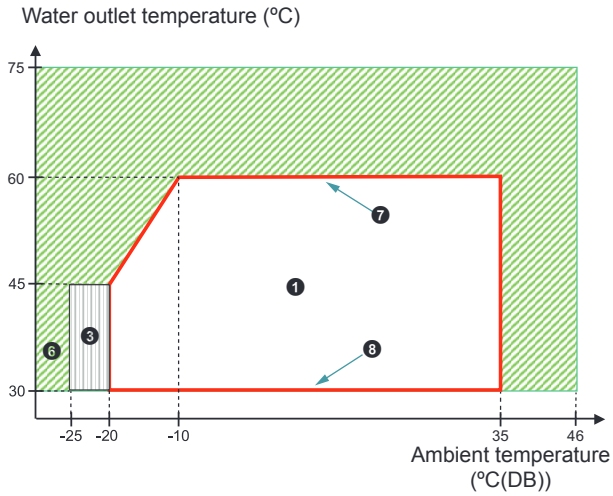


❶ Continuous working range.
❷ Starting only Back-up Heater operation.
❸ Maximum setting temperature.
❹ Minimum setting temperature.

NOTE

In case of heating up the DHW tank with an outdoor ambient temperature lower than -5 ºC and without using the DHW electrical heater, the setting temperature must not exceed the maximum value in the specified continuous working range.

(4.0-10.0)HP



❶ Continuous working range.

❸ Heat Pump operation possible.

❻ Starting only Back-up Heater operation.

❼ Maximum setting temperature.

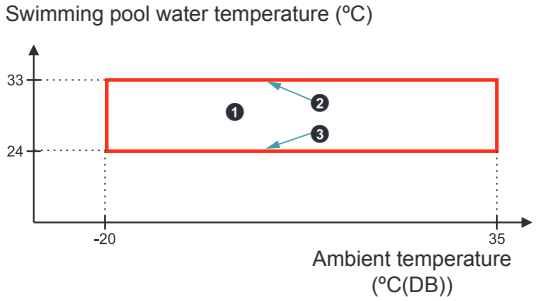
❽ Minimum setting temperature.

NOTE

- *In case of heating up the DHW tank with an outdoor ambient temperature lower than -10 ºC and without using the DHW electrical heater, the setting temperature must not exceed the maximum value in the specified continuous working range.*

4.2.3 Swimming pool heating

(2.0~3.0)HP

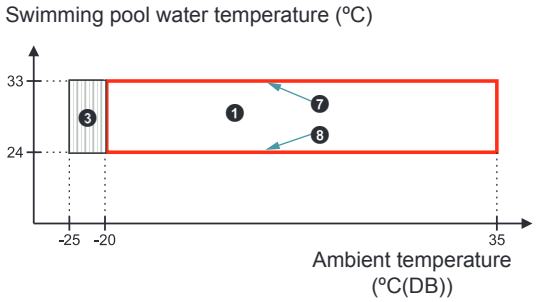


❶ Continuous working range.

❷ Maximum setting temperature.

❸ Minimum setting temperature.

(4.0-10.0)HP



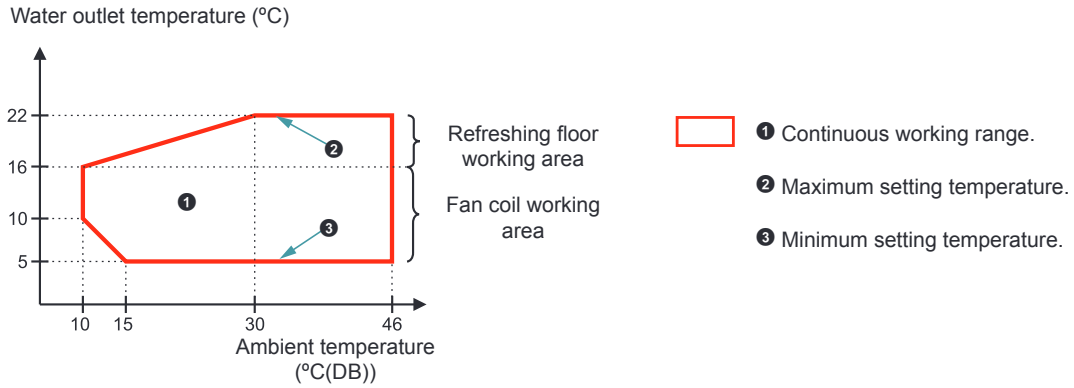
❶ Continuous working range.

❸ Heat Pump operation possible.

❼ Maximum setting temperature.

❽ Minimum setting temperature.

4.2.4 Space cooling (Necessary cooling kit)



4.3 R410A HYDRAULIC WORKING RANGE

4.3.1 Hydraulic data

◆ YUTAKI S

MODEL		4.0 HP	5.0 HP	6.0 HP	8.0 HP	10.0 HP
Minimum water flow rate (*1)	m^3/h	1.0	1.1	1.2	2.0	2.2
Maximum water flow rate (*1)	m^3/h	2.9	3.0	3.0	4.5	4.6
Minimum installation water volume (*2)	l	38	46	55	76	79
Minimum allowable water pressure	MPa	0.1				
Maximum allowable water pressure	MPa	0.3				

◆ YUTAKI S COMBI

MODEL		4.0 HP	5.0 HP	6.0 HP
Minimum water flow rate (*1)	m^3/h	1.0	1.1	1.2
Maximum water flow rate (*1)	m^3/h	2.7	2.8	2.8
Minimum installation water volume (*2)	l	38	46	55
Minimum allowable water pressure	MPa	0.1		
Maximum allowable water pressure	MPa	0.3		

4.4 R32 HYDRAULIC WORKING RANGE

4.4.1 Hydraulic data

◆ YUTAKI S

MODEL		2.0 HP	2.5 HP	3.0 HP
Minimum water flow rate (*1)	m^3/h	0.5	0.6	0.6
Maximum water flow rate (*1)	m^3/h	1.9	2.0	2.1
Minimum installation water volume	l	28	28	28
Minimum allowable water pressure	MPa	0.1		
Maximum allowable water pressure	MPa	0.3		

◆ YUTAKI S COMBI

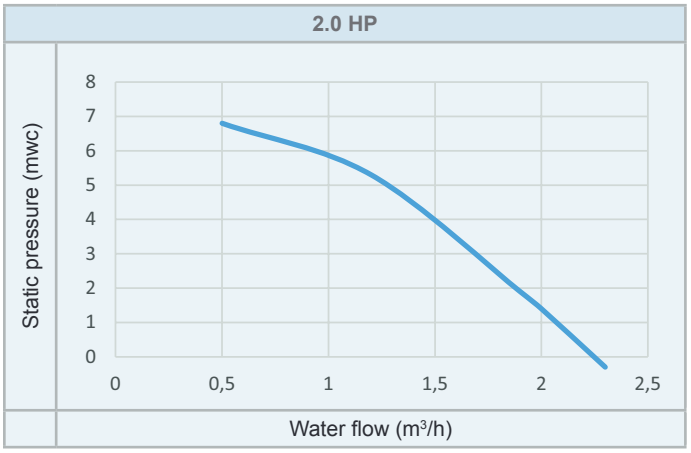
MODEL		2.0 HP	2.5 HP	3.0 HP
Minimum water flow rate (*1)	m^3/h	0.5	0.6	0.6
Maximum water flow rate (*1)	m^3/h	1.8	1.9	1.9
Minimum installation water volume	l	28	28	28
Minimum allowable water pressure	MPa	0.1		
Maximum allowable water pressure	MPa	0.3		

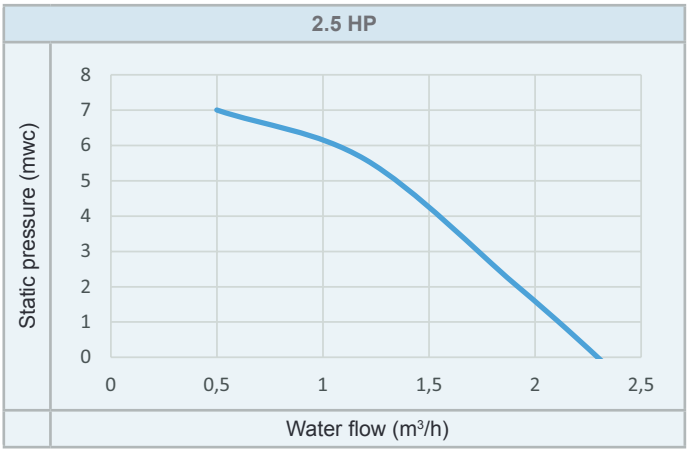
4.4.2 Pump performance curves

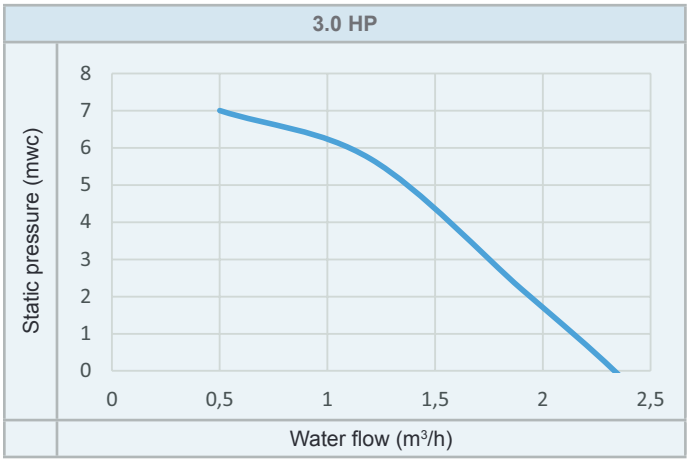
NOTE

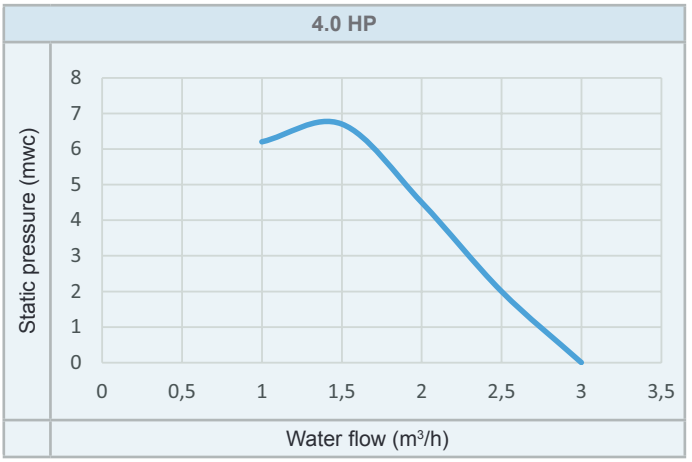
If a water flow rate is selected out of the working range of the unit, it can cause malfunction on the unit. Please, try to operate the pump within the minimum and maximum water flow of the indoor unit.

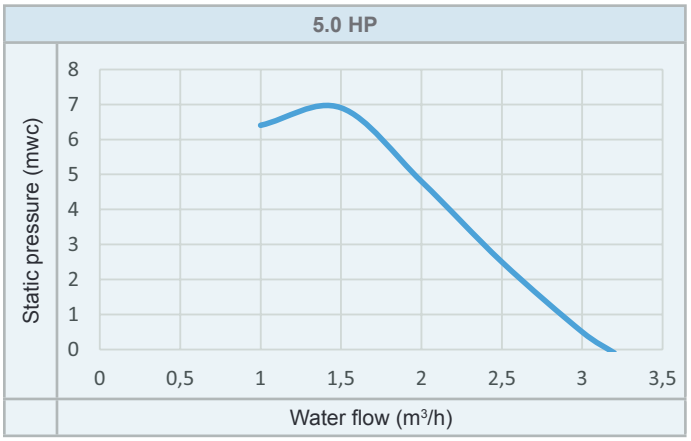
◆ YUTAKI S

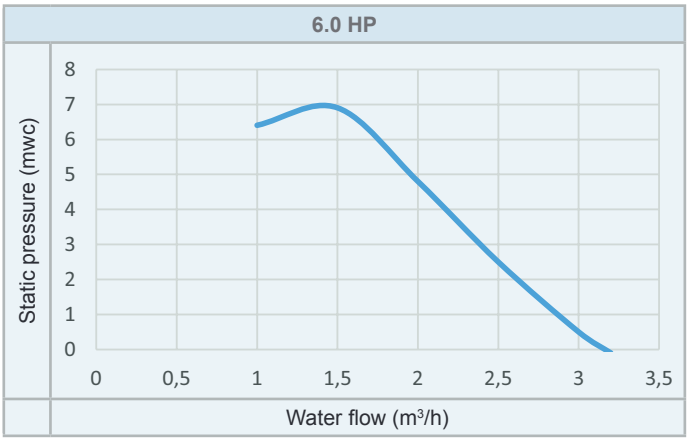


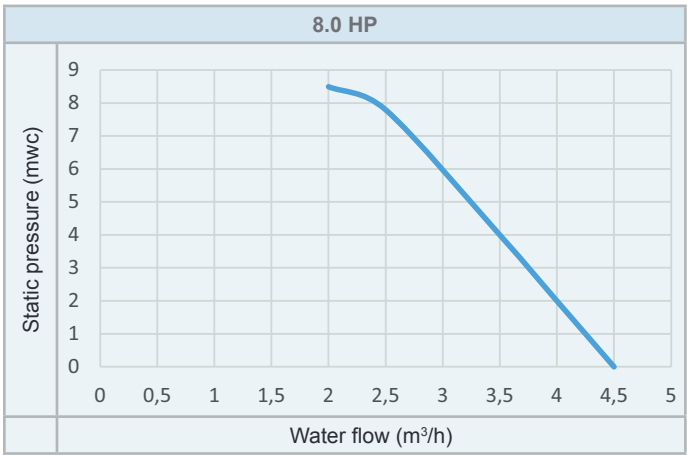


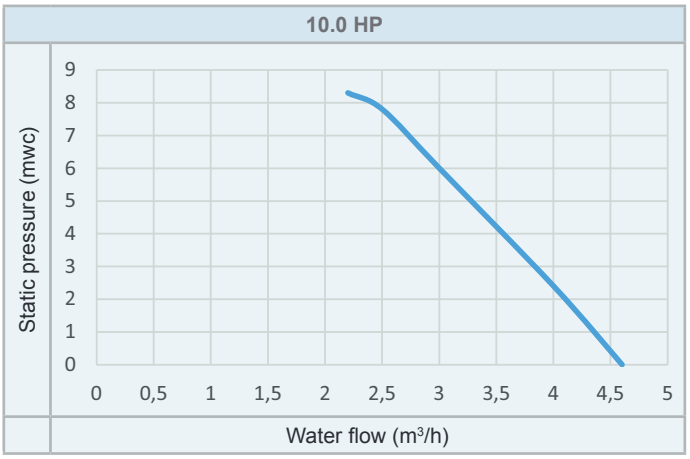




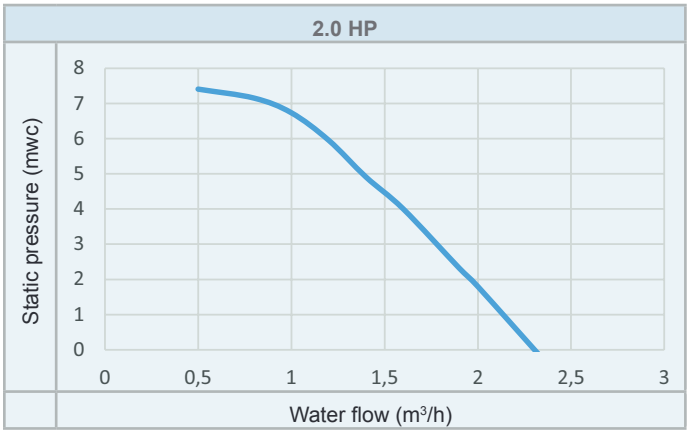

5.0 HP
Static pressure (mwc)
0 1 2 3 4 5 6 7 8
0 0,5 1 1,5 2 2,5 3 3,5
Water flow (m³/h)

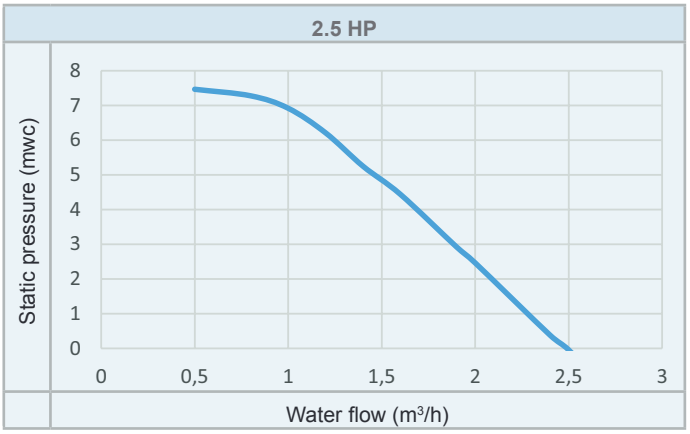

6.0 HP
Static pressure (mwc)
0 1 2 3 4 5 6 7 8
0 0,5 1 1,5 2 2,5 3 3,5
Water flow (m³/h)

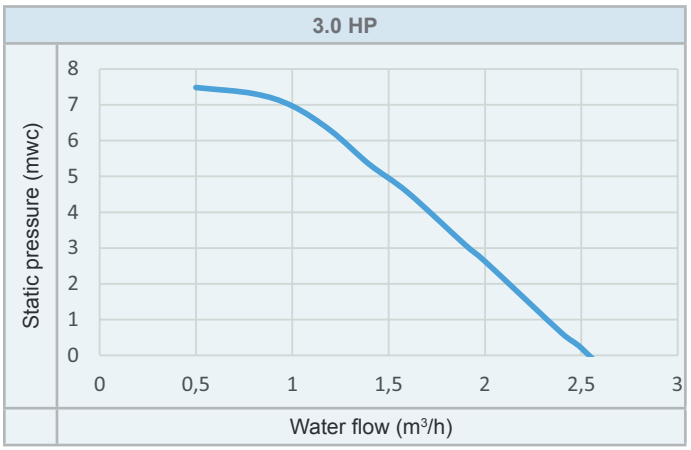

8.0 HP
Static pressure (mwc)
0 1 2 3 4 5 6 7 8 9
0 0,5 1 1,5 2 2,5 3 3,5 4 4,5 5
Water flow (m³/h)

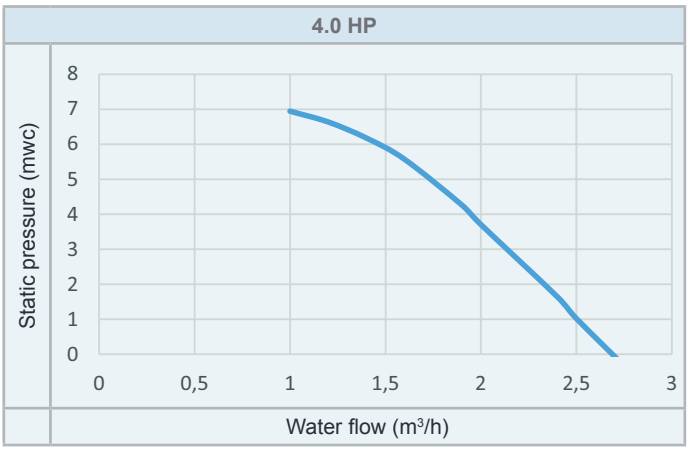

10.0 HP
Static pressure (mwc)
0 1 2 3 4 5 6 7 8 9
0 0,5 1 1,5 2 2,5 3 3,5 4 4,5 5
Water flow (m³/h)

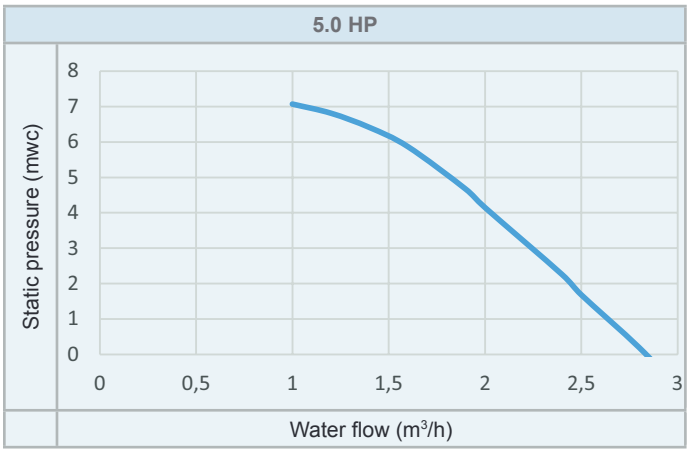
◆ YUTAKI S COMBI

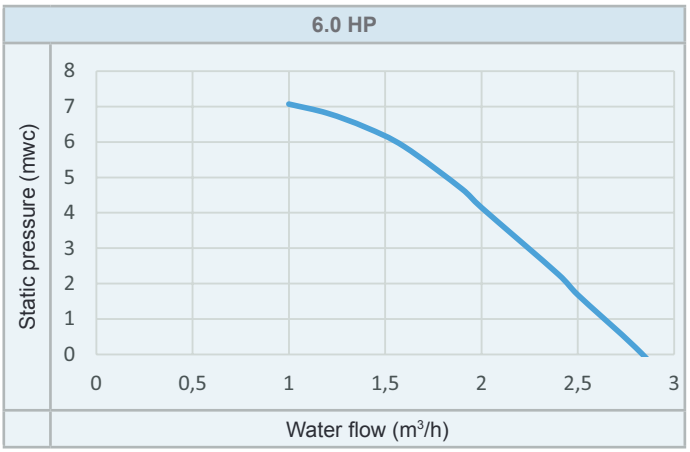












5 REFRIGERANT AND WATER PIPING

5.1 R32 REFRIGERANT CIRCUIT

5.1.1 General notes R32 refrigerant

This appliance is filled with R32, an odourless flammable refrigerant gas with low burning velocity (A2L class pursuant to ISO 817). If the refrigerant is leaked, there is a possibility of ignition if it enters in contact with an external ignition source.

Make sure that unit installation and refrigerant piping installation comply with applicable legislation in each country. Also, in Europe, EN378 must be complied, as it is the applicable standard.

5.1.2 Refrigerant piping

◆ Refrigerant piping length between indoor unit and outdoor unit

The unit installation and refrigerant piping should comply with the relevant local and national regulations for the designed refrigerant.

Due to R32 refrigerant and depending on final refrigerant charge amount, a minimum floor area for installation must be considered.

- If total refrigerant charge amount <1.84kg, there are no additional minimum floor area requirements.
- If total refrigerant charge amount ≥1.84kg, there are additional minimum floor area requirements to be checked.

New YUTAKI R32 range (2~3HP) due to low refrigerant charge amount and due to low additional charge needed, unit installation can achieve up to 30m (2/2.5HP) / 27m (3HP) without any minimum floor area requirement.

			2HP	2.5HP	3HP
Factory Charge		kg	1.20	1.30	1.30
Charge-less piping length		m	10	10	10
Additional Charge needed		g/m	15	15	30
Maximum piping		m	30	30	27
Maximum total refrigerant charge		kg	1.50	1.60	1.81
Minimum room area requirement (Amin)		m^2	No requirement is needed		
Minimum piping length between outdoor unit and indoor unit (Lmin)		m	3		
Maximum height difference between indoor and outdoor unit (H)					
	Outdoor unit higher than indoor unit	m	30 (2/2.5 HP) 27 (3 HP)		
	Indoor unit higher than outdoor unit	m	20		

In case of increasing more than 30m (2/2.5HP) / 27m (3HP) a minimum floor area requirement must be considered.

			2HP	2.5HP	3HP (*)
Factory Charge		kg	1.20	1.30	1.30
Charge-less piping length		m	10	10	10
Additional Charge needed		g/m	15	15	30
Maximum piping		m	50	50	40
Maximum total refrigerant charge		kg	1.80	1.90	2.20
Minimum room area requirement (Amin)		m^2	No requirement is needed	Minimum area is required	
Minimum piping length between outdoor unit and indoor unit (Lmin)		m	3		
Maximum height difference between indoor and outdoor unit (H)					
	Outdoor unit higher than indoor unit	m	30		
	Indoor unit higher than outdoor unit	m	20		

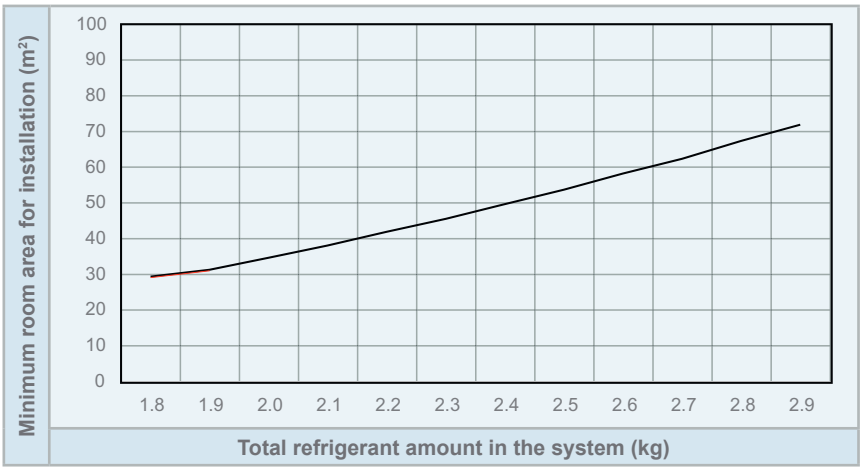
NOTE

(*) In case of 3HP with piping length >27m, refrigerant piping diameter and additional charge quantity must be considered.

◆ Minimum area requirements

In case of total refrigerant amount ≥1.84 kg, the unit should be installed, operated and stored in a room with a floor area larger than the minimum criteria. Use following graphic and table to determine these minimum criteria:

Refrigerant Amount (kg)	Minimum Area (m^2) (H:2.2m)
1.84	28.81
1.9	30.72
2.0	34.09
2.1	37.53
2.2	41.19
2.3	45.02
2.4	49.02
2.5	53.19
2.6	57.53
2.7	62.04
2.8	66.72
2.9	71.58



NOTE

In case of not achieving the minimum floor area, contact with your dealer.

◆ Refrigerant piping size

Piping connection size of outdoor unit & indoor unit

Model	Piping length	Outdoor unit		Refrigerant pipe		Indoor Unit	
		Pipe Connection size		(Between Outdoor unit and Indoor unit)		Pipe Connection size	
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
2HP	3~50m	Ø 12.7 (1/2")	Ø 6.35 (1/4")	Ø 12.7	Ø 6.35	Ø 15.88 (5/8") (*)	Ø 6.35 (1/4")
2.5HP	3~50m						Ø 9.52 (3/8") (*)
3HP	3~27m	Ø 15.88 (5/8") (*)	Ø 9.52 (3/8") (*)	Ø 15.88	Ø 6.35	Ø 15.88 (5/8")	Ø 9.52 (3/8") (*)
	27~40m	Ø 15.88 (5/8")	Ø 9.52 (3/8")	Ø 15.88	Ø 9.52	Ø 15.88 (5/8")	Ø 9.52 (3/8") (*)

NOTE

(*): The refrigerant gas and liquid piping size for 2/2.5/3HP are different between outdoor and indoor unit, so refrigerant pipe adapters are required. These pipe adapters are factory supplied with the outdoor unit:

Model	Pipe adapter	
	Gas pipe	Liquid pipe
2 HP	Ø15.88→Ø12.7	-
2.5 HP	Ø15.88→Ø12.7	Ø9.52→Ø6.35
3.0 HP	-	Ø9.52→Ø6.35 (x2)

5.1.3 Refrigerant charge

5.1.3.1 Refrigerant charge amount

The R32 refrigerant is factory charged in the outdoor unit with a refrigerant charge amount for 10 m of piping length between outdoor and indoor unit.

5.1.3.2 Refrigerant charge before shipment (W_0 (kg))

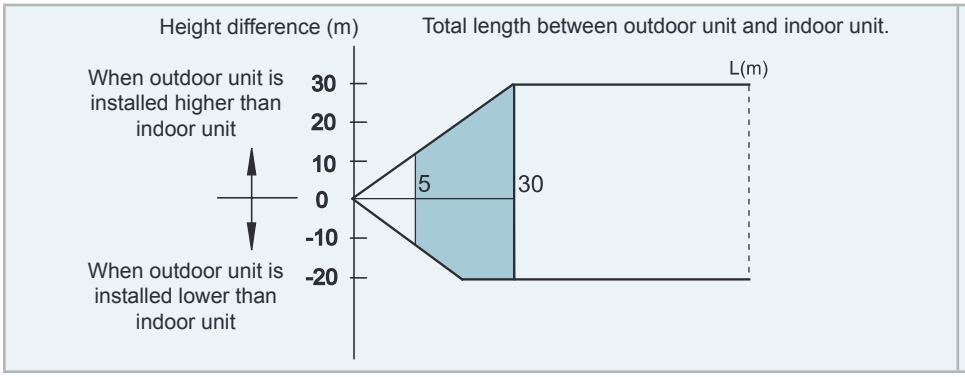
Outdoor unit model	W_0 (kg)
RAS-2WHVRP1	1.2
RAS-2.5WHVRP1	1.3
RAS-3WHVRP1	1.3

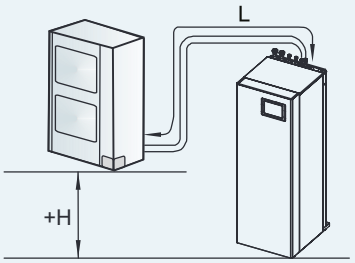
5.2 R410A REFRIGERANT CIRCUIT

5.2.1 Refrigerant piping

◆ Refrigerant piping length between indoor unit and outdoor unit

The refrigerant piping length between indoor unit and outdoor unit should be designed using the following chart. Keep the design point within the area of the chart, which is showing the applicable height difference according to piping length.





		OU Model	
		4-6 HP	8/10 HP
Maximum piping length between outdoor unit and indoor unit (Lmax)	Actual piping length (L)	75 m	70 m
	Equivalent piping length (X)	95 m	90 m
Minimum piping length between outdoor unit and indoor unit (Lmin)	Actual piping length	5 m (*)	
Maximum height difference between indoor and outdoor unit (H)	Outdoor unit higher than indoor unit	30 m	
	Indoor unit higher than outdoor unit	20 m	

NOTE

(*): If the actual piping length between outdoor and indoor unit needs to be less than 5m, contact with your dealer.

◆ Refrigerant piping size

Piping connection size of outdoor unit & indoor unit

Model	Pipe size		Indoor unit		
			Model	Pipe size	
	Gas pipe	Liquid pipe		Gas pipe	Liquid pipe
(4-6) HP	Ø 15.88 (5/8”)	Ø 9.52 (3/8”)	(4.0-6.0) HP	Ø 15.88 (5/8”)	Ø 9.52 (3/8”)
8 HP	Ø 25.4 (1”)	Ø 9.52 (3/8”)	8 HP	Ø 25.4 (1”)	Ø 9.52 (3/8”)
10 HP		Ø 12.7 (1/2”)	10 HP		Ø 12.7 (1/2”)

5.2.1.1 Refrigerant charge before shipment (W_0 (kg))

YUTAKI S/S COMBI

Outdoor unit model	W_0 (kg)
RAS-4WH(V)NPE	3.3
RAS-(5/6)WH(V)NPE	3.4
RAS-8WHNPE	5.0
RAS-10WHNPE	5.3

5.2.2 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 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

The minimum volume of a closed room where the system is installed to avoid suffocation in case of leakage is:

System combination		Minimum volume (m³)
YUTAKI (S / S COMBI)	4 HP	7.5
	5/6 HP	7.8
YUTAKI S	8 HP	11.4
	10 HP	12.1

The formula used for the calculation of the maximum allowed refrigerant concentration in cases of refrigerant leakage is the following:

$\frac{R}{V} = C$	R: Total quantity of refrigerant charged (kg) V: Room volume (m³) C: Refrigerant concentration

If the room volume is below the minimum value some effective measure must be taken into account after installing to prevent suffocation is case of leakage.

◆ Countermeasure in the event of possible refrigerant leakage

The room must have the following features to prevent suffocation in case a refrigerant leakage occurs:

1 Provide a shutterless opening which will allow fresh air to circulate into the room.

2 Provide a doorless opening of 0.15% or more size to the floor area.

3 There must be a ventilator fan connected to a gas leak detector, with a ventilator capacity of 0.4 m^3/min or higher per Japanese refrigeration ton (= compressor displacement volume / (5.7 m^3/h (R410A) or 14.4 m^3/h (R134a)) of the air conditioning system using the refrigerant.

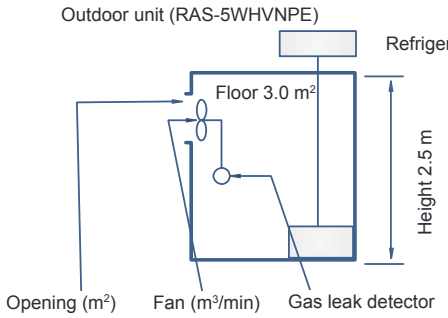
Model	Tonnes
RAS-(4-6)WH(V)NPE	2.27
RAS-8WHNPE	3.16
RAS-10WHNPE	4.11

NOTE

Always take the maximum value between the R410A and R134a.

4 Pay special attention to the place, such as a basement, etc., where the refrigerant can stay, since refrigerant is heavier than air.

Example:



R (kg)	V (m^3)	C (kg/m^3)	Countermeasure
3.4	7.5	0.46	1.0 m^3/min fan linked with gas leak detector or 0.5 m^2 opening

5.3 WATER PIPING

5.3.1 Water piping length

Consider the following guidelines when designing the water circuit.

Item	YUTAKI S	YUTAKI S COMBI
Maximum water piping length between indoor unit and DHW tank	10 m	--
Maximum water piping length between indoor unit and 3-way valve	3 m	--
Maximum water piping length between 3-way valve and DHW tank	10 m	--

5.3.2 Water piping size

YUTAKI S

(inches)

Model	Space heating pipes connection		
	Inlet connection	Outlet connection	Shut-off valves
(2.0-3.0)HP	G 1” (female)	G 1” (female)	G 1” (male) - G 1” (male)
(4.0-10.0)HP	G 1-1/4” (female)	G 1-1/4” (female)	G 1-1/4” (male) - G 1-1/4” (male)

YUTAKI S COMBI

(inches)

Model	Space heating connection			DHW connection		
	Inlet connection	Outlet connection	Shut-off valves	Inlet connection	Outlet connection	Pressure and temperature relief valve (*)
(2.0-3.0)HP	G 1” (female)	G 1” (female)	G 1” (male) - G 1” (male)	G 3/4” (male)	G 3/4” (male)	Ø15 mm
(4.0-6.0)HP	G 1” (female)	G 1” (female)	G 1” (male) - G 1” (male)	G 3/4” (male)	G 3/4” (male)	Ø15 mm

(*): Only for models for UK market

5.3.3 Water quality

CAUTION

- *Water quality must be according to EU council directive 98/83 EC.*
- *Water should be subjected to filtration or to a softening treatment with chemicals before application as treated water.*
- *It is also necessary to analyse the quality of water by checking pH, electrical conductivity, ammonia ion content, sulphur content, and others. Should the results of the analysis be not good, the use of industrial water would be recommended.*
- *No antifreeze agent shall be added to the water circuit.*
- *To avoid deposits of scale on the heat exchangers surface it is mandatory to ensure a high water quality with low levels of $CaCO_3$.*

◆ Recommendations for the DHW circuit

The following is the recommended standard water quality.

Item	DHW space	Tendency (1)	
	Water supplied (3)	Corrosion	Deposits of scales
Electrical Conductivity (mS/m) (25°C) {µS/cm} (25 °C) (2)	100~2000	●	●
Chlorine Ion (mg Cl^-/l)	max 250	●	
Sulphate (mg/l)	max 250	●	
Combination of chloride and sulphate (mg/l)	max 300	●	●
Total Hardness (mg $CaCO_3$ /l)	60~150		●

NOTE

- *(1): The mark "●" in the table means the factor concerned with the tendency of corrosion or deposits of scales.*
- *(2): The value shown in "{}" are for reference only according to the former unit.*
- *(3): Water range will be according s/UNE 112076:2004 IN.*

5.3.4 Water flow control

YUTAKI pumps can estimate the water flow by electronic calculation. Therefore, there is no need to install a water flow switch with the new YUTAKI pumps.

However, if a secondary pump is installed or glycol is used, it is necessary to install a water flow control, as the electronic calculation may be affected.

6 ELECTRICAL AND CONTROL SETTINGS

6.1 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 + indoor 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 2014/30/EU, 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.

◆ Split system - R410A Outdoor unit

Model	Power supply	Z_{max} (Ω)
RAS-4WHVNPE	1~ 230V 50Hz	0.25
RAS-5WHVNPE		0.25
RAS-6WHVNPE		0.25
RAS-4WHNPE	3N~ 400V 50Hz	-
RAS-5WHNPE		-
RAS-6WHNPE		-
RAS-8WHNPE		-
RAS-10WHNPE		-

◆ Split system - R32 Outdoor unit

Model	Power supply	Z_{max} (Ω)
RAS-2WHVRP1	1~ 230V 50Hz	-
RAS-2.5WHVRP1		-
RAS-3WHVRP1		0.43

◆ Split system - Indoor unit

YUTAKI S

Model	Power supply	Operation mode	Z_{max} (Ω)
RWM-(2.0-3.0)R1E	1~ 230V 50Hz	Without electric heater	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	0.28
RWM-(2.0-3.0)R1E	3N~ 400V 50Hz	Without electric heater	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	-
RWM-(4.0-6.0)N1E	1~ 230V 50Hz	Without electric heater	-
		With electric heater	0.28
		With DHW tank heater	-
		With electric and DHW tank heaters	0.19
	3N~ 400V 50Hz	Without electric heater	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	-
RWM-(8.0/10.0)N1E	3N~ 400V 50Hz	Without electric heater	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	-

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".

YUTAKI S COMBI

Model	Power supply	Operation mode	Z_{max} (Ω)
RWD-(2.0-3.0)RW1E-220S(-K)	1~ 230V 50Hz	Without electric heaters	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	0.29
RWD-(2.0-3.0)RW1E-220S(-K)	3N~ 400V 50Hz	Without electric heaters	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	-
RWD-(4.0-6.0)NW1E-220S(-K)	1~ 230V 50Hz	Without electric heaters	-
		With electric heater	0.28
		With DHW tank heater	-
		With electric and DHW tank heaters	0.19
	3N~ 400V 50Hz	Without electric heaters	-
		With electric heater	-
		With DHW tank heater	-
		With electric and DHW tank heaters	-

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

Status regarding compliance with EN 61000-3-2 and EN 61000-3-12	Models		
	Split system		
	Outdoor unit	Indoor unit	
		YUTAKI S	YUTAKI S COMBI
Equipment complying with EN 61000-3-2 (*): Professional use	RAS-2WHVRP1(*) RAS-2.5WHVRP1(*) RAS-3WHVRP1 (*) RAS-4WHNPE (*) RAS-5WHNPE (*) RAS-6WHNPE (*)	RWM-2.0R1E RWM-2.5R1E RWM-3.0R1E RWM-4.0N1E (3N~) RWM-5.0N1E (3N~) RWM-6.0N1E (3N~) RWM-8.0N1E RWM-10.0N1E	-
Equipment complying with EN 61000-3-12	RAS-4WHVNPE RAS-5WHVNPE RAS-6WHVNPE	RWM-4.0N1E (1~) RWM-5.0N1E (1~) RWM-6.0N1E (1~)	RWD-2.0RW1E-220S RWD-2.5RW1E-220S RWD-3.0RW1E-220S RWD-4.0NW1E-220S RWD-5.0NW1E-220S RWD-6.0NW1E-220S
Installation restrictions may be applied by supply authorities in relation to harmonics	RAS-8WHNPE RAS-10WHNPE	-	-

- Check to ensure that existing installation (main 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 indoor unit operation, adjust the DSW4 pin 3 of the PCB1 to the ON position and use the adequate protections. Refer to the section *"6.2 Electrical connection"* for the detailed information.

6.2 ELECTRICAL CONNECTION

⚠ 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 indoor unit. Do not use a power circuit shared with the outdoor unit or any other appliance.*

6.2.1 Wiring size

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

◆ Split system - R410A Outdoor unit

Model	Power supply	Max. current (A)	Power supply cables	Transmitting cables	Actuator cables
			EN60335-1	EN60335-1	EN60335-1
RAS-4WHVNPE	1~ 230V 50Hz	30	2 x 6.0 mm² + GND	2 x 0.75 mm² (Shielded cable)	2 x 0.75 mm² + GND
RAS-5WHVNPE		30	2 x 6.0 mm² + GND		
RAS-6WHVNPE		30	2 x 6.0 mm² + GND		
RAS-4WHNPE	3N~ 400V 50Hz	14	4 x 2.5 mm² + GND		
RAS-5WHNPE		14	4 x 2.5 mm² + GND		
RAS-6WHNPE		16	4 x 4.0 mm² + GND		
RAS-8WHNPE		24	4 x 6.0 mm² + GND		
RAS-10WHNPE		24	4 x 6.0 mm² + GND		

◆ Split system - R32 Outdoor unit

Model	Power supply	Max. current (A)	Power supply cables	Transmitting cables	Actuator cables
			EN60335-1	EN60335-1	EN60335-1
RAS-2WHVRP1	1~ 230V 50Hz	10.4	2 x 2.5 mm² + GND	2 x 0.75 mm² (Shielded cable)	2 x 0.75 mm² + GND
RAS-2.5WHVRP1		12.9	2 x 2.5 mm² + GND		
RAS-3WHVRP1		15.8	2 x 4.0 mm² + GND		

◆ Split system - Indoor unit

YUTAKI S

Model	Power supply	Operation mode	Max. current (A)	Power supply cables	Transmitting cables	Actuator cables
				EN60335-1	EN60335-1	EN60335-1
RWM-(2.0-3.0)R1E	1~ 230V 50Hz	Without electric heaters	0.63	2 x 0.75 mm² + GND	2 x 0.75 mm² (Shielded cable)	2 x 0.75 mm² + GND
		With electric heater	13.7	2 x 2.5 mm² + GND		
		With DHW tank heater	13.7	2 x 2.5 mm² + GND		
		With electric and DHW tank heaters	26.7	2 x 6.0 mm² + GND		
RWM-(2.0-3.0)R1E	3N~ 400V 50Hz	Without electric heaters	0.6	4 x 0.75 mm² + GND		
		With electric heater	5.0	4 x 2.5 mm² + GND		
		With DHW tank heater	13.7	4 x 4.0 mm² + GND		
		With electric and DHW tank heaters	18.0	4 x 6.0 mm² + GND		
RWM-(4.0-6.0)N1E	1~ 230V 50Hz	Without electric heaters	0.7	2 x 0.75 mm² + GND		
		With electric heater	26.7	2 x 6.0 mm² + GND		
		With DHW tank heater	13.7	2 x 2.5 mm² + GND		
		With electric and DHW tank heaters	39.8	2 x 10.0 mm² + GND		
	3N~ 400V 50Hz	Without electric heaters	0.7	4 x 0.75 mm² + GND		
		With electric heater	9.3	4 x 2.5 mm² + GND		
		With DHW tank heater	13.7	4 x 2.5 mm² + GND		
		With electric and DHW tank heaters	22.4	4 x 6.0 mm² + GND		
RWM-(8.0/10.0)N1E	3N~ 400V 50Hz	Without electric heaters	0.7	4 x 0.75 mm² + GND		
		With electric heater	13.7	4 x 4.0 mm² + GND		
		With DHW tank heater	13.7	4 x 4.0 mm² + GND		
		With electric and DHW tank heaters	26.7	4 x 10.0 mm² + GND		

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".

YUTAKI S COMBI

Model	Power supply	Operation mode	Max. current (A)	Power supply cables	Transmitting cables	Actuator cables
				EN60335-1	EN60335-1	EN60335-1
RWD-(2.5-3.0)RW1E-220S(-K)	1~230V 50Hz	Without electric heaters	0.63	2 x 0.75 mm² + GND	2 x 0.75 mm² (Shielded cable)	2 x 0.75 mm² + GND
		With electric heater	13.7	2 x 2.5 mm² + GND		
		With DHW tank heater	12.6	2 x 2.5 mm² + GND		
		With electric and DHW tank heaters	25.6	2 x 6.0 mm² + GND		
RWD-(2.5-3.0)RW1E-220S(-K)	3N~400V 50Hz	Without electric heaters	0.63	4 x 0.75 mm² + GND		
		With electric heater	9.3	4 x 2.5 mm² + GND		
		With DHW tank heater	12.6	4 x 2.5 mm² + GND		
		With electric and DHW tank heaters	12.6	4 x 2.5 mm² + GND		
RWD-(4.0-6.0)NW1E-220S(-K)	1~230V 50Hz	Without electric heaters	0.65	2 x 0.75 mm² + GND		
		With electric heater	26.7	2 x 6.0 mm² + GND		
		With DHW tank heater	12.6	2 x 2.5 mm² + GND		
		With electric and DHW tank heaters	38.7	2 x 10.0 mm² + GND		
	3N~400V 50Hz	Without electric heaters	0.65	4 x 0.75 mm² + GND		
		With electric heater	18.0	4 x 6.0 mm² + GND		
		With DHW tank heater	12.6	4 x 2.5 mm² + GND		
		With electric and DHW tank heaters	18.0	4 x 6.0 mm² + GND		

6.2.2 Minimum requirements of the protection devices

⚠ CAUTION

- *Ensure specifically that there is an Earth Leakage Breaker (ELB) installed for the units (outdoor and indoor 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 and indoor 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).*

◆ Split system - R410A Outdoor unit

Model	Power supply	Applicable voltage		MC (A)	CB (A)	ELB (nº of poles/A/mA)
		U max. (V)	U min. (V)			
RAS-4WHVNPE	1~ 230V 50Hz	253	207	30	32	2/40/30
RAS-5WHVNPE				30	32	
RAS-6WHVNPE				30	32	
RAS-4WHNPE	3N~ 400V 50Hz	440	360	14	15	4/40/30
RAS-5WHNPE				14	15	
RAS-6WHNPE				16	20	
RAS-8WHNPE				24	25	
RAS-10WHNPE				24	25	

MC: Maximum current; CB: Circuit breaker; ELB: Earth leakage breaker

◆ Split system - R32 Outdoor unit

Model	Power supply	Applicable voltage		MC (A)	CB (A)	ELB (nº of poles/A/mA)
		U max. (V)	U min. (V)			
RAS-2WHVRP1	1~ 230V 50Hz	253	207	10.4	16	2/40/30
RAS-2.5WHVRP1				12.9	16	
RAS-3WHVRP1				15.8	20	

MC: Maximum current; CB: Circuit breaker; ELB: Earth leakage breaker

◆ Split system - Indoor unit

YUTAKI S

Model	Power supply	Applicable voltage		Operation mode	MC (A)	CB (A)	ELB (nº of poles/A/mA)
		U max. (V)	U min. (V)				
RWM-(2.0-3.0)R1E	1~ 230V 50Hz	253	207	Without electric heaters	0.6	5	2/40/30
				With electric heater	14	16	
				With DHW tank heater	14	16	
				With electric and DHW tank heaters	27	32	
RWM-(2.0-3.0)R1E	3N~ 400V 50Hz	440	360	Without electric heaters	0.6	5	4/40/30
				With electric heater	5	10	
				With DHW tank heater	14	20	
				With electric and DHW tank heaters	18	25	
RWM-(4.0-6.0)N1E	1~ 230V 50Hz	253	207	Without electric heaters	0.7	5	2/40/30
				With electric heater	27	32	
				With DHW tank heater	14	16	
				With electric and DHW tank heaters	40	50	2/63/30
	3N~ 400V 50Hz	440	360	Without electric heaters	0.7	5	4/40/30
				With electric heater	9	15	
				With DHW tank heater	14	15	
				With electric and DHW tank heaters	22	25	
RWM-(8.0/10.0)N1E	3N~ 400V 50Hz	440	360	Without electric heaters	0.7	5	4/40/30
				With electric heater	14	20	
				With DHW tank heater	14	20	
				With electric and DHW tank heaters	27	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".

YUTAKI S COMBI

Model	Power supply	Applicable voltage		Operation mode	MC (A)	CB (A)	ELB (nº of poles/A/mA)
		U max. (V)	U min. (V)				
RWD-(2.0-3.0)RW1E-220(-K)	1~ 230V 50Hz	253	207	Without electric heaters	0.6	5	2/40/30
				With electric heater	13.7	16	
				With DHW tank heater	12.6	16	
				With electric and DHW tank heaters	25.6	32	
RWD-(2.0-3.0)RW1E-220(-K)	3N~ 400V 50Hz	440	360	Without electric heaters	0.6	5	4/40/30
				With electric heater	9.3	15	
				With DHW tank heater	12.6	15	
				With electric and DHW tank heaters	12.6	15	
RWD-(4.0-6.0)NW1E-220S(-K)	1~ 230V 50Hz	253	207	Without electric heaters	0.7	5	2/40/30
				With electric heater	26.7	32	
				With DHW tank heater	12.6	16	
				With electric and DHW tank heaters	38.7	50	2/63/30
	3N~ 400V 50Hz	440	360	Without electric heaters	0.7	5	4/40/30
				With electric heater	18.0	25	
				With DHW tank heater	12.6	15	
				With electric and DHW tank heaters	18.0	25	

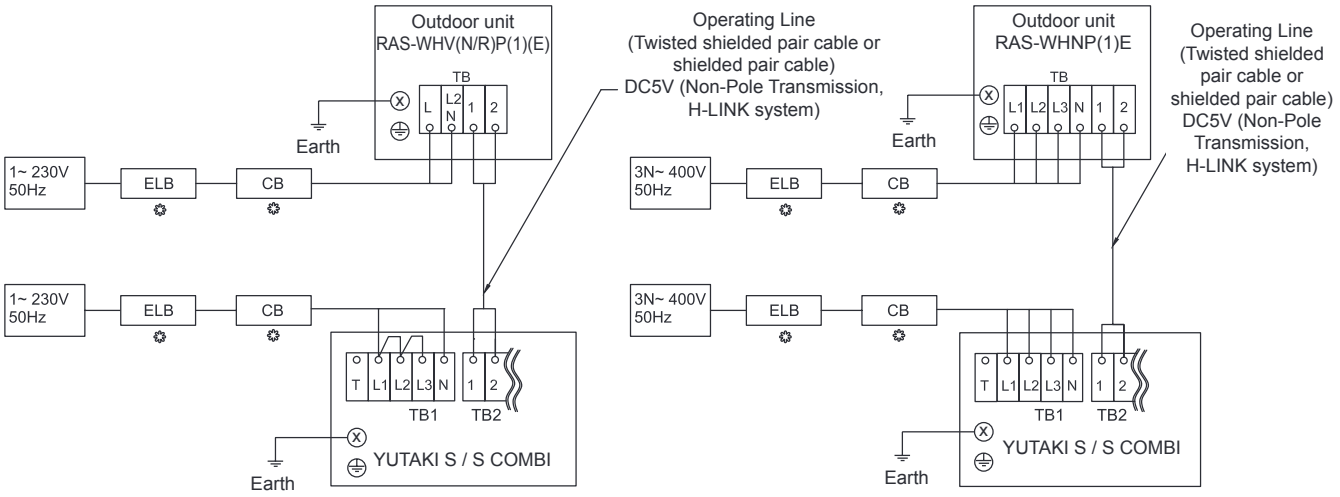
6.3 TERMINAL BOARD CONNECTIONS

6.3.1 Table board 1

◆ Main power supply

The main power supply connection is wired to the Terminal board (TB1) as follows:

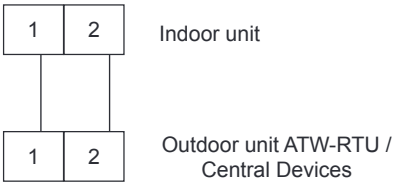
YUTAKI (S / S COMBI)



6.3.2 Table board 2

◆ Indoor/outdoor communication wiring (TB2) / ATW-RTU Communication / Central Devices Communication

- The transmission is wired to terminals 1-2.
- The H-LINK II wiring system requires only two transmission cables that connect the indoor unit and the outdoor unit in case of split system and also connect the indoor unit with ATW-RTU or Central devices like ATW-TAG-02, ATW-KNX-02 and ATW-MBS-02.



- Use twist pair wires (0.75 mm²) for operation wiring between outdoor unit and indoor unit. The wiring must consist of 2-core wires (Do not use wire with more than 3 cores).
- Use shielded wires for intermediate wiring to protect the units from noise interference, with a length of less than 300 m and a size in compliance with local codes.
- In the event that a conduit tube for field-wiring is not used, fix rubber bushes to the panel with adhesive.

⚠ CAUTION

Ensure that the transmission wiring is not wrongly connected to any live part that could be damaged the PCB.

Input and output terminals give the possibility to configure the installation according to the needs of the user. The default settings and I/O terminals reach most of the options necessary for an optimal performance of the system. Additionally, the settings can be modified through the unit controller, and input/output terminals can be used, if required, to have additional options.

YUTAKI S

Input terminals (Default input functions)

◆ Room thermostat communication cables

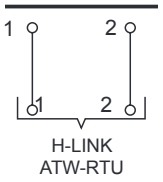
There are two different room thermostat types as accessory

Optional wireless intelligent room thermostat (TB2) ATW-RTU

Only for wireless room thermostat accessory: the receiver is connected to the polarity-free terminals1 and 2.

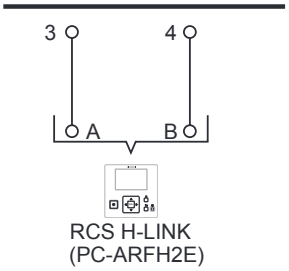
The Wireless room thermostat and the Intelligent receiver are already configured to communicate with each other. If the Wireless room thermostat or the Intelligent receiver is replaced or an additional second temperature circuit thermostat is added, it is necessary to rebind them as explained in the manual of the Wireless intelligent room thermostat.

The Intelligent receiver is connected to the indoor unit table board as shown in the next picture:



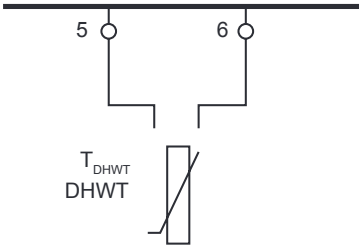
◆ PC-ARFH2E connection

In cases where another PC-ARFH2E must be connected as a second thermostat, the connections between PC-ARFH2E and the indoor unit must be done in terminals 3 and 4 and the connection of the power supply in terminals 28-29, as it is shown in the next picture:



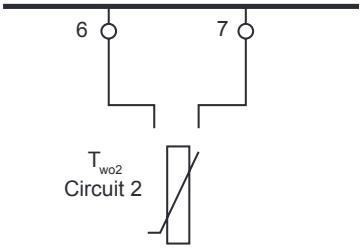
◆ DHWT Thermistor (TDHWT)

For those cases in which a tank is installed as accessory, a thermistor must be installed to control the water temperature. The connection for this thermistor must be done between terminals 5 and 6 of the TB2.

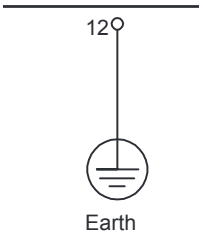


◆ Water outlet thermistor for circuit 2 (TWO2)

When the installation is configured with a second circuit the thermistor for the water outlet temperature have to be connected between terminals 6 and 7 of the terminal board 2.



◆ Earth

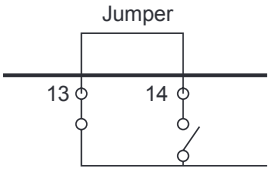


◆ Optional wireless ON/OFF room thermostat ATW-RTU-04

The heat pump system has been designed to allow the connection of a remote ON/OFF thermostat to effectively control the home temperature. Depending on the room temperature, the thermostat will turn the system to ON or OFF.

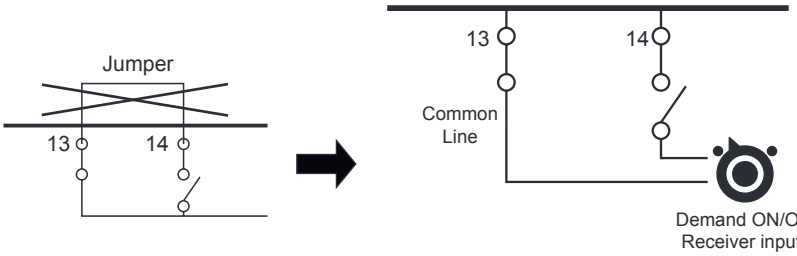
a. If no thermostat is installed

Terminals 13 and 14 are jumped if there is no ON/OFF receiver connected. When no remote thermostat is installed the operating condition for the unit (Thermo ON/OFF) will be controlled by the water calculation control system.



b. Installation of the ATW-RTU-04

In case of setting an installation with 2 circuits (circuit 1 and circuit 2) and the same demand ON/OFF is used for both of them, remove the jumper between terminals 13 and 14 of the Terminal board 2 and connect the RF receiver as shown in the following picture.



Thermostat requirements:

- Power supply: 230V AC
- Contact voltage: 230V

NOTE

- *If wireless intelligent thermostat is selected, optional ON/OFF thermostat has no effect.*
- *Set the configuration in the user's control. See chapter "7 Unit controller" for more information.*
- *In case of setting an installation with 2 circuits (Circuit 1 and Circuit 2) and a different Demand ON/OFF is used for each of them, please refer to "YUTAKI S" section in this chapter.*
- *Auxiliary power supply is available for thermostats and central devices (28 and 29 terminals of TB2).*

◆ ECO (Default for input 2)

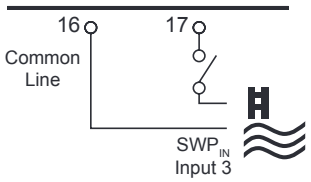
When enabled at Unit controller, both for circuit 1 and circuit 2, also for heating and cooling, this input switches the indoor unit into an ECO mode by adjusting its settings only when input is closed.

The input can come from a push button, a thermostat or any other external device with that purpose.



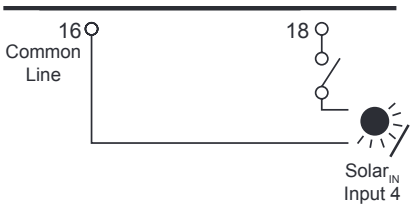
◆ Swimming pool (Default for input 3)

When it is necessary to control the temperature of the swimming pool water, a connection between the heat pump and the corresponding sensor must be done on terminals 16 and 17 at the Terminal board (input 4).



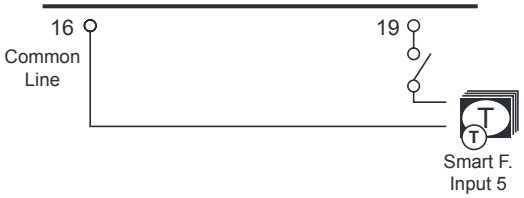
◆ Solar (Default for input 4)

This input comes from a solar panel sensor. The solar combination by input demand allows HSW to be heated by solar system when there is enough solar energy available. The connection of this input signal has to be done between terminals 16 and 18 at TB2.



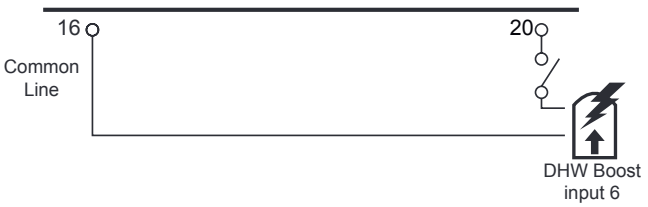
◆ Smart tariff (Default for input 5)

This function can be used to block or limit the heat pump. It allows an external Smart switch device to switch off or limit the heat pump during a period of peak electricity demand. Terminals 16 and 19 of the TB2.



◆ DHW boost (Default for input 6)

This function allows a request for a one-time heating up of the domestic hot water temperature. The input can be sent by a push button, a NC contact and a NO contact. This input is switched on terminals 16 and 20 of the TB2.



◆ Power Meter (Default for input 7)

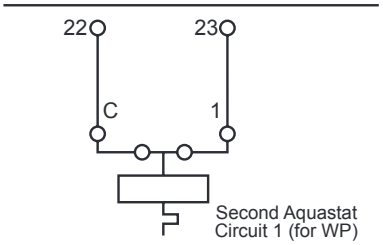
This function is used to monitor real consumption of the system by means an external power meter device connected at this input. The calculation method is done by measuring real consumption of the whole installation with one power meter device or 2 separate power meter (one for indoor unit and another one for outdoor unit.



◆ Aquastat for circuit 1

Aquastat is a security accessory to control in order to prevent high water temperature entering into floor system (Circuit 1). This devices must be connected to terminals 22 & 23 for circuit 1.

When this devices is activated because of the high temperature of the water, it stops the water pump in order to stop the flow of water to the heating floor.



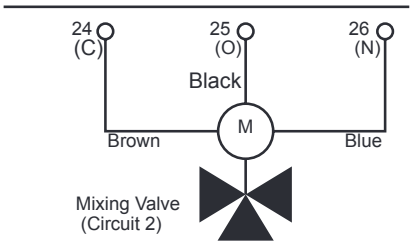
NOTE

In case of YUTAKI S COMBI UK model, Domestic Hot water tank security thermostat its connected to terminals 22&23 and this funcion is not available for circuit 1.

Output terminals (Default output functions)

◆ Mixing valve for Circuit 2

The mixing valve is controlled to maintain the second heating temperature at the second heating temperature set point. The control system decides how much to open or close the mixing valve to achieve the desired position of the valve.



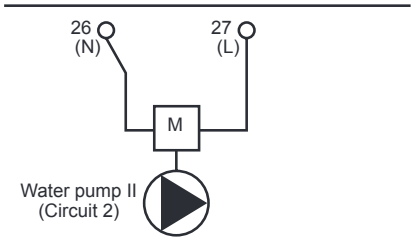
Terminal	Name	Description
24	C	Close
25	O	Open
26	N	Neutral

Valve requirements:

- Power supply: 230V AC 50Hz
- Maximum running current: 100mA

◆ Water pump 2 Circuit 2

In case of a second circuit installation (second temperature level) the secondary pump is the circulating pump for the second heating temperature.

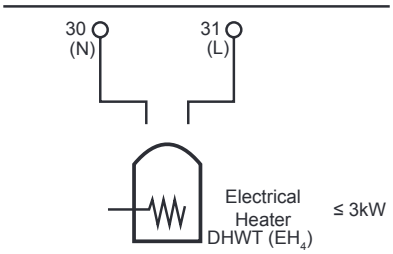


Pump requirements:

- Power supply: 230V AC 50Hz
- Maximum running current: 500mA (An auxiliary relay must be installed in case of high consumption of the water pump).

◆ Electrical heater DHWT output

In those cases where a DHW tank is installed with an electrical heater, the Air to Water heat pump can activate the electric heater of the tank when the heat pump cannot achieve the required DHW temperature by itself.

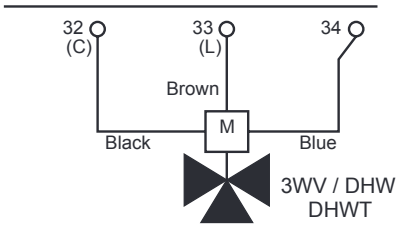


⚠ CAUTION

When using a DHW tank other than those from Hitachi, the maximum connectable heater load is 3 kW (connected to TB2 terminals 30-31).

◆ 3 Way valve for DHW tank output

YUTAKI units can be used to heat DHW. The signal is used on a 3-way motorized diverting valve and to provide control of supply water flow (water flow for space heating when there is no signal, and water flow for DHW when signal is ON)



Valve requirements:

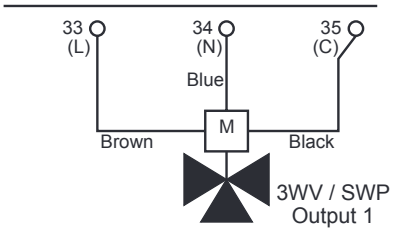
- Power supply: 230V AC 50Hz
- Maximum running current: 100mA

Output terminals (Optional output functions)

◆ 3 Way valve for Swimming pool (Default for Output 1)

YUTAKI units can be used to heat the water of a swimming pool. The signal is used on a 3-way motorized diverting valve and to provide control of supply water flow for the swimming pool. This output is available when the function is enabled from the Unit controller.

Using the appropriate wiring, connect the valve cables as shown in the previous picture.

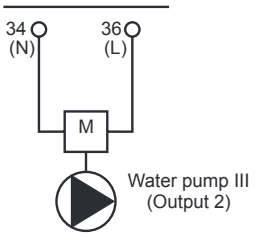


Valve requirements:

- Power supply: 230V AC 50Hz
- Maximum running current: 100mA

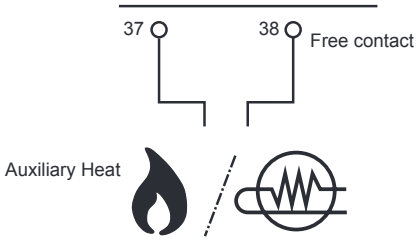
◆ Water pump 3 (Default for Output 2)

When the boiler is configured with the heat pump or needs an additional pump for the system, a hydraulic separator or buffer tank must be used to ensure a correct hydraulic balance



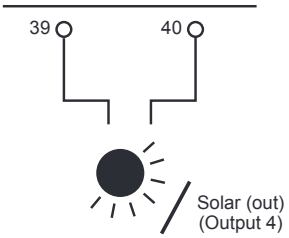
◆ Auxiliary boiler or heater (Default for Output 3)

The auxiliary boiler or heater can be used when the heat pump cannot achieve the require temperature by itself.



◆ Solar (Default for output 4)

This output is used when solar mode is enabled (from Unit controller) and the temperature in the solar panel rises above the water temperature in the domestic hot water tank (DHWT). The connection between terminals 39 and 40 shall be closed in order to activate the dedicated water pump for solar panel combination.



YUTAKI S COMBI

Input terminals (Default input functions)

◆ Room thermostat communication cables

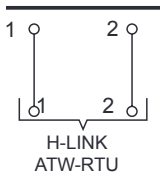
There are two different room thermostat types as accessory

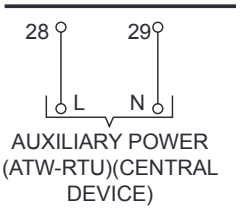
Optional wireless intelligent room thermostat (TB2) ATW-RTU

Only for wireless room thermostat accessory: the receiver is connected to the polarity-free terminals1 and 2.

The Wireless room thermostat and the Intelligent receiver are already configured to communicate with each other. If the Wireless room thermostat or the Intelligent receiver is replaced or an additional second temperature circuit thermostat is added, it is necessary to rebind them as explained in the manual of the Wireless intelligent room thermostat.

The Intelligent receiver is connected to the indoor unit table board as shown in the next picture:

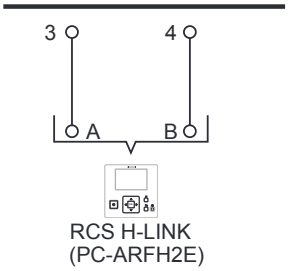




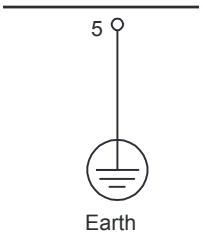
Power supply: 230V AC 50Hz

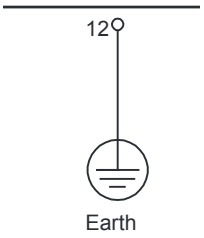
◆ PC-ARFH2E connection

In cases where another PC-ARFH2E must be connected as a second thermostat, the connections between PC-ARFH2E and the indoor unit must be done in terminals 3 and 4, as it is shown in the next picture:



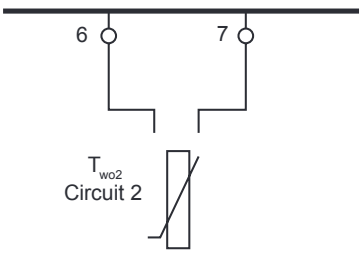
◆ Earth





◆ Water outlet thermistor for circuit 2 (TWO2)

When the installation is configured with a second circuit the thermistor for the water outlet temperature have to be connected between terminals 6 and 7 of the terminal board 2.

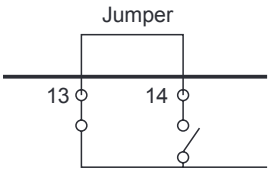


◆ Optional wireless ON/OFF room thermostat ATW-RTU-04

The heat pump system has been designed to allow the connection of a remote ON/OFF thermostat to effectively control the home temperature. Depending on the room temperature, the thermostat will turn the system to ON or OFF.

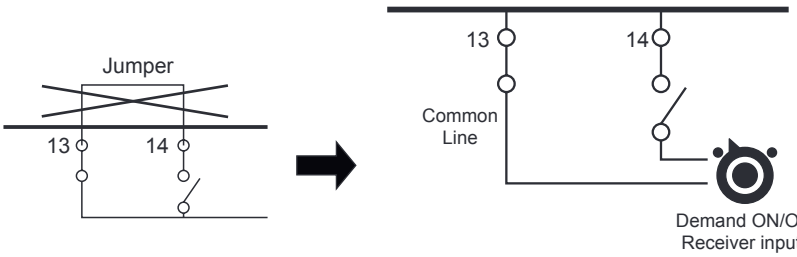
a. If no thermostat is installed

Terminals 13 and 14 are jumped if there is no ON/OFF receiver connected. When no remote thermostat is installed the operating condition for the unit (Thermo ON/OFF) will be controlled by the water calculation control system.



b. Installation of the ATW-RTU-04

In case of setting an installation with 2 circuits (circuit 1 and circuit 2) and the same demand ON/OFF is used for both of them, remove the jumper between terminals 13 and 14 of the Terminal board 2 and connect the RF receiver as shown in the following picture.



Thermostat requirements:

- Power supply: 230V AC
- Contact voltage: 230V

NOTE

- *If wireless intelligent thermostat is selected, optional ON/OFF thermostat has no effect.*
- *Set the configuration in the user's control. See chapter "7 Unit controller" for more information.*
- *In case of setting an installation with 2 circuits (Circuit 1 and Circuit 2) and a different Demand ON/OFF is used for each of them, please refer to "YUTAKI S" section in this chapter.*
- *Auxiliary power supply is available for thermostats and central devices (28 and 29 terminals of TB2).*

◆ ECO (Default for input 2)

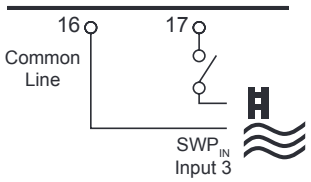
When enabled at Unit controller, both for circuit 1 and circuit 2, also for heating and cooling, this input switches the indoor unit into an ECO mode by adjusting its settings only when input is closed.

The input can come from a push button, a thermostat or any other external device with that purpose.



◆ Swimming pool (Default for input 3)

When it is necessary to control the temperature of the swimming pool water, a connection between the heat pump and the corresponding sensor must be done on terminals 16 and 17 at the Terminal board (input 4).



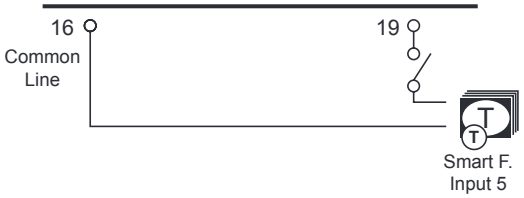
◆ Solar (Default for input 4)

This input comes from a solar panel sensor. The solar combination by input demand allows HSW to be heated by solar system when there is enough solar energy available. The connection of this input signal has to be done between terminals 16 and 18 at TB2.



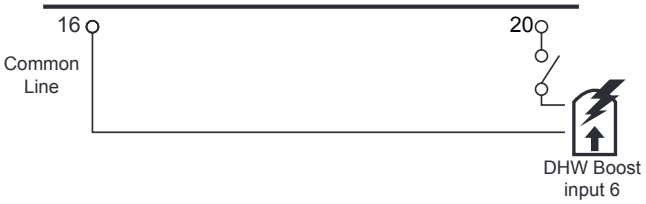
◆ Smart tariff (Default for input 5)

This function can be used to block or limit the heat pump. It allows an external Smart switch device to switch off or limit the heat pump during a period of peak electricity demand. Terminals 16 and 19 of the TB2.



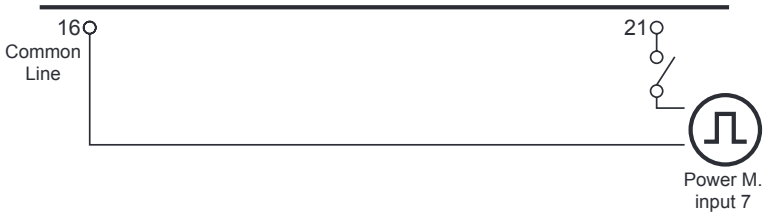
◆ DHW boost (Default for input 6)

This function allows a request for a one-time heating up of the domestic hot water temperature. The input can be sent by a push button, a NC contact and a NO contact. This input is switched on terminals 16 and 20 of the TB2.



◆ Power Meter (Default for input 7)

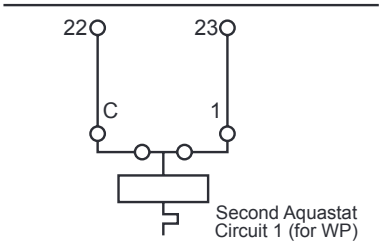
This function is used to monitor real consumption of the system by means an external power meter device connected at this input. The calculation method is done by measuring real consumption of the whole installation with one power meter device or 2 separate power meter (one for indoor unit and another one for outdoor unit.



◆ Aquastat for circuit 1

Aquastat is a security accessory to control in order to prevent high water temperature entering into floor system (Circuit 1). This devices must be connected to terminals 22 & 23 for circuit 1.

When this devices is activated because of the high temperature of the water, it stops the water pump in order to stop the flow of water to the heating floor.

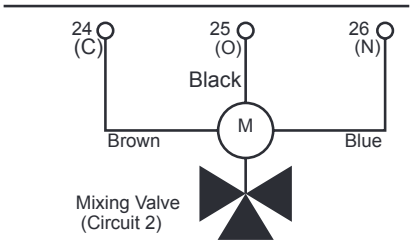


In case of YUTAKI S COMBI UK model, Domestic Hot water tank security thermostat its connected to terminals 22&23 and this funcion is not available for circuit 1.

Output terminals (Default output functions)

◆ Mixing valve for Circuit 2

The mixing valve is controlled to maintain the second heating temperature at the second heating temperature set point. The control system decides how much to open or close the mixing valve to achieve the desired position of the valve.



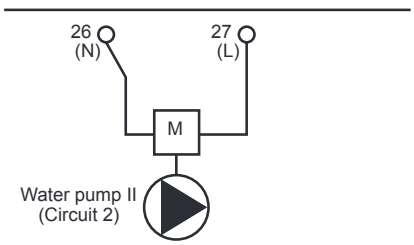
Terminal	Name	Description
24	C	Close
25	O	Open
26	N	Neutral

Valve requirements:

- Power supply: 230V AC 50Hz
- Maximum running current: 100mA

◆ Water pump 2 Circuit 2

In case of a second circuit installation (second temperature level) the secondary pump is the circulating pump for the second heating temperature.

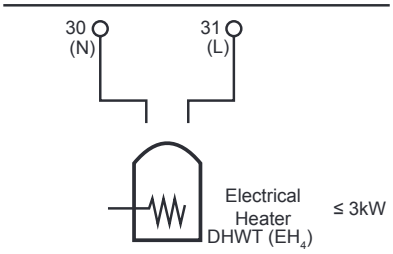


Pump requirements:

- Power supply: 230V AC 50Hz
- Maximum running current: 500mA (An auxiliary relay must be installed in case of high consumption of the water pump).

◆ Electrical heater DHWT output

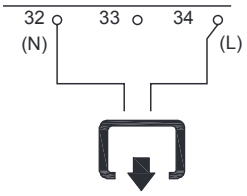
In those cases where a DHW tank is installed with an electrical heater, the Air to Water heat pump can activate the electric heater of the tank when the heat pump cannot achieve the required DHW temperature by itself.



⚠ CAUTION

When using a DHW tank other than those from Hitachi, the maximum connectable heater load is 3 kW (connected to TB2 terminals 30-31).

◆ Output 9

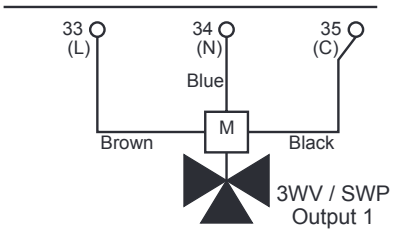


Output terminals (Optional output functions)

◆ 3 Way valve for Swimming pool (Default for Output 1)

YUTAKI units can be used to heat the water of a swimming pool. The signal is used on a 3-way motorized diverting valve and to provide control of supply water flow for the swimming pool. This output is available when the function is enabled from the Unit controller.

Using the appropriate wiring, connect the valve cables as shown in the previous picture.

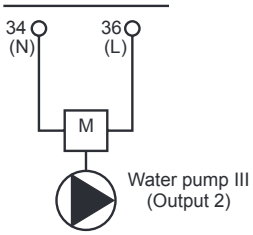


Valve requirements:

- Power supply: 230V AC 50Hz
- Maximum running current: 100mA

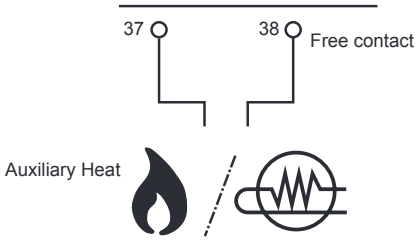
◆ Water pump 3 (Default for Output 2)

When the boiler is configured with the heat pump or needs an additional pump for the system, a hydraulic separator or buffer tank must be used to ensure a correct hydraulic balance



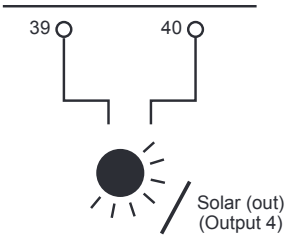
◆ Auxiliary boiler or heater (Default for Output 3)

The auxiliary boiler or heater can be used when the heat pump cannot achieve the require temperature by itself.



◆ Solar (Default for output 4)

This output is used when solar mode is enabled (from Unit controller) and the temperature in the solar panel rises above the water temperature in the domestic hot water tank (DHWT). The connection between terminals 39 and 40 shall be closed in order to activate the dedicated water pump for solar panel combination.

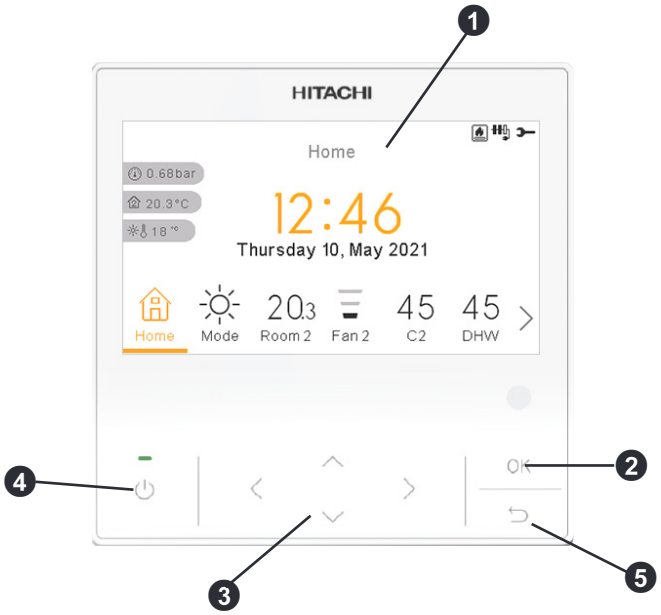


7 UNIT CONTROLLER

The new unit controller for YUTAKI series (PC-ARFH2E) is an user-friendly remote control which ensures a strong and safe communication through H-LINK

The following information applies in the case of PC-ARFH2E software of version H-0122 and later used in combination with PCB indoor unit software of version H-0114 and later.

7.1 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 Return button

To return to the previous screen.

7.2 DESCRIPTION OF THE ICONS

Icon	Name	Explanation	
	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
	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	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 indoor communication is lost, this icon disappears	
	Holiday	When some of the zones are set as holiday, it has it's own holiday icon on their icons zone. The holiday icon is also shown on the home screen.	
	Ambient temperature	The ambient temperature of Circuit 1 or 2 is indicated at the right side of this button	
			
	Outdoor temperature	The outdoor temperature is indicated at the right side of this button	
	Water pressure	The water pressure is indicated at the right side of this button	
	Pump	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.	
			
			

Icon	Name	Explanation	
	Heater step	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 (For YUTAKI S, S COMBI)
			Compressors enabled. 1: R410A/R32 2: R-134a (For YUTAKI S80)
	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		Central mode icon is shown after some central order has been received and for the next 60 seconds.
			Central error
	Forced OFF	When forced off Input is configured and its signal is received, all the configured items (C1, C2, DHW, and/or SWP) are shown in OFF, with this small icon below	
	Auto ON/OFF	When daily average is over auto summer switch-off temperature, circuits 1 and 2 are forced to OFF (Only if Auto ON/OFF enabled)	
	Test Run	Informs about the activation of the “Test Run” function	
	Anti-Legionella	Activation of the Anti-Legionella operation	
	DHW boost	It activates the DHW heater for an immediate DHW operation	
	ECO mode	-	No icon means Comfort mode
			ECO/Comfort mode for circuits 1 and 2
	Night Shift	Informs about night shift operation	
	CASCADE CONTROLLER	Informs about the activation of the “CASCADE” mode.	
		CASCADE CONTROLLER in alarm state	
	Fan stopped by Demand OFF	Informs about the stopagge of fan 1 or 2 by Demand OFF	

7.3 UNIT CONTROLLER CONTENTS

Menu Contents				
Level 1	Level 2	Level 3	Level 4	Level 5
Operation Information				
	Live view			
	Recent Status Register			
	General			
	Circuit 1			
	Circuit 2			
	Hot Water Tank			
	Swimming Pool			
	Heat Pump Details			
	Electrical Heater			
	Boiler Combination			
	Solar Combination			
	Alarm History			
	Communication Status			
Energy data				
Timer and schedule				
	Room 1 / Room 2			
		Heating / Cooling (air)		
			Timer status	
				Enabled
				Deactivated
			Timer configuration	
			Copy to Circuit 1 / 2	
			Reset configuration	
		Launch timer assistant		
	Circuit 1 / Circuit 2			
		Heating / Cooling (water)		
			Timer status	
				Enabled
				Deactivated
			Timer configuration	
			Copy to Circuit 1 / 2	
			Reset configuration	
	DHW			
		Timer status		
			Enabled	
			Deactivated	
		Timer configuration		
		Reset configuration		
	Swimming Pool			
		Timer status		
			Enabled	
			Deactivated	
		Timer configuration		
		Reset configuration		
	Override Configuration			

Menu Contents				
Level 1	Level 2	Level 3	Level 4	Level 5
		Type		
			Until next action	
			Specific time	
			Forever	
		Override duration		
	Delete all timers configuration			
System Configuration				
	Room Thermostats			
		Setting temperature range (air)		
		Air Eco Offset		
		Thermostat Configuration		
			Check RT address	
		Compensation Factors		
		Room Temp Demand OFF		
	Water settings			
		Space Heating / Space Cooling		
			Circuit 1/ Circuit 2	
		DHW		
		SWP		
	Space Heating / Cooling			
		Circuit 1 / 2		
			Water Calculation Mode	
			Eco offset	
			Working limits	
			Mixing valve (only circuit 2)	
	Hot Water Tank			
		Mode		
			Economic	
			Standard	
		Space Priority Status		
		Antilegionella		
		Smart Configuration		
	Swimming Pool			
		Status		
			Enabled	
			Deactivated	
		Setting Temperature		
		Offset Temperature		
	Complementary Heating			
		Heating Source		
		Electrical Heater		
		Boiler Combination		
		Solar Combination		
			Status	
				Input demand
				Total control
	Heat Pump			

Menu Contents				
Level 1	Level 2	Level 3	Level 4	Level 5
		Water Pump Configuration		
		Outdoor average Timer		
		Minimum ON Time		
		Minimum OFF Time		
		Seizure Protection		
			Status	
			Operation Day	
			Starting Time	
	Fan Coils			
		Controlled Fan Zones		
		Delay ON Time		
		Demand OFF Actions		
	Optional Functions			
		Hydraulic Sep. Status		
		Energy Configuration		
		Smart Function		
		Heating Auto On/Off		
		Auto Heat/Cool		
		Hot Water Tank		
			Circuit pump	
			Recirculation timer	
			DHW Boost	
		Emergency Operation		
	I/O and Sensors			
		Inputs		
		Standard outputs		
		Outputs		
		Auxiliary sensors		
	Holiday mode			
		Affected zones		
		Start Holiday Mode		
Controller Settings				
	Room Configuration			
		Room Names		
		Live view icons		
	Date and Time			
		European Summer Time		
		Hour Format		
	Screen settings			
	Language selection			
Installer Access				
Commissioning				
	Air purge procedure			
		Start Air purge		
	Unit test run			
		Start test run		
	Screed drying			
		Start Screed Drying		
About				
	System Information			
	Contact Information			
Factory Reset				
Lock the controller				
Return to user mode				

◆ Installer mode

Icon means that this menu is available only for installer, a special user with higher access privileges to configure the system. In order to access the controller as Installer, go to “Installer access” menu.

After that, the “Enter password” message is displayed.

The login password for the Installer is:

Right ▶, Down ▼, Left ◀, Right ▶

Press “OK” to confirm the password.

If the correct access code is entered, the installer mode icon appears on the notifications bar (bottom line).

Installer mode icon	

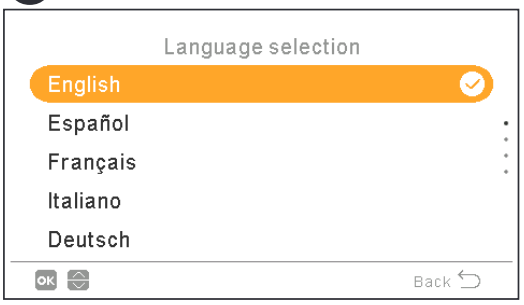
After 30 minutes of inactivity, it is necessary to repeat the log in process. To exit the Installer mode and return to the unit menu, go to the “Return to user mode” on the main menu.

NOTE

The following chapters explain the special settings the Installer can edit. It is important to understand that the Installer can also perform all the actions available for the typical user.

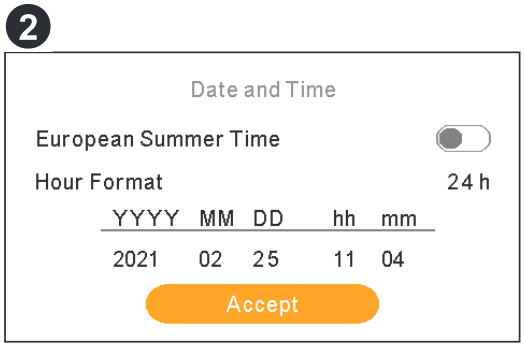
7.4 CONTROLLER CONFIGURATION

1



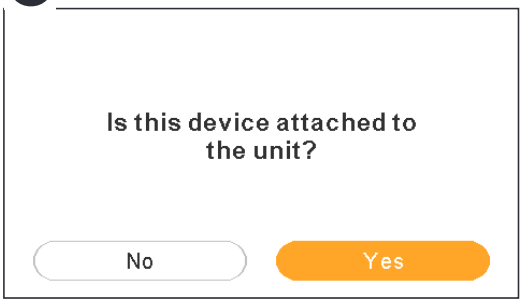
- Select the desired language using the arrow keys.
- Press OK button.

2



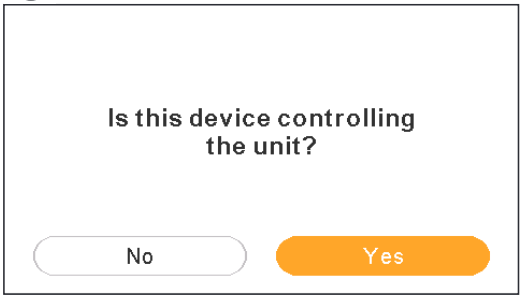
- Select the date and time using the arrow keys.
- Press OK button.

3



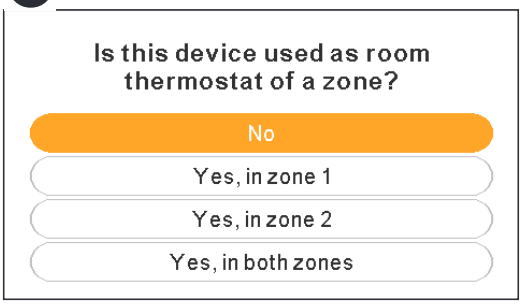
- Select Yes when the device is controlling the unit which it is attached. Jump to screen 6.
- Select No when the device is installed in a different site than the unit.
- Press OK button.

4



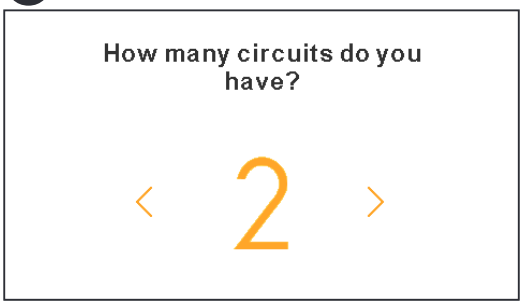
- Select No when the device acts as Room Thermostat only. It does not control the unit.
- Press OK button.

5



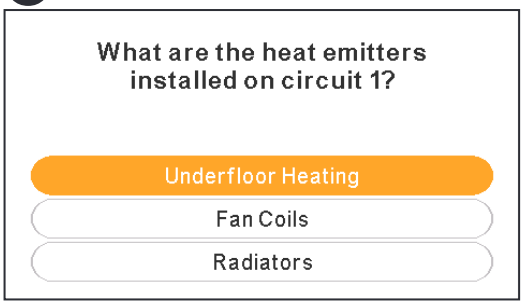
- Select No when the device is not used as a room thermostat.
- Select Yes, in zone 1/ Yes, in zone 2 / Yes, in both zones, depending on the number of circuits controlled.
- When select Yes, in both zones, jump to screen 8.
- Press OK button.

6



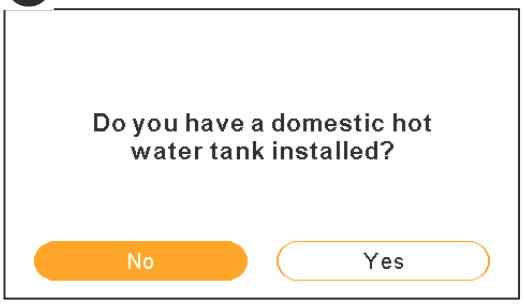
- Select the number of circuits (1 or 2) .
- Press OK button.

7



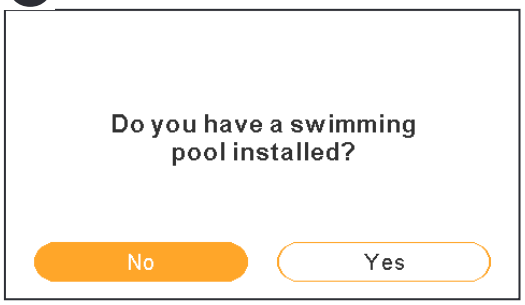
- Select the heat emitters on the circuit 1: Underfloor heating, Fan coils or Radiators.
- Repeat this step in case of circuit 2.
- Press OK button.

8



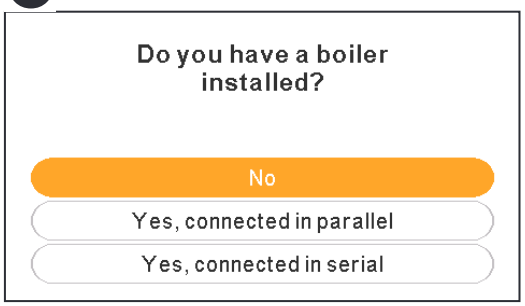
- Select Yes if Domestic Hot Water tank is installed.
- Press OK button.

9



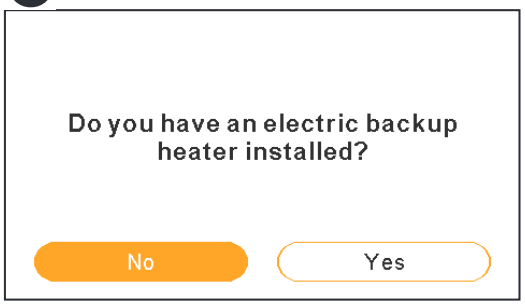
- Select Yes if Swimming Pool is installed.
- Press OK button.

10



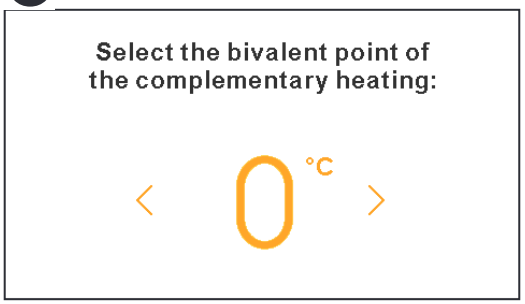
- Select Yes if Boiler is installed.
- Press OK button.

11



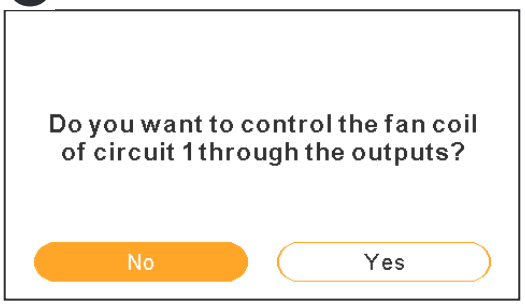
- Select Yes if an electrical backup heater is installed.
- Press OK button.

12



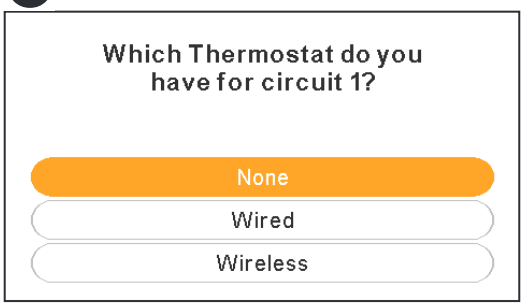
- Select the bivalent point for boiler or electric backup heater (from -20 ºC to 20 ºC).
- Press OK button.

13



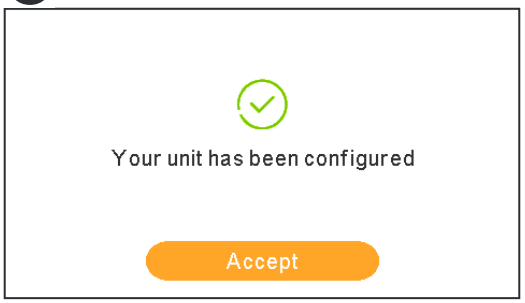
- Select Yes if fan coil can be controlled through the outputs.
- Press OK button.

14



- Select the type of room thermostat installed in circuit 1 or 2 (depending on the previous setting): None, wired or wireless.
- Repeat this step in case of circuit 2.
- Press OK button.

15

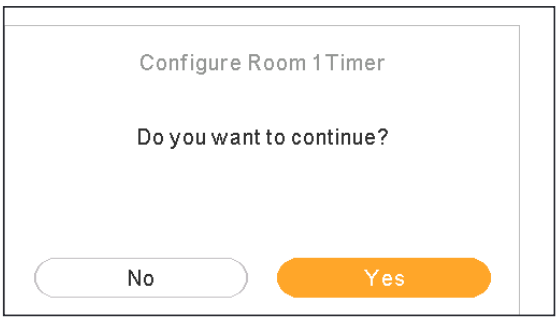


- Configuration assistant is completed.
- Press OK button to go to the main screen.

7.4.1 Timer Assitant for Room Thermostat

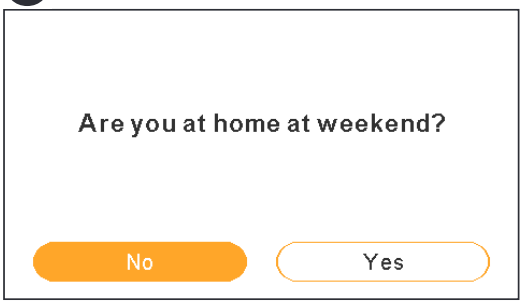
In case that the device is selected as a room thermostat of a zone, a timer assitant is displayed after the initial wizard.

1



- Select Yes to launch the timer assistant for Room Thermostat 1.
- Press OK button.

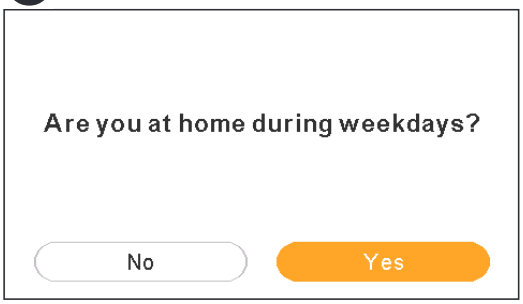
2



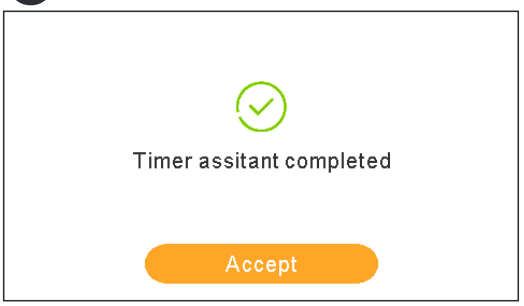
4



3



5



- If stay at home at weekend / weedays the following patterns are applied:
  - Heating: 6:30h =20ºC / 22:30h =18ºC
  - Cooling 6:30h =23ºC / 22:30h =25ºC
- If senstive to cold is marked as Yes, an offset of +1ºC is applied for heating.

7.4.2 Examples of possible configurations

NOTE

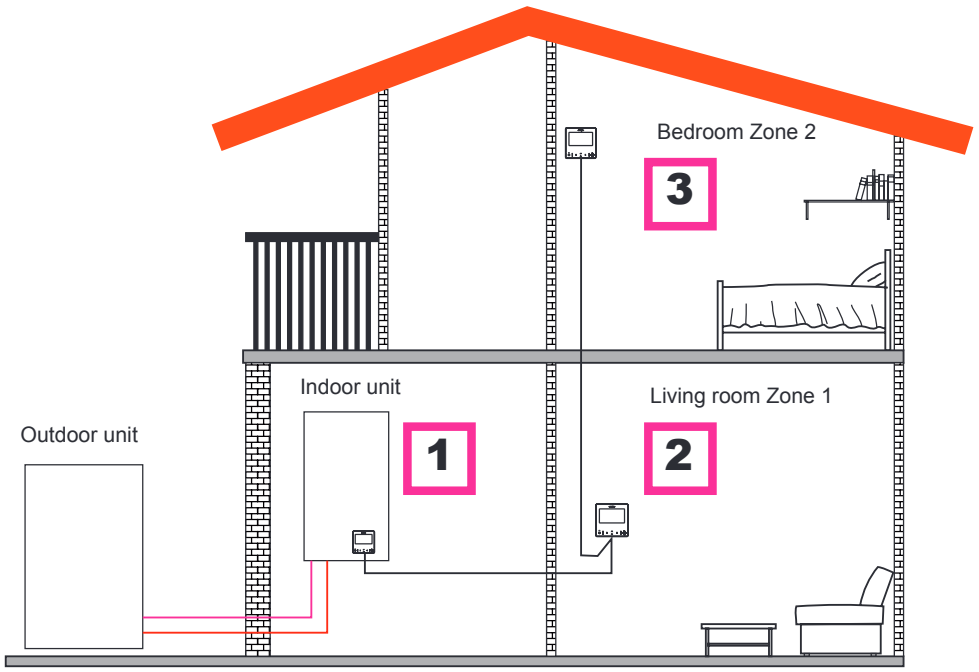
- *Other installation configurations are possible. These are examples only for illustration purposes.*
- *It is recommended to set firstly the Main device so as the ease the configuration of the Sub devices.*

◆ Example 1

1- Main unit controller as unit configuration.

2- Sub Unit controller as a room thermostat for Zone 1, as accessory

3- Sub Unit controller as a room thermostat for Zone 2, as accessory



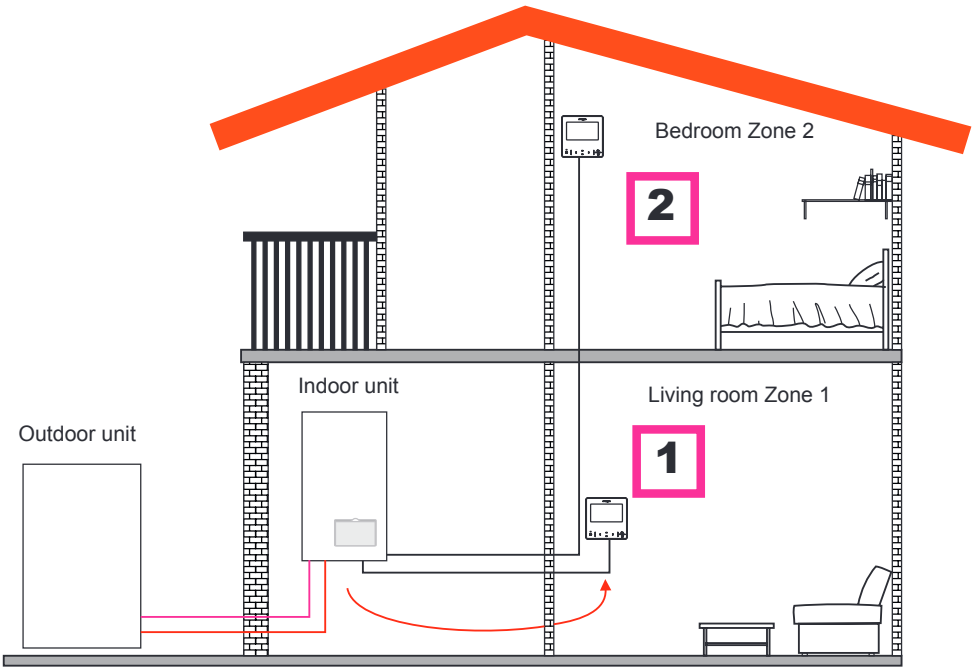
Order	FIRST	SECOND	THIRD
Type	Main	Sub	Sub
	Unit	Circuit 1	Circuit 2
Questions	**Answers**		
Is this device attached to the unit?	YES	-	-
Is this device controlling the unit?	YES	-	-
Is this device used as a Room Thermostat of a zone?	-	YES, IN ZONE 1	YES, IN ZONE 2
How many circuits do you have?	2	-	-
Which are the heat emitters of circuit 1?	Underfloor heating	-	-
Which are the heat emitters of circuit 2?	Underfloor heating	-	-
Which are the cool emitters of circuit 1?	-	-	-
Which are the cool emitters of circuit 2?	-	-	-
Do you have domestic hot water tank?	NO	-	-
Do you have swimming pool?	NO	-	-
Do you have boiler?	NO	-	-
Do you have electric backup heater?	NO	-	-
Select the bivalent point	-	-	-
Which Thermostat do you have for Circuit 1?	Wired	-	-
Which Thermostat do you have for Circuit 2?	Wired	-	-
	COMPLETED	COMPLETED	COMPLETED

◆ Example 2

1- Move Unit controller to the living room (use as Unit controller + Room Thermostat)

2- Main unit controller moved to living room Zone 1

3- Sub Unit controller as a room thermostat for Zone 2



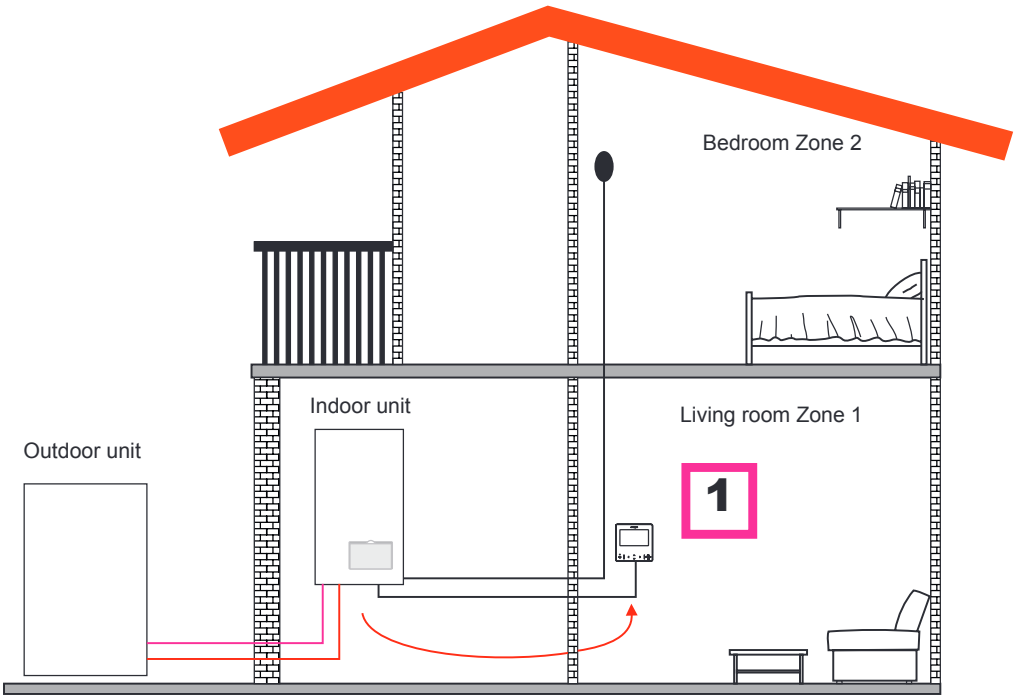
Order	FIRST	SECOND
Type	Main	Sub
	Unit	Circuit 2
Questions	**Answers**	
Is this device attached to the unit?	NO	-
Is this device controlling the unit?	YES	-
Is this device used as a Room Thermostat of a zone?	YES, IN ZONE 1	YES, IN ZONE 2
How many circuits do you have?	2	-
Which are the heat emitters of circuit 1?	Underfloor heating	-
Which are the heat emitters of circuit 2?	Underfloor heating	-
Which are the cool emitters of circuit 1?	-	-
Which are the cool emitters of circuit 2?	-	-
Do you have domestic hot water tank?	NO	-
Do you have swimming pool?	NO	-
Do you have boiler?	NO	-
Do you have electric backup heater?	NO	-
Which Thermostat do you have for Circuit 2?	Wired	-
	COMPLETED	COMPLETED

◆ Example 3

1- Move Unit controller to the living room (use as Unit controller + Room Thermostat)

2- Wired unit controller as a Room Thermostat for Zone 1

3- Wired room sensor for Zone 2



Order	FIRST
Type	Main
	Unit + Circuits
Questions	**Answers**
Is this device attached to the unit?	NO
Is this device controlling the unit?	YES
Is this device used as a Room Thermostat of a zone?	YES, IN BOTH ZONES
Which are the heat emitters of circuit 1?	Underfloor heating
Which are the heat emitters of circuit 2?	Underfloor heating
Which are the cool emitters of circuit 1?	-
Which are the cool emitters of circuit 2?	-
Do you have domestic hot water tank?	NO
Do you have swimming pool?	NO
Do you have boiler?	NO
Do you have electric backup heater?	NO
	COMPLETED

NOTE

- *After finishing Configuration assistant, go to Input&Outputs&Sensor menu and select which auxiliary sensor do you want to use for ambient temperature in Zone 2.*
- *Example: Sensor 1: C2 Ambient*

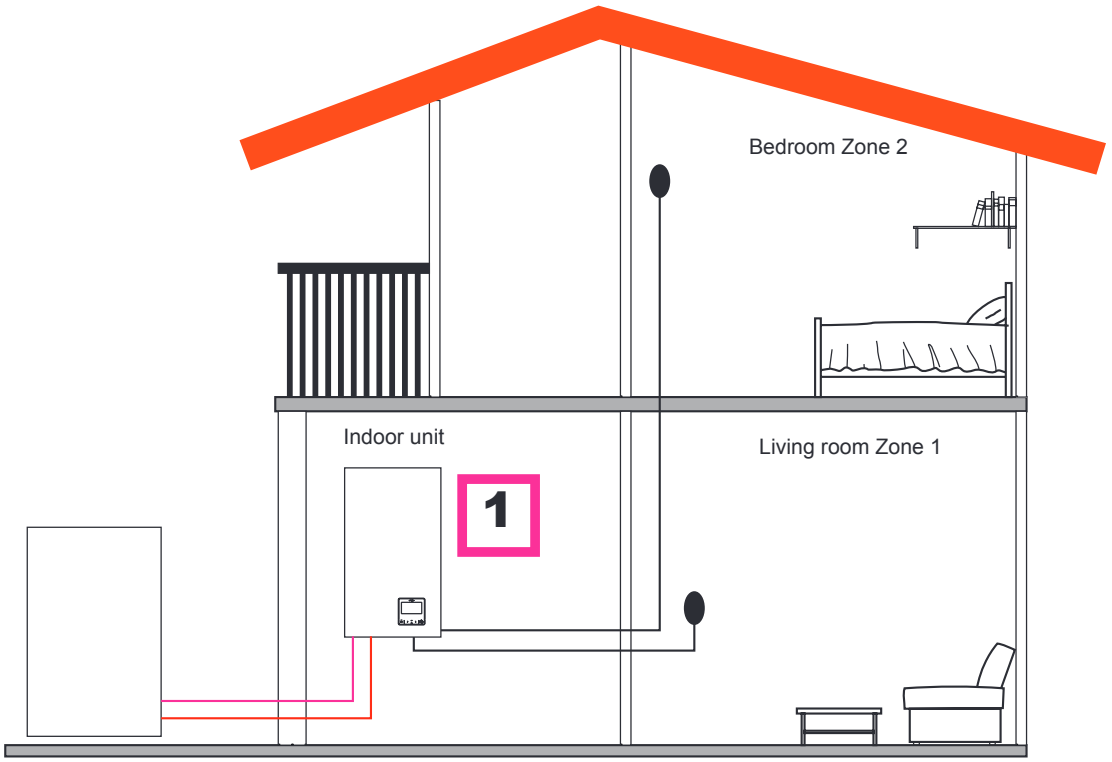
REF	Access	Description	Default Value	Selected value
Auxiliary Sensors				
Taux1		Sensor 1 (Taux1)	Two3 (if Boiler)	C2 Ambient
Taux2		Sensor 2 (Taux2)	Swimming pool (if SWP existing)	-
Taux3		Sensor 3 (Taux3)	Outdoor Sensor	-

◆ Example 4

1- PC-ARFH2E attached into the unit and used as unit controller and room thermostat for both zones.

2- Wired room sensor for Zone 1

3- Wired room sensor for Zone 2



Order	FIRST
Type	Main
	Unit + Circuits
Questions	**Answers**
Is this device attached to the unit?	YES
Is this device used as a Room Thermostat of a zone?	YES, IN BOTH ZONES
Which are the heat emitters of circuit 1?	Underfloor heating
Which are the heat emitters of circuit 2?	Underfloor heating
Which are the cool emitters of circuit 1?	-
Which are the cool emitters of circuit 2?	-
Do you have domestic hot water tank?	NO
Do you have swimming pool?	NO
Do you have boiler?	NO
Do you have electric backup heater?	NO
	COMPLETED

NOTE

- *After finishing Configuration assistant, go to Input&Outputs&Sensor menu and select which auxiliary sensor do you want to use for ambient temperature in each zone.*
- *Example:*

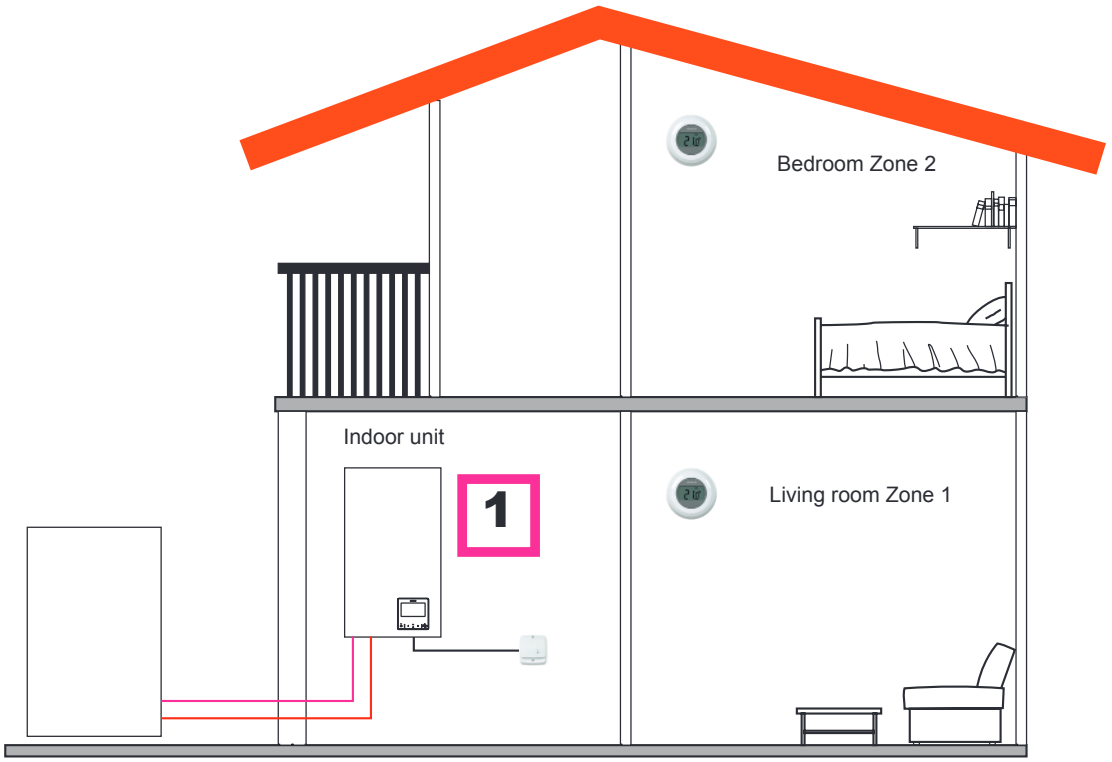
REF	Access	Description	Default Value	Selected value
Auxiliary Sensors				
Taux1		Sensor 1 (Taux1)	Two3 (if Boiler)	C1 Ambient
Taux2		Sensor 2 (Taux2)	Swimming pool (if SWP existing)	C2 Ambient
Taux3		Sensor 3 (Taux3)	Outdoor Sensor	-

◆ Example 5

1- Main unit controller as unit configuration

2- Wireless intelligent thermostat for zone 1 (ATW-RTU-07) (Receiver + Room thermostat)

3- Wireless intelligent thermostat for zone 2 (ATW-RTU-06) (Only Room thermostat)



Order	FIRST
Type	Main
	Unit + Circuits
Questions	**Answers**
Is this device attached to the unit?	YES
Is this device used as a Room Thermostat of a zone?	NO
How many circuits do you have?	2
Which are the heat emitters of circuit 2?	Underfloor heating
Do you have domestic hot water tank?	NO
Do you have swimming pool?	NO
Do you have boiler?	NO
Do you have electric backup heater?	NO
Which Thermostat do you have for Circuit 1?	Wireless
Which Thermostat do you have for Circuit 2?	Wireless
	COMPLETED

NOTE

- *After finishing Configuration assistant proceed to wireless room thermostat binding procedure. (Refer to installation manual of room thermostat)*
- *If necessary, change Wireless Binding ID to the selected thermostat by using room thermostat menu in general options:*

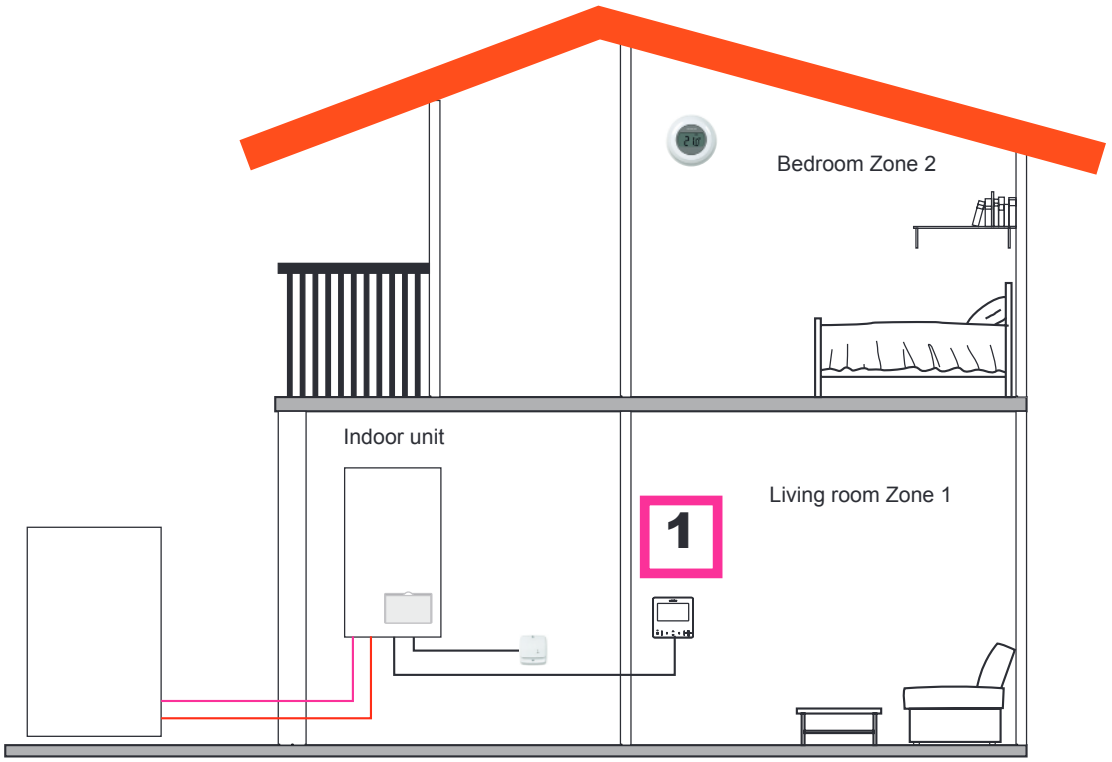
Description	Default Value	Range	Selected value
Wireless Binding ID (for C1)	1	1 2	1
Wireless Binding ID (for C2)	2	1 2	2

◆ Mixed configurations (Wireless + Wired)

1- Move Unit controller to the living room (use as Unit controller + Room Thermostat)

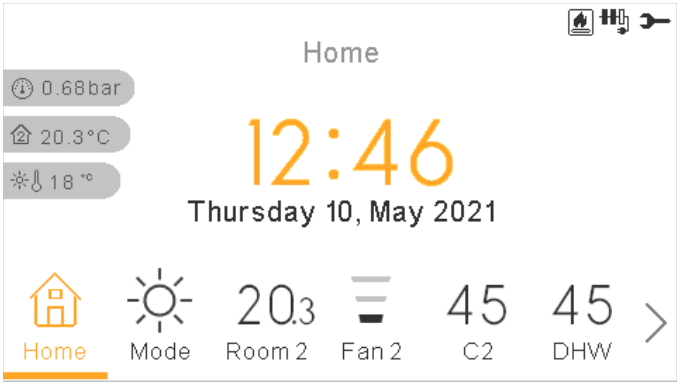
2- Main unit controller moved to living room Zone

3- Wireless intelligent thermostat for zone 2 (ATW-RTU-07) (Receiver + Room thermostat)



Order	FIRST
Type	Main
	Unit
Questions	**Answers**
Is this device attached to the unit?	NO
Is this device controlling the unit?	YES
Is this device installed on a controlled zone?	YES, ZONE 1
How many circuits do you have?	2
Which are the heat emitters of circuit 1?	Underfloor heating
Which are the heat emitters of circuit 2?	Underfloor heating
Which are the cool emitters of circuit 1?	-
Which are the cool emitters of circuit 2?	-
Do you have swimming pool?	NO
Do you have boiler?	NO
Do you have electric backup heater?	NO
Which Thermostat do you have for Circuit 2?	Wireless
	COMPLETED

7.5 MAIN VIEW



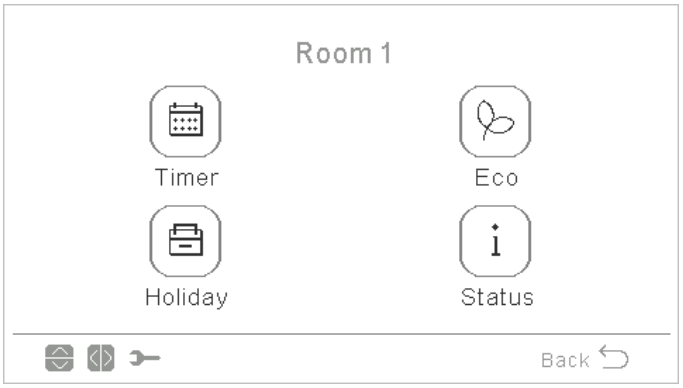
Main view of the device is composed by a bottom tab widget to move around the different views:

- Home
- Mode
- Room 1 (if space is small it shows R1)
- Room 2 (if space is small it shows R2)
- Circuit 1 (if space is small it shows C1)
- Circuit 2 (if space is small it shows C2)
- Fan 1 (if space is small it shows F1)
- Fan 2 (if space is smaill it shows F2)
- DHW
- SWP
- Menu

7.5.1 Quick actions function

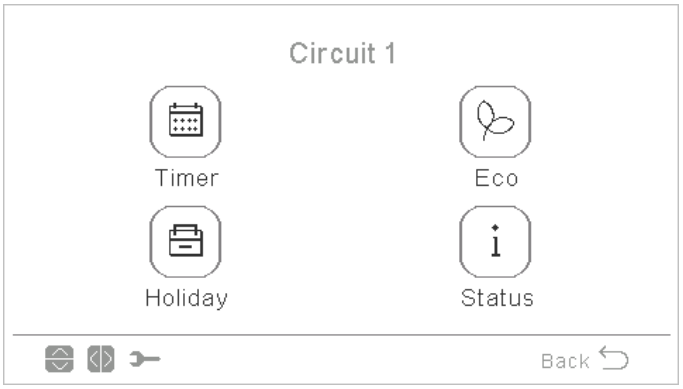
The following quick actions are shown when pressing the OK button at the selected zone in comprehensive view or room thermostat view:

◆ **Room 1/2**



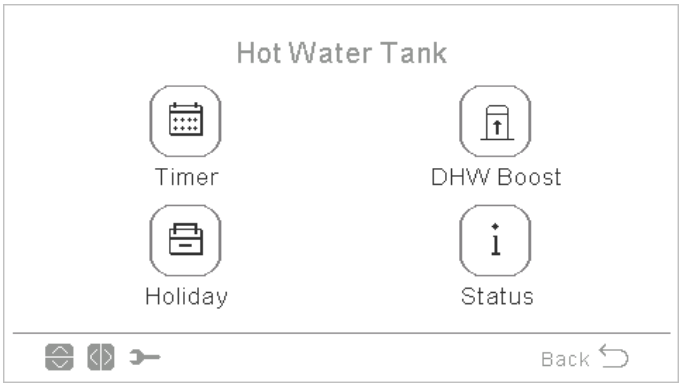
- Timer
- ECO
- Holiday (If Zone is enabled)
- Status

◆ **Circuit 1/2**



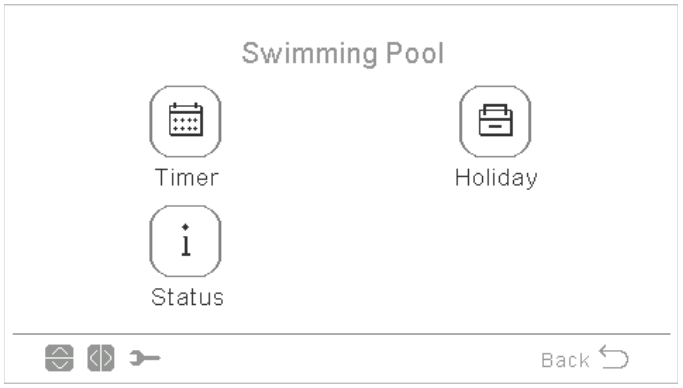
- Timer
- ECO
- Holiday (If Zone is enabled)
- Status

◆ Domestic Hot Water Tank (DHW)



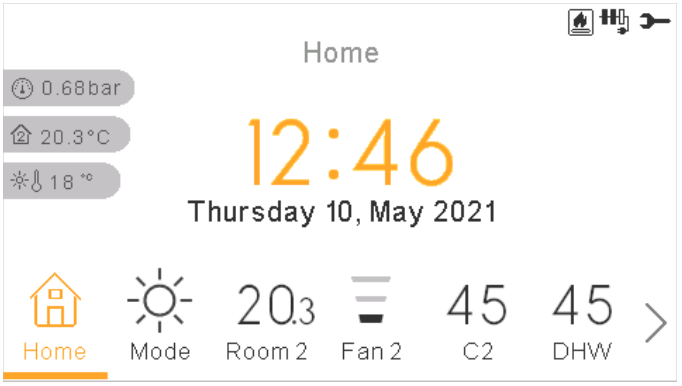
- Timer
- Boost (If DHW is ON and Boost is availbable. It can also be cancelled from quick actions).
- Holiday (If Zone is enabled)
- Status

◆ Swimming Pool (SWP)



- Timer
- Holiday (If Zone is enabled)
- Status

7.6 HOME VIEW

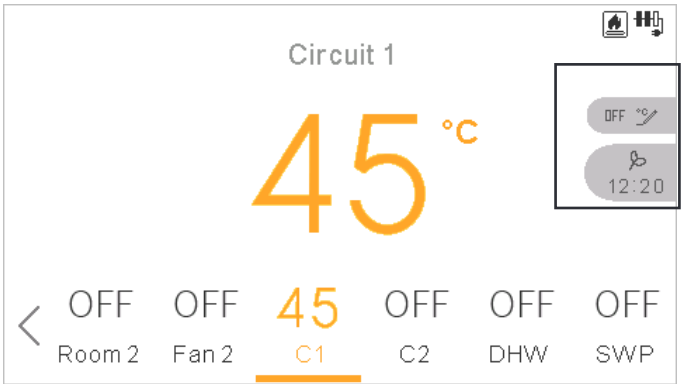


Home view shows on the middle the date and time

On the left side it shows:

- Inside temperature (home icon):
  - If LCD works as Room 1, it took it from the controller sensor or auxiliary sensor
  - If LCD works as Room 2, it took it from the controller sensor or auxiliary sensor
  - If LCD works as Room 1+2, it took it from the controller sensor or auxiliary sensor, or the average of the ones used per each zones.
  - If LCD works as main LCD or water control but not room, it will took them from the configured Rooms, if no one is configured, that temperature will not be displayed.
- Outside temperature (thermometer icon).
- Water pressure indicator

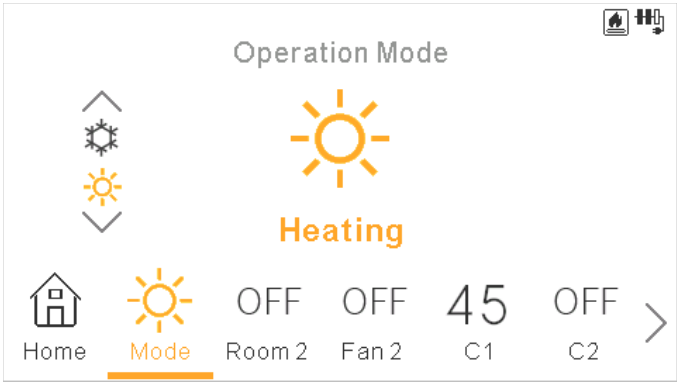
7.6.1 Next schedule indication



The indication of next schedule shows by priority:

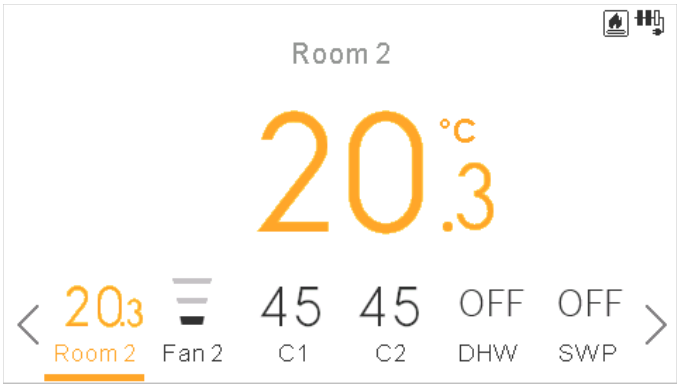
- Date of returning of absent mode
- Next schedule action:
  - If no derogation has been made, shows next schedule action
  - If derogation has been made it checks the configured override type:
    - If override type is Next action, it shows next schedule action.
    - If override type is Forever, does not show any information
    - If override type is Specific time, it shows “Pending” text and the remaining minutes.

7.7 MODE VIEW



- Mode view shows the selected mode.
- In case of being a heating and cooling unit, it lets also to change the mode by using the top/bottom arrows, and it shows the mode spinner on the left side.
- If it has been enabled the auto mode, it is also available here.

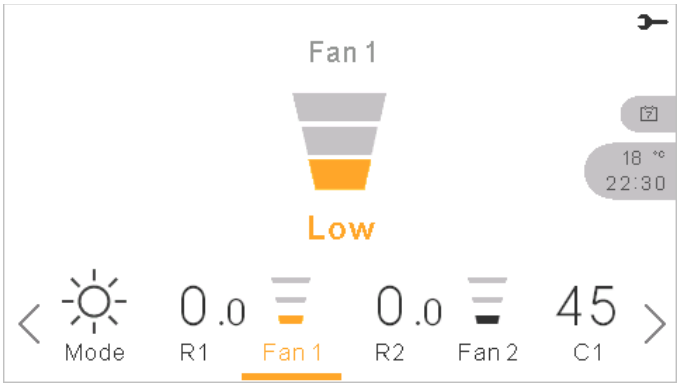
7.8 ROOM 1/2 VIEW



Room thermostats view displays:

- Ambient Temperature of the room. This temperature is got from controller or external sensor.
- When editing it shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Eco and timer icons

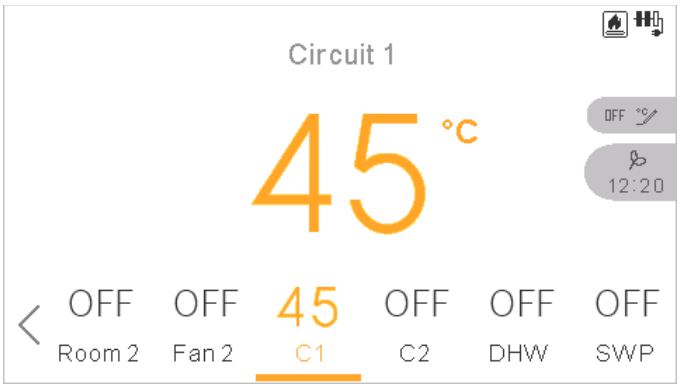
7.9 FAN COILS 1/2 VIEW



Room 1 or 2 could control Fan Coils. Once configured to control them on the menu, the bottom bar includes the option to manage those fan coils:

- Fan speeds: Low, Medium, High and Auto
- Each fan has its independent on/off

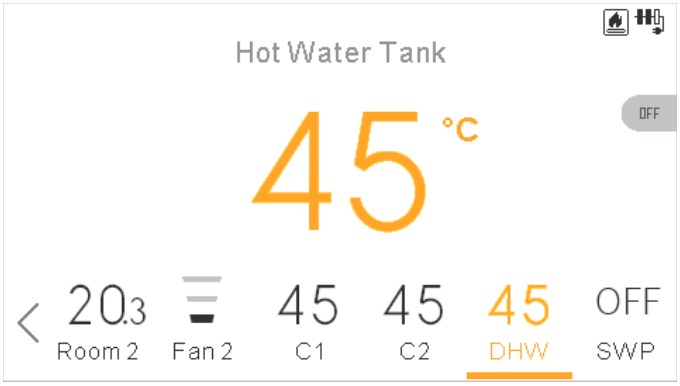
7.10 CIRCUIT 1/2 VIEW



Circuit 1 or 2 view displays:

- Water setting feedback
- When editing it shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Eco, throughput, summer switch-off, forced off and timer icons

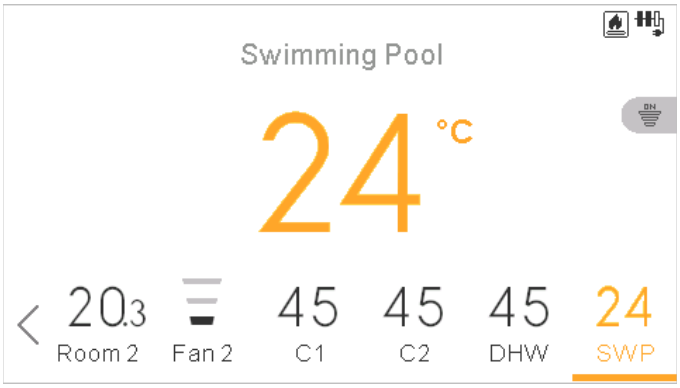
7.11 DHW VIEW



DHW view displays:

- Water setting feedback
- When editing it shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Boost, throughput, operating in comfort and timer icons
- During boost, setting changed is the boost seeting

7.12 SWP VIEW



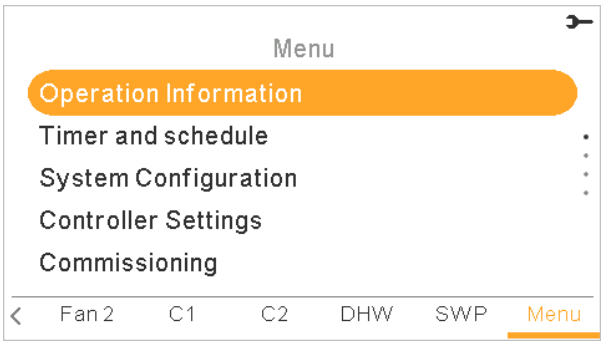
SWP view displays:

- Water setting feedback
- When editing if shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Throughput and timer icons

7.13 MENU

7.13.1 OPERATION INFORMATION

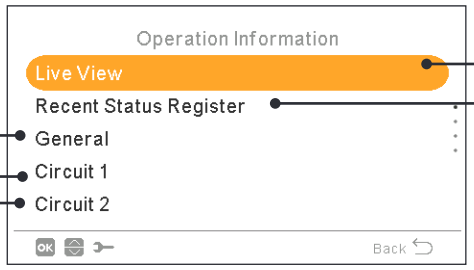
In operation information menu it is possible to find the most important setting parameters of the system besides the information of the operation conditions.



Detailed information about:
- Operation status
- Water inlet temperature
- Water outlet temperature
- Water setting temperature
- Outdoor ambient temperature
- Outdoor ambient 2 temperature
- Outdoor ambient average temperature
- Second ambient average temperature
- 24h average temperature

Detailed information about Circuit 1-2:
- Operation (Demand ON/OFF)
- Mode (Eco/Comfort)
- Room temperature
- Room setting temperature
- Fan setting speed
- Fan real speed
- Fan stopped by D-OFF
- Current water temperature
- Water setting temperature
- Water OTC setting temperature
- Mixing valve position (only for circuit 2)

1 / 4



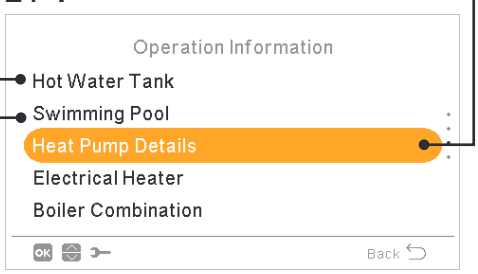
Summary of system status information:
- Refrigerant Cycle
- Water Generation
- Circuit 1
- Circuit 2
- Hot Water Tank
- Swimming Pool

Recent Status Register:
- Table of the main variables of the system registered by steps of 5 minutes during 120min

Detailed information about DHW:
- Operation
- Current temperature (Only for YUTAKI S)
- Top Sensor (Only for YUTAKI S COMBI)
- Bottom sensor (Only for YUTAKI S COMBI)
- Setting Temperature
- Electrical Heater Status
- Electrical Heater Operation
- Legionella Status
- Legionella Operation

Detailed information about Swimming pool:
- Operation (Demand ON/OFF)
- Current temperature
- Setting temperature

2 / 4

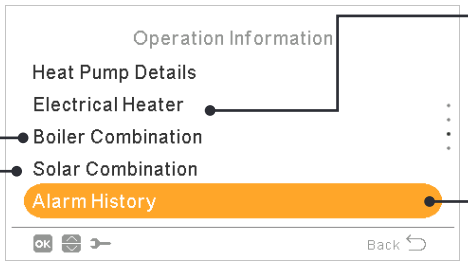


Detailed information about Heat Pump:
- Water Outlet PHEX Temperature
- Two3
- Water Flow Level
- Water Pump Speed
- Water Pressure
- Outdoor Ambient temperature
- Outdoor Ambient 2 temperature
- Gas temperature
- Liquid temperature
- Discharge Gas temperature
- Evaporation Gas temperature
- Suction Gas temperature
- Discharge Pressure
- Suction Pressure
- Ind. Exp. Valve Open
- Ind. Exp. Valve 2 Open
- Out. Exp. Valve Open
- Injection Exansion Valve
- Inverter Op. Freq.
- Defrosting
- Cause Of Stoppage
- Compressor Curr.
- Unit Capacity
- Unit Type

Detailed information about Boiler combination:
- Operation (Demand ON/OFF)
- Current temperature
- Setting temperature

Detailed information about Solar combination:
- Operation (Demand ON/OFF)
- Solal Panel temperature

3 / 4

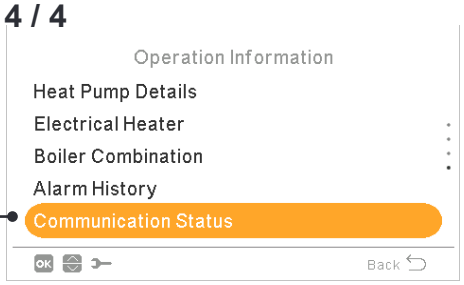


Detailed information about Electrical Heater:
- Operation (Demand ON/OFF)
- Current temperature
- Setting temperature
- Load Factor
- Step

Shows a list of the alarm history of the system

Detailed information about Communication status:
- H-Link
- H-Link Central
- RCS Central
- Cascade Controller

4 / 4

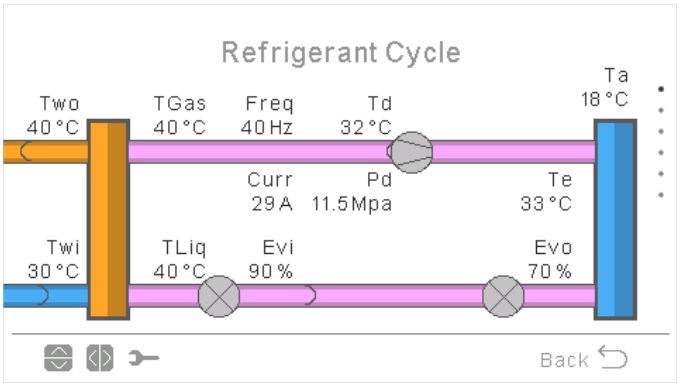


7.13.1.1 Live view

Live view is a summary of system status information shown on operation information.

It has the following screens:

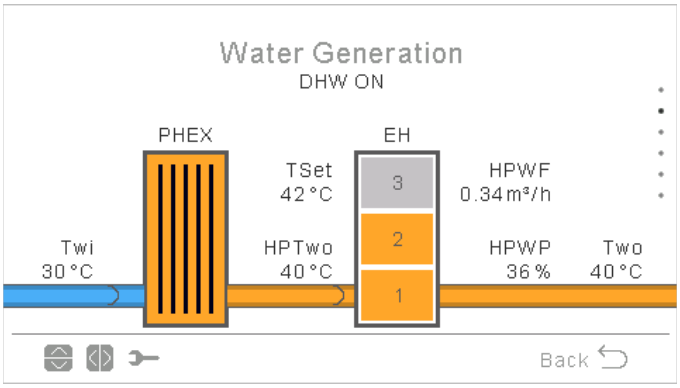
◆ **Refrigerant Cycle**



Considerations:

- Arrows move in anti-clock direction in Heating mode. When Cooling arrows move in clock direction.
- Pipes between exchangers are pink if operating or gray if unit is in thermo off.
- T_{WO} pipe is orange when heating and blue when cooling.
- T_{WI} pipe is orange when cooling and blue when heating.
- Defrost indication is only shown when defrosting.
- T_{WO} value is T_{WO}HP when using a YUTAKI S COMBI or YUTAKI S, otherwise it is normal $T_{WO.}$

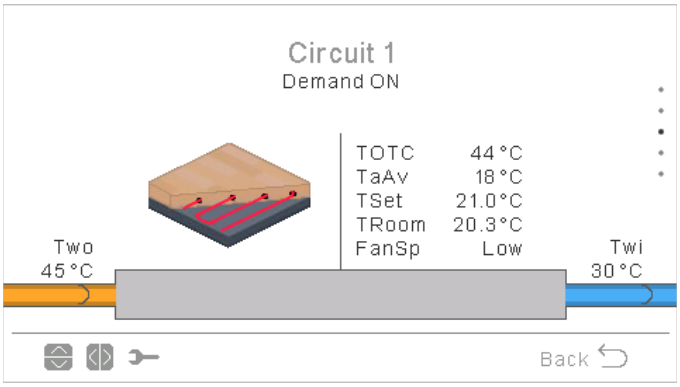
◆ **Water generation**



Considerations:

- When operation status is COOL ON, inlet pipe is orange, outdoor pipe is blue.
- When operaion status is HEAT ON, SWP ON or DHW ON, inlet pipe is blue, outdoor pipe is orange, otherwise pipe is in gray.
- T_{WO}value is TwoHP when using a YUTAKI S COMBI or YUTAKI S, otherwise it is normal $T_{WO.}$
- Pump 1 icon is shown when it is operating.
- Heater indication is shown always except:
  - Cooling Operation
  - Heater is disabled by DSW
- If maximum heater step is disabled, the disabled steps are shown as disabled.

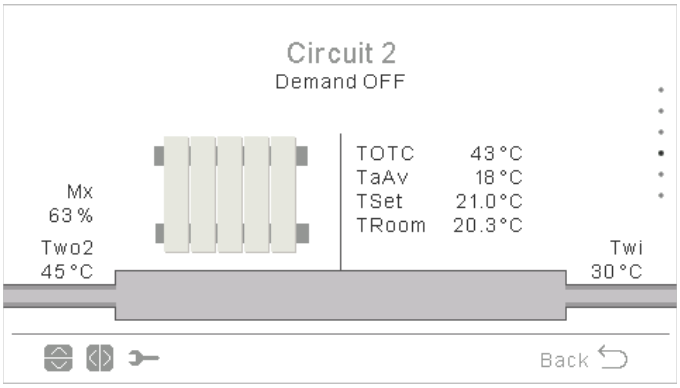
◆ Circuit 1



Considerations:

- When demand on, inlet pipe is in orange, outlet in blue.
- When cooling, inlet pipe is in blue, outlet in orange. If thermo off, it is shown in gray.
- T_{WO} shows value of T_{WO3} in case there is buffer tank and T_{WO3} sensor is used.
- Water pump 3 is shown when it is switched ON since there is buffer tank. Otherwise, water pump 1 is showed whenever it is switched ON.
- Fan speed only shown when fan configured.
- T_{room} & T_{set} are only shown when available on operation information (exist wired or wireless thermostat for C1).
- The icon shown is defined on “Room icon” parameter under “controller settings”.

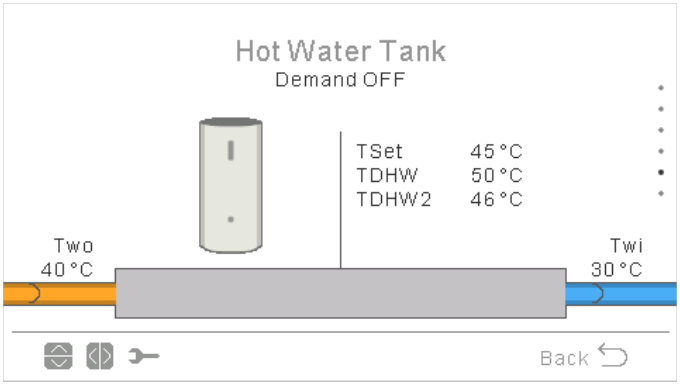
◆ Circuit 2



Considerations:

- When demand on, inlet pipe is in orange, outlet in blue.
- When cooling, inlet pipe is in blue, outlet in orange. If thermo off, it is shown in gray.
- Water pump 2 is shown if used.
- Fan speed only shown when fan configured.
- T_{room} & T_{set} are only shown when available on operation information (exist wired or wireless thermostat for C1).
- The icon shown is defined on “Room icon” parameter under “Controller settings”.

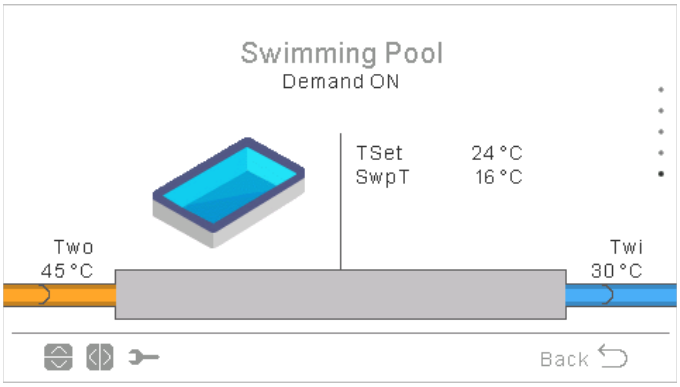
◆ Hot Water Tank



Considerations:

- When Operation status is DHW ON: inlet pipe has orange color inside and arrows moving. Outlet pipe is blue with arrows too.
- When not working on DHW ON pipes are shown in light grey.
- When antilegionella is enabled a text is shown, indicating if it is being execute or not.
- T_{WO} is T_{WHP} when using a YUTAKI S COMBI, otherwise:
  - If buffer tank is located after DHW use T_{wo}, if buffer tank is located before DHW use T_{WO3}
  - Otherwise use T_{wo}
- Second sensor temperature shown only for YUTAKI S COMBI.

◆ Swimming Pool

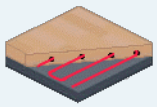
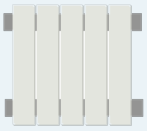


Considerations:

- When demand off: inlet and outlet pipes are gray.
- When demand on: T_{WO} water is orange (hot) and T_{WI} water is blue (cold).

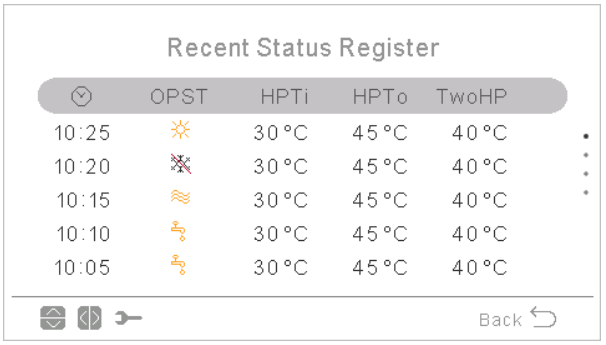
◆ Room icons for synoptic view

Circuit 1 and 2 can be displayed with the following icons

Icon	Name
	Fan Coils
	Radiant floor
	Radiators

7.13.1.2 Recent Status Register

Recent Status Register is an historical data that displays the main variables during the last hours.



Considerations:

- Moving to left/right variables shown change.
- Moving up/down we scroll through the registered time.
- DWHT2: Only shown for YUTAKI S COMBI, when not show “- -“.
- DWHT1 and DWHT2 shown as “- -“ when no tank is configured.

Icon	Meaning
	Off
	Cool D-OFF
	Cool T-OFF
	Cool ON
	Heat D-OFF
	Heat T-OFF
	Heat ON
	DHW OFF

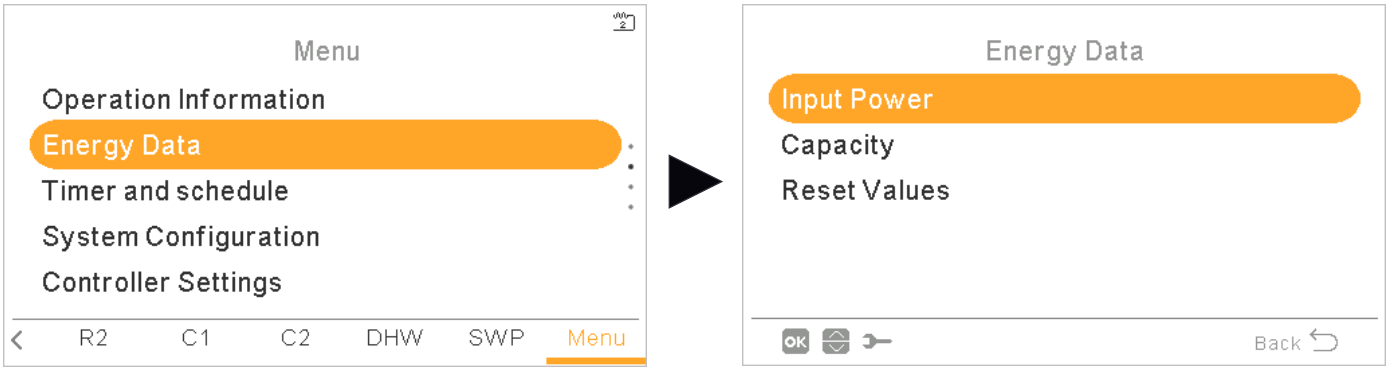
Icon	Meaning
	DHW ON
	SWP OFF
	SWP ON
	Alarm

7.13.2 Energy data

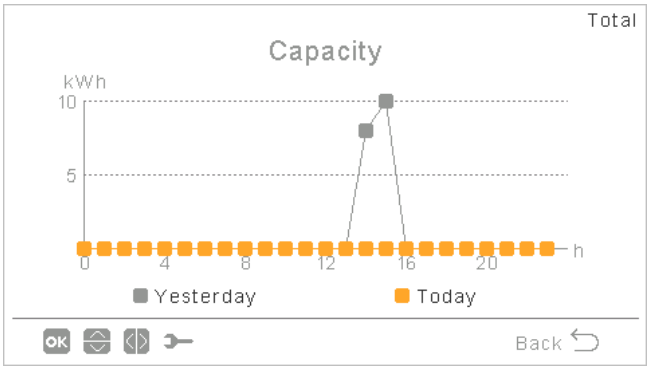
In energy data menu it is possible to check the input power or capacity for space heating / cooling, DHW, SWP or total input power / capacity.

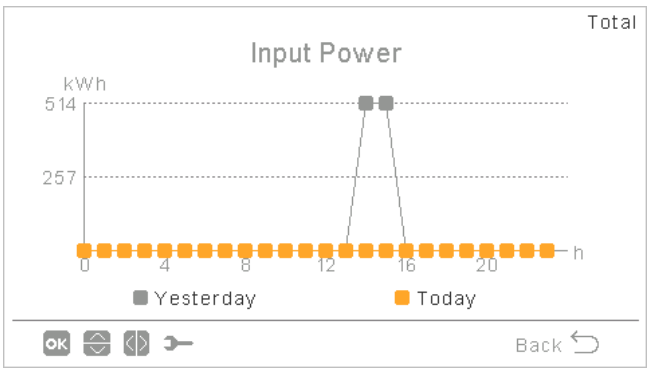
In case no external pulse power meter is used, YUTAKI unit performs an estimation of the consumption taking into consideration, compressor, tank heaters, space heating heaters, compressor crankase heater, WP1 and electronics. As an estimation, this value may differ from real consumption measured by means an external power meter.

When power meter is used, YUTAKI considers consumption read from pulse power meter



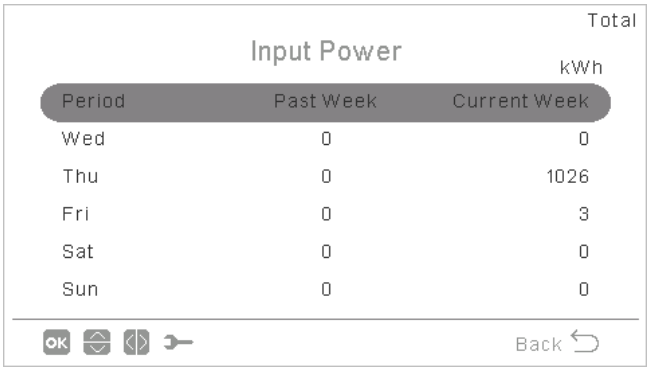
Main view is a chart comparing total input power or total capacity depending on the menu.





- By pressing right/left, it can be changed between zones:
  - Total
  - Space Heating
  - Space Cooling
  - DHW
  - Swimming Pool
- By pressing up/down, the comparison method can be changed:
  - Today vs yesterday
  - This week vs past week
  - This year vs past year

- Pressing OK the chart view changes for a table view of the data:



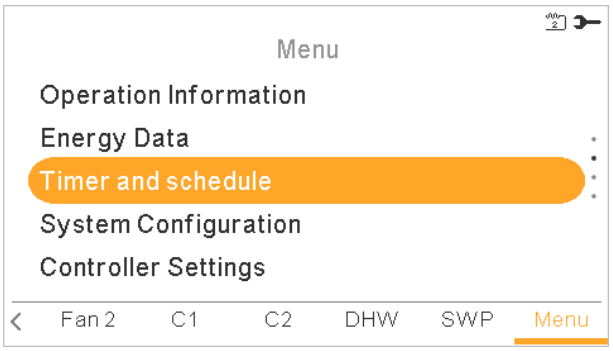
- By pressing right/left, it can be changed between zones:
  - Total
  - Space Heating
  - Space Cooling
  - DHW
  - Swimming Pool
- By pressing up/down, the different periods are shown.
- By pressing OK or back we return to the chart view, keeping the zone and comparison selected.

7.13.3 Timer and schedule configuration

NOTE

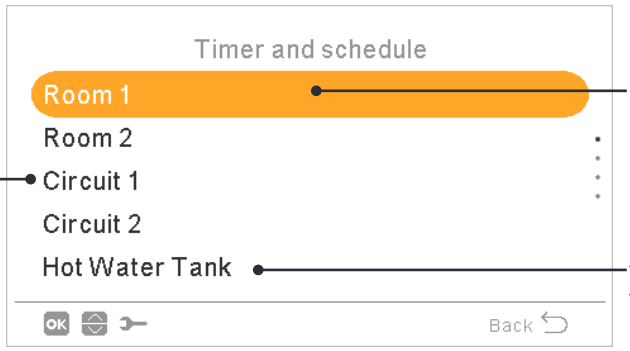
Timer settings are only valid if the corresponding zone is in ON state at the time of execution of the respective timer program.

The LCD controller must be set to the correct date and time before using the timer function.



Select the desired area to apply the timer function or delete all timers configuration:

1 / 2



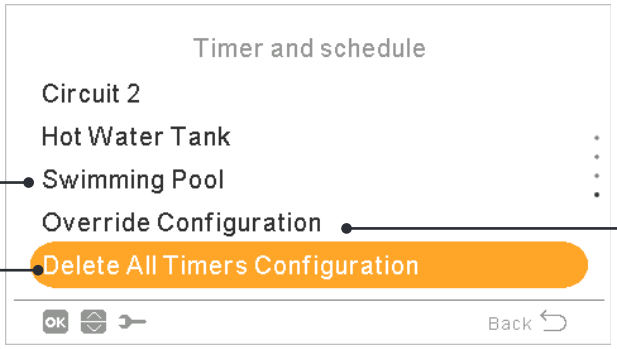
Heating/Cooling (Water): To set the timer to adjust the water working conditions for Circuit 1/2.

Heating/Cooling (Air): To set the timer to adjust the room temperature for Room 1/2. Only when using room thermostats.

Is possible to launch a timer assistant.

To set the timer to adjust the hot water tank temperature.

2 / 2



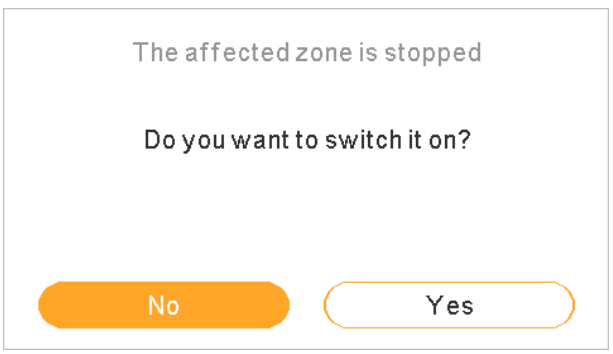
To set the timer to adjust the swimming pool temperature.

Press OK button to reset scheduled timers.

To set the **Override type**:

- Until next action
- Specific time
- Forever

When a timer is being switched on, if that zone is stopped, it will request to switch on the zone or not.

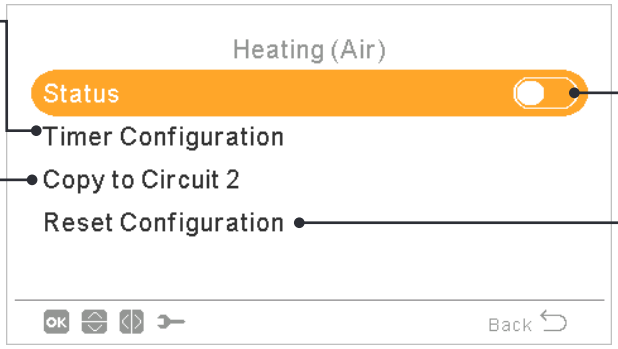


7.13.3.1 Setting of timer for Room Thermostats

Setting of temperature or change of operation state from ON to OFF for a defined period, after which operation returns to the previous settings. Manual operation of the unit controller has priority over schedule settings.

Timer configuration: New screen appears to configure a schedule timer. See explanation below.

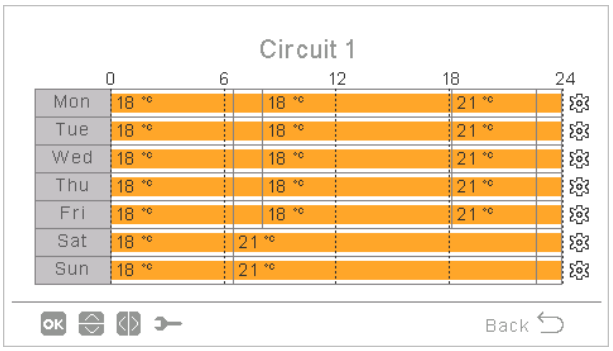
Copy to circuit 2: It is possible to copy the schedule timer to circuit 2.



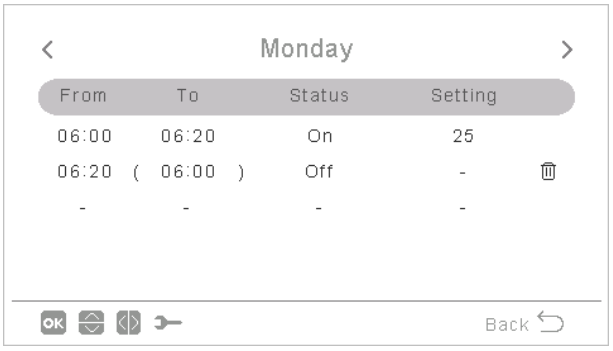
Timer status:
- Disable
- Enable

Reset configuration:
Press OK button to reset scheduled timers.

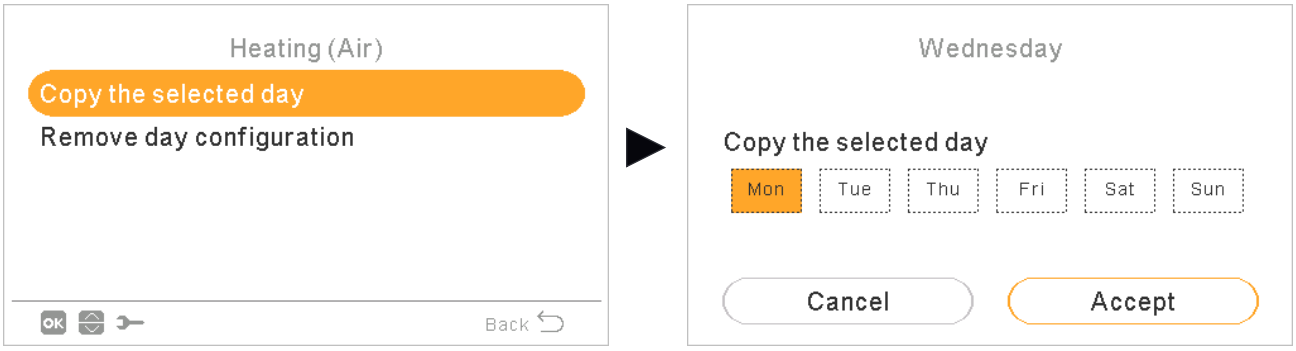
Pressing the OK button with “Timer Configuration” being selected displays the detailed schedule screen. The active schedule timers are shown in a weekly calendar.



Up to six timer events can be defined for each weekday, and these can be used for turning the operation ON or OFF or to change the setting temperature. Pressing the OK key with one of the weekdays being selected in the weekly calendar screen displays the detailed schedule for the weekday.

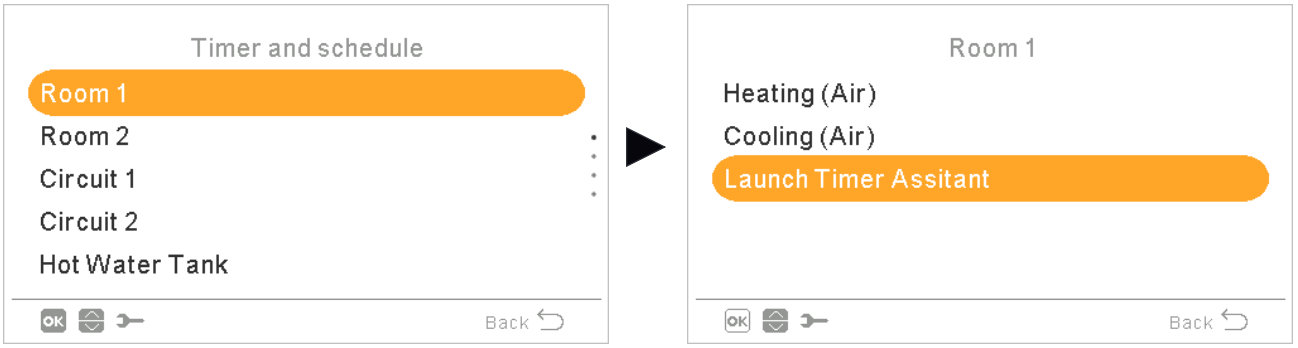


Pressing the “Gear” button during the edition of the timer events for a given weekday displays a menu to copy the daily pattern to other weekdays or to suppress the selected timer event.

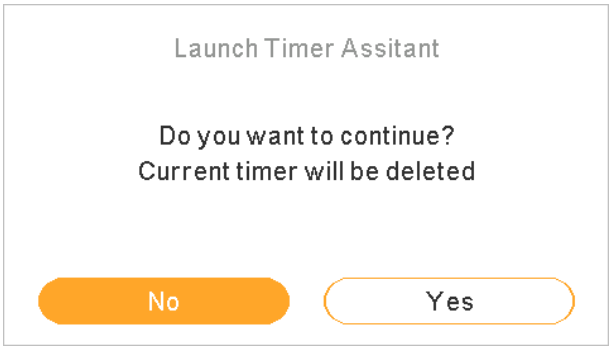


◆ Setting with Timer assistant

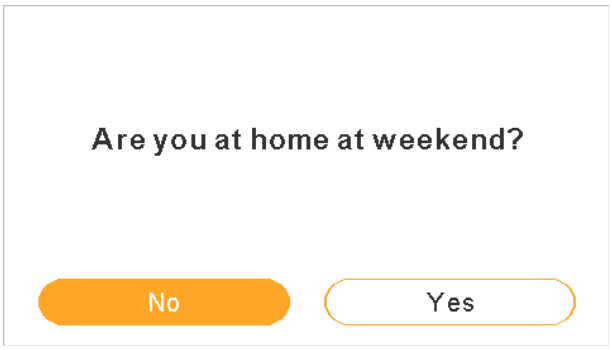
It is possible to set the timer for Room thermostats with a timer assistant.

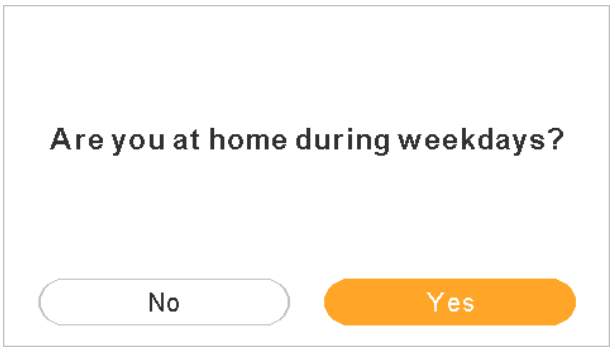


When launching the timer assistant the current timer will be deleted.



Timer assistant asks if user stays at home during weekend and weekdays

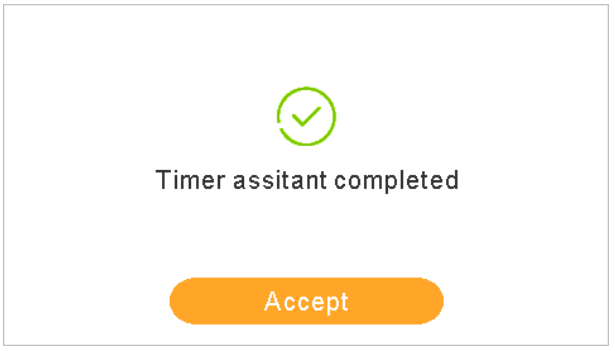




- If stay at home at weekend / weekdays the following patterns are applied:
  - Heating: 6:30h =20ºC / 22:30h =18ºC
  - Cooling 6:30h =23ºC / 22:30h =25ºC

Timer assistant asks if user is sensistive to cold.

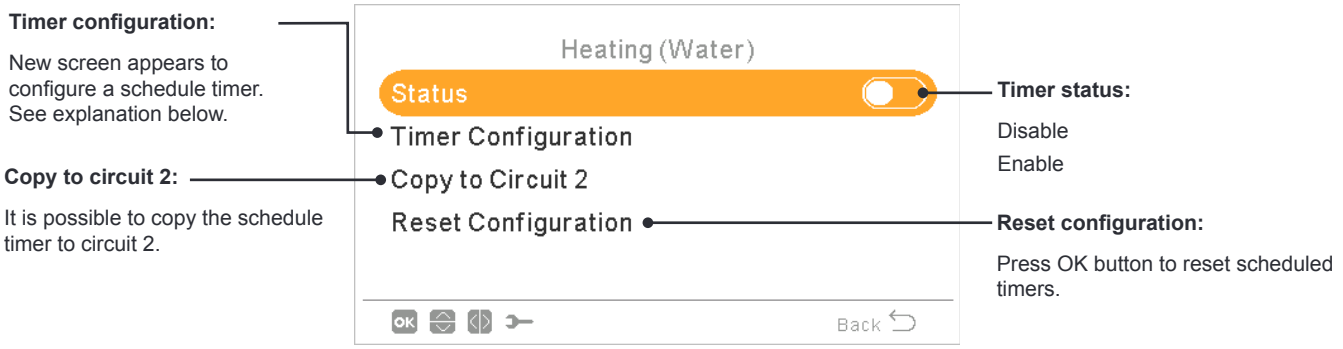




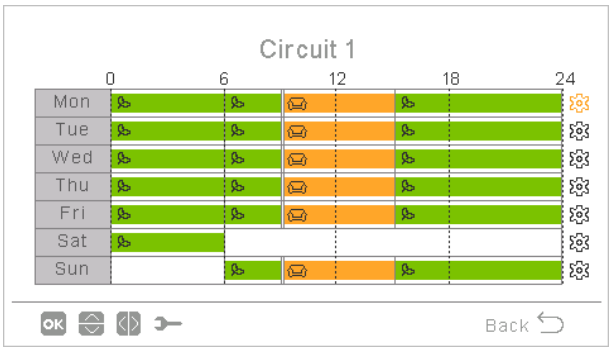
- If senstive to cold is marked as Yes, an offset of 1ºC is applied for heating.

7.13.3.2 Setting of timer for Circuit 1/2

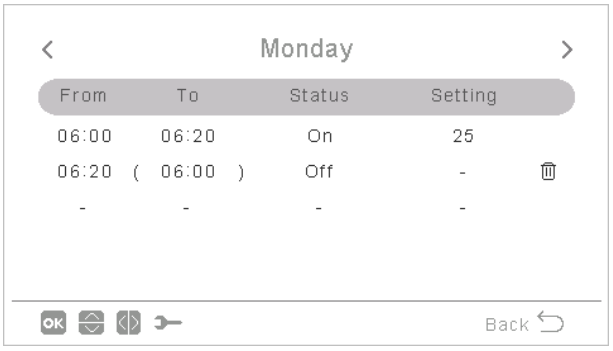
To change the operation mode (ECO or Comfort) or change of operation state from ON to OFF for a defined period, after which operation returns to the previous settings. Manual operation of the unit controller has priority over schedule settings.



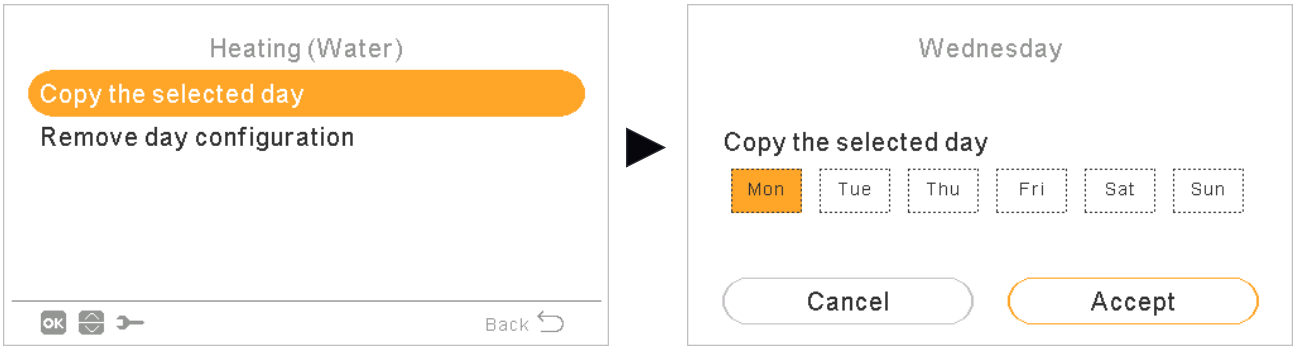
Pressing the OK button with “Timer Configuration” being selected displays the detailed schedule screen. The active schedule timers are shown in a weekly calendar.



Up to six timer events can be defined for each weekday, and these can be used for turning the operation ON or OFF or operation mode (ECO or Comfort). Pressing the OK key with one of the weekdays being selected in the weekly calendar screen displays the detailed schedule for the weekday.



Pressing the “Gear” button during the edition of the timer events for a given weekday displays a menu to copy the daily pattern to other weekdays or to suppress the selected timer event.

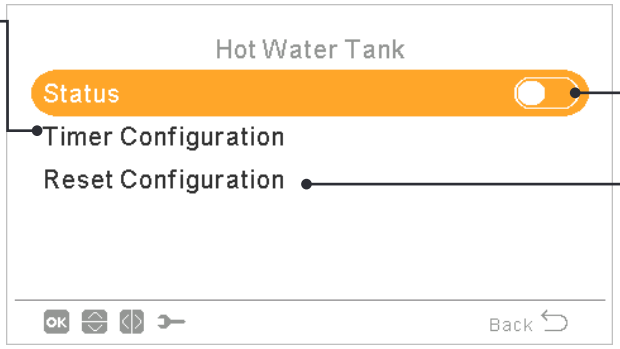


7.13.3.3 Setting of timer for Hot water tank or Swimming Pool

Setting the temperature or change of operation state from ON to OFF for a defined period, after which operation returns to the previous settings. Manual operation of the unit controller has priority over schedule settings.

Timer configuration:

New screen appears to configure a schedule timer. See explanation below.



Timer status:

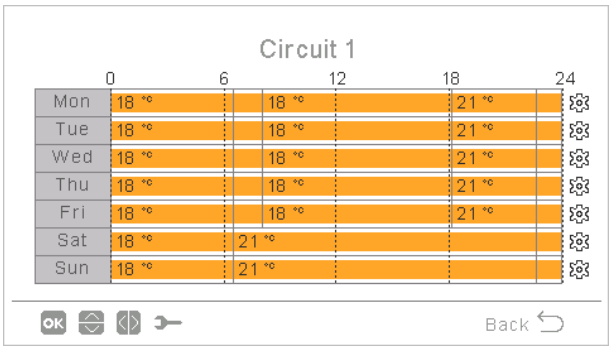
Disable

Enable

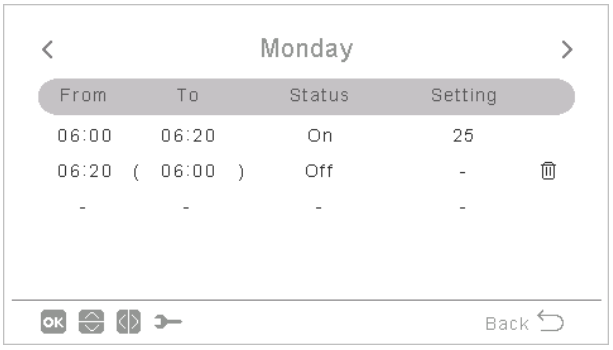
Reset configuration:

Press OK button to reset scheduled timers.

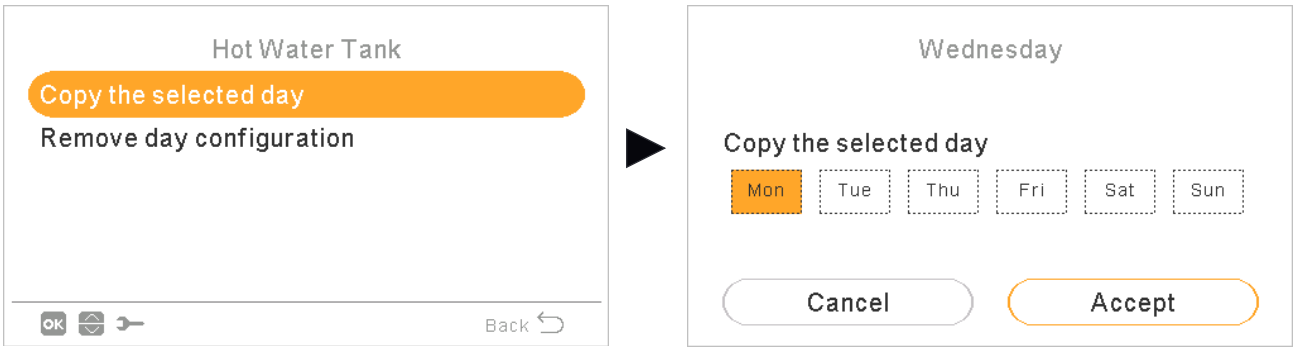
Pressing the OK button with “Timer Configuration” being selected displays the detailed schedule screen. The active schedule timers are shown in a weekly calendar.



Up to six timer events can be defined for each weekday, and these can be used for turning the operation ON or OFF or to change the setting temperature. Pressing the OK key with one of the weekdays being selected in the weekly calendar screen displays the detailed schedule for the weekday.

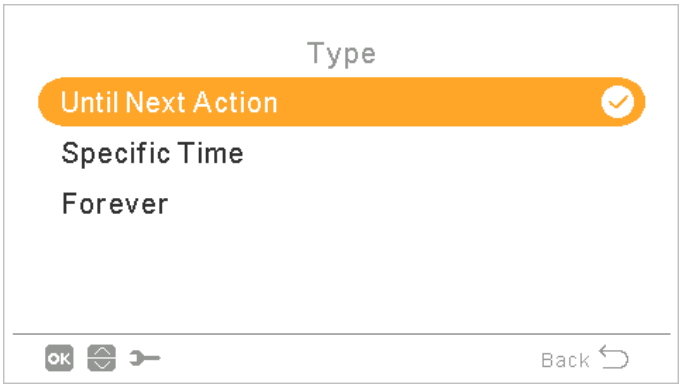


Pressing the “Gear” button during the edition of the timer events for a given weekday displays a menu to copy the daily pattern to other weekdays or to suppress the selected timer event.



7.13.3.4 Override Configuration

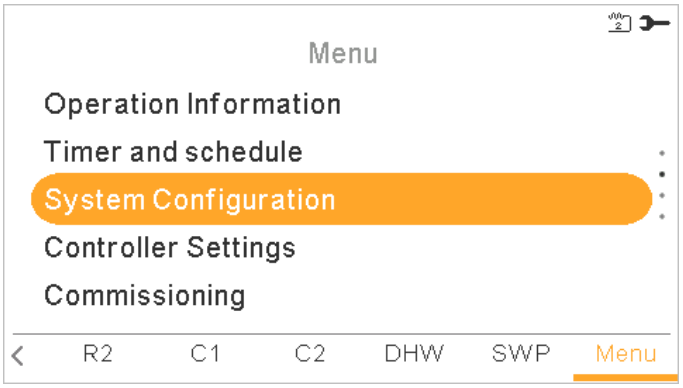
When a different configuration from the defined by the timer of a zone is done, it is possible to override the timer configuration during a specific time.



- Until next action: derogation remains until next action of the timer.
- Specific Time: derogation status remains for the specified minutes.
- Forever: Derogation status is never released.

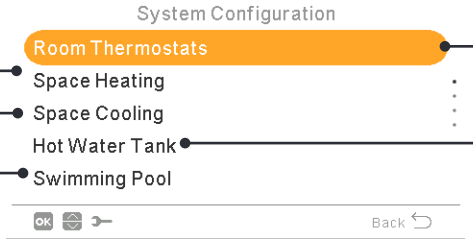
7.13.4 System configuration

In system configuration menu it is possible to configure all the system settings.



Room thermostats configuration:
(Screen visible only for room thermostats)
- Setting temperature range (air)
- Air Eco Offset
- Thermostat configuration
- Compensation factors
- Room temperature demand OFF

1 / 3

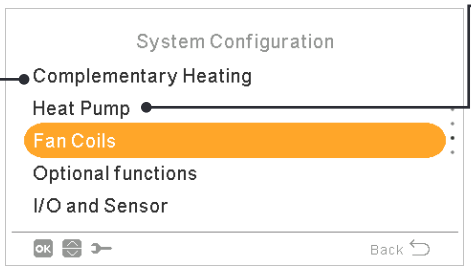


Space Heating / Cooling configuration:
- Water calculation mode
- Eco offset water setting
- Working limits
- Mixing valve (for circuit2)

Swimming Pool configuration:
- Status
- Setting temperature
- Offset temperature

DHW configuration:
- Status
- Mode
- Setting temperature
- HP control
- HP control setting
- Maximum setting temperature
- Differential temperature
- HP OFF differential temperature
- HP ON differential temperature
- Maximum time
- Cycle Time
- Space Priority status
- Space Priority temperature
- DHW Heater
- Smart configuration
- Anti Legionella

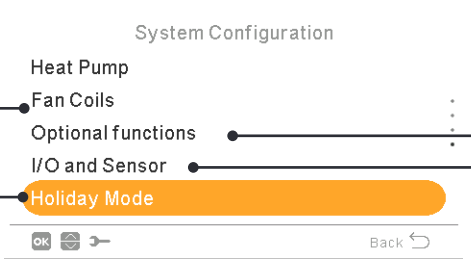
2 / 3



Complementary Heating configuration:
- Heating Source (HP Only, HP+Boiler, HP+Heater, HP+Heater+Boiler)
- Electrical heater
- Boiler combination
- Solar combination

Heat pump configuration:
- Water Pump Configuration
- Night Shift
- Outdoor Average Timer
- Minimum ON Time
- Minimum OFF Time
- Seizure Protection

3 / 3



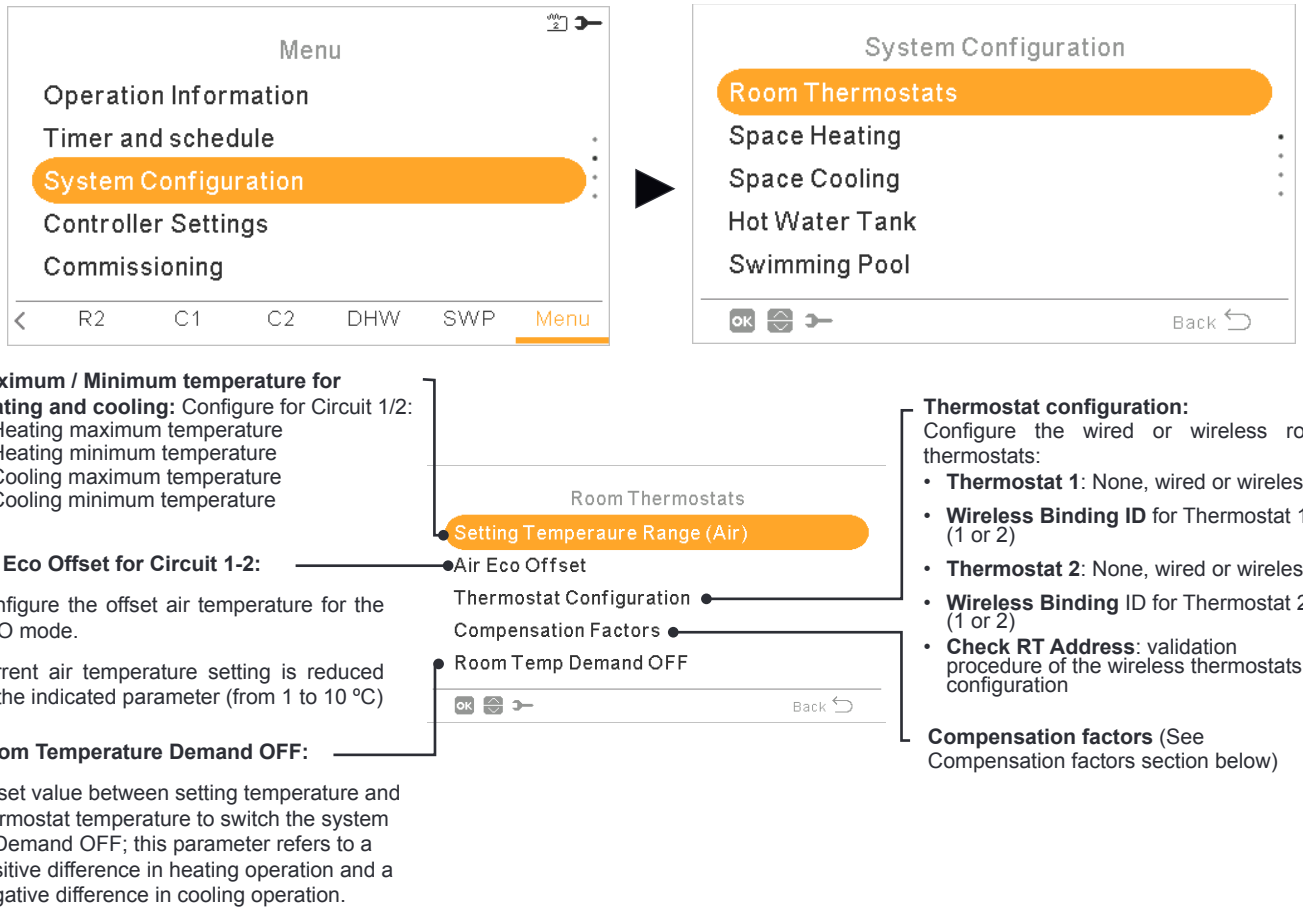
Fan coils configuration:
- Controlled fan zones
- Delay on time
- Demand OFF actions

Holiday mode:
- Year
- Month
- Day
- Returning time
- Affected zones
- Start/stop holiday mode

Optional functions configuration:
- Hydraulic separator
- Energy configuration
- Smart function
- Heating auto on/off
- Auto heat/cool
- Hot water tank
- Emergency operation

I/O and Sensor configuration:
- Inputs
- Standard outputs
- Optional outputs
- Auxiliary sensors

7.13.4.1 Room thermostats configuration



◆ Compensation factors for Heating / Cooling

The temperature of the water supplied by the YUTAKI unit to the circuits is determined by means of OTC (See *"Water calculation mode"*).

This control determines water temperature according to the outdoor temperature. The higher the outdoor temperature, the lower the building demand is, and in consequence the temperature of the water supplied to the circuits is lower. Conversely, the thermal demand of the building rises in the case of low outdoor temperature, and therefore the temperature of the supplied water becomes higher.

The room temperature compensation control allows to modify the water temperature determined by OTC control according to the setting room temperature and the actual room temperature.

In the case of heating, if the difference between room temperature and setting temperature is large, then water temperature is increased by the YUTAKI unit in order to achieve the desired room temperature in a faster way, thus compensating the thermal difference between setting temperature and actual temperature.

In this manner, given two identical rooms, the YUTAKI unit determines the same room temperature according to OTC control. On the other hand, for a room in which there is a wider difference between setting temperature and actual temperature, the YUTAKI unit will increase the temperature of the pumped water in order to ensure a similar heating up time until reaching the setting temperature.

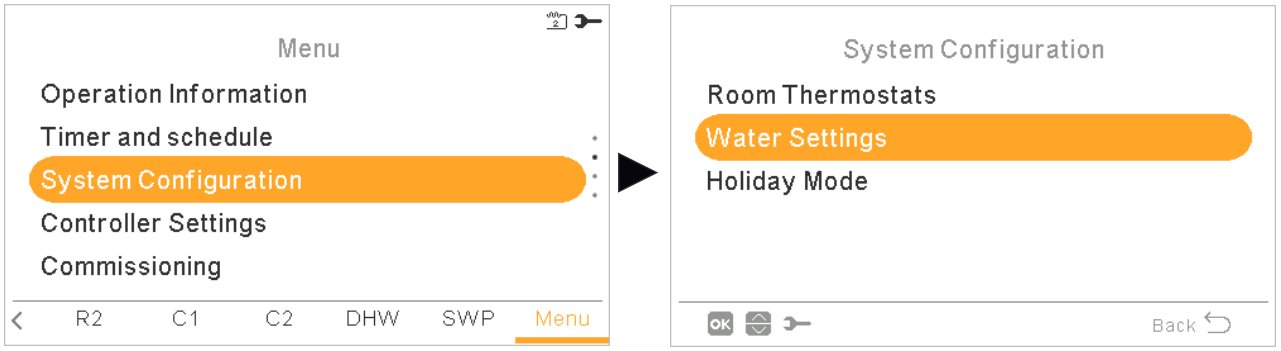
Compensation has no effect if Compensation factor is 0 or when OTC is Fix, and water temperature is determined according to OTC in chapter *"Water calculation mode"* in such case.

The more the factor is increased, the more is water temperature increased by the YUTAKI unit according to the difference between setting temperature and the current temperature.

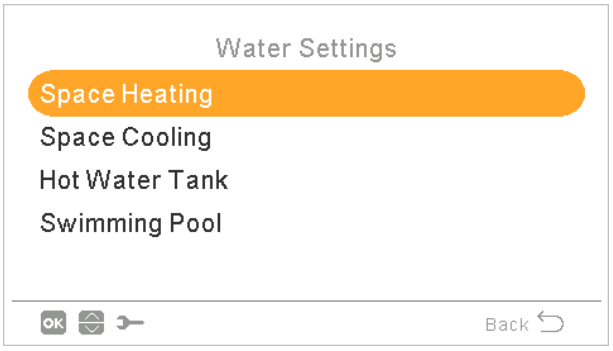
Maximum compensation factor heat + and -: Maximum difference between room temperature and setting temperature. In case that the difference between room temperature and setting temperature is higher than this value, the YUTAKI unit takes the selected value as the maximum.

7.13.4.2 Water settings configuration

This menu is only visible for a room thermostat if the controller is not controlling the unit.



Select the desired area to apply the water settings configuration:



◆ Space Heating or Space Cooling water settings

Δθ (Vertex offset):

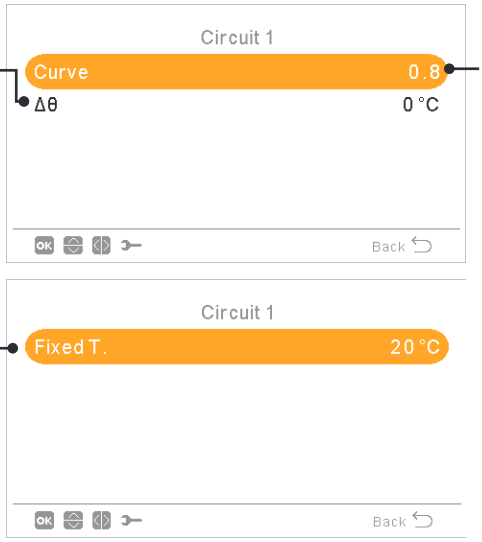
To modify the curve vertex for Circuit 1 or Circuit 2 (only for heating mode).

- Only when water calculation mode is Gradient or Points (setting in Main device).
- Range: -10 ~ 10
- Circuit 1 or Circuit 2 must be ON to configure this setting.

Fixed temperature:

Selection of the temperature for Circuit 1 or Circuit 2 (heating or cooling mode).

- Only when water calculation mode is Fix (setting in Main device).
- Circuit 1 or Circuit 2 must be ON to configure this setting.

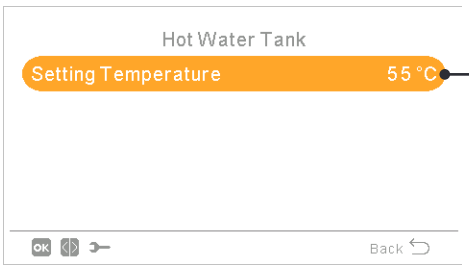


Curve:

Selection of the gradient curve for Circuit 1 or Circuit 2 (only for heating mode).

- Only when water calculation mode is Gradient (setting in Main device).
- Range: 0.2 ~ 2.2
- Circuit 1 or Circuit 2 must be ON to configure this setting.

◆ Hot Water Tank or Swimming pool water settings



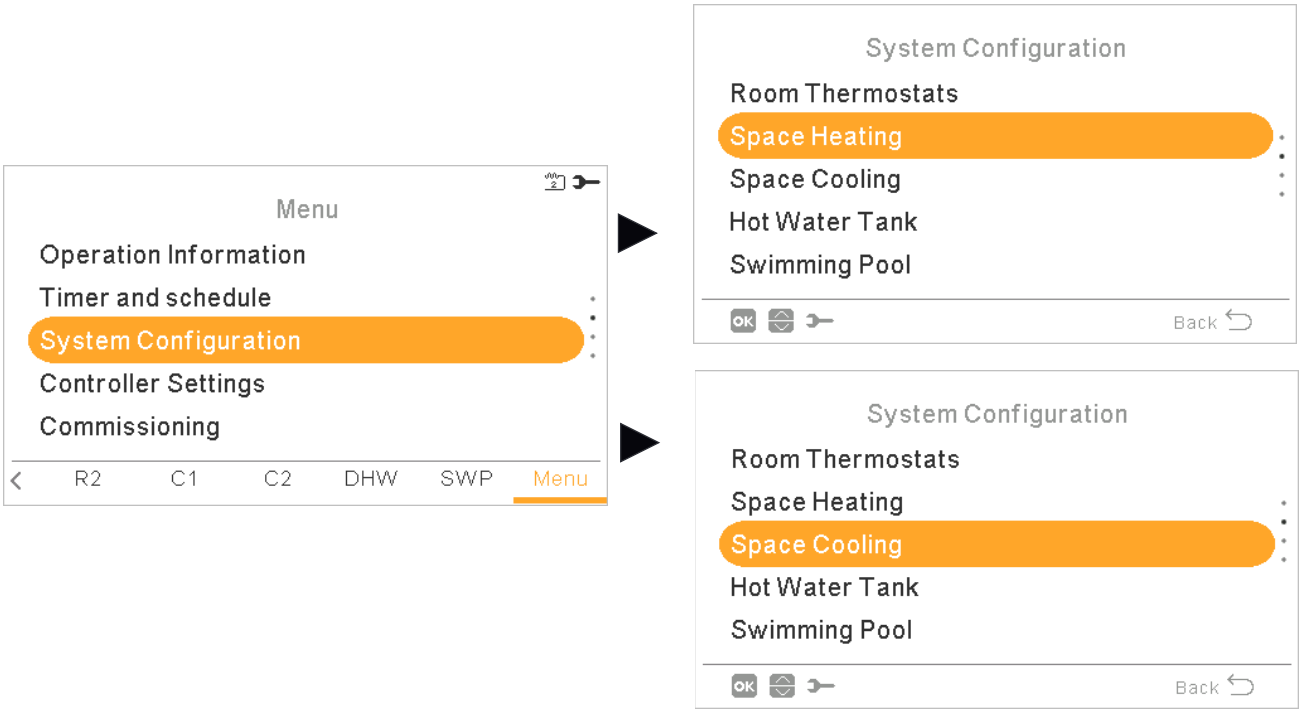
Setting temperature:

Selection of the temperature for DHW or Swimming Pool.

- Hot water tank or Swimming pool must be ON to configure this setting
- Range:
  - DHW: 30 ºC ~Max. setting temperature
  - Swimming pool: 24 ~33 ºC

7.13.4.3 Space Heating / Space Cooling configuration

Control the temperature for Space Heating or Space Cooling by configuring the following parameters.



Water calculation mode:

Selection of the water set point for Circuit 1 or Circuit 2 (Space Heating or Space Cooling).

- Deactivated
- Points
- Gradient (only in heating mode)
- Fix

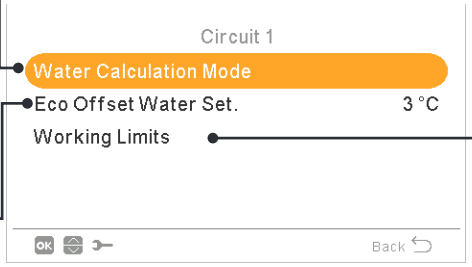
See detailed explanation below.

Eco Offset Water setting:

Configure the offset water temperature for the ECO mode for Space Heating or Space Cooling.

By using this function, current water temperature setting is reduced by the indicated parameter.

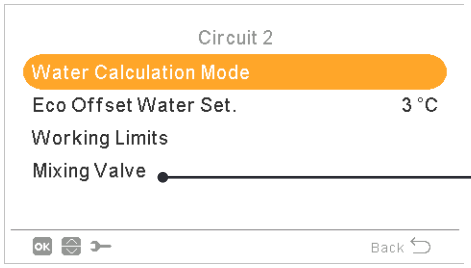
- Range: 0 ~ 10



Working Limits:

Limit for the temperature set-point to prevent high or low temperatures at Space Heating or Space Cooling:

- Maximum supply temperature
- Minimum supply temperature



Mixing valve:

To control the second water temperature (only for circuit 2).

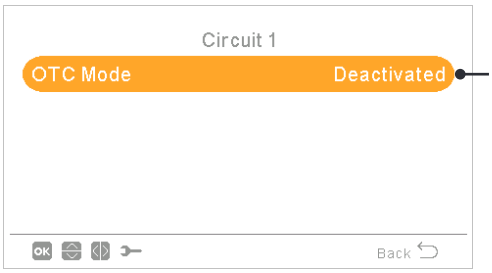
Values are adjusted for the use with the 2nd zone mixing kit accessory ATW-2KT-05. It is highly recommended not to change these values.

In case of using a mixing kit different from the ATW-2KT-05 configure the following parameters:

- Proportional band: 0 ~20 K (6.0 K by default).
- Integral reset factor: 0.0 ~20 % (2.5 % by default).
- Running time factor: 10 ~250 sec (140 sec by default).
- Over temperature offset protection: OFF, 3 ~10 ºC (5 ºC by default).

◆ Water calculation mode

Deactivated



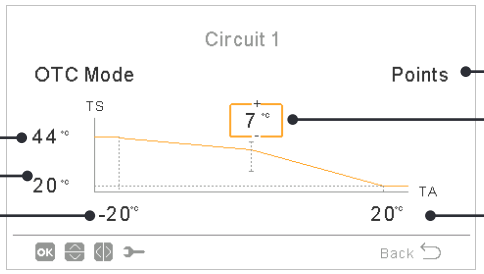
The “Deactivated” option sets the circuit as disabled.

Points

Points is the most versatile calculation type.

Set 4 points and one vertex point, to create a line representing the function that the air to water heat pump will use to give the temperature setting according to the current ambient temperature.

Use the down arrow key to select the parameter to modify. Then modify the value using the left and right arrow keys.



Vertex offset

Set point at high ambient temperature

Set point at low ambient temperature

Low ambient temperature

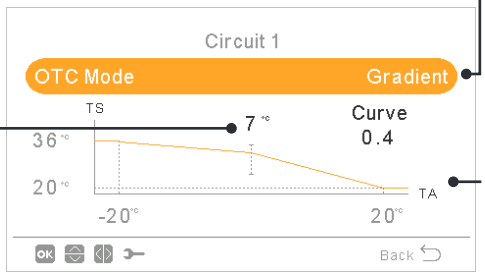
High ambient temperature

Gradient

Configure the same variables as in the “Points” view, but automatically.

User can only edit the gradient variable and it will automatically set the values for the other 4 variables on the chart.

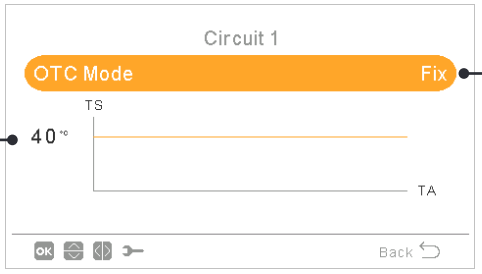
Use the down arrow key to select the parameter to modify. Then modify the value using the left and right arrow keys.



Vertex offset

Gradient curve

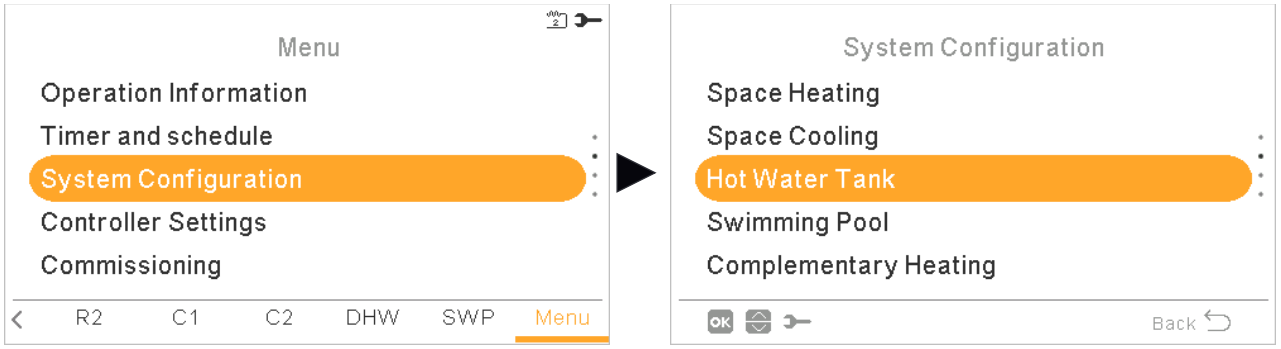
Fix



Fixed temperature

Set the circuit’s temperature to a defined value, forcing the unit to maintain it.

7.13.4.4 Hot Water Tank configuration



Setting temperature:

Setting for domestic hot water temperature selected by the user. The maximum value of this setting depends on the Maximum setting temperature set by the installer. (Between 30 to maximum setting temperature.)

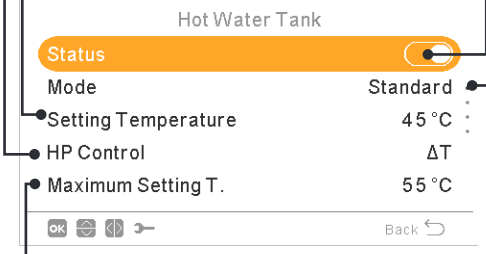
HP Control:

- To achieve the DHW setting temperature it is possible to select between two different modes of control:
- **ΔT:** The most efficient way to achieve the setting temperature. The outlet water temperature is 15° higher than the tank temperature, increasing gradually until achieve the target water outlet temperature (setting temperature).
- **Fix:** This is the fastest way to achieve setting temperature. The outlet water temperature is set to HP Control setting. HP Control setting can be only adjuested in case HP Control is Fix.

Maximum setting temperature:

Maximum value of DHW setting temperature permitted by the installer.

1 / 3



Status of Hot Water Tank:

- Deactivated
- Enabled (by default for YUTAKI S COMBI).

Mode:

- **Standard:** DHW heating operation starts when the temperature of the water in the tank is low enough to start up the heat pump. DHW is heated up with the heat pump or the electrical heater (if electrical heater is enabled).
- **Economic (Only for YUTAKI S COMBI):** DHW heating operation starts under same conditions as Standard Mode with the difference that water temperature measurement is done at higher tank position. Due to this fact number of DHW operations decrease and its duration becomes longer which becomes more efficiency.
- **High Demand:** DHW heating operation starts if water temperature and setting temperature difference is larger than differential temperature. DHW can be heated up using the heater, the heat pump or a combination of both.Only available when Hot Water Tank heater is activated (DSW4 pin 3 ON).

Cycle time:

Defines the minimum time between 2 heat pump cycles of domestic hot water.

DHW will be able to operate again after wait in Thermo off the specified cycle time.

- Range: 0 ~24 hour
- Not available in High demand mode.

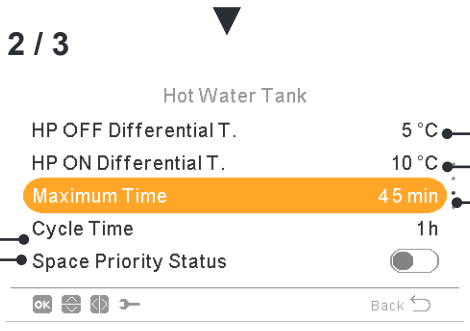
Space priority status:

If space priority function is enabled, Heat Pump operation by DHW mode stops (and continue with DHW heater, if necessary).

This function is only performed if space heating or space cooling can be done. If it is not possible, operation will continue in DHW normally.

- Not available in High demand mode.

2 / 3



HP OFF differential temperature:

Hysteresis for the stop of DHW heating operation with the heat pump.

HP ON differential temperature:

Hysteresis for the start of DHW heating operation with the heat pump.

Maximum time:

Maximum time that DHW operation can work using heat pump mode. When the heat pump is stopped by this function, DHW is still heated by DHW heater when it is enabled, until other conditions request stoppage.

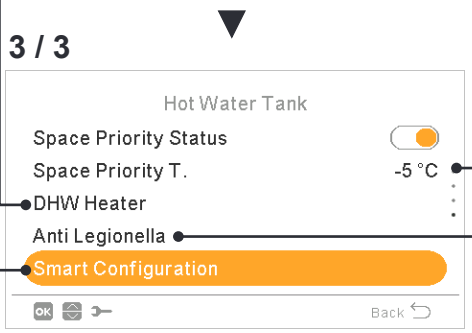
- Range: OFF, 5 ~250 min
- Not available in High demand mode.

DHW Heater: Only available when DHW heater is activated (DSW4 pin 3 ON).

- **Waiting time**: Enable or disable waiting time for DHW heater.
- **Electrical Heater waiting time:** To select the delay time since the moment HP has started in order to start the electric heater. In case Waiting time is set to 0 (default), electric heater is never started due to waiting time. In case waiting time has a value different than 0, it means that heater will we switched ON after configured minutes since the moment HP has been switched ON.

Smart Configuration: Option to allow the tank to be heated to an intermediate temperature of comfort in conditions of water consumption in order to avoid heating to the traditional setting temperature (Only available in Economic mode).

- **Comfort setting**: Intermediate target temperature of tank heating under water consumption conditions
- **Comfort cycles:** Number of operations allowed to heat water to the comfort temperature.



Space priority temperature:

Threshold value of outdoor ambient temperature for the activation of the space priority function.

- Range: -20~0ºC
- Not available in High demand mode.

Anti Legionella:

In order to help prevent against Legionella in the DHW system, the DHW set point can be raised to a higher than normal temperature.

The Legionella protection only makes sense if there is a DHW electric heater to raise the DHW temperature to this high temperature.

See the possible configurable parameters below.

◆ Anti Legionella function



Status of anti legionella operation (enabled/deactivated)

Specified day for anti legionella operation

Specified time of the day for anti legionella operation

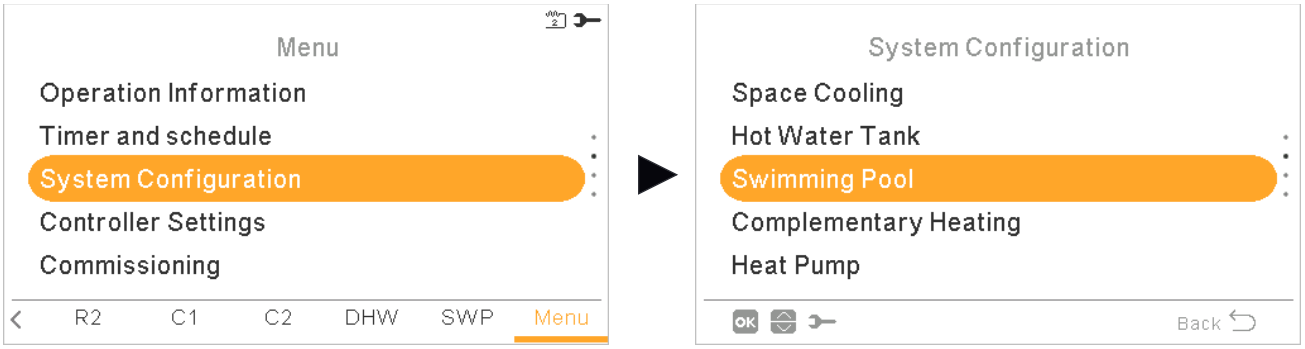
Setting for domestic hot water temperature in anti legionella operation..

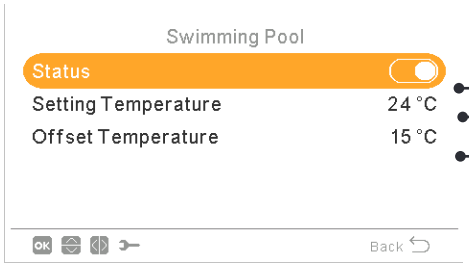
Duration of shock treatment. Between 10 to 60 minutes.

NOTE

In case anti legionella treatment has not been possible to achieve within a time lapse of 6 hours since the moment it has been trigered, anti legionella treatment is released and normal operation can be resumed.

7.13.4.5 Swimming Pool configuration





Status:

Enable or disable swimming pool.

Set input 3, output 1 and sensor 2. (See section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*)

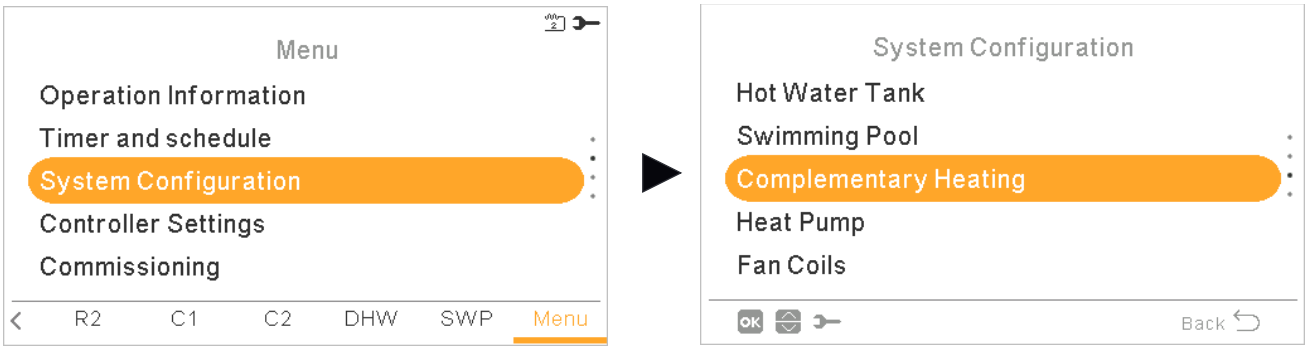
Setting temperature:

Adjustment of the swimming pool water temperature setting.

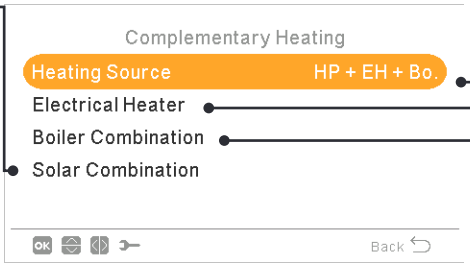
- Range: 24~33 ºC

Offset temperature: The setting temperature is increased by the indicated parameter.

7.13.4.6 Complementary Heating configuration



Heating Source:
- HP Only
- HP + Heater
- HP + Boiler
- HP + Heater + Boiler (Only for YUTAKI S and YUTAKI S COMBI)



Solar combination:

The solar combination will enable you to heat up your domestic water by means of the sun whenever the sun is available.

- Set input 4, output 4 and sensor (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*).
- **Deactivated:** No solar Kit is installed.
- **Input Demand:** Alternative DHW tank operation is done by solar system or YUTAKI unit. Solar input can disable DHW operations done by YUTAKI unit.
- DHW Hysteresis (OFF, 35 ~ 240 min).
- DHW Maximum Time (5 ~240 min).
- **Total Control**: YUTAKI units controls the solar operation for the system, based on different temperatures: DHWT is heated by either the hot water that comes from the solar panels or the hot water that comes from the heat pump, depending on the solar temperature. See detailed information in *"Solar combination - Total control"*.

Electrical heater: See detailed information in *"Electrical heater"*.

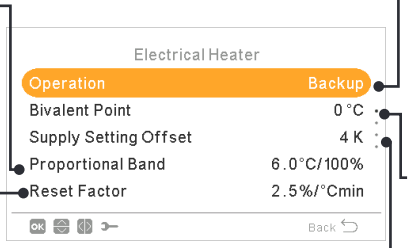
Boiler combination: Boiler will only operate if unit is in Space Heating or Hot Sanitary Water modes. It will always be Deactivated in any other mode (Swimming Pool and Cooling mode). Set output 3 and sensor 1 for boiler (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*).

See detailed information in *"Boiler combination"*.

◆ Electrical heater

Proportional band:
- Control to determine how fast setting temperature is going to be reached. Higher values imply fast achievement of water setting point and therefore higher utilization of heater.

Reset factor:
- Used to guarantee setting temperature achievement without surpassing its value. Higher values imply less utilization of heater.

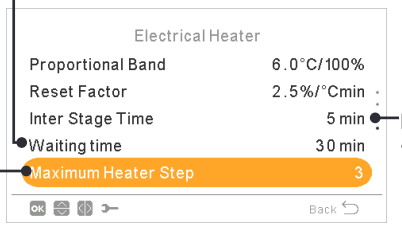


Operation:
- **Starting:** Space Heating electric Heater is switched ON in case of low water temperature and low ambient temperature to provide extra capacity to HP.
- **Backup:** Space Heating Electric Heater is switched ON in case of low ambient temperature (below Bivalent point) in order to provide extra capacity to HP at coldest days of winter.

Bivalent point:
- Electric heater is enabled to operate in case ambient temperature goes below this value. Only in case of Backup option.

Supply setting offset:
- Setting offset for electric Heater. Higher values imply earlier stoppage of electric heater and vice versa. Only in case of Backup option.

Waiting time:
- Delay time to start Electric Heater in case all conditions allow Electric Heater to start after HP has been started. Only in case of Backup option.

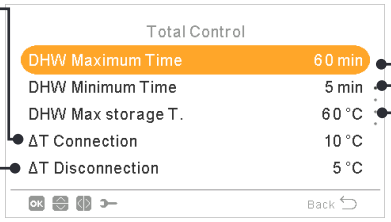


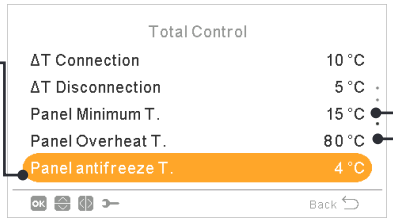
Maximum heater step:

(Only in case of Backup option).
- To limit the maximum heater step it can be switched ON regardless of the real Heater demand.

Inter stage time:
- Time of Electric Heater phase overlapping when there is switch ON/OFF transition from/to phase 1 to/from phase 2. Only in case of Backup option.

◆ Solar combination - Total control





ΔT connection:

- Allows to specify a difference temperature between tank and Panel temperature to allow solar operation. Solar operation is allowed in case Panel temperature is "**Δ**T connection" ºC above tank temperature.

ΔT disconnection:

- Allows to specify a difference temperature between tank and Panel temperature to stop solar operation. Solar operation is not allowed in case Panel temperature is "**Δ**T connection" ºC below tank temperature.

Panel antifreeze temperature:

- Minimum Solar panel temperature at which Solar Pump is switched ON in order to protect system against frost formation at pipes due to low ambient temperature.

DHW maximum time:

- Maximum time YUTAKI allows to heat tank by means Solar. At the end of this time Solar pump is stopped regardless temperature conditions at Solar Panel.

DHW minimum time:

- Minimum Time solar operation cannot be performed once it has been stopped due to DHW Maximum Time or due to low temperature at solar panel.

DHWT maximum storage temperature:

- Maximum DHW temperature that allows Solar operation.

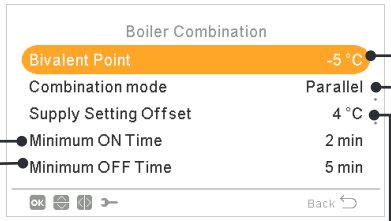
Panel minimum temperature:

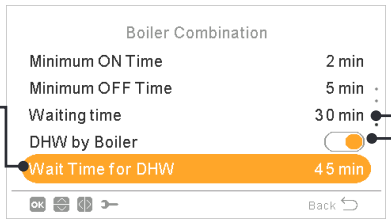
- Minimum temperature of the solar Panel to allow Solar operation

Panel overheat temperature:

- Maximum panel operation temperature at which Solar Pump is set to off in case Panel sensor reads a temperature above this value in order to protect system.
- In case that the solar pump is stopped due to panel overheat temperature, the YUTAKI unit sets solar overheat output to high state provided that this function has been setup as described in *"7.13.4.10 Inputs, Outputs and Sensors configuration"*

◆ Boiler combination





Minimum ON time:

- Time that must pass before stop boiler after being switched ON

Minimum OFF time:

- Time that must pass before start boiler after being switched OFF

Bivalent point:

- Boiler is allowed to operate in case ambient temperature is below this value.

Combination mode:

- Serial: Boiler operates in series with the heat-pump. The boiler provides additional peak load capacity and works together with the HP.
- Parallel: Boiler operates in parallel with the heat pump. The boiler provides the full heating requirements. In case Boiler is ON, HP is not allowed to operate.

Supply setting offset:

- Setting offset for Boiler. Higher values imply earlier stoppage of Boiler and vice versa.

Wait time for DHW (Only for YUTAKI S):

- Delay time to start Boiler for DHW in case all conditions allow Boiler to start after HP has been started for DHW.

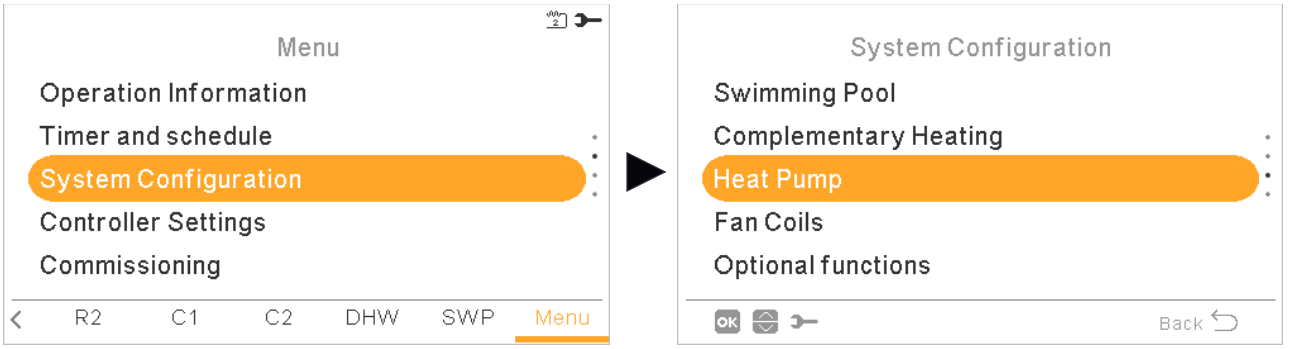
Waiting time:

- Delay time to start Boiler in case all conditions allow Boiler to start after HP has been started for Space Heating.

DHW by boiler (Only for YUTAKI S):

- Control to allow heat DHW by means Boiler.

7.13.4.7 Heat Pump configuration



Night shift:

Reduces compressor load in order to reduce environmental noise, preferably at night.

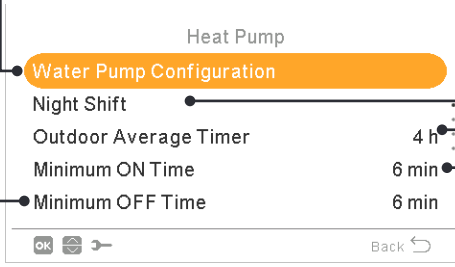
See detailed information in the next page.

Water pump configuration:

Configure the water pump of the heat pump.

See detailed information in the next page.

1 / 2



Outdoor average temperature:

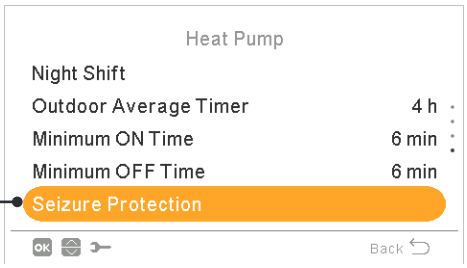
OTC average is used to neutralise the effect of occasional temperature variations.

The average value of outdoor temperature sampled over a selected period (between 1 and 24 hours) is used for the calculation of weather-dependent set point temperature.

Minimum OFF time: In order to reduce a possible compressor damage, demand OFF cycles can be reduced by determining the time that must pass before accepting new Demand ON.

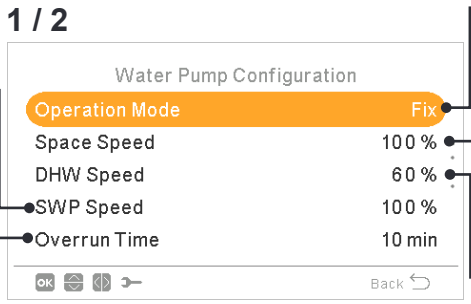
Minimum ON time: In order to reduce a possible compressor damage, demand ON cycles can be reduced by determining the time that must pass before accepting new Demand OFF.

2 / 2



Seizure protection:
The pump seizure protection function prevents sticking of components due to long periods of inactivity, by running the components during a short period every week. Mixing valves and pumps are fully opened and then fully closed (time depends on Mixing valve Run Time Factor).

◆ Water pump configuration



Swimming pool speed:

Selection of the % for the pump speed when using Swimming pool.

Overrun Time:

Added operation time of water pump after Demand OFF.

Operation mode:

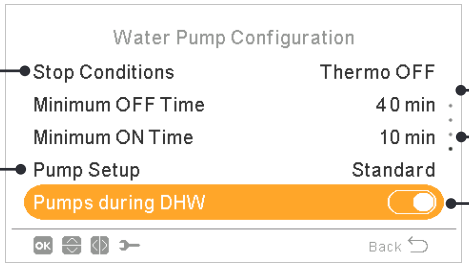
- **ΔT:** To control the pump speed to guarantee the ΔT between Two and Twi.
- **Fix:** The water pump works at the specified speed % at the space speed menu.

Space speed:

Selection of the % for the pump speed when fix mode is selected.

DHW speed:

Selection of the % for the pump speed when using DHW.



Stop conditions:

- **Standard**
- **Thermo OFF:** The water pump stops after Thermo OFF. (DSW5 pin 4 ON).

Pump Setup:

This option allows user to select hydraulic configuration of the system when hydraulic separator is used.

- **Standard:** WP2 is connected after WP3 by means an hydraulic separator or directly by means Hitachi mixing kit accessory. Whenever WP2 is switched ON, WP3 is also switched ON in order to transfer heat to C2.
- **Parallel:** WP2 is directly connected to the buffer tank in parallel with WP3. Operation of WP3 is independent of the operation of WP2. When this configuration is used, Hitachi mixing kit accessory cannot be used.

Option available only when there is Hydraulic separator configured.

Minimum OFF Time:

Minimum time of the water pump OFF.

- Only when Economic mode is active (DSW)

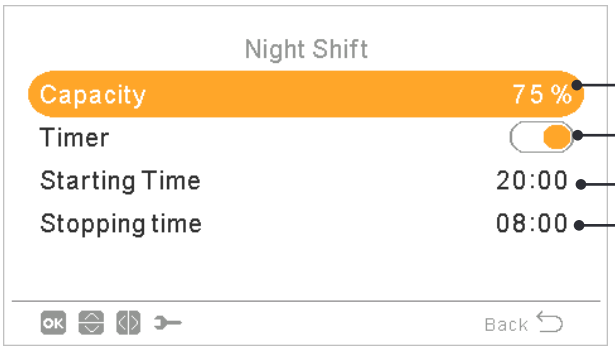
Minimum ON Time:

Minimum time of the water pump ON.

- Only when Economic mode is active (DSW)

Pumps during DHW:
This option allows to stop Water Pumps during DHW operation. Water pumps that are allowed to stop are the ones that are not directly involved to DHW heating-up procedure. This is WP2 and WP3 depending on the hydraulic configuration.

◆ Night Shift



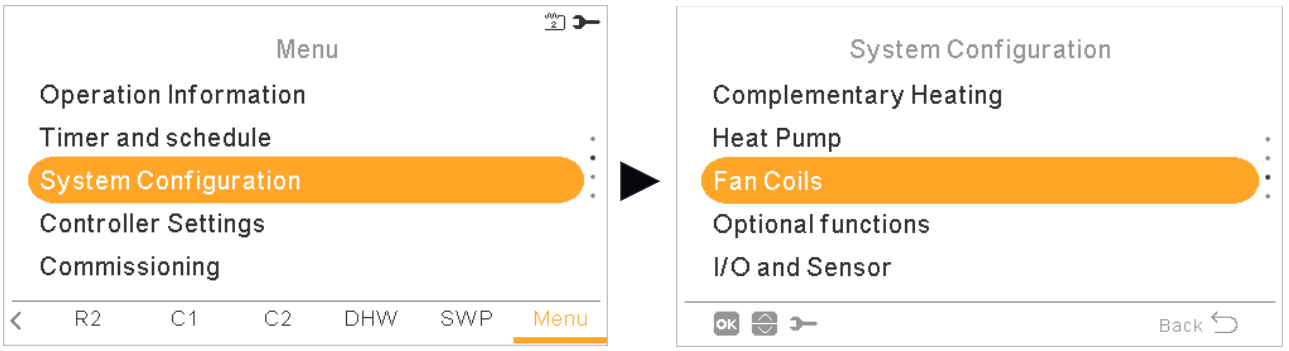
Ratio of reduction in heat pump capacity

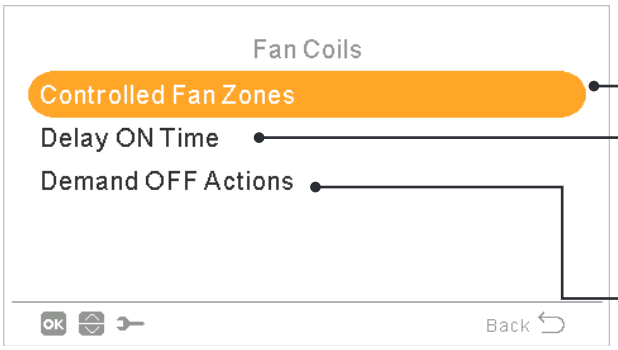
Status of activation of Night Shift (reduction of compressor load in order to reduce operation noise during the night hours).

Starting time of Nigh Shift operation

Ending time of Night Shift operation

7.13.4.8 Fan coils





Controlled fan zones:

Fan coil usage assignation in function of Mode and Room:

- Deactivated
- Heating
- Cooling
- Heating & Cooling

Delay ON time:

Delay time to start Fan operation for Fan 1 or Fan 2 only in heating operation. Purpose of this control is to make sure water temperature at fan coil is hot enough before fan is started in order to ensure user comfort.

Demand OFF Actions:

The purpose of this control is to enhance user comfort by allowing to stop fan or keep it in operation when Demand OFF conditions by room temperature are fulfilled.

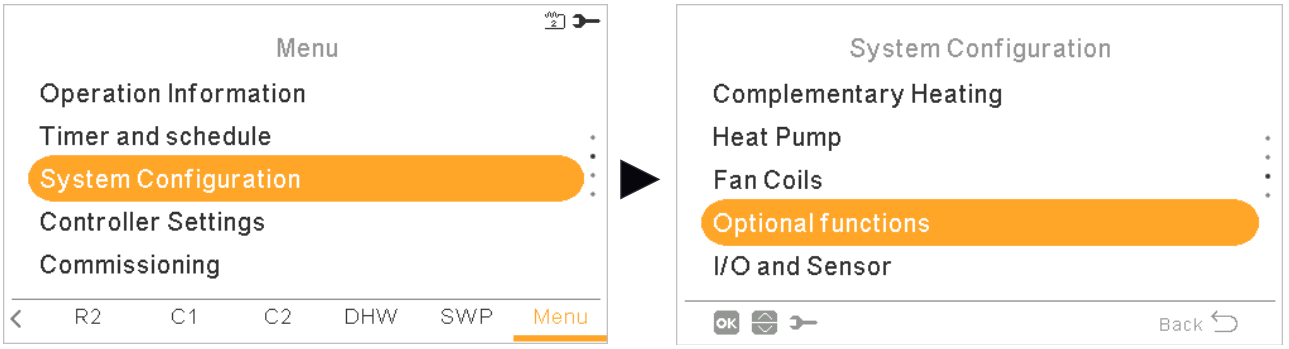
The best user comfort is typically achieved by stopping the fan in heating applications and keeping it in operation for cooling operations.

Configure the Demand OFF action for Heating or Cooling operation in Room 1 or Room 2.

- Nothing
- Stop fan

7.13.4.9 Optional functions configuration

This menu allows to configure the optional functions for system, space heating or space cooling, DHW and Emergency operation.



Energy configuration:

Setup of power consumption readings. See detailed information below.

Hydraulic separator:

Enable or disable a Hydraulic separator or a buffer tank. See detailed information below.

Smart function:

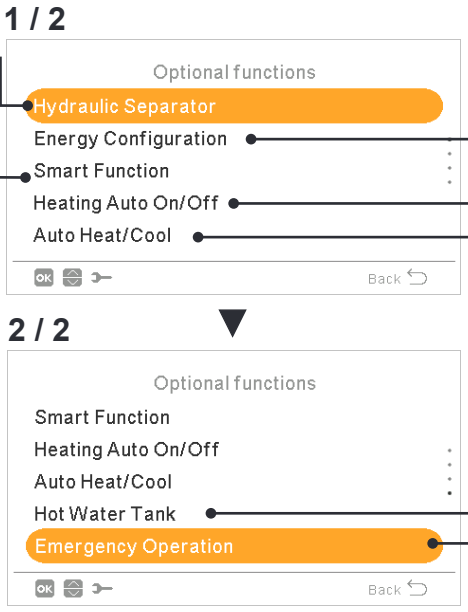
To block or limit the heat pump or increase demand due to electricity availability. See detailed information on Smart function chapter.

Heating Auto On/Off:

To stop automatically stop heating operation when the daily average outdoor temperature of the previous day is higher than the defined Switch-OFF temperature. See detailed information below.

Auto Heat/Cool:

Allows to set automatic switch over to heating and cooling operation using the same daily average outdoor temperature of the previous day as in Heating auto ON/OFF.



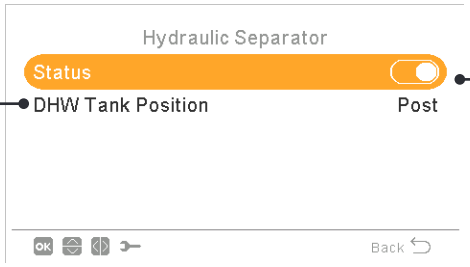
Hot water tank:

Configure the optional functions for the DHW. See detailed information below.

Emergency operation:

Enable or disable emergency operation for space heating or DHW. See detailed information below.

◆ Hydraulic separator



Hydraulic separator status:

Enable if there is a Hydraulic separator or a buffer tank installed. Check that WP3 is set in output 2 (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*).

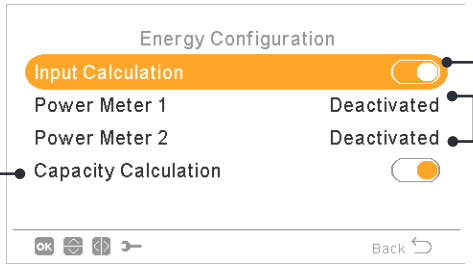
DWH Tank position:

This selection option is not available for YUTAKI S COMBI since DHW tank is located before buffer tank in any case.

Pre: DHW tank and the 3 way valve are located between Heater Plate exchanger and buffer tank.

Post: DHW tank and the 3 way valve are located after buffer tank.

Energy configuration



Input calculation:

Enable or disable energy configuration options.

Power meter 1 or 2:

- The power meter does a real measuring of the power consumption.
- If the power meter is enabled, it is possible to see the information collected through the Operation information - Energy data menu.
- If "power meter" is Deactivated the YUTAKI software does an estimate consumption of the system.
- In case of using power meter 1 or 2 input must be configured at the Inputs menu (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*).

Capacity configuration:

Due to usage of water temperature inlet and outlet + water flow level, an estimation of capacity can be checked through the Operation information - Energy data menu.

Due to the estimation, values may differ from real ones.

Smart Function

Status:

Enable or disable smart function.

Trigger type:

- Closed: Action when input is closed
- Open: Action when input is open

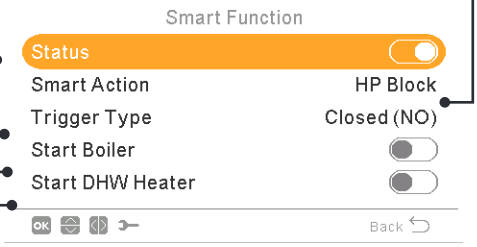
Start boiler:

Permission to use the boiler in case that the system has been blocked due to HP Block.

Start DHW Heater:

Permission to use the DHW heater in case that the system has been blocked due to HP Block.

1 / 3

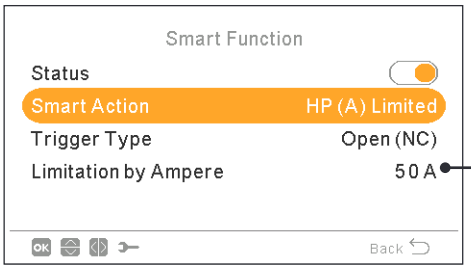


Smart Action:

Check that Smart Act/SG1 is set in input 5 (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*).

- **HP Block:** Heat Pump is forbidden in any condition (Space Heating, Cooling, DHW) when signal is active.
- **HP Limited (A):** Limitation of power consumption up to a limit of "x" amperes (to be set up in Limitation of amperage).
- **SG Ready:** The SG Grid is awarded to heat pump series. This control technology integrates the system in a smart grid by using two digital inputs establishing an unidirectional connection. See Service Manual for detailed information. It is necessary to configure an input for SG2.
- **DHW Block:** DHW Operation is forbidden when signal is active.
- **DHW only:** Heat pump operation for any condition except DHW is forbidden when signal is active. DHW operation is allowed normally.

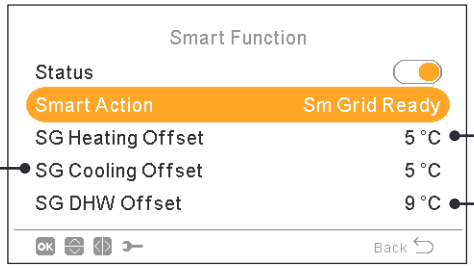
2 / 3



Limitation by ampere:

Configure the ampere consumption limitation. Only visible when smart action is set as HP Limited (A).

3 / 3



SG Heating offset:

To adjust Space Heating setting temperature increase when SG ready is in Low price mode.

SG DHW offset:

To adjust DHW setting temperature increase when SG ready is in Low price mode.

SG Cooling offset:

To adjust Space Cooling setting temperature decrease when SG ready is in Low price mode.

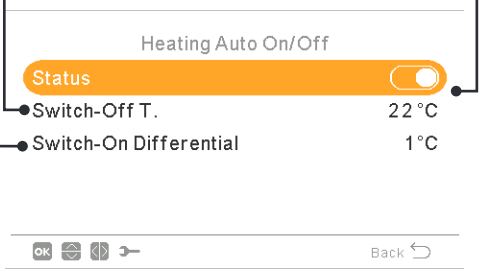
◆ Heating Auto On / Off

Switch-Off Temperature:

- Switch Off temperature: System is stopped in case that the outdoor temperature is higher than the Switch-OFF temperature.

Switch-On Differential:

- Differential temperature between average outdoor temperature of the previous day and the Switch Off temperature.



Status:

- Enable or disable heating auto on/off function.
- Switch Off temperature: System is stopped in case that the outdoor temperature is higher than the Switch-OFF temperature.
- Switch On differential: Differential temperature between average outdoor temperature of the previous day and the Switch Off temperature.

◆ Auto Heat/Cool

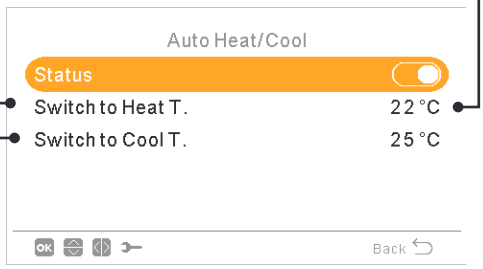
Only available in units capable of heating and cooling operation, and when cooling operation is enabled.

Status:

- Enable or disable auto heat/cool.

Switch to Cool temperature:

- Operation switches to cooling in case that the measured outdoor temperature value is higher than the threshold for switching to cooling.



Switch to Heat temperature:

- Operation switches to heating in case that the measured outdoor temperature value is lower than the threshold for switching to heating.

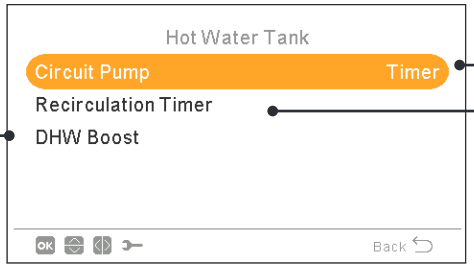
◆ Hot water tank optional functions

DHW Boost:

To force a one-time heating of the DHW tank up to the temperature set as DHW Boost temperature.

This feature is useful to cover exceptional demand of DHW.

- **Trigger type:** Push (favourite button), Open (NC) or Closed (NO). Set input 6 for DHW Boost (for trigger type open/closed). (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*)
- **Boost setting:** DHW temperature setting for the Boost function.



Circuit Pump: By using this output, user can heat all the water inside DHW piping system. Output must be configured at the I/O and sensors menu. (see section *"7.13.4.10 Inputs, Outputs and Sensors configuration"*).

- Deactivated.
- Demand: Enable DHW recirculation.
- Anti Legionella: Allows DHW recirculation while anti legionella is active.
- Timer: A timer can be programmed in order to start or stop the water recirculation.

Recirculation timer:

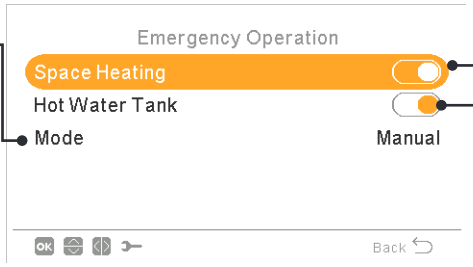
- Frequency: Allows to select when timer is applied (Everyday, weekend, workday).
- Starting Time: When the water pump circulation starts.
- Stopping Time: When the water pump circulation stops.
- Operation: In case of ON, means that water pump is always ON between "Starting Time" and "Stopping Time". In case it is set to Timer, Recirculation pump is ON during "ON Time" after being OFF during "OFF Time" within Starting Time and Stopping Time.
- ON Time: On time period of Recirculation pump.
- OFF Time: Off time period of Recirculation pump.

◆ Emergency Operation

Mode:

Selection of the emergency operation mode:

- **Manual:** Emergency operation is active when is manually enabled (by DSW4 pin 4 ON). The emergency mode uses the heater (space heating or DHW) to provide the required heating.
- **Automatic:** Emergency mode operates when there is an event of outdoor unit failure and Demand ON of space heating (enabled) or DHW (enabled).



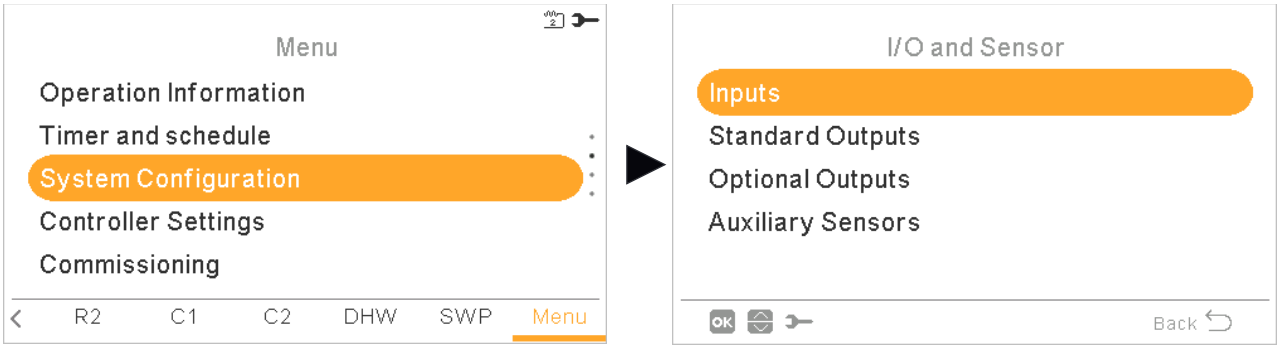
Space Heating:

Enable or disable emergency operation for space heating.
Only available in case "Heating source" on *"7.13.4.6 Complementary Heating configuration"* contains "Electrical heater or boiler" option.

Hot water tank:

Enable or disable emergency operation for DHW. Only available when electrical heater for DHW is enabled (by DSW).

7.13.4.10 Inputs, Outputs and Sensors configuration



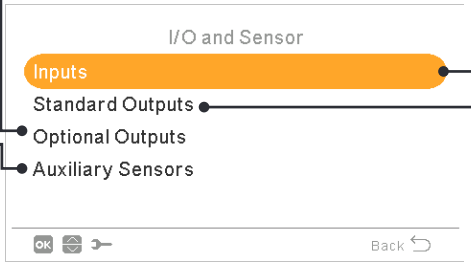
Optional outputs:

There 4 additional available outputs to set. These 4 additional outputs are not wired to the YUTAKI terminal board.

In order to use them it is required accessory (field supplied). Its configuration follow same constrains as Standard outputs.

Auxiliary sensors:

There are 7 available auxiliary sensors to set.



Inputs:

The system allows to set 7 inputs depending on the operations and preferences of the installation.

Standard Outputs:

There are 4 available outputs to set already wired to the terminal board. There are conditions of setting depending on the installation.

◆ List of available inputs:

- **Deactivated**
- **Demand ON/OFF** (by default in input 1): Consider both Circuit 1 and Circuit 2 in Demand ON when the signal is ON.
- **Demand ON/OFF C1:** Consider Circuit 1 in Demand ON when the signal is ON.
- **Demand ON/OFF C2:** Consider Circuit 2 in Demand ON when the signal is ON.
- **Power Meter 2:** To count any pulse received from the power meter 2 and sent to central control energy consumption calculation.
- **ECO C1 + C2:** Switch both Circuit 1 and Circuit 2 to ECO mode when input is closed.
- **ECO C1** (by default in input 2, if there is circuit 1 in the installation): Switch Circuit 1 to ECO mode when input is closed.
- **ECO C2:** Switch Circuit 2 to ECO mode when input is closed.
- **Forced Off:** Forbid DHW, space heating and space cooling.
- **Smart Act / SG1** (Fixed in input 5 if smart action is enabled): To active Smart Function.
- **Swimming Pool** (Fixed in input 3 if swimming pool is enabled): Consider Swimming pool in Demand ON when the signal is ON.
- **Solar** (Fixed in input 4 if solar is enabled): To let YUTAKI know that external Solar management system is ready to provide Solar energy.
- **Operation:** To switch between space cooling and space heating.
- **DHW Boost** (Fixed in input 6 if is DHW Boost is enabled): If it is set to open (NC), boost signal ON if circuit is open. If it is set to close (NO), boost signal ON if circuit is closed.
- **Power Meter 1** (Fixed in input 7 if Power Meter 1 is enabled): To count any pulse received from the power meter 1 and sent to central control energy consumption calculation.
- **Forced Heating:** Force mode heating when input is closed
- **Forced Cooling:** Force mode cooling when input is closed.
- **SG2:** To active the different estates of Sm Grid Ready.
- **Drain pump**: System forbids operation and alarm 85 is triggered in case signal is closed for more than 30 seconds. Purpose of this input is to be used in conjunction with Water float switch (field supplied) located at drain pan.

◆ List of available outputs:

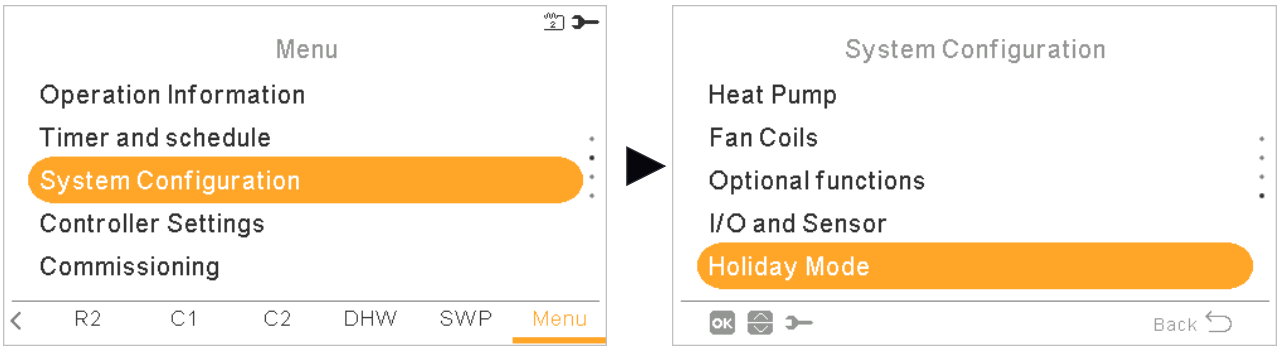
- **Deactivated**
- **SWP 3WV:** (Fixed in output 1 if swimming pool is enabled): Signal control of the 3-way valve of the swimming pool.
- **Water pump 3:** (Fixed in output 2 if hydraulic separator or buffer tank is installed): Signal control of the water pump for hydraulic separator or buffer tank.
- **Boiler:** (Fixed in input 3 if boiler is enabled): Signal control of the boiler.
- **Solar Pump:** (Fixed in input 4 if solar pump is enabled): Signal control of the solar pump.
- **Alarm:** (By default in output 5):Signal is active if there is an alarm.
- **Operation:** (By default in output 6): Signal active in case Thermo ON in any condition.
- **Cooling:** (By default in output 7): Signal active when space cooling is operating.
- **Dem-ON C1:** (By default in output 8): Signal active when there is Demand in circuit 1.
- **Heating:** Signal active when space heating is operating.
- **DHW:** Signal active when DHW is operating.
- **Solar overheat:** Signal is active when solar overheat (only when solar combination status is total control)
- **Defrost:** Signal active when outdoor unit is defrosting.
- **DHW Re-circulation:** Signal active depending on option selected at chapter Circuit pump.
- **Fan 1 Low:** Signal is active when fan coil speed selected for Circuit 1 is set to Low.
- **Fan 1 Medium:** Signal is active when fan coil speed selected for Circuit 1 is set to Medium.
- **Fan 1 High:** Signal is active when fan coil speed selected for Circuit 1 is set to High.
- **Fan 2 Low:** Signal is active when fan coil speed selected for Circuit 2 is set to Low
- **Fan 2 Medium:** Signal is active when fan coil speed selected for Circuit 2 is set to Medium.
- **Fan 2 High:** Signal is active when fan coil speed selected for Circuit 2 is set to High.
- **Constant Heating:** Signal is active in case operation mode of LCD controller is set to Heating.
- **Constant Cooling:** Signal is active in case operation mode of LCD controller is set to Cooling.

◆ List of available sensors:

- **Deactivated**
- **Two3:** (Fixed in sensor 1 if boiler is installed): Use this sensor to monitor water temperature when boiler is used.
- **Swimming Pool:** (Fixed in sensor 2 if swimming pool is installed): Use this sensor when swimming pool is used in order to monitor swimming pool temperature.
- **Solar panel sensor:** Use this sensor when Total control is configured to monitor Solar Panel temperature.
- **C1 + C2 Ambient:** Use this sensor when auxiliary ambient temperature sensor is used for C1 and C2.
- **C1 Ambient:** Use this sensor when auxiliary ambient temperature sensor is used for C1.
- **C2 Ambient:** Use this sensor when auxiliary ambient temperature sensor is used for C2.
- **Outdoor sensor (NTC):** (By default sensor 3) To connect to the controller an auxiliary outside temperature sensor in case the heat pump is located in a position not suitable for this measurement.

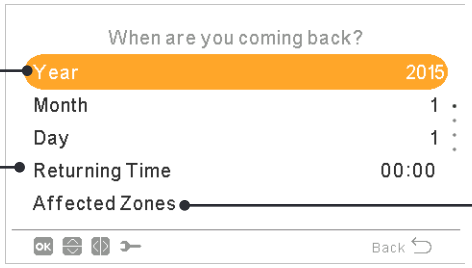
7.13.5 Holiday mode

This menu allows to configure the date, time and the temperature conditions for the holiday come back.



1 / 2

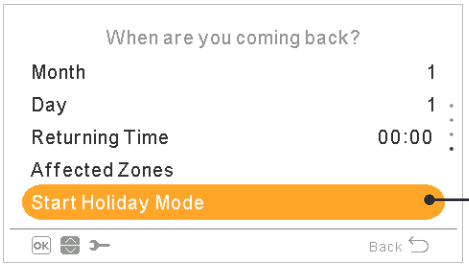
Holiday Mode: Configure holiday come back
- Year
- Month
- Day
- Returning time



Affected zones:

Enable (switch off) or disable (switch on) the zones during the holiday period.
- Circuit 1 / 2
- Room 1 / 2
- Room 1 / 2 Setting temperature
- Hot water tank
- Swimming pool

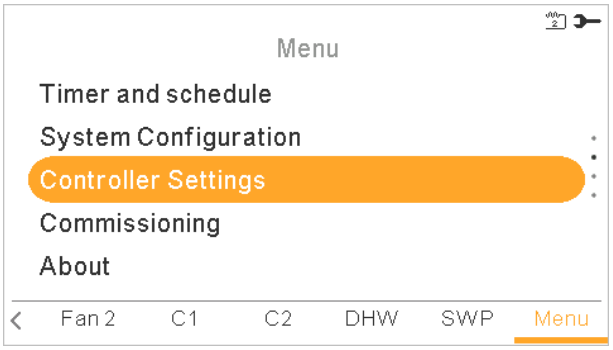
2 / 2

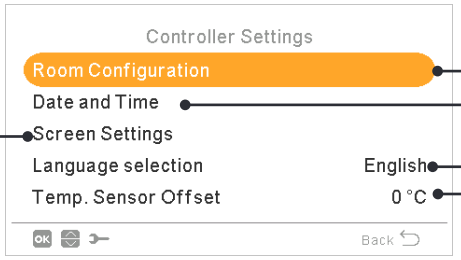


Start / Stop holiday mode

7.13.6 Controller settings

Under the controller settings menu it is possible to adjust the several parameters:





Screen settings:
- Display theme (light / dark / auto)
- Backlight time
- Backlight bright
- Contrast
- Brightness
- ON LED bright
- Beep on touch volume

Room Configuration:
- Room names: create or edit a name for circuit 1 or circuit 2.
- Synoptic view icons: selection of the icon shown in Live view menu for cooling / heating emitters.

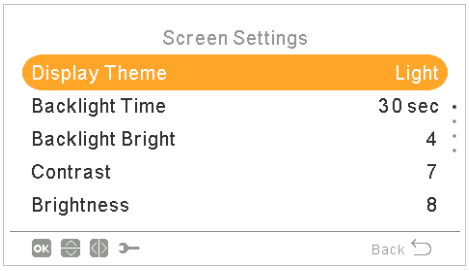
Date and time:
- Adjust date and time
- European summer time

Selection of the unit controller language.

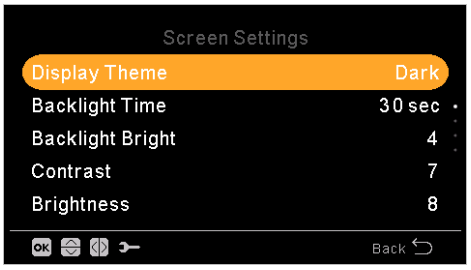
Temp. sensor offset:

To apply an offset to the room temperature read by the in build sensor of the controller in order to match real room temperature.

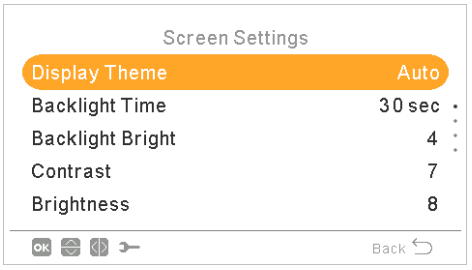
◆ Display theme



Light



Dark



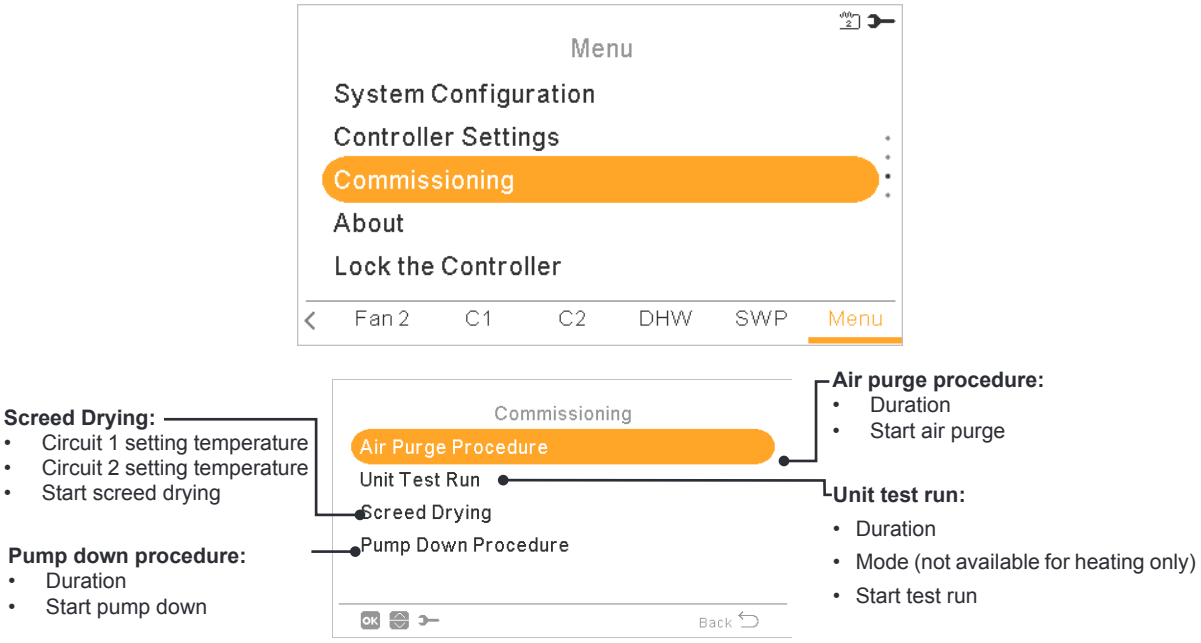
Auto

When Dark theme is selected, background is changed to black, text and icons to white.

When Auto theme is selected, it changes automatically between light (at 8:00 am) and dark (at 20:00 pm)

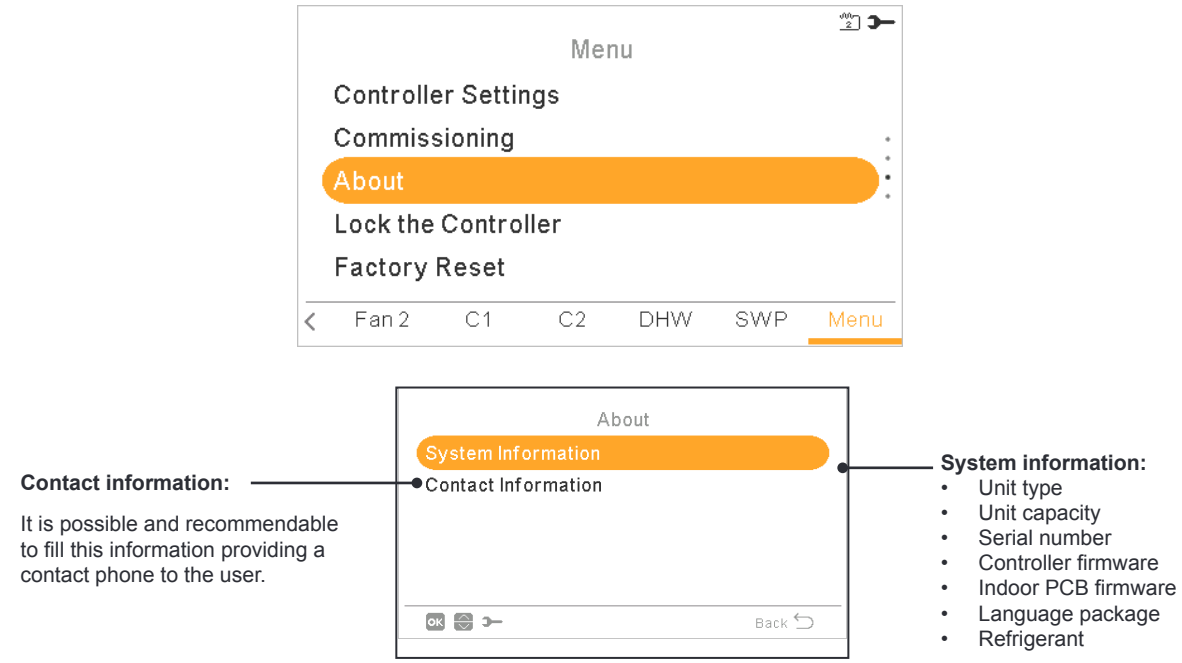
7.13.7 Commissioning

Under the commissioning menu it is possible to adjust the several parameters:



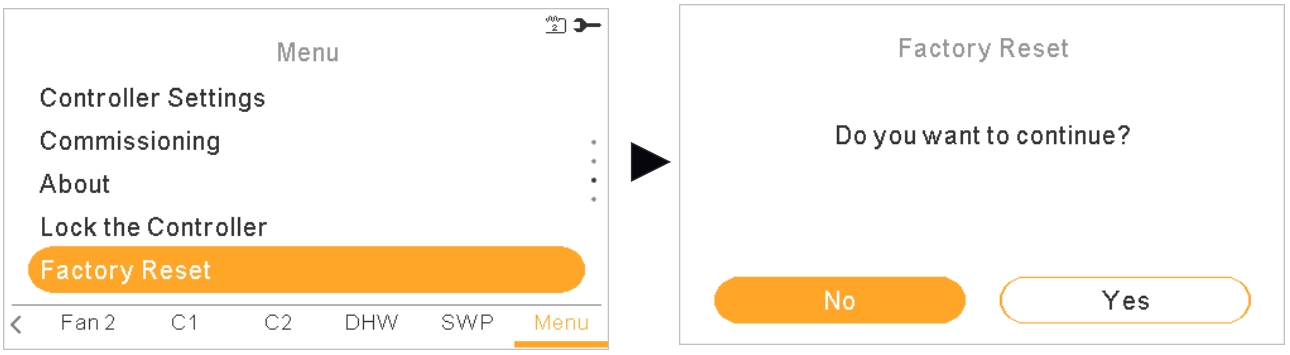
7.13.8 About

In this section of the LCD controller it is possible to find the following information:



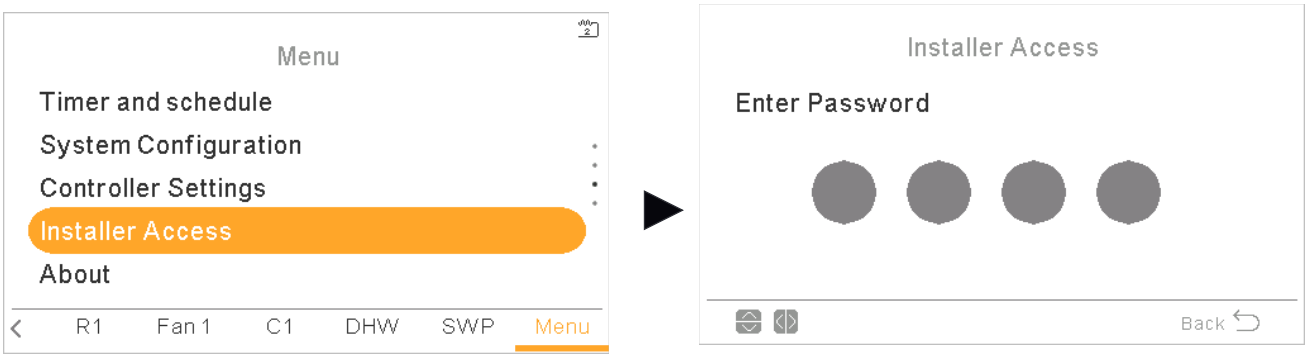
7.13.9 Factory reset

This function is only visible for the installer. It asks for removing all the settings and returns to the factory setting configuration.



7.13.10 Installer access

Menu to enable the access to configure the system.



The login password for the Installer is:

Right ▶, Down ▼, Left ◀, Right ▶

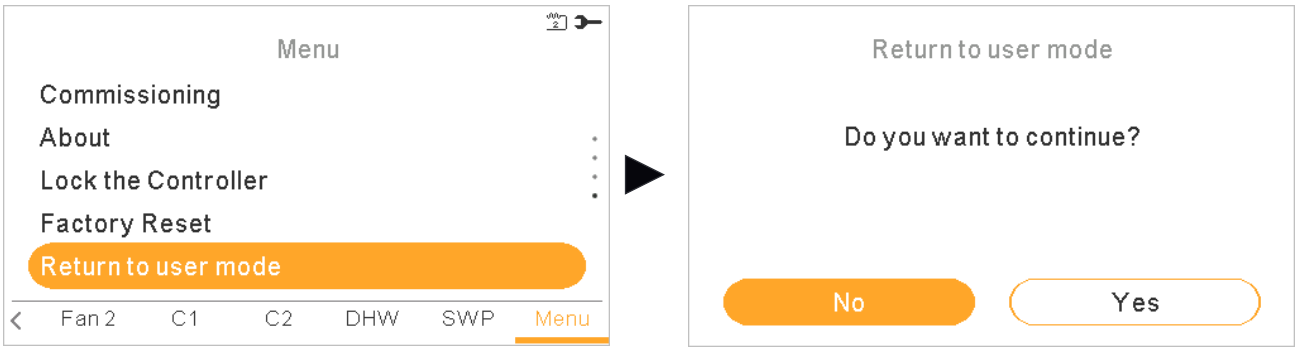
Press “OK” to confirm the password.

If the correct access code is entered, the installer mode icon appears on the notifications bar (bottom line).

After 30 minutes of inactivity, it is necessary to repeat the log in process. To exit the Installer mode and return to the unit menu, go to the “Return to user mode” on the main menu.

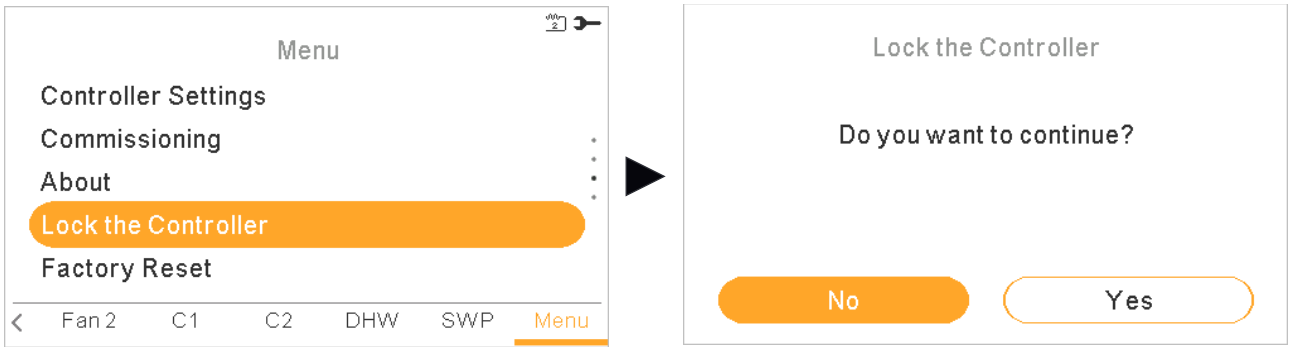
7.13.11 Return to user mode

This function allows to getting out of the “Installer mode”.

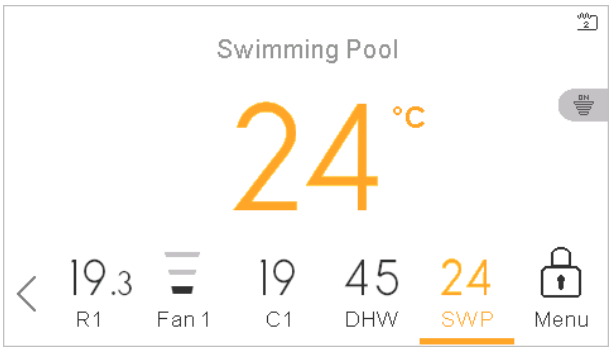


7.13.12 Lock the controller

This function is only visible for the installer and allows to lock the menu in case of exhibition. This action can also be launched from central.



When the controller is locked the lock icon appears insted the icon menu.

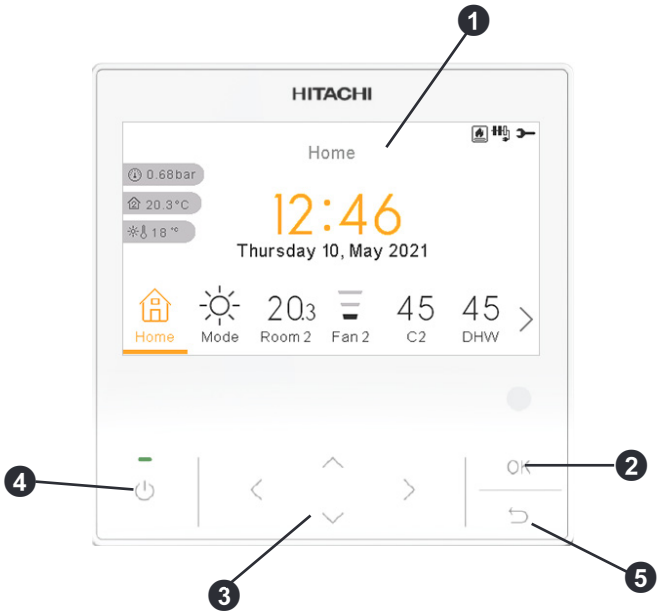


The password requested to unblock the controller is: Right, Down, Left, Right

8 YUTAKI CASCADE CONTROLLER

The new YUTAKI CASCADE CONTROLLER for YUTAKI series (PC-ARFH2E) is an user-friendly remote control which ensures a strong and safe communication through H-LINK.

8.1 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 Return button

To return to the previous screen.

8.2 DESCRIPTION OF THE ICONS

Icon	Name	Explanation	
	Status for circuit 1, 2, DHW and swimming pool.	OFF	Circuit I or II is in Demand-OFF
		ON	Circuit I or II is on Thermo-OFF
ON		ON	Circuit I or II is working between 0 < X ≤ 33% of the desired water outlet temperature
		ON	Circuit I or II is working between 33 < X ≤ 66% of the desired water outlet temperature
		ON	Circuit I or II is working between 66 < X ≤ 100% of the desired water outlet temperature
	Mode		Heating
			Cooling
		A	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	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 indoor communication is lost, this icon disappears	
	Holiday	When some of the zones are set as holiday, it has it's own holiday icon on their icons zone. The holiday icon is also shown on the home screen.	
1	Ambient temperature	The ambient temperature of Circuit 1 or 2 is indicated at the right side of this button	
2			
	Outdoor temperature	The outdoor temperature is indicated at the right side of this button	
1	Pump	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	
2			
3			

Icon	Name	Explanation	
	Heater step	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 (For YUTAKI S, S COMBI)
			Compressors enabled. 1: R410A/R32 2: R-134a (For YUTAKI S80)
	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		Central mode icon is shown after some central order has been received and for the next 60 seconds.
			Central error
	Forced OFF	When forced off Input is configured and its signal is received, all the configured items (C1, C2, DHW, and/or SWP) are shown in OFF, with this small icon below	
	Auto ON/OFF	When daily average is over auto summer switch-off temperature, circuits 1 and 2 are forced to OFF (Only if Auto ON/OFF enabled)	
	Test Run	Informs about the activation of the “Test Run” function	
	Anti-Legionella	Activation of the Anti-Legionella operation	
	DHW boost	It activates the DHW heater for an immediate DHW operation	
	ECO mode	-	No icon means Comfort mode
			ECO/Comfort mode for circuits 1 and 2
	Night Shift	Informs about night shift operation	
	CASCADE CONTROLLER	Informs about the activation of the “CASCADE” mode.	
		CASCADE CONTROLLER in alarm state	
	Fan stopped by Demand OFF	Informs about the stopagge of fan 1 or 2 by Demand OFF	

8.3 CASCADE CONTROLLER CONTENTS

Menu Contents				
Level 1	Level 2	Level 3	Level 4	Level 5
Operation Information				
	General			
	Modules information			
	Circuit 1			
	Circuit 2			
	Hot Water Tank			
	Swimming Pool			
	Electrical Heater			
	Boiler Combination			
	Solar Combination			
	Alarm History			
	Communication Status			
Timer and schedule				
	Room 1 / Room 2			
		Heating / Cooling (air)		
			Timer status	
				Enabled
				Deactivated
			Timer configuration	
			Copy to Circuit 1 / 2	
			Reset configuration	
		Launch timer assistant		
	Circuit 1 / Circuit 2			
		Heating / Cooling (water)		
			Timer status	
				Enabled
				Deactivated
			Timer configuration	
			Copy to Circuit 1 / 2	
			Reset configuration	
	DHW			
		Timer status		
			Enabled	
			Deactivated	
		Timer configuration		
		Reset configuration		
	Swimming Pool			
		Timer status		
			Enabled	
			Deactivated	
		Timer configuration		
		Reset configuration		
	Override Configuration			
		Type		
			Until next action	
			Specific time	
			Forever	
		Override duration		

Menu Contents				
Level 1	Level 2	Level 3	Level 4	Level 5
	Delete all timers configuration			
System Configuration				
	Room Thermostats			
		Setting temperature range (air)		
		Air Eco Offset		
		Thermostat Configuration		
			Check RT address	
		Compensation Factors		
		Room Temp Demand OFF		
	Water settings			
		Space Heating / Space Cooling		
			Circuit 1/ Circuit 2	
		DHW		
		SWP		
	Cascade configuration			
		Supply setting offset		
		Modules configuration		
			Module 1	
				Status
				Refrig. cycle address
				Indoor unit address
				Individual DHW
	Space Heating / Cooling			
		Circuit 1 / 2		
			Water Calculation Mode	
			Eco offset	
			Working limits	
			Mixing valve (only circuit 2)	
	Hot Water Tank			
		Mode		
			Economic	
			Standard	
		Space Priority Status		
		Antilegionella		
		Smart Configuration		
	Swimming Pool			
		Status		
			Enabled	
			Deactivated	
		Setting Temperature		
		Offset Temperature		
	Complementary Heating			
		Heating Source		
		Electrical Heater		
		Boiler Combination		
		Solar Combination		
			Status	
				Input demand
				Total control
	Heat Pump			

Menu Contents				
Level 1	Level 2	Level 3	Level 4	Level 5
		Water Pump Configuration		
		Outdoor average Timer		
		Minimum ON Time		
		Minimum OFF Time		
		Seizure Protection		
			Status	
			Operation Day	
			Starting Time	
	Fan Coils			
		Controlled Fan Zones		
		Delay ON Time		
		Demand OFF Actions		
	Optional Functions			
		Hydraulic Sep. Status		
		Smart Function		
		Heating Auto On/Off		
		Auto Heat/Cool		
		Hot Water Tank		
			Circuit pump	
			Recirculation timer	
			DHW Boost	
		Emergency Operation		
	I/O and Sensors			
		Inputs		
		Standard outputs		
		Outputs		
		Auxiliary sensors		
	Holiday mode			
		Affected zones		
		Start Holiday Mode		
Controller Settings				
	Room Configuration			
		Room Names		
	Date and Time			
		European Summer Time		
		Hour Format		
	Screen settings			
	Language selection			
Installer Access				
Commissioning				
	Screed drying			
		Start Screed Drying		
About				
	System Information			
	Contact Information			
Factory Reset				
Lock the controller				
Return to user mode				

◆ Installer mode

Icon means that this menu is available only for installer, a special user with higher access privileges to configure the system. In order to access the controller as Installer, go to “Installer access” menu.

After that, the “Enter password” message is displayed.

The login password for the Installer is:

Right ▶, Down ▼, Left ◀, Right ▶

Press “OK” to confirm the password.

If the correct access code is entered, the installer mode icon appears on the notifications bar (bottom line).

Installer mode icon	

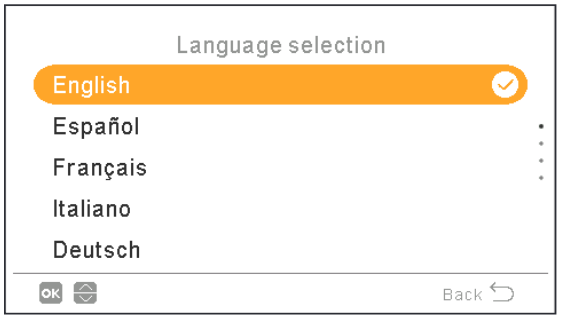
After 30 minutes of inactivity, it is necessary to repeat the log in process. To exit the Installer mode and return to the unit menu, go to the “Return to user mode” on the main menu.

NOTE

The following chapters explain the special settings the Installer can edit. It is important to understand that the Installer can also perform all the actions available for the typical user.

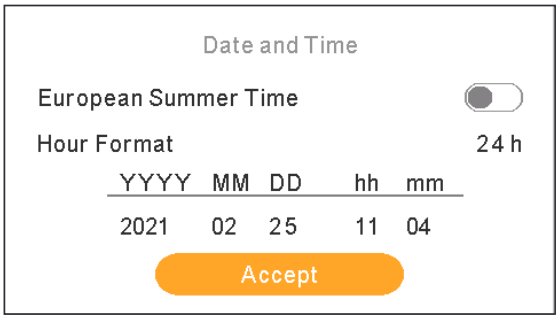
8.4 CASCADE CONTROLLER CONFIGURATION

1



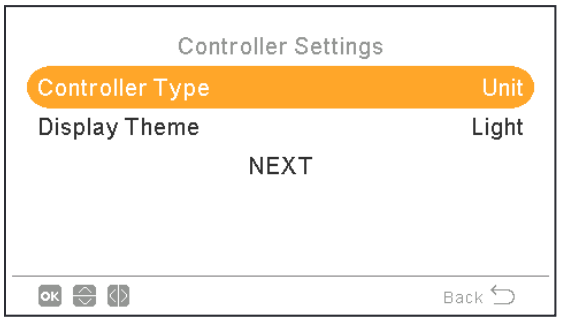
- Select the desired language using the arrow keys.
- Press OK button.

2



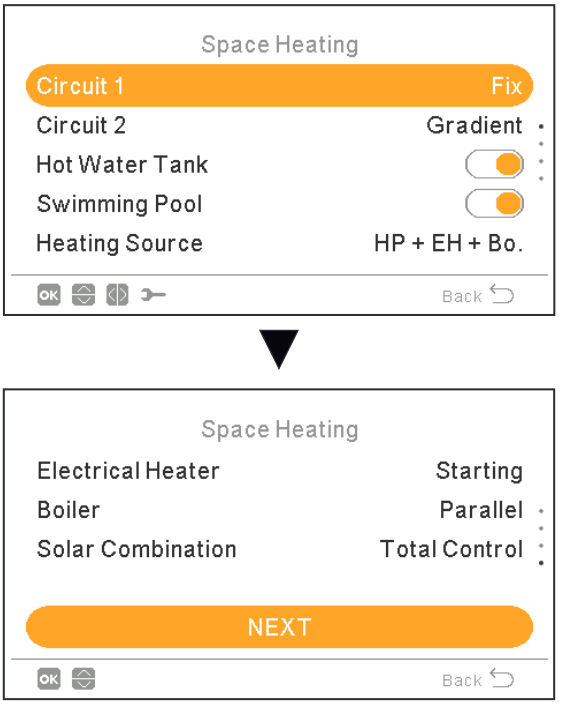
- Select the date and time using the arrow keys.
- Select Enabled or Deactivated for European summer time.
- Press OK button.

4



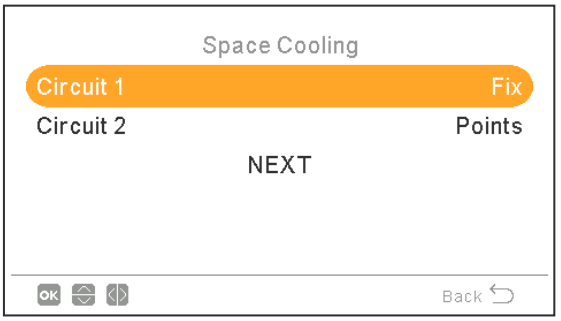
- Select the controller type:
  - Unit: the device controls the unit.
  - Room: the device acts as a room thermostat of a zone.
  - Unit + Room: the device controls the unit and acts as a room thermostat.
- Select the display theme:
  - Light: normal view.
  - Dark: black background with white icons.
  - Auto: changes automatically to light at 08:00 am and turns to dark at 20:00 pm.

4



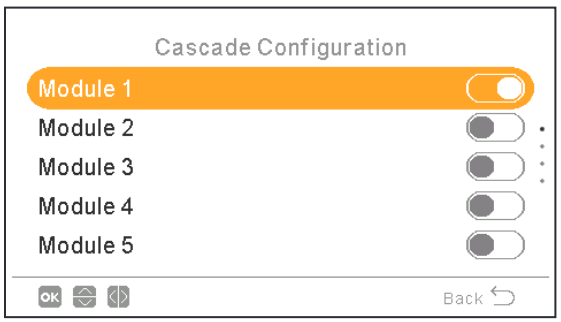
- Configure circuit 1 and circuit 2 OTC: Deactivated, Points, Gradient, Fix.
- Enable or disable DHW and Swimming Pool.
- Select the heating source: HP only, HP + EH, HP + Boiler.
- Configure electrical heater use: Starting or Backup.
- Configure Boiler type: Parallel or Serial.
- Configure Solar Combination options: Deactivated, Input Demand, Total Control. (only in case DHW is enabled).
- Select Next and press OK button.

5



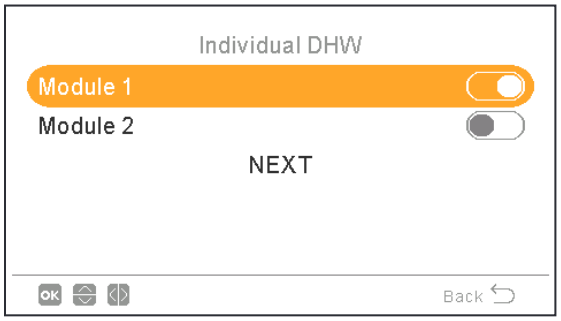
- Configure circuit 1 and circuit 2 options (Only available for cooling mode): Deactivated, Points, Gradient, Fix.
- Select Next and press OK button.

6



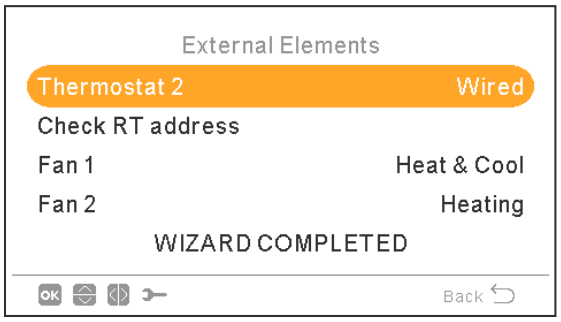
- Enable or disable the desired modules (module 1 is enabled by default)
- Select Next and press OK button.

7



- Enable or disable the individual DHW for each module.
- Select Next and press OK button.

8



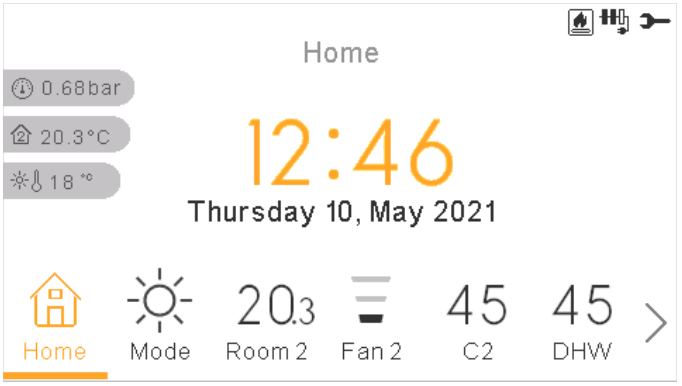
- Configure thermostat (1 or 2): None, wired or wireless.
- Check RT address if wired is selected.
- Select Wireless binding ID (1 or 2) if wireless is selected.
- Configure Fan coils: Deactivated, cooling, heating or heat & cool if wired is selected.
- Select Wizard complete and press OK button.

9



- Select Yes to complete the configuration.
- Press OK button to go to the main screen.

8.5 MAIN VIEW



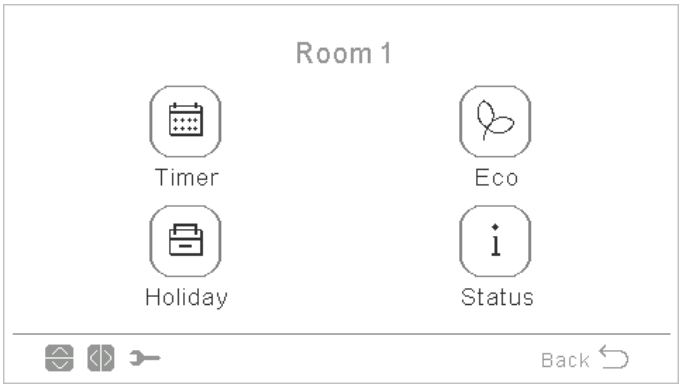
Main view of the device is composed by a bottom tab widget to move around the different views:

- Home
- Mode
- Room 1 (if space is small it shows R1)
- Room 2 (if space is small it shows R2)
- Circuit 1 (if space is small it shows C1)
- Circuit 2 (if space is small it shows C2)
- Fan 1 (if space is small it shows F1)
- Fan 2 (if space is smaill it shows F2)
- DHW
- SWP
- Menu

8.5.1 Quick actions function

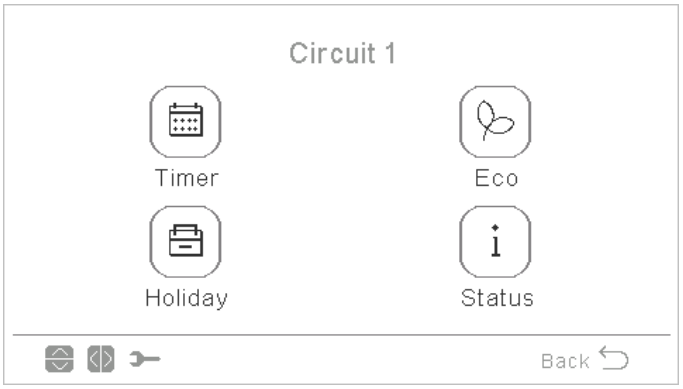
The following quick actions are shown when pressing the OK button at the selected zone in comprehensive view or room thermostat view:

◆ **Room 1/2**



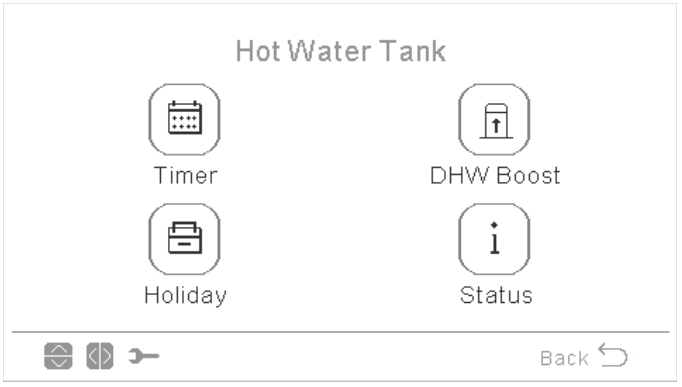
- Timer
- ECO
- Holiday (If Zone is enabled)
- Status

◆ **Circuit 1/2**



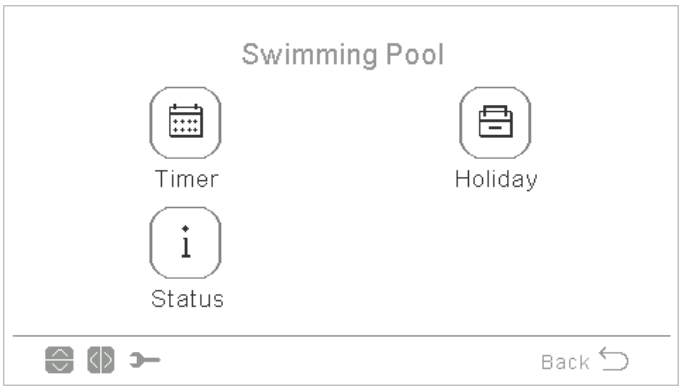
- Timer
- ECO
- Holiday (If Zone is enabled)
- Status

◆ Domestic Hot Water Tank (DHW)



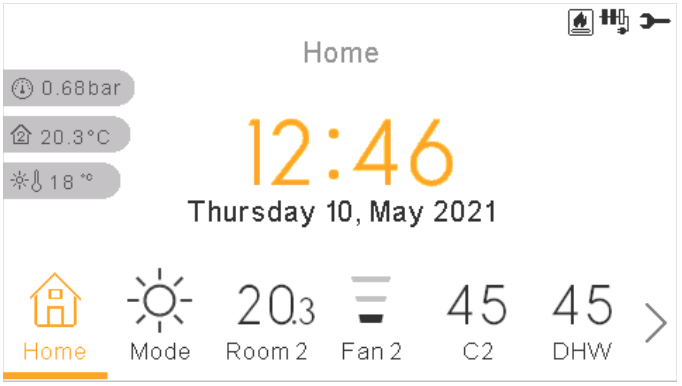
- Timer
- Boost (If DHW is ON and Boost is availbable. It can also be cancelled from quick actions).
- Holiday (If Zone is enabled)
- Status

◆ Swimming Pool (SWP)



- Timer
- Holiday (If Zone is enabled)
- Status

8.6 HOME VIEW

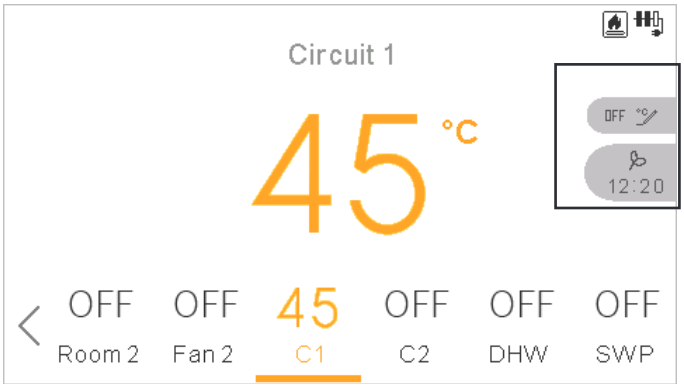


Home view shows on the middle the date and time

On the left side it shows:

- Inside temperature (home icon):
  - If LCD works as Room 1, it took it from the controller sensor or auxiliary sensor
  - If LCD works as Room 2, it took it from the controller sensor or auxiliary sensor
  - If LCD works as Room 1+2, it took it from the controller sensor or auxiliary sensor, or the average of the ones used per each zones.
  - If LCD works as main LCD or water control but not room, it will took them from the configured Rooms, if no one is configured, that temperature will not be displayed.
- Outside temperature (thermometer icon).
- Water pressure indicator

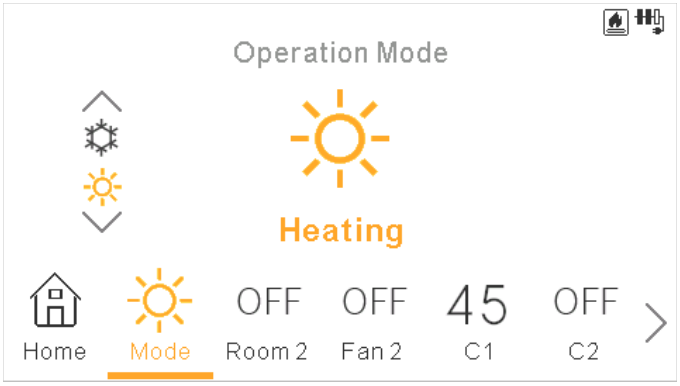
8.6.1 Next schedule indication



The indication of next schedule shows by priority:

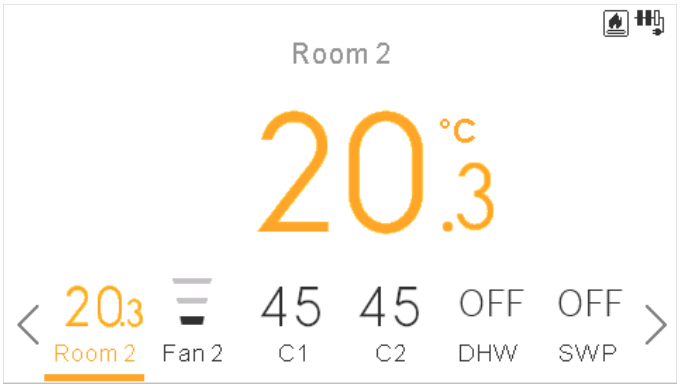
- Date of returning of absent mode
- Next schedule action:
  - If no derogation has been made, shows next schedule action
  - If derogation has been made it checks the configured override type:
    - If override type is Next action, it shows next schedule action.
    - If override type is Forever, does not show any information
    - If override type is Specific time, it shows “Pending” text and the remaining minutes.

8.7 MODE VIEW



- Mode view shows the selected mode.
- In case of being a heating and cooling unit, it lets also to change the mode by using the top/bottom arrows, and it shows the mode spinner on the left side.
- If it has been enabled the auto mode, it is also available here.

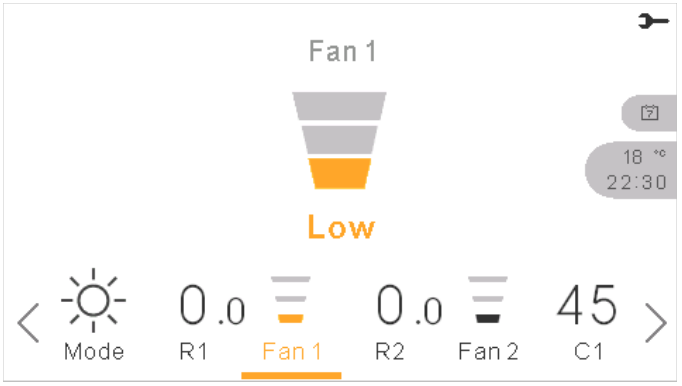
8.8 ROOM 1/2 VIEW



Room thermostats view displays:

- Ambient Temperature of the room. This temperature is got from controller or external sensor.
- When editing it shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Eco and timer icons

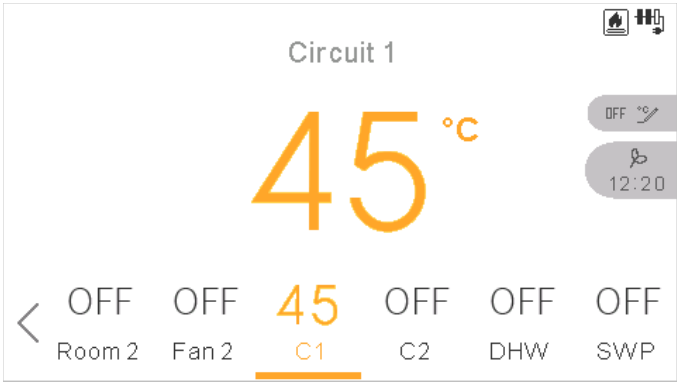
8.9 FAN COILS 1/2 VIEW



Room 1 or 2 could control Fan Coils. Once configured to control them on the menu, the bottom bar includes the option to manage those fan coils:

- Fan speeds: Low, Medium, High and Auto
- Each fan has its independent on/off

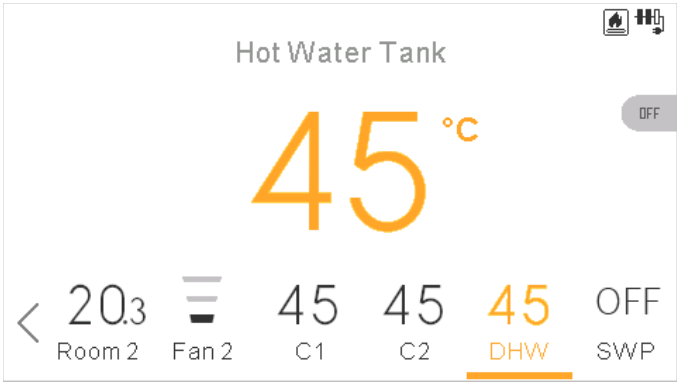
8.10 CIRCUIT 1/2 VIEW



Circuit 1 or 2 view displays:

- Water setting feedback
- When editing it shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Eco, throughput, summer switch-off, forced off and timer icons

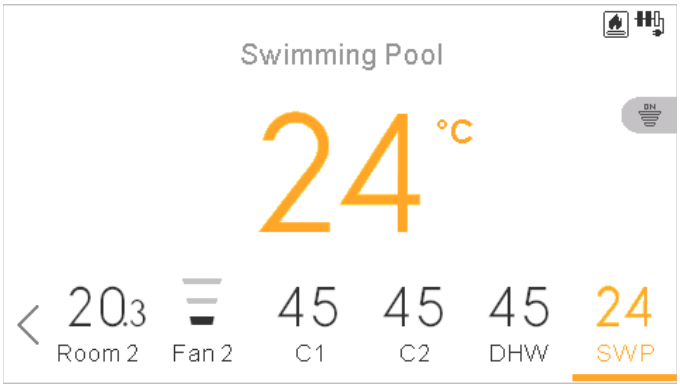
8.11 DHW VIEW



DHW view displays:

- Water setting feedback
- When editing it shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Boost, throughput, operating in comfort and timer icons
- During boost, setting changed is the boost seeting

8.12 SWP VIEW



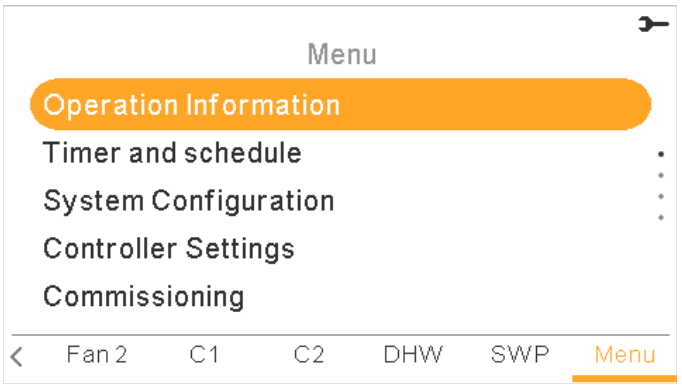
SWP view displays:

- Water setting feedback
- When editing if shows the setting temperature
- On right side it has zone notifications for:
  - Next timer action
  - Throughput and timer icons

8.13 MENU

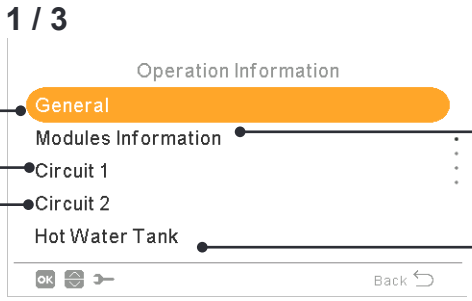
8.13.1 Operation information

In operation information menu it is possible to find the most important setting parameters of the system besides the information of the operation conditions.



Detailed information about:
- Operation status
- Water setting temperature
- Outdoor ambient temperature
- Outdoor ambient 2 temperature
- Outdoor ambient average temperature
- Second ambient average temperature
- 24h average temperature

Detailed information about Circuit 1-2:
- Operation (Demand ON/OFF)
- Mode (Eco/Comfort)
- Room temperature
- Room setting temperature
- Fan setting speed
- Fan real speed
- Fan stopped by D-OFF
- Current water temperature
- Water setting temperature
- Water OTC setting temperature
- Mixing valve position (only for circuit 2)

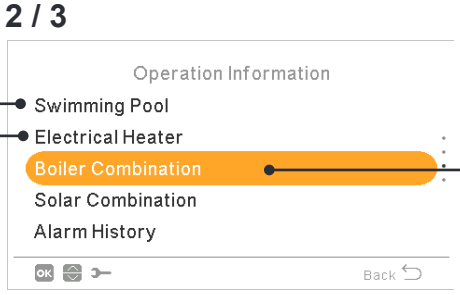


Detailed information modules:
- Operation status
- Water inlet temperature
- Water outlet temperature
- Individual DHW (Enable or disable)
- Type (Main or Sub)

Detailed information about DHW:
- Operation
- Current temperature (Only for YUTAKI S)
- Top Sensor (Only for YUTAKI S COMBI)
- Bottom sensor (Only for YUTAKI S COMBI)
- Setting Temperature
- Electrical Heater Status
- Electrical Heater Operation
- Legionella Status
- Legionella Operation

Detailed information about Swimming pool:
- Operation (Demand ON/OFF)
- Current temperature
- Setting temperature

Detailed information about Electrical Heater:
- Operation (Demand ON/OFF)
- Current temperature
- Setting temperature
- Load Factor
- Step

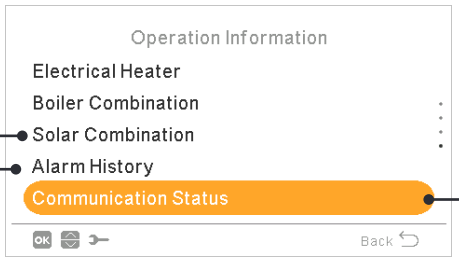


Detailed information about Boiler combination:
- Operation (Demand ON/OFF)
- Current temperature
- Setting temperature

Detailed information about Solar combination:
- Operation (Demand ON/OFF)
- Solal Panel temperature

Shows a list of the alarm history of the system

3 / 3



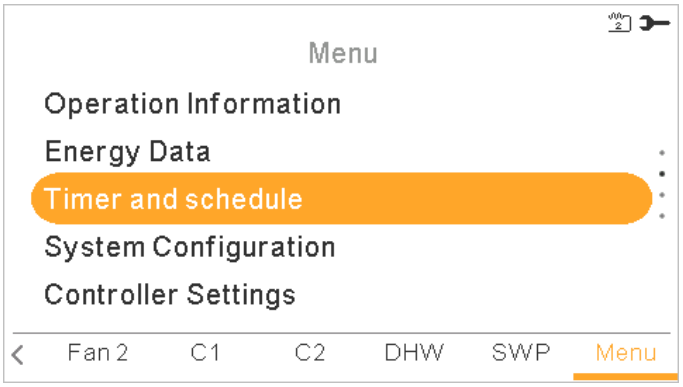
Detailed information about Communication status:
- H-Link
- H-Link Central
- RCS Central
- Cascade Controller

8.13.2 Timer and schedule configuration

NOTE

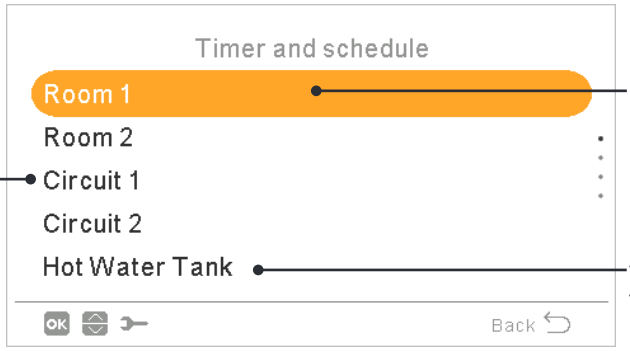
Timer settings are only valid if the corresponding zone is in ON state at the time of execution of the respective timer program.

The LCD controller must be set to the correct date and time before using the timer function.



Select the desired area to apply the timer function or delete all timers configuration:

1 / 2



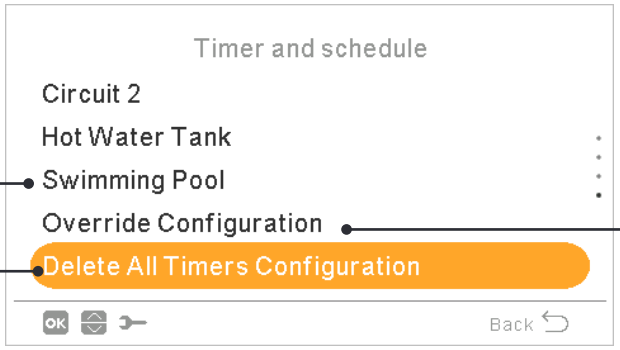
Heating/Cooling (Water): To set the timer to adjust the water working conditions for Circuit 1/2.

Heating/Cooling (Air): To set the timer to adjust the room temperature for Room 1/2. Only when using room thermostats.

Is possible to launch a timer assistant.

To set the timer to adjust the hot water tank temperature.

2 / 2

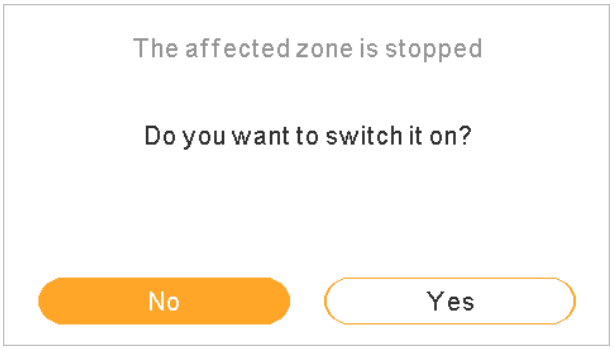


To set the timer to adjust the swimming pool temperature.

Press OK button to reset scheduled timers.

To set the Override type:
- Until next action
- Specific time
- Forever

When a timer is being switched on, if that zone is stopped, it will request to switch on the zone or not.



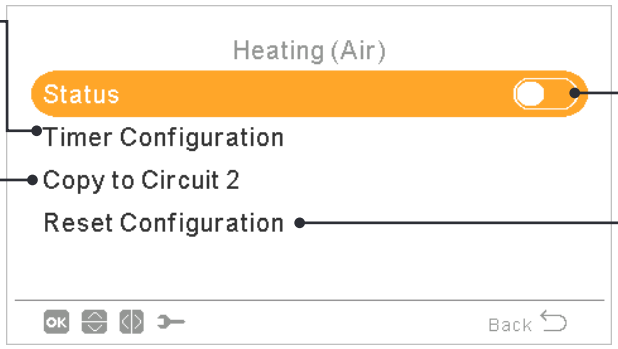
8.13.2.1 Setting of timer for Room Thermostats

Setting of temperature or change of operation state from ON to OFF for a defined period, after which operation returns to the previous settings. Manual operation of the unit controller has priority over schedule settings.

Timer configuration: New screen appears to configure a schedule timer. See explanation below.

Copy to circuit 2:

It is possible to copy the schedule timer to circuit 2.

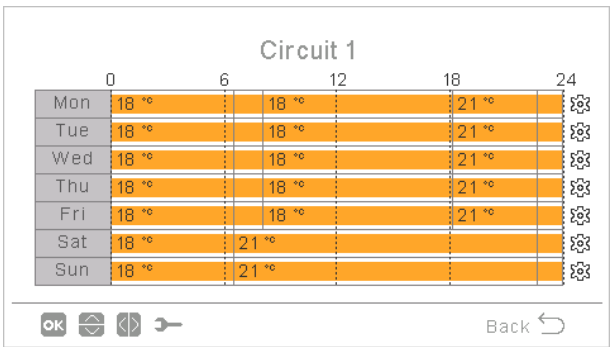


Timer status:
- Disable
- Enable

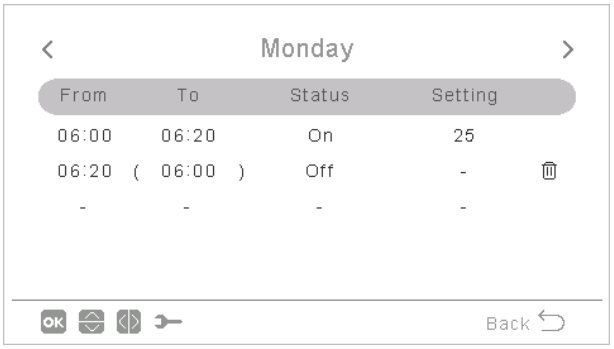
Reset configuration:

Press OK button to reset scheduled timers.

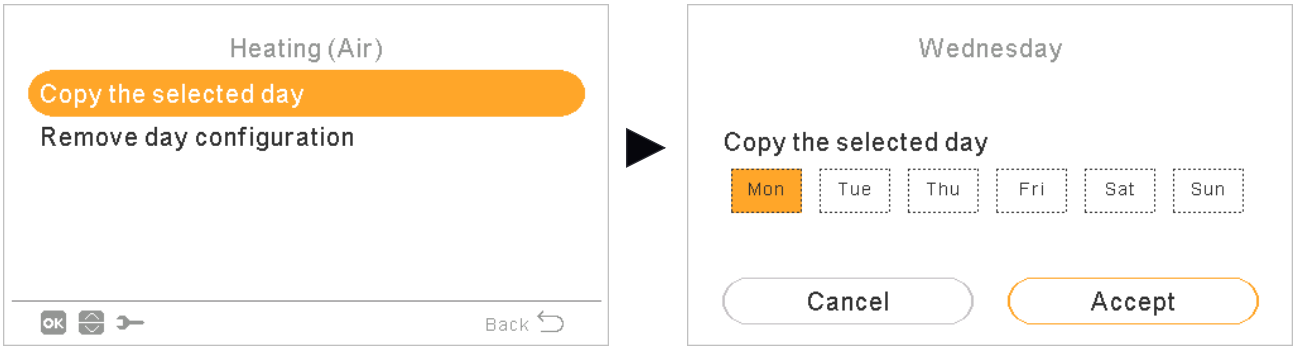
Pressing the OK button with “Timer Configuration” being selected displays the detailed schedule screen. The active schedule timers are shown in a weekly calendar.



Up to six timer events can be defined for each weekday, and these can be used for turning the operation ON or OFF or to change the setting temperature. Pressing the OK key with one of the weekdays being selected in the weekly calendar screen displays the detailed schedule for the weekday.

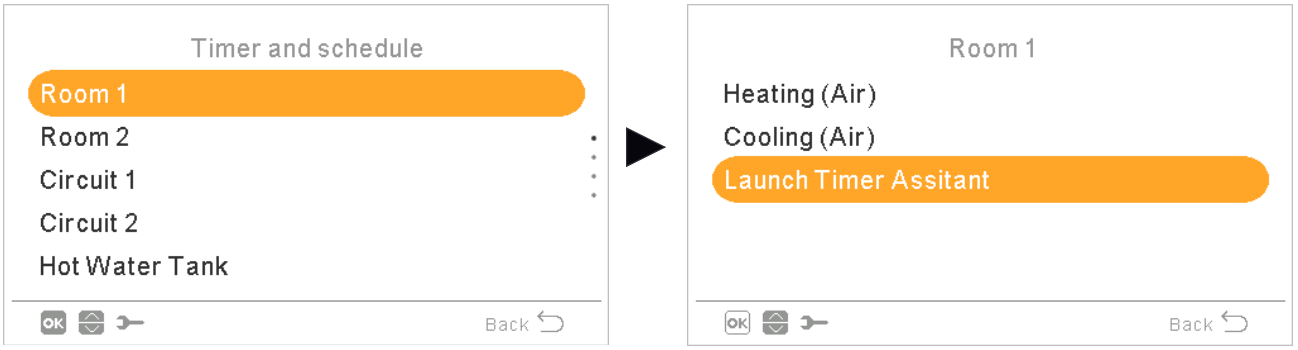


Pressing the “Gear” button during the edition of the timer events for a given weekday displays a menu to copy the daily pattern to other weekdays or to suppress the selected timer event.

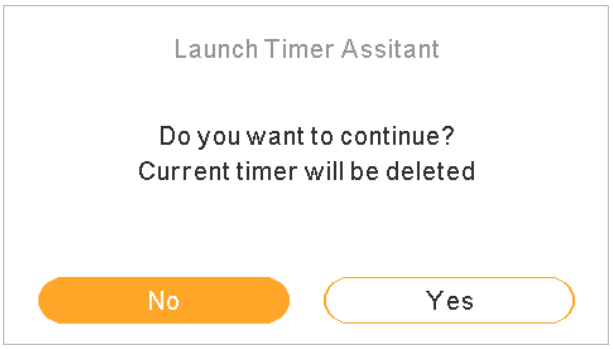


◆ Setting with Timer assistant

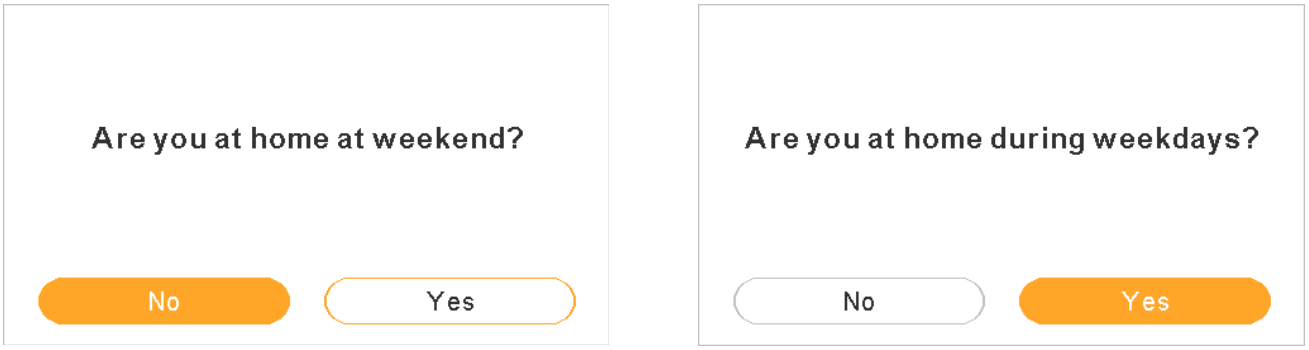
It is possible to set the timer for Room thermostats with a timer assistant.



When launching the timer assistant the current timer will be deleted.



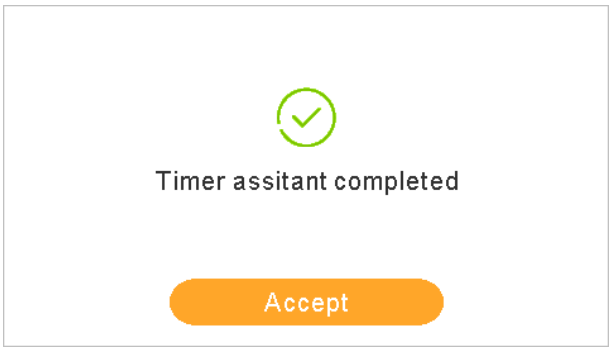
Timer assistant asks if user stays at home during weekend and weekdays



- If stay at home at weekend / weekdays the following patterns are applied:
  - .Heating: 6:30h =20ºC / 22:30h =18ºC
  - Cooling 6:30h =23ºC / 22:30h =25ºC

Timer assistant asks if user is sensistive to cold.





- If senstive to cold is marked as Yes, an offset of 1ºC is applied for heating.

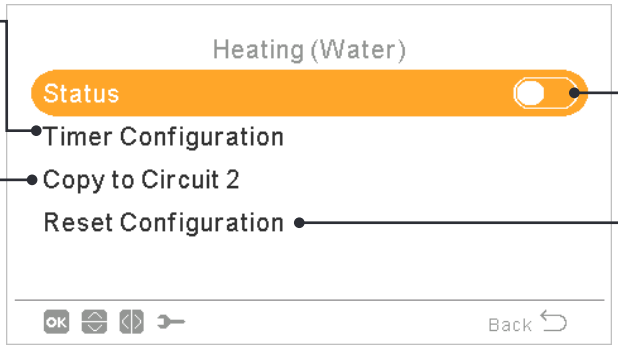
8.13.2.2 Setting of timer for Circuit 1/2

To change the operation mode (ECO or Comfort) or change of operation state from ON to OFF for a defined period, after which operation returns to the previous settings. Manual operation of the unit controller has priority over schedule settings.

Timer configuration: New screen appears to configure a schedule timer. See explanation below.

Copy to circuit 2:

It is possible to copy the schedule timer to circuit 2.

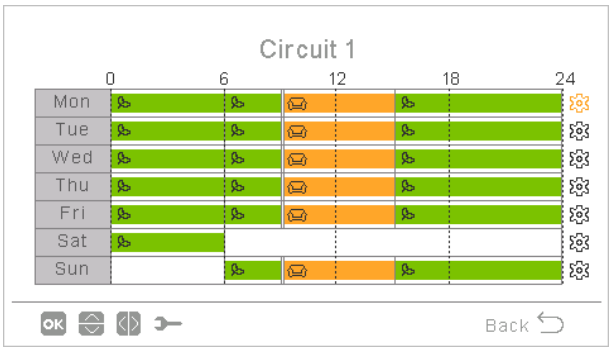


Timer status:
- Disable
- Enable

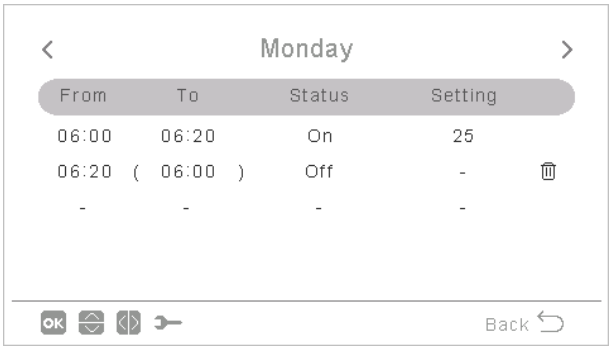
Reset configuration:

Press OK button to reset scheduled timers.

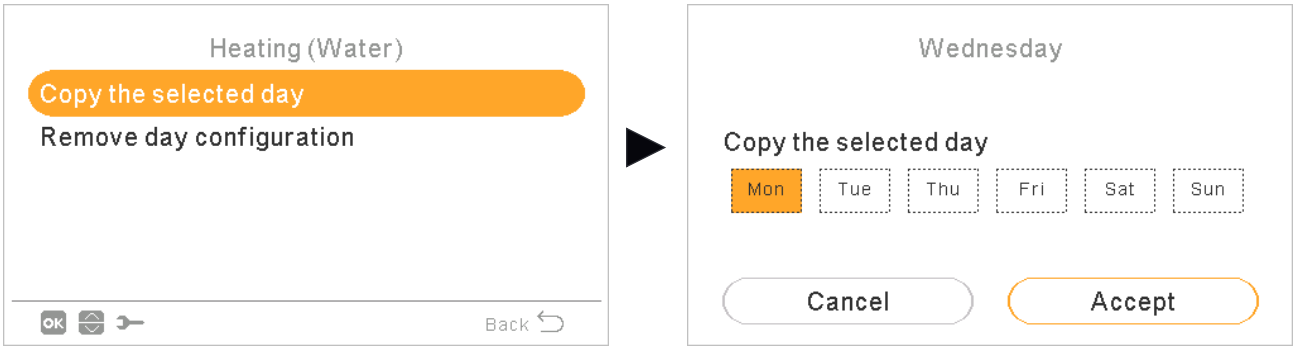
Pressing the OK button with “Timer Configuration” being selected displays the detailed schedule screen. The active schedule timers are shown in a weekly calendar.



Up to six timer events can be defined for each weekday, and these can be used for turning the operation ON or OFF or operation mode (ECO or Comfort). Pressing the OK key with one of the weekdays being selected in the weekly calendar screen displays the detailed schedule for the weekday.



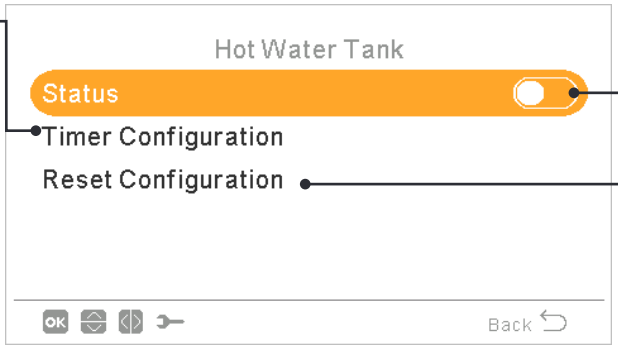
Pressing the “Gear” button during the edition of the timer events for a given weekday displays a menu to copy the daily pattern to other weekdays or to suppress the selected timer event.



8.13.2.3 Setting of timer for Hot water tank or Swimming Pool

Setting the temperature or change of operation state from ON to OFF for a defined period, after which operation returns to the previous settings. Manual operation of the unit controller has priority over schedule settings.

Timer configuration: New screen appears to configure a schedule timer. See explanation below.

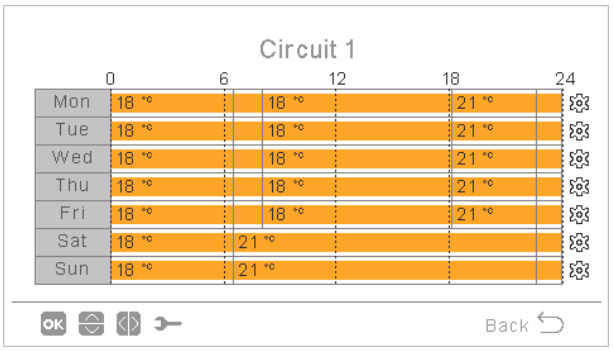


Timer status:
- Disable
- Enable

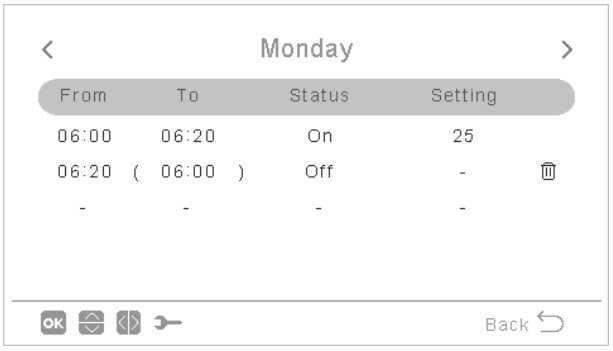
Reset configuration:

Press OK button to reset scheduled timers.

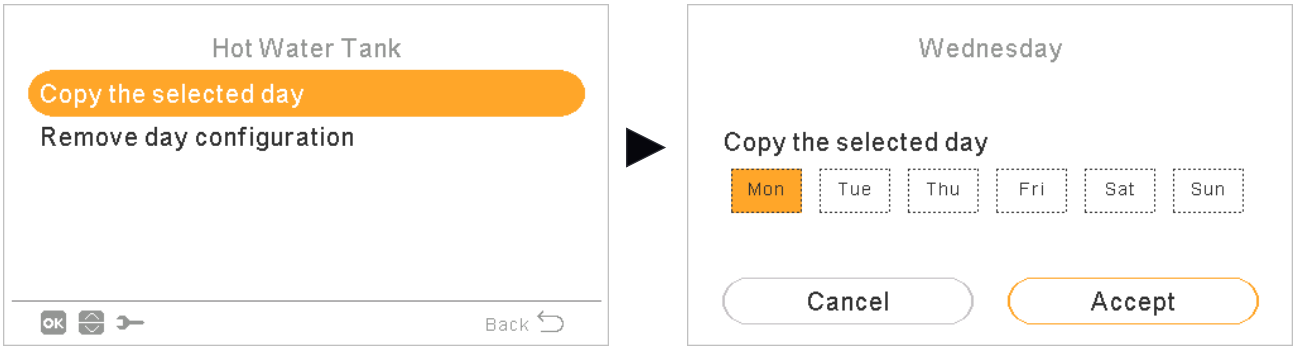
Pressing the OK button with “Timer Configuration” being selected displays the detailed schedule screen. The active schedule timers are shown in a weekly calendar.



Up to six timer events can be defined for each weekday, and these can be used for turning the operation ON or OFF or to change the setting temperature. Pressing the OK key with one of the weekdays being selected in the weekly calendar screen displays the detailed schedule for the weekday.

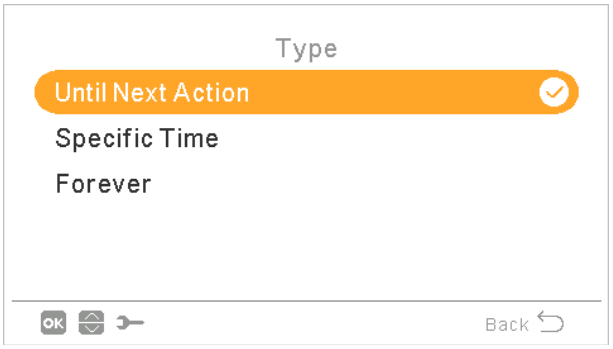


Pressing the “Gear” button during the edition of the timer events for a given weekday displays a menu to copy the daily pattern to other weekdays or to suppress the selected timer event.



8.13.2.4 Override Configuration

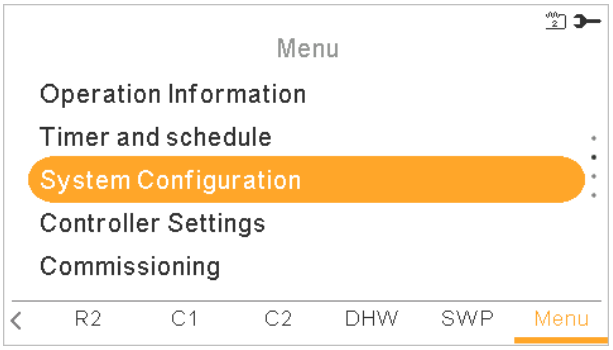
When a different configuration from the defined by the timer of a zone is done, it is possible to override the timer configuration during a specific time.



- Until next action: derogation remains until next action of the timer.
- Specific Time: derogation status remains for the specified minutes.
- Forever: Derogation status is never released.

8.13.3 System configuration

In system configuration menu it is possible to configure all the system settings.



Room thermostats configuration:

(Screen visible only for room thermostats)

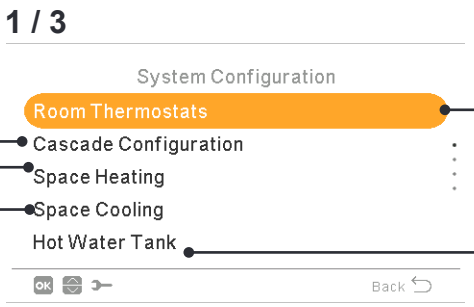
- Setting temperature range (air)
- Air Eco Offset
- Thermostat configuration
- Compensation factors
- Room temperature demand OFF

Cascade configuration:

- Supply setting offset
- Modules configuration

Space Heating / Cooling configuration:

- Water calculation mode
- Eco offset water setting
- Working limits
- Mixing valve (for circuit2)



DHW configuration:

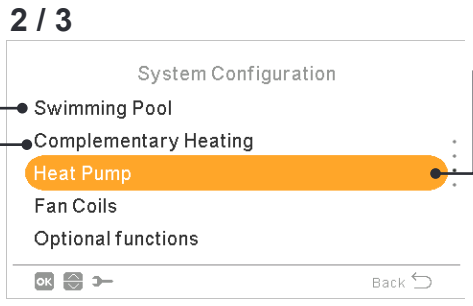
- Status
- Mode
- Setting temperature
- HP control
- HP control setting
- Maximum setting temperature
- Differential temperature
- HP OFF differential temperature
- HP ON differential temperature
- Maximum time
- Cycle Time
- Space Priority status
- Space Priority temperature
- DHW Heater
- Smart configuration
- Anti Legionella

Swimming Pool configuration:

- Status
- Setting temperature
- Offset temperature

Complementary Heating configuration:

- Heating Source (HP Only, HP+Boiler, HP+Heater, HP+Heater+Boiler)
- Electrical heater
- Boiler combination
- Solar combination

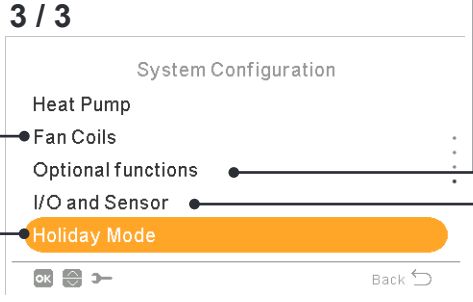


Heat pump configuration:

- Water Pump Configuration
- Night Shift
- Outdoor Average Timer
- Minimum ON Time
- Minimum OFF Time
- Seizure Protection

Fan coils configuration:

- Controlled fan zones
- Delay on time
- Demand OFF actions



Optional functions configuration:

- Hydraulic separator
- Energy configuration
- Smart function
- Heating auto on/off
- Auto heat/cool
- Hot water tank
- Emergency operation

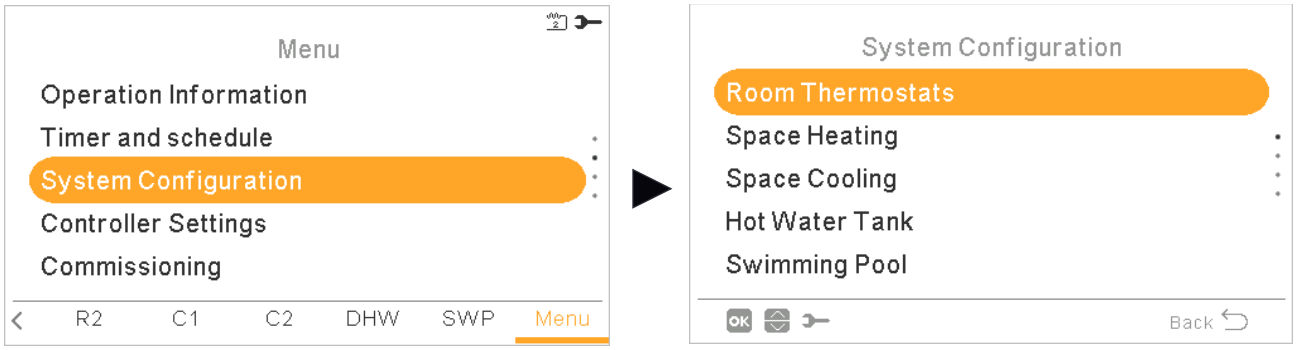
I/O and Sensor configuration:

- Inputs
- Standard outputs
- Optional outputs
- Auxiliary sensors

Holiday mode:

- Year
- Month
- Day
- Returning time
- Affected zones
- Start/stop holiday mode

8.13.3.1 Room thermostats configuration



Maximum / Minimum temperature for heating and cooling: Configure for Circuit 1/2:

- Heating maximum temperature
- Heating minimum temperature
- Cooling maximum temperature
- Cooling minimum temperature

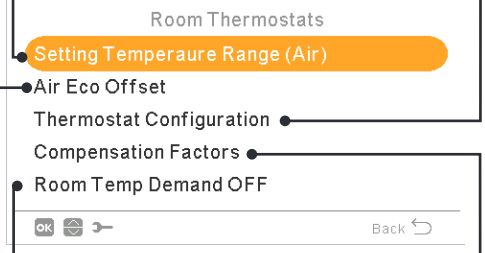
Air Eco Offset for Circuit 1-2:

Configure the offset air temperature for the ECO mode.

Current air temperature setting is reduced by the indicated parameter (from 1 to 10ºC)

Room Temperature Demand OFF:

Offset value between setting temperature and thermostat temperature to switch the system to Demand OFF; this parameter refers to a positive difference in heating operation and a negative difference in cooling operation.



Thermostat configuration:

Configure the wired or wireless room thermostats:

- **Thermostat 1**: None, wired or wireless
- **Wireless Binding ID** for Thermostat 1: (1 or 2)
- **Thermostat 2**: None, wired or wireless
- **Wireless Binding** ID for Thermostat 2: (1 or 2)
- **Check RT Address**: validation procedure of the wireless thermostats configuration

Compensation factors
(See Compensation factors section below)

◆ Compensation factors for Heating / Cooling

The temperature of the water supplied by the YUTAKI unit to the circuits is determined by means of OTC (See *"Water calculation mode"*).

This control determines water temperature according to the outdoor temperature. The higher the outdoor temperature, the lower the building demand is, and in consequence the temperature of the water supplied to the circuits is lower. Conversely, the thermal demand of the building rises in the case of low outdoor temperature, and therefore the temperature of the supplied water becomes higher.

The room temperature compensation control allows to modify the water temperature determined by OTC control according to the setting room temperature and the actual room temperature.

In the case of heating, if the difference between room temperature and setting temperature is large, then water temperature is increased by the YUTAKI unit in order to achieve the desired room temperature in a faster way, thus compensating the thermal difference between setting temperature and actual temperature.

In this manner, given two identical rooms, the YUTAKI unit determines the same room temperature according to OTC control. On the other hand, for a room in which there is a wider difference between setting temperature and actual temperature, the YUTAKI unit will increase the temperature of the pumped water in order to ensure a similar heating up time until reaching the setting temperature.

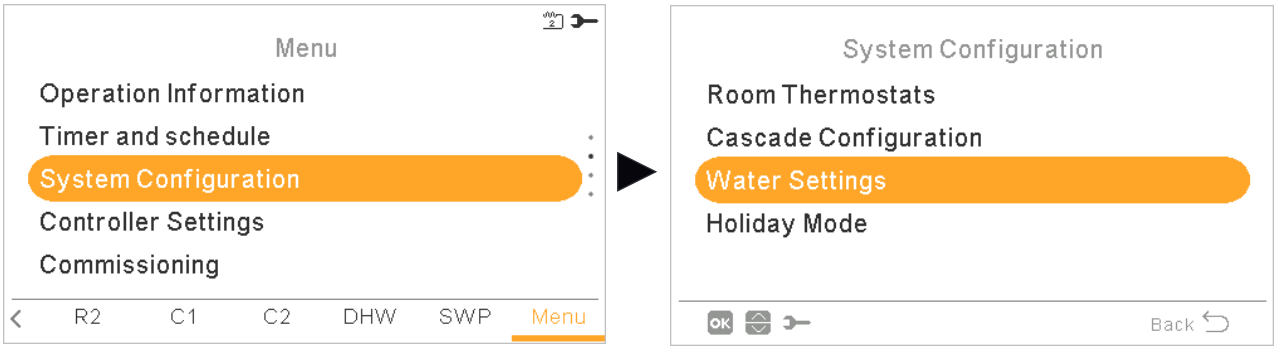
Compensation has no effect if Compensation factor is 0 or when OTC is Fix, and water temperature is determined according to OTC in chapter *"Water calculation mode"* in such case.

The more the factor is increased, the more is water temperature increased by the YUTAKI unit according to the difference between setting temperature and the current temperature.

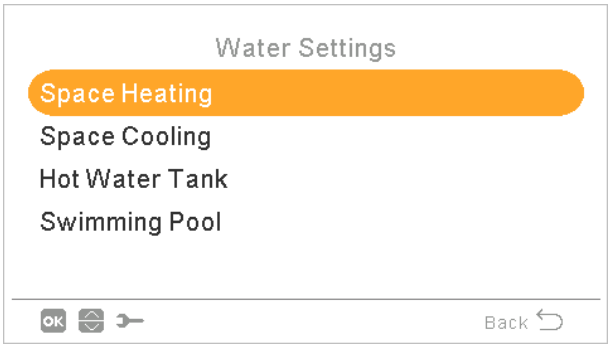
Maximum compensation factor heat + and -: Maximum difference between room temperature and setting temperature. In case that the difference between room temperature and setting temperature is higher than this value, the YUTAKI unit takes the selected value as the maximum.

8.13.3.2 Water settings configuration

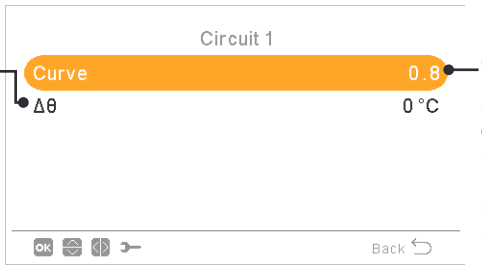
This menu is only visible for a room thermostat if the controller is not controlling the unit.



Select the desired area to apply the water settings configuration:



◆ Space Heating or Space Cooling water settings



Δθ (Vertex offset):

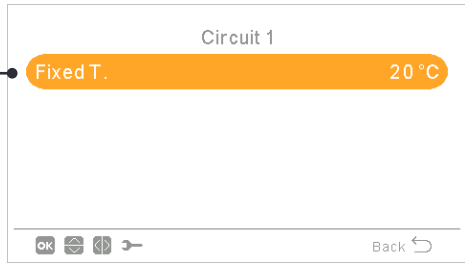
To modify the curve vertex for Circuit 1 or Circuit 2 (only for heating mode).

- Only when water calculation mode is Gradient or Points (setting in Main device).
- Range: -10 ~ 10
- Circuit 1 or Circuit 2 must be ON to configure this setting.

Curve:

Selection of the gradient curve for Circuit 1 or Circuit 2 (only for heating mode).

- Only when water calculation mode is Gradient (setting in Main device).
- Range: 0.2 ~ 2.2
- Circuit 1 or Circuit 2 must be ON to configure this setting.

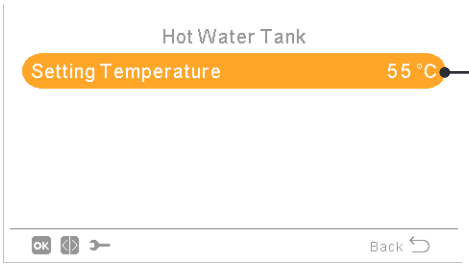


Fixed temperature:

Selection of the temperature for Circuit 1 or Circuit 2 (heating or cooling mode).

- Only when water calculation mode is Fix (setting in Main device).
- Circuit 1 or Circuit 2 must be ON to configure this setting.

◆ Hot Water Tank or Swimming pool water settings

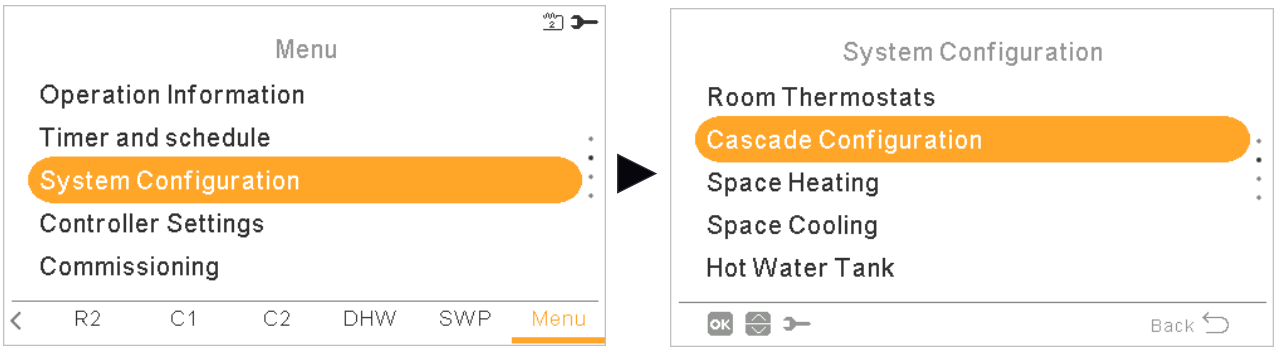


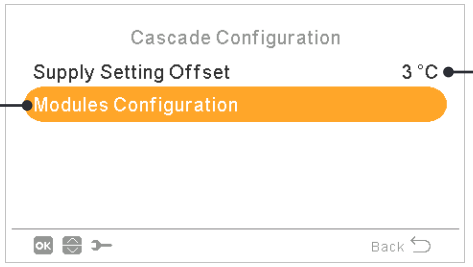
Setting temperature:

Selection of the temperature for DHW or Swimming Pool.

- Hot water tank or Swimming pool must be ON to configure this setting.
- Range:
  - DHW: 30ºC ~ Max. setting temperature
  - Swimming pool: 24 ~33ºC

8.13.3.3 Cascade configuration



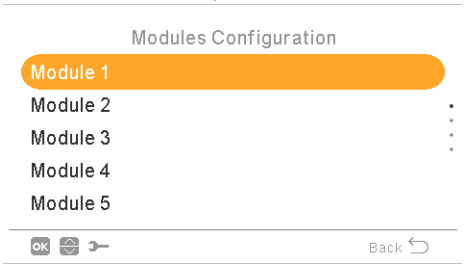


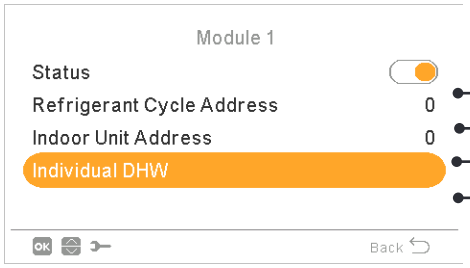
Modules configuration:

- Configure the status, refrigerant cycle address, indoor unit address and individual DHW for each module.

Supply setting offset

- To set YUTAKI Sub Units to work at a setting temperature higher than setting temperature determined by YUTAKI CASCADE CONTROLLER
- 3 °C by default (from 0 to 15 °C)





Module status:

- Enable or disable the module.

Refrigerant cycle address:

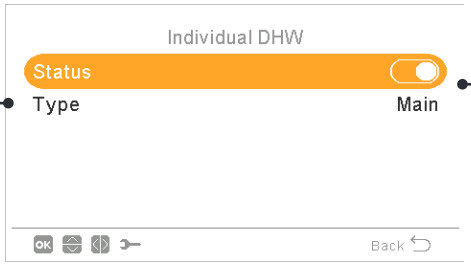
- Set the refrigerant cycle address for each module, making sure that the setting is common with that of the outdoor (DSW4-RSW1) and indoor (DSW15 – RSW2) units which are part of the module.

Indoor unit address:

- It must be always set to 0 (factory default)

Individual DHW:

- Configure the status and type of individual DHW for the selected module.



Individual DHW type:

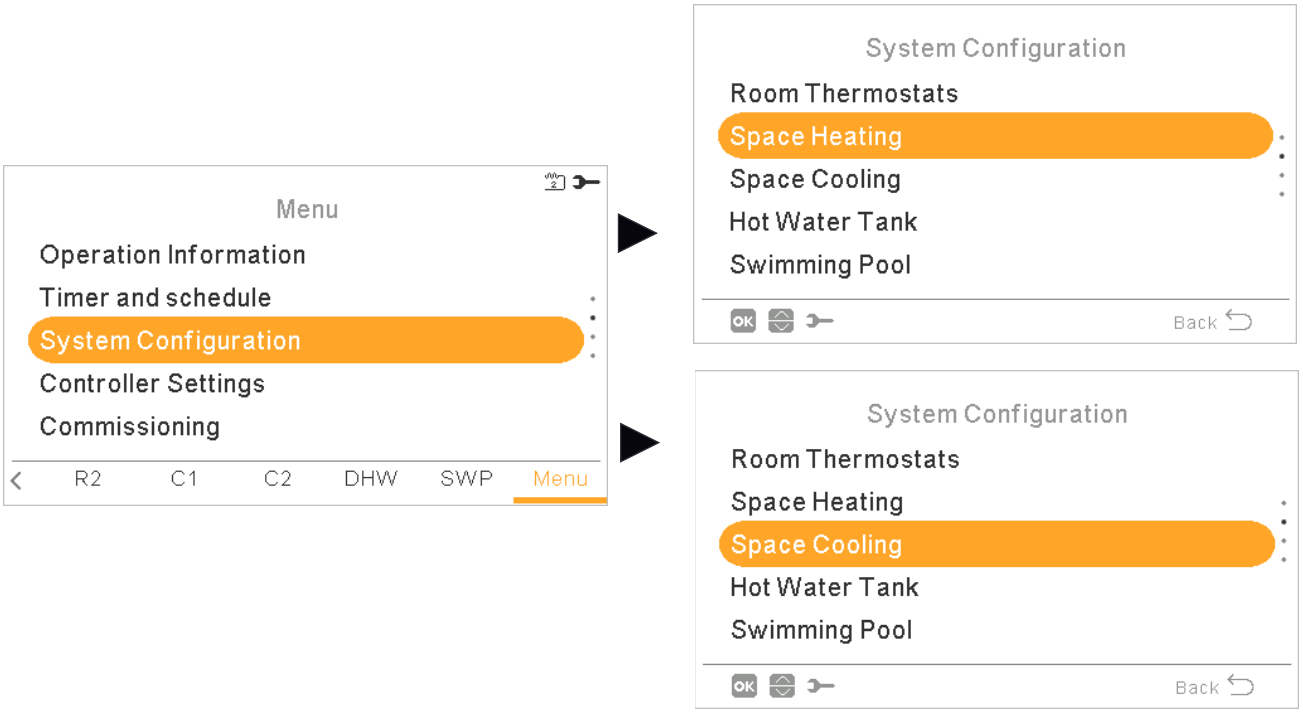
- Select Main or Secondary depending on the installation of the DHW system.
- When Secondary type is selected, choose the Main module number.

Individual DHW status:

- Enable or disable the individual DHW for the selected module.

8.13.3.4 Space Heating / Space Cooling configuration

Control the temperature for Space Heating or Space Cooling by configuring the following parameters.



Water calculation mode:

Selection of the water set point for Circuit 1 or Circuit 2 (Space Heating or Space Cooling).

- Deactivated
- Points
- Gradient (only in heating mode)
- Fix

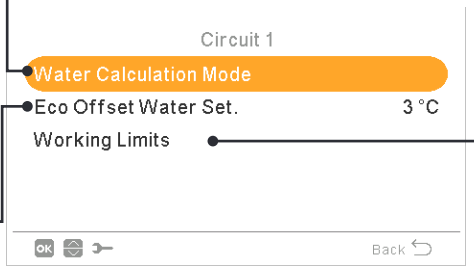
See detailed explanation below.

Eco Offset Water setting:

Configure the offset water temperature for the ECO mode for Space Heating or Space Cooling.

By using this function, current water temperature setting is reduced by the indicated parameter.

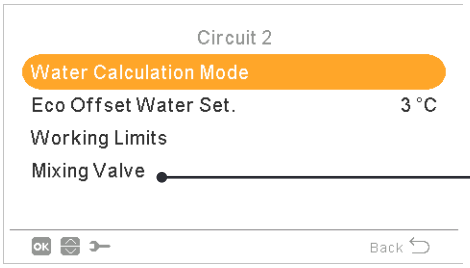
- Range: 0 ~ 10



Working Limits:

Limit for the temperature set-point to prevent high or low temperatures at Space Heating or Space Cooling:

- Maximum supply temperature
- Minimum supply temperature



Mixing valve:

To control the second water temperature (only for circuit 2).

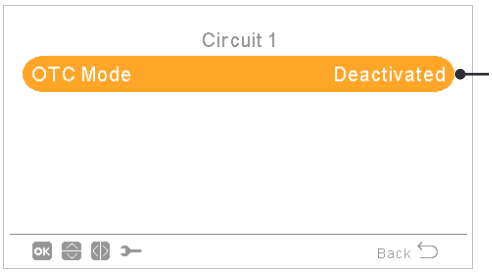
Values are adjusted for the use with the 2nd zone mixing kit accessory ATW-2KT-05. It is highly recommended not to change these values.

In case of using a mixing kit different from the ATW-2KT-05 configure the following parameters:

- Proportional band: 0~20K (6.0 K by default).
- Integral reset factor: 0.0~20% (2.5 % by default).
- Running time factor: 10~250 sec (140 sec by default).
- Over temperature offset protection: OFF, 3~10ºC (5 ºC by default).

◆ Water calculation mode

Deactivated



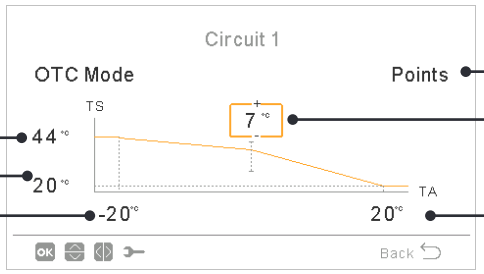
The “Deactivated” option sets the circuit as disabled.

Points

Points is the most versatile calculation type.

Set 4 points and one vertex point, to create a line representing the function that the air to water heat pump will use to give the temperature setting according to the current ambient temperature.

Use the down arrow key to select the parameter to modify. Then modify the value using the left and right arrow keys.



Set point at high ambient temperature

Set point at low ambient temperature

Low ambient temperature

Vertex offset

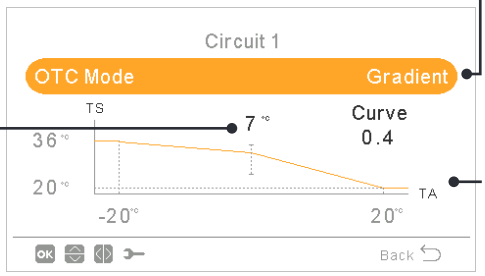
High ambient temperature

Gradient

Configure the same variables as in the “Points” view, but automatically.

User can only edit the gradient variable and it will automatically set the values for the other 4 variables on the chart.

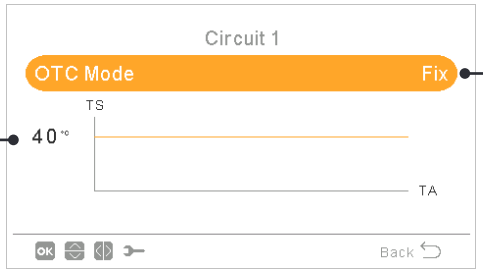
Use the down arrow key to select the parameter to modify. Then modify the value using the left and right arrow keys.



Vertex offset

Gradient curve

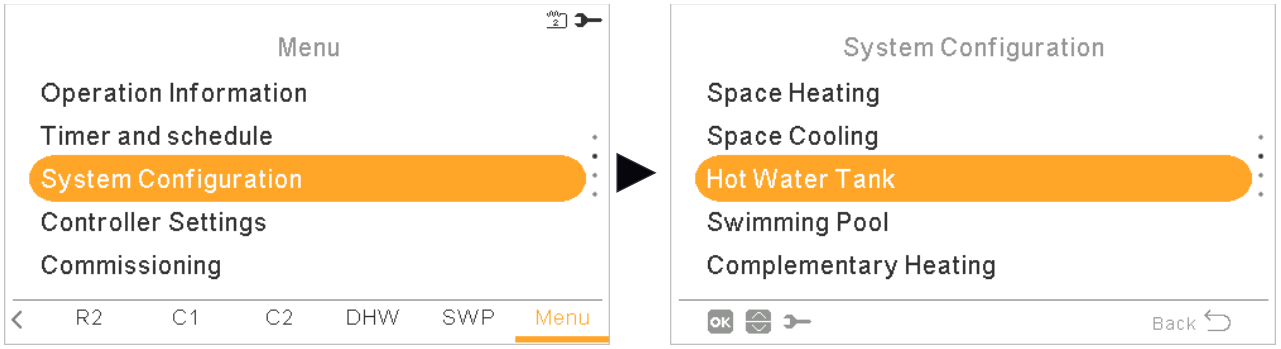
Fix



Fixed temperature

Set the circuit’s temperature to a defined value, forcing the unit to maintain it.

8.13.3.5 Hot Water Tank configuration



Setting temperature:

Setting for domestic hot water temperature selected by the user. The maximum value of this setting depends on the Maximum setting temperature set by the installer. (Between 30 to maximum setting temperature.)

HP Control:

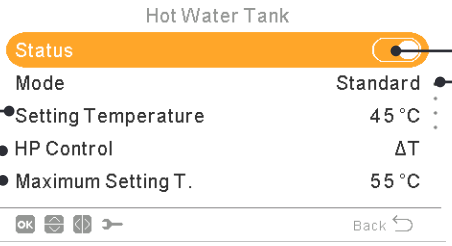
To achieve the DHW setting temperature it is possible to select between two different modes of control:

- **ΔT:** The most efficient way to achieve the setting temperature. The outlet water temperature is 15º higher than the tank temperature, increasing gradually until achieve the target water outlet temperature (setting temperature).
- **Fix:** This is the fastest way to achieve setting temperature. The outlet water temperature is set to HP Control setting. HP Control setting can be only adjusted in case HP Control is Fix.

Maximum setting temperature:

Maximum value of DHW setting temperature permitted by the installer.

1 / 3



Status of Hot Water Tank:

- Deactivated
- Enabled (by default for YUTAKI S COMBI).

Mode:

- **Standard:** DHW heating operation starts when the temperature of the water in the tank is low enough to start up the heat pump. DHW is heated up with the heat pump or the electrical heater (if electrical heater is enabled).
- **Economic (Only for YUTAKI S COMBI):** DHW heating operation starts under same conditions as Standard Mode with the difference that water temperature measurement is done at higher tank position. Due to this fact number of DHW operations decrease and its duration becomes longer which becomes more efficiency.
- **High Demand:** DHW heating operation starts if water temperature and setting temperature difference is larger than differential temperature. DHW can be heated up using the heater, the heat pump or a combination of both.Only available when Hot Water Tank heater is activated (DSW4 pin 3 ON).

Cycle time:

Defines the minimum time between 2 heat pump cycles of domestic hot water.

DHW will be able to operate again after wait in Thermo off the specified cycle time.

- Range: 0 ~24 hour
- Not available in High demand mode.

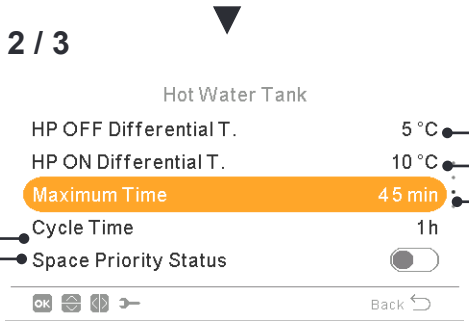
Space priority status:

If space priority function is enabled, Heat Pump operation by DHW mode stops (and continue with DHW heater, if necessary).

This function is only performed if space heating or space cooling can be done. If it is not possible, operation will continue in DHW normally.

- Not available in High demand mode.

2 / 3



HP OFF differential temperature:

Hysteresis for the stop of DHW heating operation with the heat pump.

HP ON differential temperature:

Hysteresis for the start of DHW heating operation with the heat pump.

Maximum time:

Maximum time that DHW operation can work using heat pump mode. When the heat pump is stopped by this function, DHW is still heated by DHW heater when it is enabled, until other conditions request stoppage.

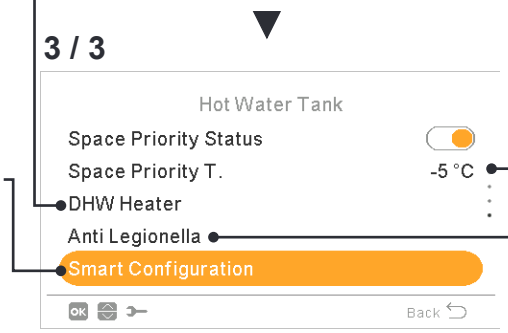
- Range: OFF, 5 ~250 min
- Not available in High demand mode.

DHW Heater: Only available when DHW heater is activated (DSW4 pin 3 ON).

- **Waiting time**: Enable or disable waiting time for DHW heater.
- **Electrical Heater waiting time:** Waiting time for the beginning of electrical heater operation since compressor start-up.

Smart Configuration: Option to allow the tank to be heated to an intermediate temperature of comfort in conditions of water consumption in order to avoid heating to the traditional setting temperature (Only available in Economic mode).

- **Comfort setting**: Intermediate target temperature of tank heating under water consumption conditions.
- **Comfort cycles:** Number of operations allowed to heat water to the comfort temperature.



Space priority temperature:

Threshold value of outdoor ambient temperature for the activation of the space priority function.

- Range: -20~0ºC
- Not available in High demand mode.

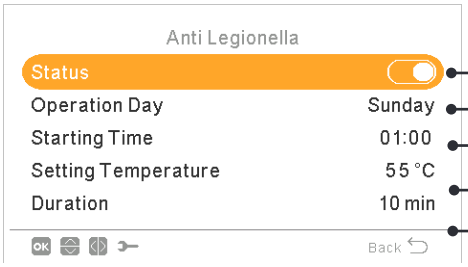
Anti Legionella:

In order to help prevent against Legionella in the DHW system, the DHW set point can be raised to a higher than normal temperature.

The Legionella protection only makes sense if there is a DHW electric heater to raise the DHW temperature to this high temperature.

See the possible configurable parameters below.

◆ Anti Legionella function



Status of anti legionella operation (enabled/deactivated)

Specified day for anti legionella operation

Specified time of the day for anti legionella operation

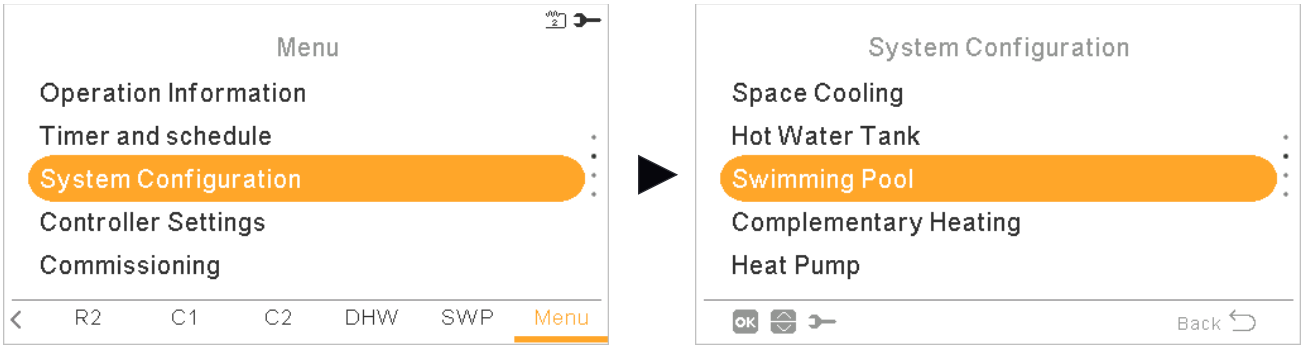
Setting for domestic hot water temperature in anti legionella operation..

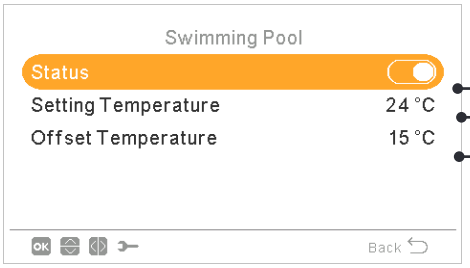
Duration of shock treatment. Between 10 to 60 minutes.

NOTE

In case anti legionella treatment has not been possible to achieve within a time lapse of 6 hours since the moment it has been trigered, anti legionella treatment is released and normal operation can be resumed.

8.13.3.6 Swimming Pool configuration





Status:

Enable or disable swimming pool.

Set input 3, output 1 and sensor 2. (see section *"8.13.3.11 Inputs, Outputs and Sensors configuration"*)

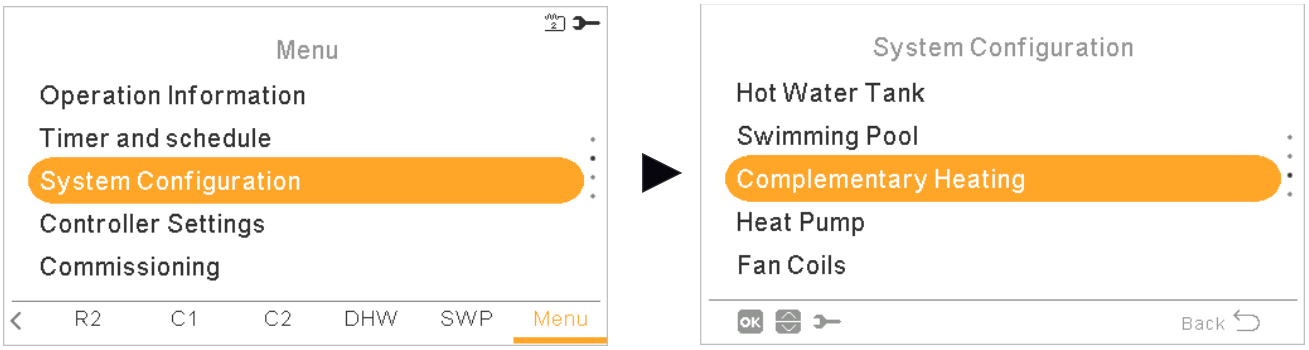
Setting temperature:

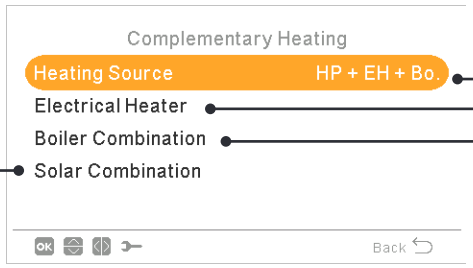
Adjustment of the swimming pool water temperature setting.

- Range: 24~33 °C

Offset temperature: The setting temperature is increased by the indicated parameter.

8.13.3.7 Complementary Heating configuration





Heating Source:

- HP Only
- HP + Heater
- HP + Boiler
- HP + Heater + Boiler (Only for YUTAKI S and YUTAKI S COMBI)

Electrical heater: See detailed information in *"Electrical heater"*

Boiler combination: Boiler will only operate if unit is in Space Heating or Hot Sanitary Water modes. It will always be Deactivated in any other mode (Swimming Pool and Cooling mode). Set output 3 and sensor 1 for boiler (see section *"8.13.3.11 Inputs, Outputs and Sensors configuration"*)

See detailed information in *"Boiler combination"*

Solar combination:

The solar combination will enable you to heat up your domestic water by means of the sun whenever the sun is available.

- Set input 4, output 4 and sensor (see section *"8.13.3.11 Inputs, Outputs and Sensors configuration"*).
- **Deactivated:** No solar Kit is installed.
- **Input Demand:** Alternative DHW tank operation is done by solar system or YUTAKI unit. Solar input can disable DHW operations done by YUTAKI unit.
  - DHW Hysteresis (OFF, 35 ~ 240 min).
  - DHW Maximum Time (5 ~240 min).
- **Total Control**: YUTAKI units controls the solar operation for the system, based on different temperatures: DHWT is heated by either the hot water that comes from the solar panels or the hot water that comes from the heat pump, depending on the solar temperature. See detailed information in *"Solar combination - Total control"*.

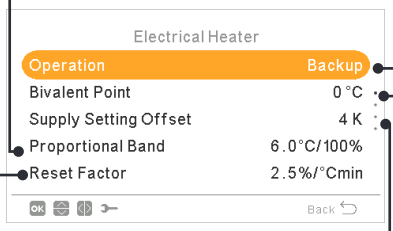
◆ Electrical heater

Proportional band:

- Control to determine how fast setting temperature is going to be reached. Higher values imply fast achievement of water setting point and therefore higher utilization of heater.

Reset factor:

- Used to guarantee setting temperature achievement without surpassing its value. Higher values imply less utilization of heater.



Operation:

- **Starting:** Space Heating electric Heater is switched ON in case of low water temperature and low ambient temperature to provide extra capacity to HP.
- **Backup:** Space Heating Electric Heater is switched ON in case of low ambient temperature (below Bivalent point) in order to provide extra capacity to HP at coldest days of winter.

Bivalent point:

- Electric heater is enabled to operate in case ambient temperature goes below this value. Only in case of Backup option.

Supply setting offset:

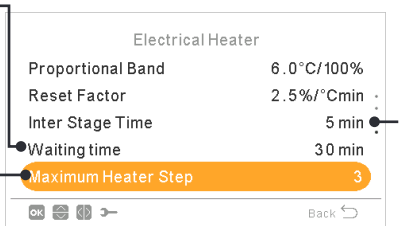
- Setting offset for electric Heater. Higher values imply earlier stoppage of electric heater and vice versa. Only in case of Backup option.

Waiting time:

- Delay time to start Electric Heater in case all conditions allow Electric Heater to start after HP has been started. Only in case of Backup option.

Maximum heater step:

- Only in case of Backup option.



Inter stage time:

- Time of Electric Heater phase overlapping when there is switch ON/OFF transition from/to phase 1 to/from phase 2. Only in case of Backup option.

◆ Solar combination - Total control

ΔT connection:

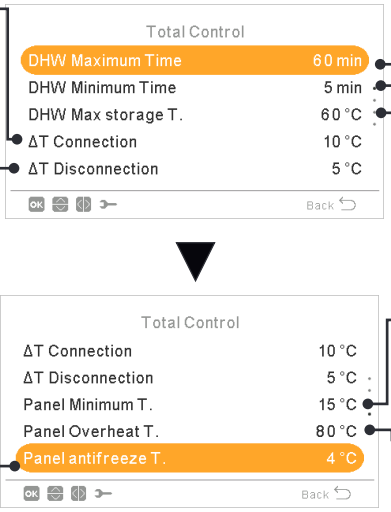
- Allows to specify a difference temperature between tank and Panel temperature to allow solar operation. Solar operation is allowed in case Panel temperature is "**Δ**T connection" ºC above tank temperature.

ΔT disconnection:

- Allows to specify a difference temperature between tank and Panel temperature to stop solar operation. Solar operation is not allowed in case Panel temperature is "**Δ**T connection"ºC below tank temperature

Panel antifreeze temperature:

- Minimum Solar panel temperature at which Solar Pump is switched ON in order to protect system against frost formation at pipes due to low ambient temperature.



DHW maximum time:

- Maximum time YUTAKI allows to heat tank by means Solar. At the end of this time Solar pump is stopped regardless temperature conditions at Solar Panel.

DHW minimum time:

- Minimum Time solar operation cannot be performed once it has been stopped due to DHW Maximum Time or due to low temperature at solar panel.

DHWT maximum storage temperature:

- Maximum DHW temperature that allows Solar operation.

Panel minimum temperature:

- Minimum temperature of the solar Panel to allow Solar operation

Panel overheat temperature:

- Maximum panel operation temperature at which Solar Pump is set to off in case Panel sensor reads a temperature above this value in order to protect system.
- In case that the solar pump is stopped due to panel overheat temperature, the YUTAKI unit sets solar overheat output to high state provided that this function has been setup as described in *"8.13.3.11 Inputs, Outputs and Sensors configuration"*.

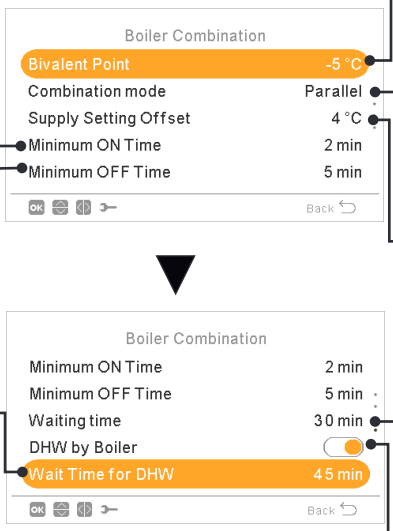
◆ Boiler combination

Minimum ON time:

- Time that must pass before stop boiler after being switched ON

Minimum OFF time:

- Time that must pass before start boiler after being switched OFF



Bivalent point:

- Boiler is allowed to operate in case ambient temperature is below this value

Combination mode:

- Serial: Boiler operates in series with the heat-pump. The boiler provides additional peak load capacity and works together with the HP
- Parallel: Boiler operates in parallel with the heat pump. The boiler provides the full heating requirements. In case Boiler is ON, HP is not allowed to operate

Supply setting offset:

- Setting offset for Boiler. Higher values imply earlier stoppage of Boiler and vice versa.

Wait time for DHW (Only for YUTAKI S):

- Delay time to start Boiler for DHW in case all conditions allow Boiler to start after HP has been started for DHW.

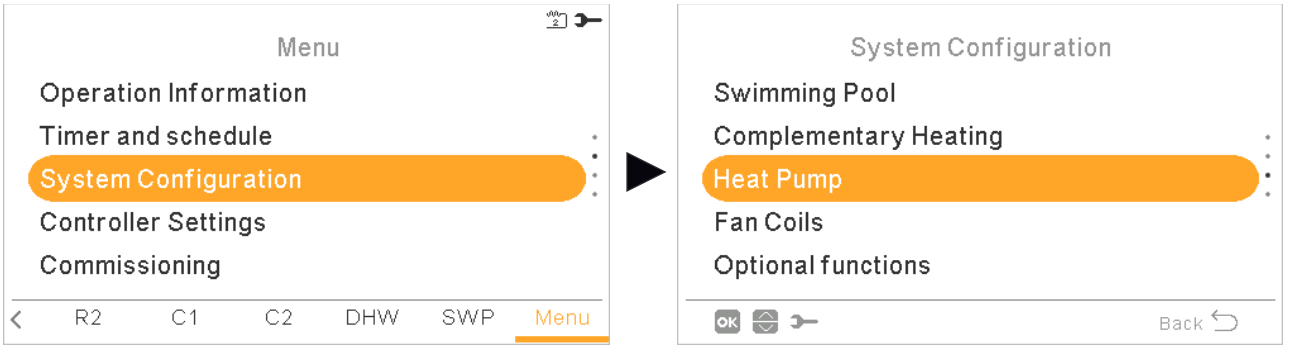
Waiting time:

- Delay time to start Boiler in case all conditions allow Boiler to start after HP has been started for Space Heating

DHW by boiler (Only for YUTAKI S):

- Control to allow heat DHW by means Boiler

8.13.3.8 Heat Pump configuration



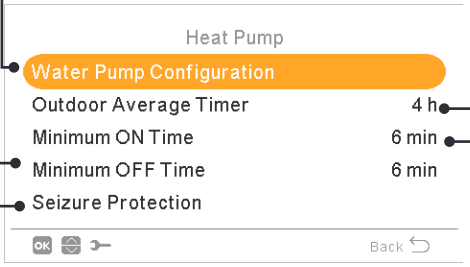
Water pump configuration:

Configure the water pump of the heat pump.

See detailed information in the next page.

Minimum OFF time: In order to reduce a possible compressor damage, demand OFF cycles can be reduced by determining the time that must pass before accepting new Demand ON.

Seizure protection:
The pump seizure protection function prevents sticking of components due to long periods of inactivity, by running the components during a short period every week. Mixing valves and pumps are fully opened and then fully closed (time depends on Mixing valve Run Time Factor).



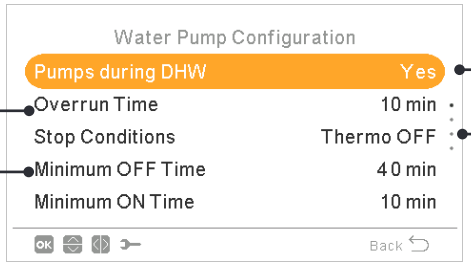
Outdoor average temperature:

OTC average is used to neutralise the effect of occasional temperature variations.

The average value of outdoor temperature sampled over a selected period (between 1 and 24 hours) is used for the calculation of weather-dependent set point temperature.

Minimum ON time: In order to reduce a possible compressor damage, demand ON cycles can be reduced by determining the time that must pass before accepting new Demand OFF.

◆ Water pump configuration



Overrun Time:

Added operation time of water pump after Demand OFF.

Minimum OFF Time:

Minimum time of the water pump OFF.

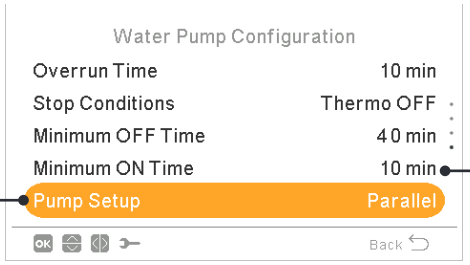
- Only when Economic mode is active (DSW)

Pumps during DHW:

This option allows to stop Water Pumps during DHW operation. Water pumps that are allowed to stop are the ones that are not directly involved to DHW heating-up procedure. This is WP2 and WP3 depending on the hydraulic configuration.

Stop conditions:

- **Standard**
- **Thermo OFF:** The water pump stops after Thermo OFF. (DSW5 pin 4 ON).



Pump Setup:

This option allows user to select hydraulic configuration of the system.

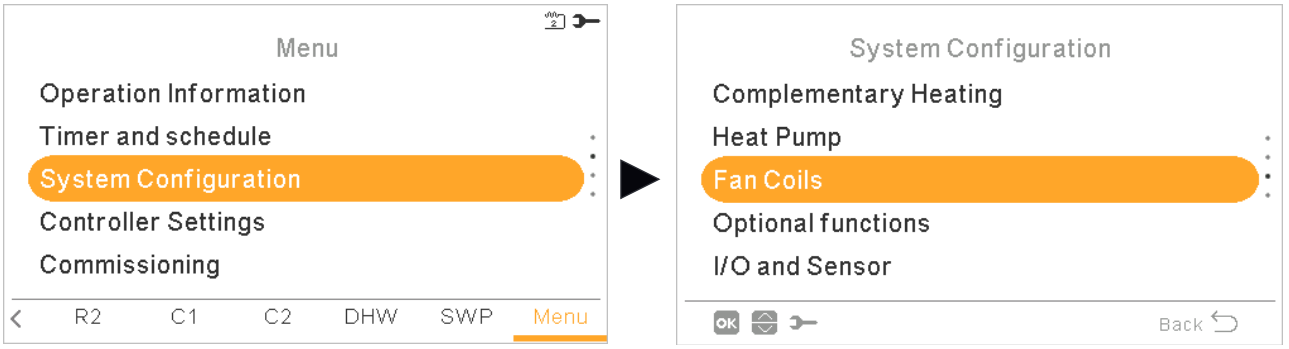
- **Standard:** WP2 is connected after WP3 by means an hydraulic separator or directly by means Hitachi mixing kit accessory. Whenever WP2 is switched ON, WP3 is also switched ON in order to transfer heat to C2
- **Parallel:** WP2 is directly connected to the buffer tank in parallel with WP3. Operation of WP3 is independent of the operation of WP2. When this configuration is used, Hitachi mixing kit accessory cannot be used.

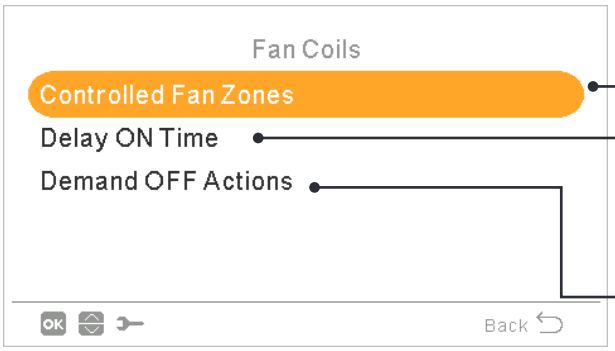
- **Minimum ON Time:**

Minimum time of the water pump ON.

- Only when Economic mode is active (DSW)

8.13.3.9 Fan coils





Controlled fan zones:

Fan coil usage assignation in function of Mode and Room.

- Deactivated
- Heating
- Cooling
- Heating & Cooling

Delay ON time:

Delay time to start Fan operation for Fan 1 or Fan 2 only in heating operation. Purpose of this control is to make sure water temperature at fan coil is hot enough before fan is started in order to ensure user comfort.

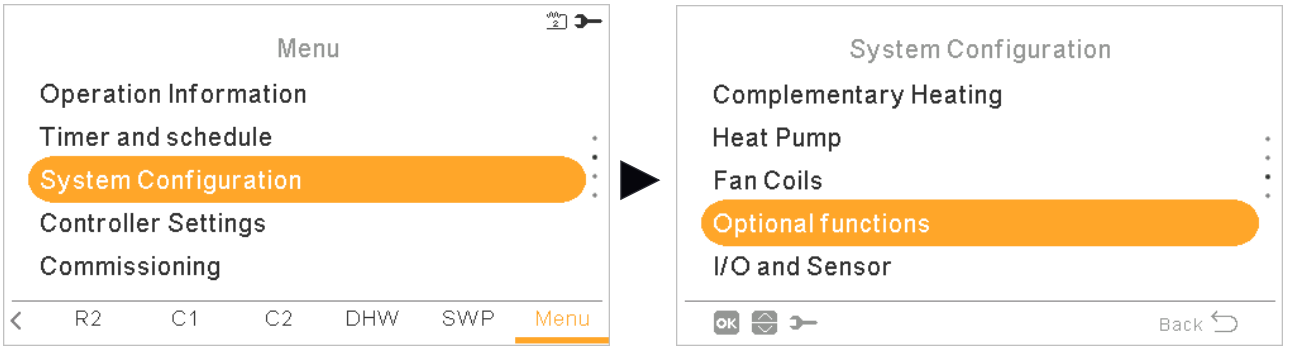
Demand OFF Actions:

Configure the Demand OFF action for Heating or Cooling operation in Room 1 or Room 2.

- Nothing
- Stop fan

8.13.3.10 Optional functions configuration

This menu allows to configure the optional functions for system, space heating or space cooling, DHW and Emergency operation.



Smart function:

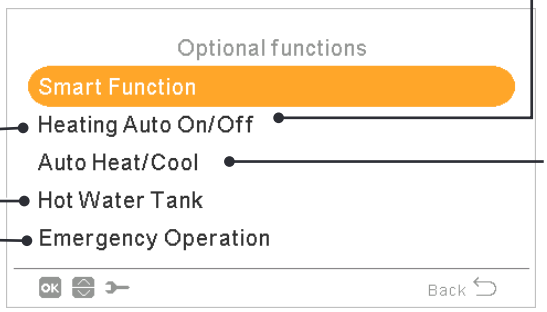
To block or limit the heat pump or increase demand due to electricity availability. See detailed information below.

Hot water tank:

Configure the optional functions for the DHW. See detailed information below.

Emergency operation:

Enable or disable emergency operation for space heating or DHW. See detailed information below.



Heating Auto On/Off:

To stop automatically stop heating operation when the daily average outdoor temperature of the previous day is higher than the defined Switch-OFF temperature. See detailed information below.

Auto Heat/Cool:

Allows to set automatic switch over to heating and cooling operation using the same daily average outdoor temperature of the previous day as in Heating auto ON/OFF.

◆ Smart Function

Status:

Enable or disable smart function.

Trigger type:

- Closed: Action when input is closed
- Open: Action when input is open

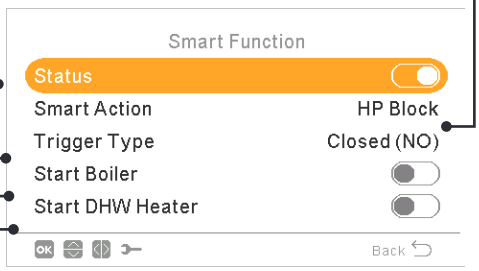
Start boiler:

Permission to use the boiler in case that the system has been blocked due to HP Block.

Start DHW Heater:

Permission to use the DHW heater in case that the system has been blocked due to HP Block.

1 / 3

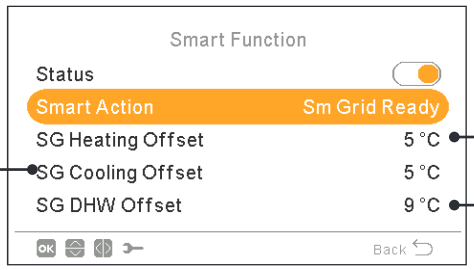


Smart Action:

Check that Smart Act/SG1 is set in input 5 (see section *"8.13.3.11 Inputs, Outputs and Sensors configuration"*).

- **HP Block:** Heat Pump is forbidden in any condition (Space Heating, Cooling, DHW) when signal is active.
- **SG Ready:** The SG Grid is awarded to heat pump series. This control technology integrates the system in a smart grid by using two digital inputs establishing an unidirectional connection. See Service Manual for detailed information. It is necessary to configure an input for SG2.
- **DHW Block:** DHW Operation is forbidden when signal is active.
- **DHW only:** Heat pump operation for any condition except DHW is forbidden when signal is active. DHW operation is allowed normally.

2 / 3



SG Cooling offset:

To adjust Space Cooling setting temperature decrease when SG ready is in Low price mode

SG Heating offset:

To adjust Space Heating setting temperature increase when SG ready is in Low price mode

SG DHW offset:

To adjust DHW setting temperature increase when SG ready is in Low price mode

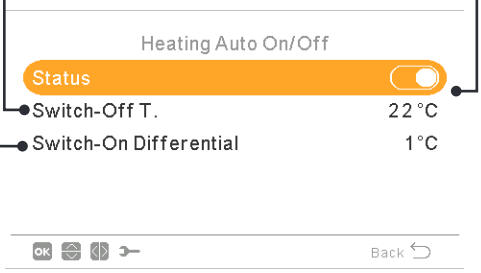
◆ Heating Auto On / Off

Switch-Off Temperature:

- Switch Off temperature: System is stopped in case that the outdoor temperature is higher than the Switch-OFF temperature.

Switch-On Differential:

- Differential temperature between average outdoor temperature of the previous day and the Switch Off temperature.



Status:

- Enable or disable heating auto on/off function.
- Switch Off temperature: System is stopped in case that the outdoor temperature is higher than the Switch-OFF temperature.
- Switch On differential: Differential temperature between average outdoor temperature of the previous day and the Switch Off temperature.

◆ Auto Heat/Cool

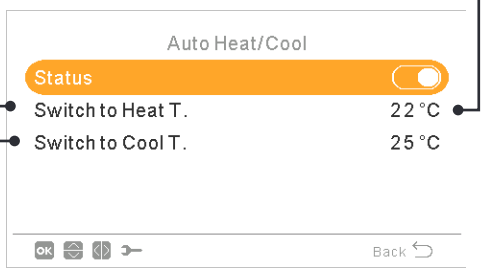
Only available in units capable of heating and cooling operation, and when cooling operation is enabled.

Status:

- Enable or disable auto heat/cool.

Switch to Cool temperature:

- Operation switches to cooling in case that the measured outdoor temperature value is higher than the threshold for switching to cooling.



Switch to Heat temperature:

- Operation switches to heating in case that the measured outdoor temperature value is lower than the threshold for switching to heating.

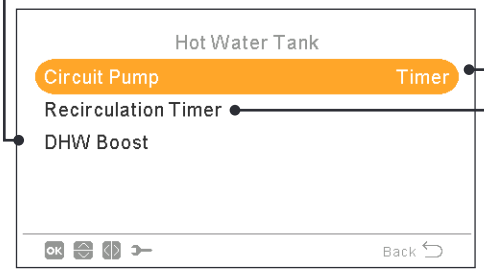
◆ Hot water tank optional functions

DHW Boost:

To force a one-time heating of the DHW tank up to the temperature set as DHW Boost temperature.

This feature is useful to cover exceptional demand of DHW.

- **Trigger type:** Push (favourite button), Open (NC) or Closed (NO). Set input 6 for DHW Boost (for trigger type open/closed). (see section *"8.13.3.11 Inputs, Outputs and Sensors configuration"*)
- **Boost setting:** DHW temperature setting for the Boost function.



Circuit Pump: By using this output, user can heat all the water inside DHW piping system. Output must be configured at the I/O and sensors menu. (see section *"8.13.3.11 Inputs, Outputs and Sensors configuration"*)

- Deactivated.
- Demand: Enable DHW recirculation.
- Anti Legionella: Allows DHW recirculation while anti legionella is active.
- Timer: A timer can be programmed in order to start or stop the water recirculation.

Recirculation timer:

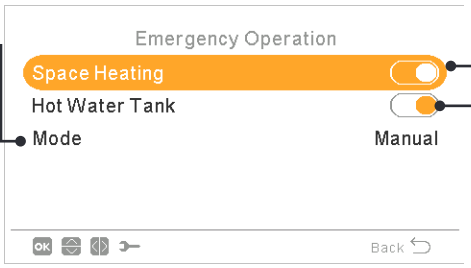
- Frequency: Allows to select when timer is applied (Everyday, weekend, workday)
- Starting Time: When the water pump circulation starts.
- Stopping Time: When the water pump circulation stops.
- Operation: In case of ON, means that water pump is always ON between "Starting Time" and "Stopping Time". In case it is set to Timer, Recirculation pump is ON during "ON Time" after being OFF during "OFF Time" within Starting Time and Stopping Time.
- ON Time: On time period of Recirculation pump.
- OFF Time: Off time period of Recirculation pump.

◆ Emergency Operation

Mode:

Selection of the emergency operation mode:

- **Manual:** Emergency operation is active when is manually enabled (by DSW4 pin 4 ON). The emergency mode uses the heater (space heating or DHW) to provide the required heating.
- **Automatic:** Emergency mode operates when there is an event of outdoor unit failure and Demand ON of space heating (enabled) or DHW (enabled).



Space Heating:

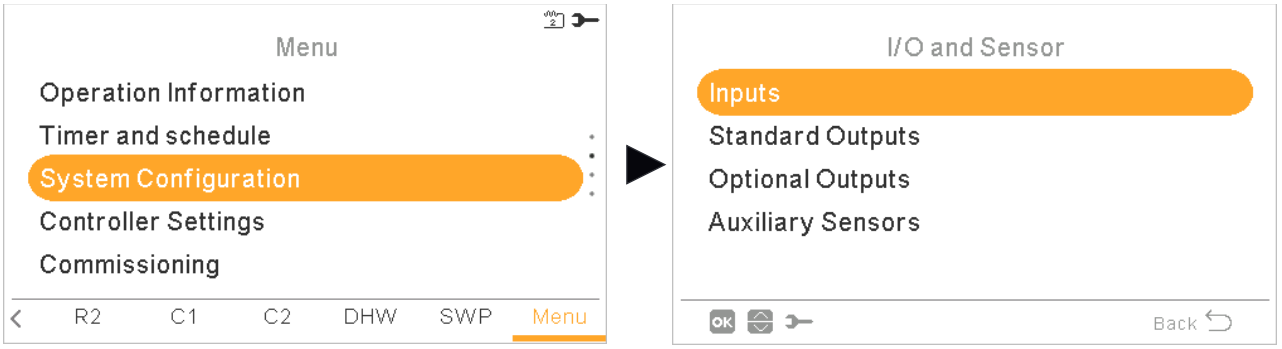
Enable or disable emergency operation for space heating.

Only available in case "Heating source" on *"8.13.3.7 Complementary Heating configuration"* contains "Electrical heater or boiler" option.

Hot water tank:

Enable or disable emergency operation for DHW. Only available when electrical heater for DHW is enabled (by DSW).

8.13.3.11 Inputs, Outputs and Sensors configuration



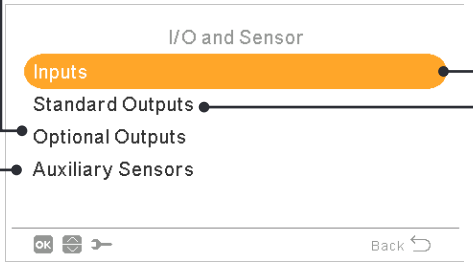
Optional outputs:

There 4 additional available outputs to set. These 4 additional outputs are not wired to the YUTAKI terminal board.

In order to use them it is required accessory (field supplied). Its configuration follow same constrains as Standard outputs.

Auxiliary sensors:

There are 7 available auxiliary sensors to set.



Inputs:

The system allows to set 7 inputs depending on the operations and preferences of the installation

Standard Outputs:

There are 4 available outputs to set already wired to the terminal board. There are conditions of setting depending on the installation

◆ List of available inputs

- **Deactivated**
- **Demand ON/OFF** (by default in input 1): Consider both Circuit 1 and Circuit 2 in Demand ON when the signal is ON.
- **Demand ON/OFF C1:** Consider Circuit 1 in Demand ON when the signal is ON.
- **Demand ON/OFF C2:** Consider Circuit 2 in Demand ON when the signal is ON.
- **Power Meter 2:** To count any pulse received from the power meter 2 and sent to central control energy consumption calculation.
- **ECO C1 + C2:** Switch both Circuit 1 and Circuit 2 to ECO mode when input is closed.
- **ECO C1** (by default in input 2, if there is circuit 1 in the installation): Switch Circuit 1 to ECO mode when input is closed.
- **ECO C2:** Switch Circuit 2 to ECO mode when input is closed.
- **Forced Off:** Forbid DHW, space heating and space cooling.
- **Smart Act / SG1** (Fixed in input 5 if smart action is enabled): To active Smart Function.
- **Swimming Pool** (Fixed in input 3 if swimming pool is enabled): Consider Swimming pool in Demand ON when the signal is ON.
- **Solar** (Fixed in input 4 if solar is enabled): To let YUTAKI know that external Solar management system is ready to provide Solar energy.
- **Operation:** To switch between space cooling and space heating.
- **DHW Boost** (Fixed in input 6 if is DHW Boost is enabled): If it is set to open (NC), boost signal ON if circuit is open. If it is set to close (NO), boost signal ON if circuit is closed.
- **Forced Heating:** Force mode heating when input is closed
- **Forced Cooling:** Force mode cooling when input is closed.
- **SG2:** To active the different estates of Sm Grid Ready.
- **Drain pump**: System forbids operation and alarm 85 is triggered in case signal is closed for more than 30 seconds. Purpose of this input is to be used in conjunction of Water float switch (field supplied) located at drain pan.

◆ List of available outputs

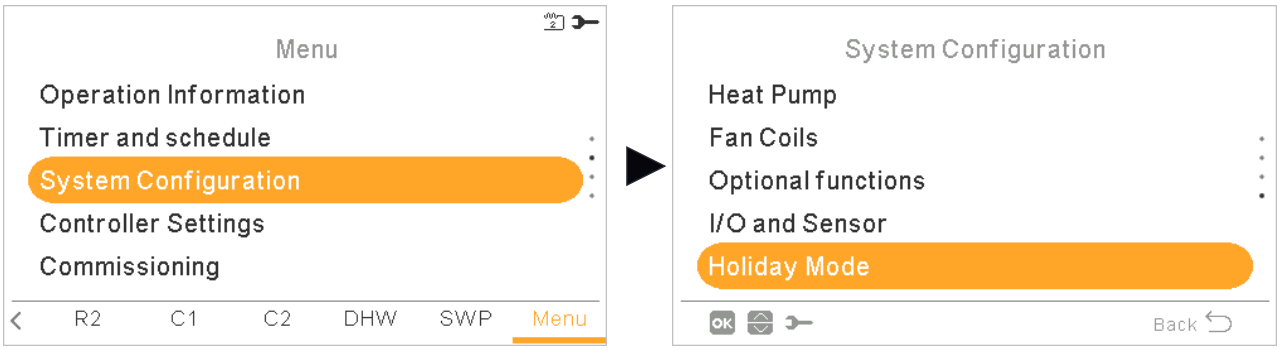
- **Deactivated**
- **SWP 3WV:** (Fixed in output 1 if swimming pool is enabled): Signal control of the 3-way valve of the swimming pool.
- **Water pump 3:** (Fixed in output 2 if buffer tank is installed): Signal control of the water pump for buffer tank.
- **Boiler:** (Fixed in input 3 if boiler is enabled): Signal control of the boiler.
- **Solar Pump:** (Fixed in input 4 if solar pump is enabled): Signal control of the solar pump.
- **Alarm:** (By default in output 5):Signal is active if there is an alarm.
- **Operation:** (By default in output 6): Signal active in case Thermo ON in any condition.
- **Cooling:** (By default in output 7): Signal active when space cooling is operating.
- **Dem-ON C1:** (By default in output 8): Signal active when there is Demand in circuit 1.
- **Heating:** Signal active when space heating is operating.
- **DHW:** Signal active when DHW is operating.
- **Solar overheat:** Signal is active when solar overheat (only when solar combination status is total control)
- **Defrost:** Signal active when outdoor unit is defrosting.
- **DHW Re-circulation:** Signal active depending on option selected at chapter Circuit pump.
- **Fan 1 Low:** Signal is active when fan coil speed selected for Circuit 1 is set to Low.
- **Fan 1 Medium:** Signal is active when fan coil speed selected for Circuit 1 is set to Medium.
- **Fan 1 High:** Signal is active when fan coil speed selected for Circuit 1 is set to High.
- **Fan 2 Low:** Signal is active when fan coil speed selected for Circuit 2 is set to Low
- **Fan 2 Medium:** Signal is active when fan coil speed selected for Circuit 2 is set to Medium.
- **Fan 2 High:** Signal is active when fan coil speed selected for Circuit 2 is set to High.
- **Constant Heating:** Signal is active in case operation mode of LCD controller is set to Heating.
- **Constant Cooling:** Signal is active in case operation mode of LCD controller is set to Cooling.

◆ List of available sensors:

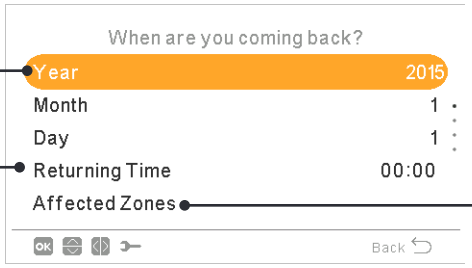
- **Deactivated**
- **Two3:** (Fixed in sensor 1 if boiler is installed): Use this sensor to monitor water temperature when boiler is used.
- **Swimming Pool:** (Fixed in sensor 2 if swimming pool is installed): Use this sensor when swimming pool is used in order to monitor swimming pool temperature.
- **Solar panel sensor:** Use this sensor when Total control is configured to monitor Solar Panel temperature.
- **C1 + C2 Ambient:** Use this sensor when auxiliary ambient temperature sensor is used for C1 and C2.
- **C1 Ambient:** Use this sensor when auxiliary ambient temperature sensor is used for C1.
- **C2 Ambient:** Use this sensor when auxiliary ambient temperature sensor is used for C2.
- **Outdoor sensor (NTC):** (By default sensor 3) To connect to the controller an auxiliary outside temperature sensor in case the heat pump is located in a position not suitable for this measurement.

8.13.4 Holiday mode

This menu allows to configure the date, time and the temperature conditions for the holiday come back.



1 / 2



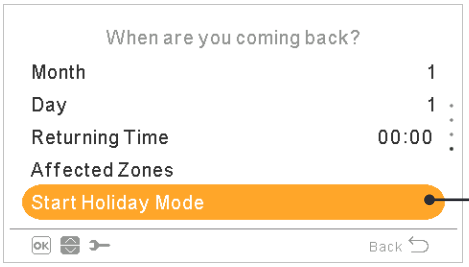
Holiday Mode: Configure holiday come back

- Year
- Month
- Day
- Returning time

Affected zones:

- Enable (switch off) or disable (switch on) the zones during the holiday period.
- Circuit 1 / 2
- Room 1 / 2
- Room 1 / 2 Setting temperature
- Hot water tank
- Swimming pool

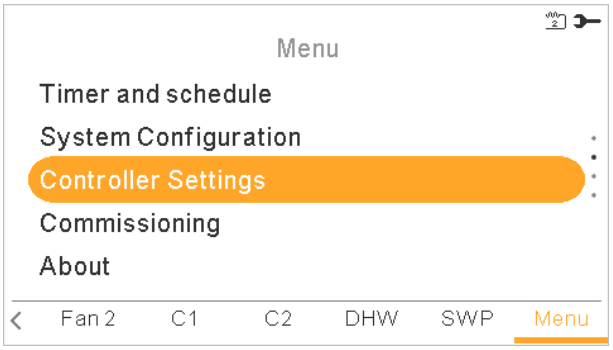
2 / 2

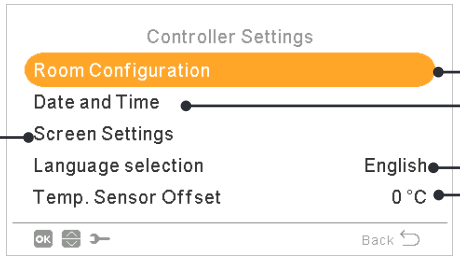


Start / Stop holiday mode

8.13.5 Controller settings

Under the controller settings menu it is possible to adjust the several parameters:





Room Configuration:

- Room names: create or edit a name for circuit 1 or circuit 2
- Synoptic view icons: selection of the icon shown in Live view menu for cooling / heating emitters.

- **Date and time:**
- Adjust date and time
- European summer time

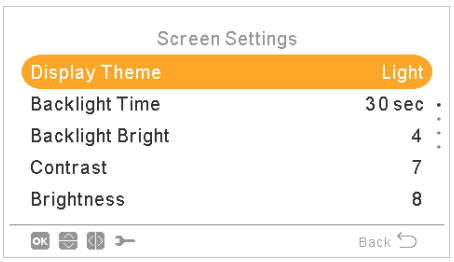
Selection of the unit controller language

Temp. sensor offset

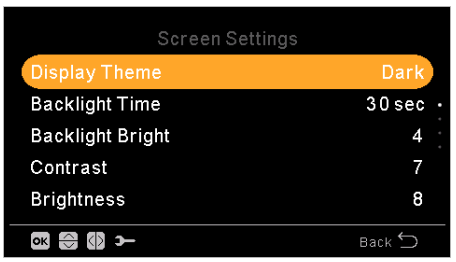
Screen settings:

- Display theme (light / dark / auto)
- Backlight time
- Backlight bright
- Contrast
- Brightness
- ON LED bright
- Beep on touch volume

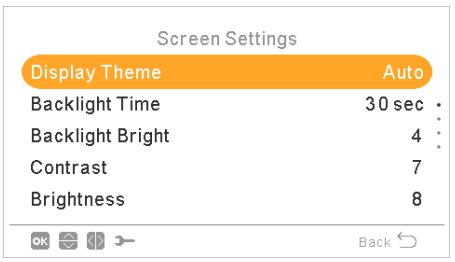
◆ Display theme



Light



Dark



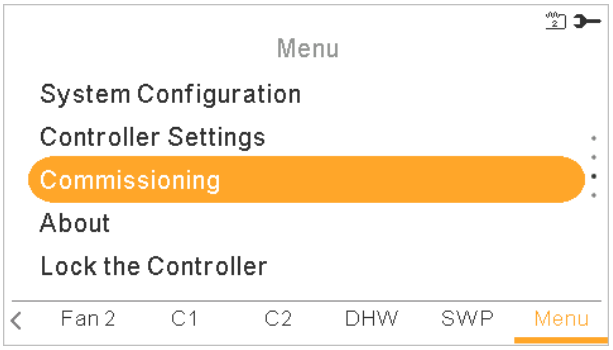
Auto

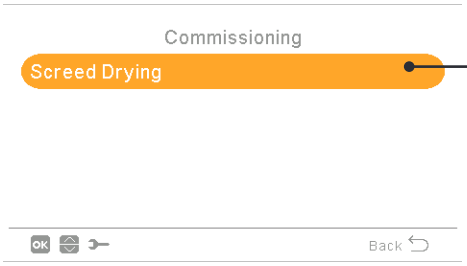
When Dark theme is selected, background is changed to black, text and icons to white.

When Auto theme is selected, it changes automatically between light (at 8:00 am) and dark (at 20:00 pm).

8.13.6 Commissioning

Under the commissioning menu it is possible to adjust the several parameters:

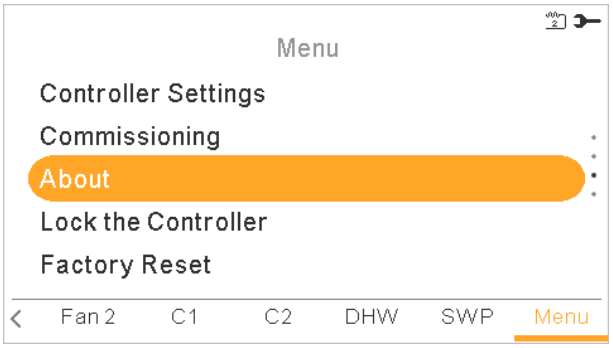


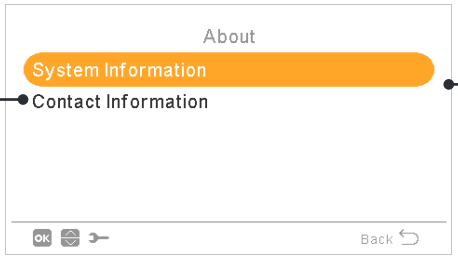


Screed Drying:
- Circuit 1 setting temperature
- Circuit 2 setting temperature
- Start screed drying

8.13.7 About

In this section of the LCD controller it is possible to find the following information:





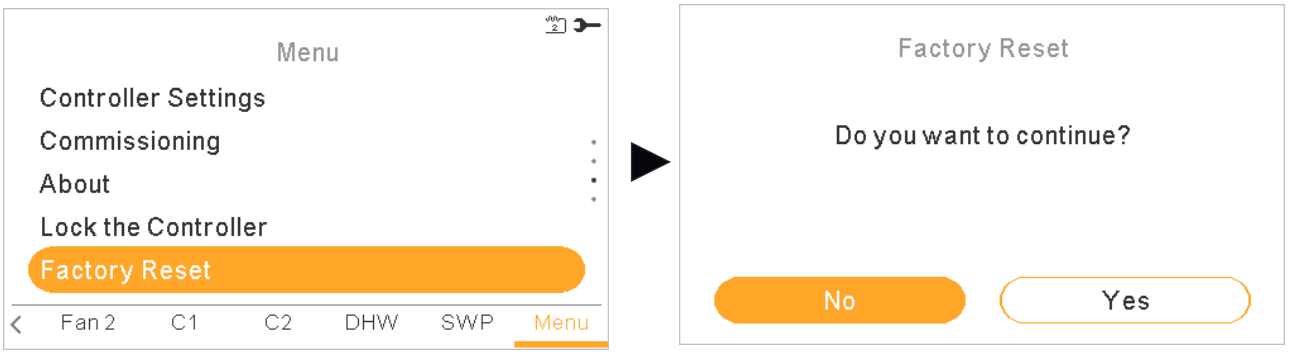
Contact information:

It is possible and recommendable to fill this information providing a contact phone to the user.

System information:
- Type
- Modules type
- System capacity
- Serial number
- Controller firmware
- Indoor PCB firmware
- Language package
- Refrigerant

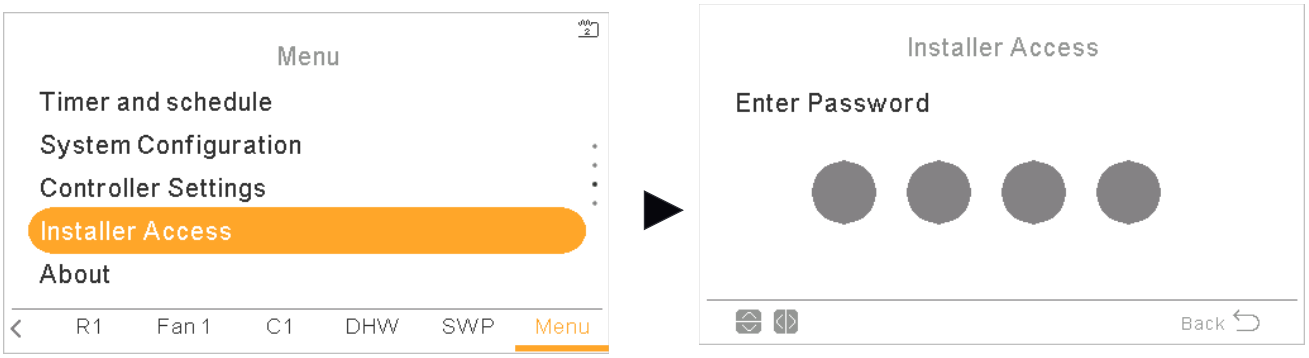
8.13.8 Factory reset

This function is only visible for the installer. It asks for removing all the settings and returns to the factory setting configuration.



8.13.9 Installer access

Menu to enable the access to configure the system.



The login password for the Installer is:

Right ▶, Down ▼, Left ◀, Right ▶

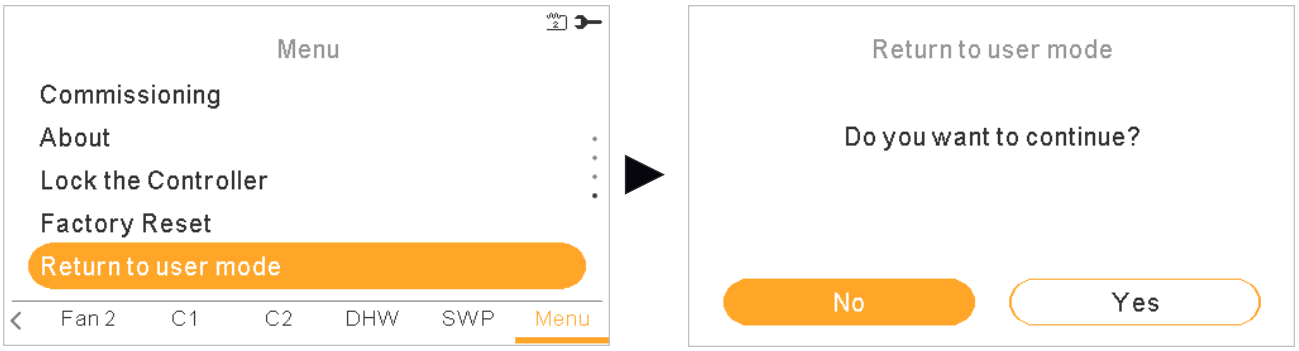
Press “OK” to confirm the password.

If the correct access code is entered, the installer mode icon appears on the notifications bar (bottom line).

After 30 minutes of inactivity, it is necessary to repeat the log in process. To exit the Installer mode and return to the unit menu, go to the “Return to user mode” on the main menu.

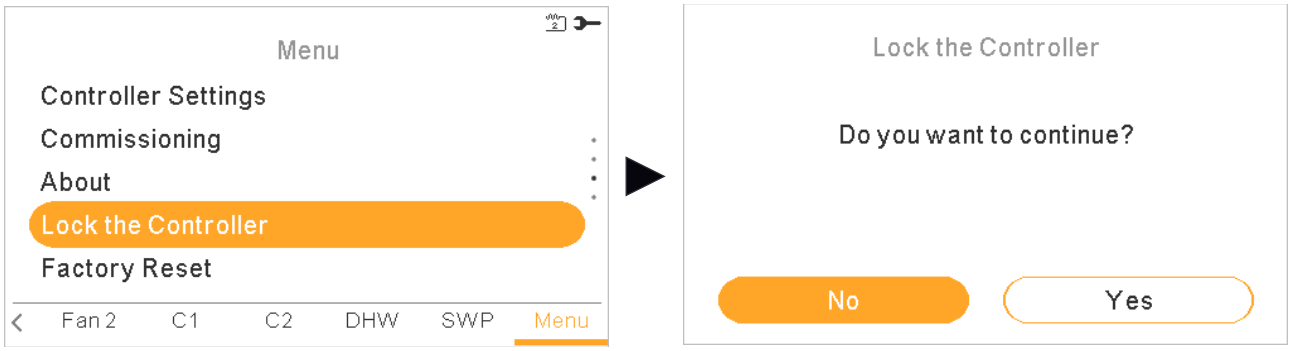
8.13.10 Return to user mode

This function allows to getting out of the “Installer mode”.

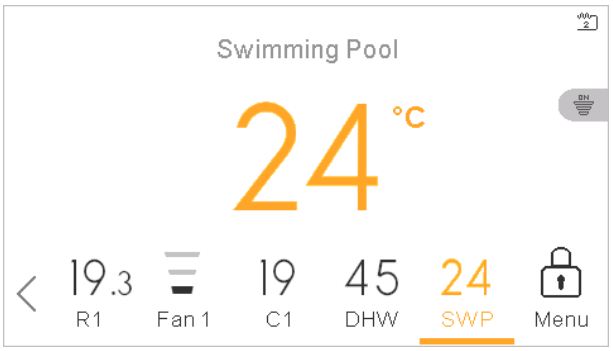


8.13.11 Lock the controller

This function is only visible for the installer and allows to lock the menu in case of exhibition. This action can also be launched from central.



When the controller is locked the lock icon appears insted the icon menu.



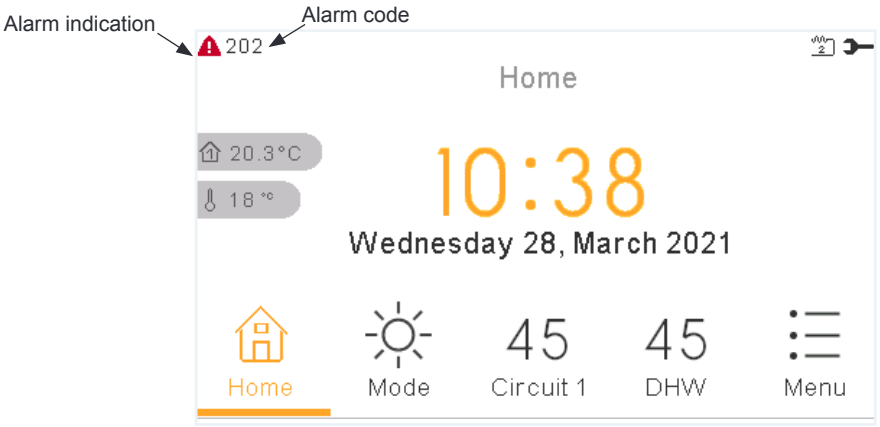
The password requested to unblock the controller is: Right, Down, Left, Right

9 TROUBLESHOOTING

NOTE

- *(o): Option configurable from Unit controller. This alarm will be displayed if the system has been configured.*
- *o: Default. This alarm will be displayed in the Unit controller.*
- *–: No applicable.*

Alarm code indication on remote control switch:



◆ Alarms for Indoor units:

Alarm Code	Retry Stop Code	YUTAKI S	YUTAKI S COMBI	Origin	Detail of Abnormality	Main Factors
3	-	o	o	Communication	Transmission Alarm (Not outdoor unit detected)	Loose, disconnected, broken or short-circuited connector
10	-	-	o	Indoor	2n DHW thermistor anomaly	Loose, disconnected, broken or short-circuited connector
11	-	o	o	Indoor	Water inlet thermistor abnormally (THMwi)	Loose, disconnected, broken or short-circuited connector
12	-	o	o	Indoor	Water outlet thermistor abnormally (THMwo)	Loose, disconnected, broken or short-circuited connector
13	–	o	o	Indoor	Indoor Liquid Pipe Temp Thermistor Abnormality (THMl)	Loose, disconnected, broken or short-circuited connector
14	–	o	o	Indoor	Indoor Gas Pipe Temperature Thermistor Abnormality (THMg)	Loose, disconnected, broken or short-circuited connector
15	-	(o)	(o)	Indoor	Water Circuit 2 thermistor abnormally (THMwo2)	Loose, disconnected, broken or short-circuited connector
16	-	(o)	(o)	Indoor	Water DHW thermistor abnormally (THMdhwt)	Loose, disconnected, broken or short-circuited connector
17	-	(o)	(o)	Indoor	Auxiliary sensor 2 thermistor abnormally (THMaux2)	Loose, disconnected, broken or short-circuited connector
18	-	(o)	(o)	Indoor	Auxiliary sensor 1 thermistor abnormally (THMaux1)	Loose, disconnected, broken or short-circuited connector
19	-	o	o	Indoor	Water Plate HEX pipe thermistor abnormally (THMwohp)	Loose, disconnected, broken or short-circuited connector
25	-	(o)	(o)	Indoor	Auxiliary sensor 3 thermistor abnormally (THMaux3)	Loose, disconnected, broken or short-circuited connector
26	-	o	o	Indoor	Water pressure sensor (WPS) abnormality	Loose, disconnected, broken or short-circuited connector
40	-	o	o	Indoor	Incorrect LCD setting	Current LCD configuration does not allow proper operation

Alarm Code	Retry Stop Code	YUTAKI S	YUTAKI S COMBI	Origin	Detail of Abnormality	Main Factors
61	-	(o)	(o)	Communication	Triggered in case no YCC messages have been received for more than 180 seconds since last message was received. In case this alarm appears, software stops Indoor and Outdoor operations until communication is restored.	YCC stops sending messages to slave unit since YCC has been powered OFF or disconnected from the H-Link Line or H-Link line has been damaged
70	P70	o	o	Indoor	Hydraulic alarm flow & Water Pump malfunction	Water flow is not detected in the hydraulic cycle or Pump defective
72		o	o	Indoor	Thermostat Heater Alarm	High temperature is detected in Electric Heater
73		o	o	Indoor	Mixing over-temperature limit protection for Mixed circuit.	Circuit 2 supply temperature > Target temperature + offset
74	P74	o	o	Indoor	Unit over-temperature limit protection	Two > Tmax +5K
76	-	o	o	Indoor	Freeze Protection Stop by indoor liquid temperature thermistor	
77	-	o	o	Indoor-LCD	Receiver Communication failure	No Opentherm/Hlink communication for a continuous period of 10 minutes.
78		o	o	Indoor-LCD	RF Communication failure	There is no communication for 1 hour with on or two RF receives which are bound to the RF-Bridge.
79	-	o	o	Indoor -outdoor	Unit Capacity setting Error	There is no concordance between indoor outdoor unit capacity
80	-	o	o	Indoor	LCD H-link RCS transmission error	No H-link communication for a continuous period of 1 minute between Indoor and LCD User control by connection wiring (breaking, wiring error, etc.)
				LCD	(If no H-LINK RCS has no power)	
81	-	o	o	Indoor	“Momentary Power interruption” or “Low voltage detected”	
83	-	o	o	Indoor	Low water pressure	Water pressure of the system is below 0.5 bar
84	-	o	o	Indoor	High water pressure	Water pressure of the system has increased above 3.7 bar
85	-	o	o	Indoor	Float Switch Alarm	Float switch detects high level of water at drain pane. Malfunction of the drain pump. It is required to configure “Float switch” Accessory as input signal
100	-	o	o	Indoor-LCD	Compressor protection	"Compressor failure. This alarm code appears when the following alarms 02, 07, 08, 45, 47 occur three times within 6 hours." **NOTE** This alarm is shown in the outdoor unit with alarm code “EE”.

◆ Alarms for YUTAKI CASCADE CONTROLLER

Alarm Code	Retry Stop Code	Origin	Detail of Abnormality	Main Factors
03	-	Communication	Lost communication with all Sub YUTAKI Units	Loose, disconnected, broken or short-circuited connector
15	-	Indoor	Water Circuit 2 thermistor abnormally (THMwo2)	Loose, disconnected, broken or short-circuited connector
16	-	Indoor	Water DHW thermistor abnormally (THMdhwt)	Loose, disconnected, broken or short-circuited connector
17	-	Indoor	Auxiliary sensor 2 thermistor abnormally (THMaux2)	Loose, disconnected, broken or short-circuited connector
18	-	Indoor	Auxiliary sensor 1 thermistor abnormally (THMaux1)	Loose, disconnected, broken or short-circuited connector
25	-	Indoor	Auxiliary sensor 3 thermistor abnormally (THMaux3)	Loose, disconnected, broken or short-circuited connector
40	-	Indoor	Incorrect LCD setting	Current LCD configuration does not allow proper operation
60	-	Sub unit	All Sub units are in alarm state or there is no communication. Alarm release, when issue disappears	Sub unit alarm
73		Indoor	Mixing over-temperature limit protection for Mixed circuit.	Circuit 2 supply temperature > Target temperature + offset
74	P74	Indoor	Unit over-temperature limit protection	Two > Tmax +5K
75	-	Indoor	Freeze Protection by Cold water inlet, outlet temperature detection	
77	-	Indoor-LCD	Receiver Communication failure	No Opentherm/Hlink communication for a continuous period of 10 minutes.
78		Indoor-LCD	RF Communication failure	There is no communication for 1 hour with on or two RF receives which are bound to the RF-Bridge.
80	-	Indoor	LCD H-link RCS transmission error	No H-link communication for a continuous period of 1 minute between Indoor and LCD User control by connection wiring (breaking, wiring error, etc.)
		LCD	(If no H-LINK RCS has no power)	
208	-	Cascade Controller	Module with Repeated H-LINK address	Wrong slave address configuration
209	-	Cascade Controller	Sub DHW configured on unexisting module	Wrong configuration of the YCC controller. There is at least one Sub unit configured as Sub DHW tank without any DHW Main unit
21X	-	Sub unit	Module X is in alarm state. X stands for the module number. A module is determined to be in alarm state in case that module is in alarm or YUTAKI CASCADE CONTROLLER lost communication with specific module.	Sub unit alarm

◆ Alarms for Outdoor units

Alarm Code	Category	Type of abnormality	Main cause
2	Outdoor unit	Activation of protection device (high pressure cut)	Activation of PSH, locked motor, abnormal operation in the power supply phase. Failure of fan motor, drain discharge, PCB, relay, float switch activated. (Pipe clogging, excessive refrigerant, innert gas mixing, fan motor locking at cooling operation)
3	Transmission	Abnormal transmission between outdoor and indoor units	Incorrect wiring. Loose terminals, Failure of PCB. Tripping of fuse. Power supply OFF.
4		Abnormal transmission between inverter PCB and RASC unit PCB	Transmission failure between inverter PCBs. (Loose Connector, Wire Breaking, Blowout of Fuse).
5	Power supply	Reception of abnormal operation code for detection of power source phase	Power source with abnormal wave pattern. Main power supply phase is reversely connected or one phase is not connected.
6	Voltage	Excessively low voltage or excessively high voltage for the inverter	Voltage drop in power supply. Incorrect wiring or insufficient capacity of power supply wiring.
7	Cycle	Decrease in discharge gas superheat	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnected Connector).
8		Excessively high discharge gas temperature at the top of compressor	Insufficient refrigerant charge, refrigerant leakage. Expansion valve closed or clogged.
19	Fan motor	Activation of the protection device for the indoor fan motor	Failure of fan motor.
20	Outdoor unit sensor	Thermistor for discharge gas temperature (THM9)	Incorrect wiring, disconnected wiring, broken cable, short circuit.
21		High pressure sensor	
22		Thermistor for outdoor ambient temperature (THM7)	
24		Thermistor for evaporating temperature (THM8)	Incorrect Wiring, Disconnected Wiring, Wire Breaking, Short Circuit, Fan Motor Locking at Heating Operation.
31	System	Incorrect capacity setting or combined capacity between outdoor and indoor units	Incorrect Capacity Code Setting, Excessive or Insufficient Indoor Unit Total Capacity Code.
35		Incorrect indoor unit number setting	Duplication of indoor unit number, number of indoor units over specifications.
36		Incorrect of Indoor Unit Combination.	
38		Abnormality of picking up circuit for protection (Outdoor unit)	Failure of indoor unit PCB, incorrect wiring, connection to PCB in indoor unit.
45	Protection device	Activation of the safety device from excessively high discharge pressure	Overload (obstruction of HEX, short circuit) mixture of inert gas, Excessive Refrigerant.
47		Activation of the safety device from excessively low suction pressure (protection from vacuum operation)	Shortage or leakage of refrigerant, piping clogging, expansion valve close-locked, fan motor locked.
48		Activation of overcurrent protection	Overload, overcurrent. Failure of Inverter PCB, heat exchanger clogged, locked compressor. EVI/EVO failure.
51	Inverter	Abnormal operation of the current sensor	Incorrect wiring of current sensor. Failure of control PCB or Inverter PCB.
53		Inverter fin temperature increase	Inverter module (IPM, DIP-IPM) and Inverter PCB abnormality. Failure of compressor, clogging of heat exchanger.
54		Abnormality of inverter fin temperature	Heat Exchanger Clogging. Fan Motor Failure.
55		Abnormality of inverter module	Failure of DIP-IPM, IPM or Inverter PCB.
57	Outdoor	Activating the protection of the fan motor	
5B	Outdoor fan	Activation of over current protection	

Alarm Code	Category	Type of abnormality	Main cause
5C	Outdoor fan	Abnormality in current detection circuit	
EE	Compressor	Compressor protection	"Compressor failure. This alarm code appears when the following alarms 02, 07, 08, 45, 47 occur three times within 6 hours."
b0	Indoor unit model setting	Incorrect setting of unit model	No setting of unit capacity or incorrect setting of unit capacity.
b1	Number setting	Incorrect setting address or refrigerant cycle	Over 64 indoor units setting by number or indoor unit address.
b5		Incorrect setting of indoor unit number for H-LINK type	The number of indoor units connected to the H-LINK II of one system is 17 or higher.

◆ Alarms for LCD

Alarm Code	Retry Stop Code	YUTAKI S/SC	Origin	Detail of Abnormality	Main Factors
202	-	(o)	LCD	Wrong settings of PC-ARFH2E	
203	-	(o)	LCD	Sub PC-ARFH2E stops answering to Main PC-ARFH2E	Loose, disconnected, broken or short-circuited connector
204	-	(o)	LCD	Indoor unit stops answering to Main PC-ARFH2E	Loose, disconnected, broken or short-circuited connector

10 MAINTENANCE

10.1 MAINTENANCE WORK

⚠ CAUTION

- *All inspections and checks have to be carried out by a licensed technician and never by the user itself.*
- *Before any inspection and check the unit main power supply has to be switched OFF.*
- *Wait a minimum off 10 minutes from all power supply have been turned OFF.*
- *Take care with the crankcase heater. It could operate even when compressor is OFF.*
- *Take care with the electrical box components. Some of them could remain hot after switching OFF the unit.*

NOTE

All these maintenance operations must be done with appropriate materials and following this manual.

10.1.1 General maintenance procedure for the outdoor unit

1 Fan and fan motor
- Lubrication: All the fan motors are pre-lubricated and sealed at factory. Therefore no lubrication maintenance is required.
- Sound and vibration: Check for abnormal sounds and vibrations.
- Rotation: Check the clockwise rotation and the rotating speed.
- Insulation: Check the electrical insulation resistance.

2 Heat exchanger
- Clog: Inspect the heat exchanger at regular intervals and remove any accumulated dirt and any accumulated dust from the heat exchanger. Other obstacles must be removed such as the growing grass and the pieces of paper which might restrict the airflow.

3 Refrigerant piping connection
- Leakage: Check for the refrigerant leakage at the piping connection between the outdoor and the indoor unit.
- Pressure: On split system, check the refrigerant pressure using the check joints of the outdoor unit.

4 Cabinet
- Stain: Check for any stain and remove it cleaning if it is the case.
- Fixing screw: Check for any loosened screw or any lost screw. Fix the loosened screws and the lost screws.
- Insulation material: Check for any peeled thermal insulator on the cabinet. Repair the thermal insulator.

5 Electrical equipment
- Activation: Check for an abnormal activation of the magnetic contactor, the auxiliary relay, the PCB and others.
- Line condition: Pay attention to the working voltage, the working amperage and the working phase balance. Check for any faulty contact that is caused by the loosened terminal connections, the oxidized contacts, the foreign matter and other items. Check the electrical insulation resistance.

6 Control device and protection device
- Setting: Do not readjust the setting in the field unless the setting is maintained at a point that is different from the point listed in the Technical Documentation.

7 Compressor
- Sound and vibration: Check for abnormal sounds and vibrations.
- Activation: Check that the voltage drop of the power supply line is within 15% at the start and within 2% during the operation.

8 Reverse valve
- Activation: Check for any abnormal activation sound.

9 Strainer
- Clog: Check that there is no temperature difference between both ends.

10 Ground wire
- Ground line: Check for the continuity to earth.

11 Oil heater (Crankcase heater of the compressor)
- Activation: The oil heater should be activated at least twelve hours before the start-up by turning ON the main switch.

10.1.2 General maintenance procedure for the indoor unit

To ensure good operation and reliability of the indoor unit, main parts and field wiring have to be checked periodically.

The following checks have to be done by qualified technicians at least once a year:

1 Cabinet

- Stain: Check for any stain and remove it cleaning if it is the case.
- Fixing screw: Check for any loosened screw or any lost screw. Tighten the loosened screws and replace the lost screws.
- Insulation material: Check for any peeled thermal insulator on the indoor part of the covers. Repair the thermal insulator.

2 Water piping connection

- Leakage: Check there are no water leakages neither in the inlet and outlet water connections (space heating and DHW if used), nor in the main water circuit nor the tank connections. Check all the joints, connections and circuit elements.

NOTE

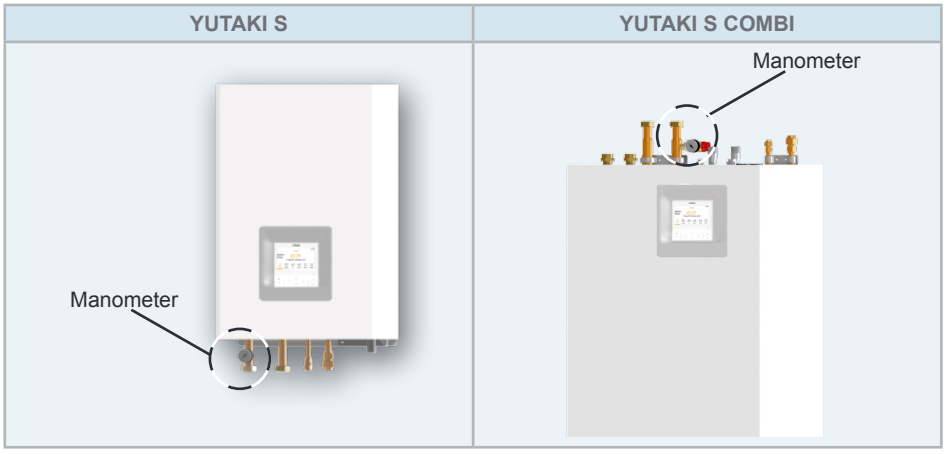
- *If leakage is detected in the inlet/outlet water connections, repair it and remember to replace the gaskets.*
- *Pay special attention to the water pipe connection placed over the electrical box.*

3 Water flow and pressure:

- Water flow:
  - Space heating: Check the water flow (m^3/h) through the unit controller in the “Heat Pump Details” of the “Operation Information” menu.
  - DHW (if used): Check whether the water circulation is correct along all the DHW circuit.
- Pressure checking:
  - Space heating: Check the water pressure using the manometer in the indoor unit. This value shall be between 1.5 and 2.0 bars approximately (1.8 bars is a proper value).

The manometer is placed at different positions according to each unit model

In YUTAKI S and S COMBI models, the manometer is installed factory supplied as it is shown:



NOTE

The water pressure must remain above 1 bar in order to prevent air from entering the circuit, and below 3.0 bars (safety valve opening value).

  - DHW (if used): Check there is no loss of pressure and ensure that DHW pressure is not higher than 6 bars. Connect a gauge to the DHW drain port for this purpose.

4 Ground wire

- Ground line: Check for the continuity to earth in the main electrical components.

5 Security water valve for DHW (if used):

- Operation: Check the correct operation of the security water valve (pressure and temperature relief valve) at the DHW inlet connection. Remember that this element must ensure that the following functions are provided: Pressure protection, non-return function, shut-off valve, filling and draining.

6 DHWTank inspection hatch

The DHW tank has an inspection hatch at the bottom. This hatch allows the inspection of the interior of the tank.

DANGER

Be careful when using this inspection hatch. There are high temperature and high pressure inside the tank. Before open it wait a reasonable time for the water to cool.

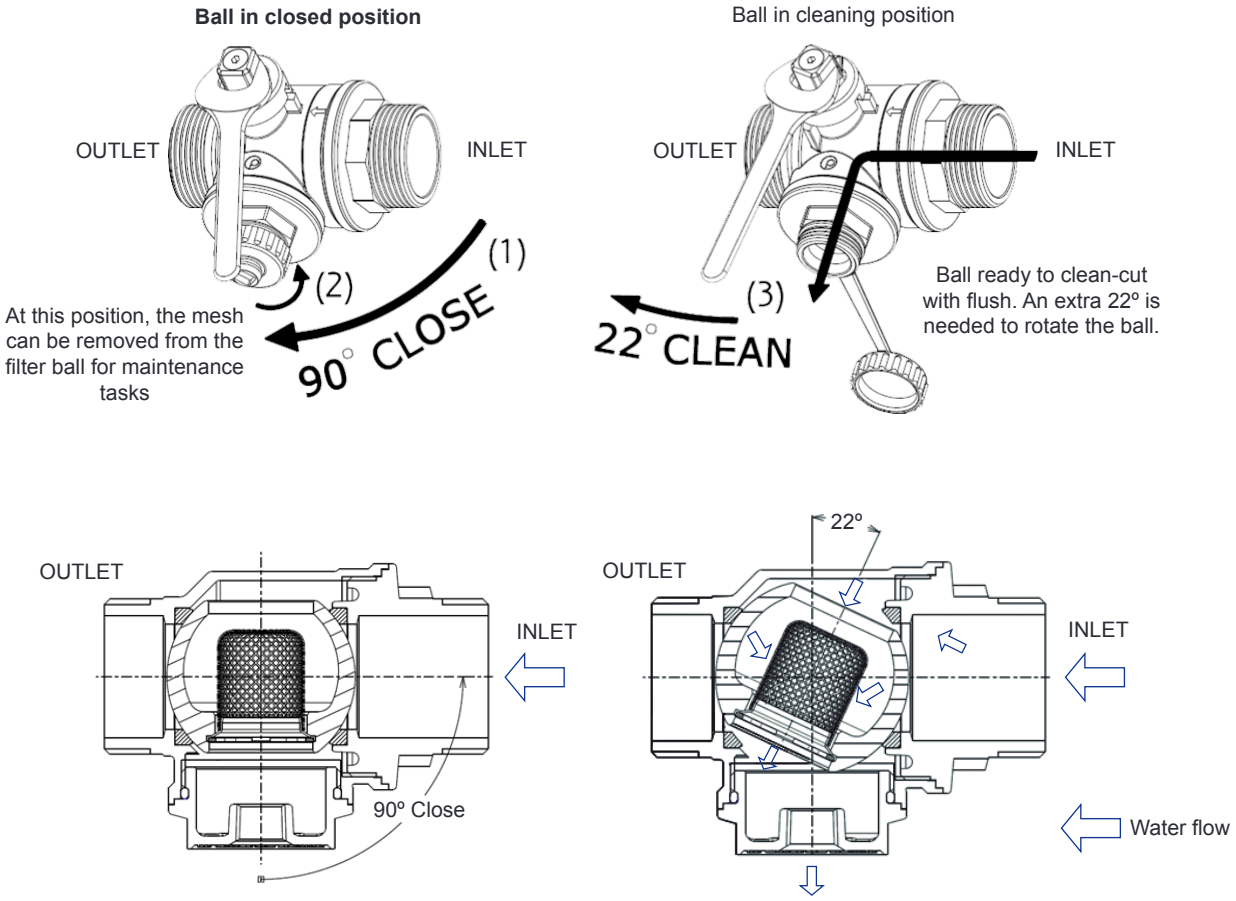
For a safe operation using the inspection hatch, proceed as it is explained in the manual of the specific unit.

Additional hydraulic elements are necessary in the DHW circuit. Refer to chapter *"5 Refrigerant and water piping"*.

7 Filter +:

The Filter + valve is an on-off ball valve containing an interchangeable cylindrical filter which is easy to inspect and remove for normal maintenance operations. Normally, Filter + ball valve it is used as a shut-off valve by turning the handle 90º clockwise (1).

Filter+ ball valve makes the maintenance operations easier. Once the valve is in closed position, open the draining port tap(2) and, by turning the handle up to 22º clockwise, the water from the inlet is guided behind the filter and runs in opposite direction through the draining port(3). The water circuit can be cleaned even under full pressure, avoiding the need to drain the unit prior the cleaning process. After cleaning, simply close the draining port tap(2), and open the valve again.



NOTE

The draining port must be connected to the sewage system by means of a hose or a pipe.

CAUTION

- *Take care when draining the unit. Ensure the connection of the hose or drain pipe in order to avoid water leakage on any electrical component.*
- *The expelled water could be hot and could keep in pressure. Take care with this draining.*

8 Safety valve

- Operation: Check the correct operation of the indoor unit safety valve (pressure relief valve) on the space heating circuit. Open it manually and some water should be expelled by its connected drain pipe.

9 Air purger:

- Excessive air: Check the correct operation of the indoor unit air purger. Turn it twice at least, since there may be air in the water circuit, which needs to be expelled by this air purger.

10 Water pump:

- Pump performance curves: Check as explained in point 3 that water flow and pressure is in accordance with the Pump performance curves.
- Electrical connection: Check the correct connection of the electrical wiring of the water pump. If moisture is detected in the pump surface, revise the water pipes, since a water leakage could have been occurred.

11 Fixing points tightening:

- Check the fixing points of the indoor unit. Check the indoor unit wall support. The indoor unit has to be always in a vertical position.

12 Refrigerant piping connection

- Leakage: Check for the refrigerant leakage at the refrigerant piping connections in the indoor unit. Check the different connections of the plate heat exchanger.

13 Electrical equipment

- Activation: Check for an abnormal activation of the magnetic contactor, the relay, the PCBs and others.
- Line condition: Pay attention to the working voltage, the working amperage and the working phase balance. Check for any faulty contact that is caused by the loosened terminal connections, the oxidized contacts, the foreign matter and other items. Check the electrical insulation resistance.

14 Control device and protection device

- Setting: Do not readjust the setting in the field unless the setting is maintained at a point that is different from the point listed in the Service Manual.

◆ Descaling

Water quality and set temperature can affect the scale production and it can deposit on the surface of the plate heat exchanger, restricting the heat exchange and the good operation of the unit.

NOTE

Descaling should be necessary periodically at certain intervals depending on the supplied water quality.

Check the scale level when proceeding maintenance to ensure reliability of the unit.

If necessary, proceed with descaling:

1 Switch OFF the main power supply of the indoor unit.

2 Empty the indoor unit water as explained in “Draining” procedure.

3 Proceed with descaling of the plate heat exchangers.

4 Ensure that the water quality remains compliant with the EU council directive 98/83 EC.

◆ Draining

NOTE

Draining operation is unique for each model. Refer to the service manual of the specific unit for drain operation procedure.

Draining operation for YUTAKI S

YUTAKI S models have no drain port factory supplied. It must be considered the installation of a drain port after the shut-off valve (factory supplied) and before the water inlet of the unit when proceeding to the installation of the unit.

Draining operation for YUTAKI S COMBI

Draining of the indoor unit

1 Switch OFF the main power supply of the indoor unit.

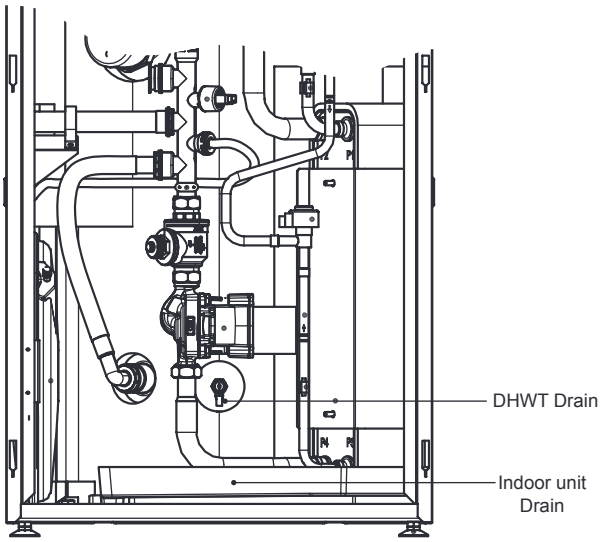
2 Close the 2 shut-off valves (factory-supplied) installed at the space heating connections (Water inlet and outlet connections).

3 Open manually the drain port for indoor unit water and collect the water into a bucket.

4 Once all the water has been drained, close again the drain port for indoor unit water.

CAUTION

When draining the indoor unit water from its drain port, the leaved water could be hot and could keep in pressure. Perform the draining procedure carefully.



Draining of the DHW circuit

1 Switch OFF the main power supply of the indoor unit.

2 Close the main DHW inlet valve (water inlet shut-off valve) in order to avoid the tank filling.

3 Open the shut-off valve of the DHW outlet to allow draining without creating a vacuum. Ensure that valve at the highest level of the DHW system is also opened.

4 Connect a drain hose to the drain port for DHW and lead the other end to the general draining.

5 Open manually the drain port for DHW and wait a long time until all the water has been removed.

CAUTION

When draining the DHW from its drain port, the leaved water could be hot and could keep in pressure. Perform the draining procedure carefully.

HITACHI

Cooling & Heating

Johnson Controls-Hitachi Air Conditioning Spain, S.A.U.
Ronda Shimizu, 1 - Políg. Ind. Can Torrella
08233 Vacarisses (Barcelona) Spain

© Copyright 2021 Johnson Controls-Hitachi Air Conditioning Spain, S.A.U. – All rights reserved.

PMML0575 rev.1 - 09/2021

Printed in Spain