

Training ClimaECO, 2020

ABB Caldion® Room Temperature Controller

Competence Center Europe – Smart Buildings

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Agenda

Introduction, Projects and Product Overview

Technical Features and Connection Diagram

ETS Application

Solutions

Commercial and Marketing Aspects

ABB Cالدion® Room Temperature Controller

Introduction, Projects and Product Overview

ABB Caldion® Room Temperature Controller

Introduction

ABB Caldion® Truly The One

ABB Caldion® is a new range of fan coil room temperature controller that is part of the ABB i-bus® KNX portfolio and ClimaECO

It is a KNX RTC sensor for hotels, commercial buildings, offices and public buildings with a dual option on the type of installation (stand alone or KNX)

It has a built-in temperature sensor, LED display, buttons and Fan Coil actuator to provide an efficient and cost-effective solution

The perfect frameless casing and intuitive icons using capacitive touch make customer life smarter and easier than ever



ABB Caldion® Room Temperature Controller

Projects

Hospitality – Hotel guest room, common area



Commercial – Office building, common area



ABB Caldion® Room Temperature Controller

Product Overview

Black version

2 devices

- On/Off - **BS standard** with/without electrical heater
- 0 - 10V - **BS standard** with/without electrical heater



White version

2 devices

- On/Off - **BS standard** with/without electrical heater
- 0 - 10V - **BS standard** with/without electrical heater

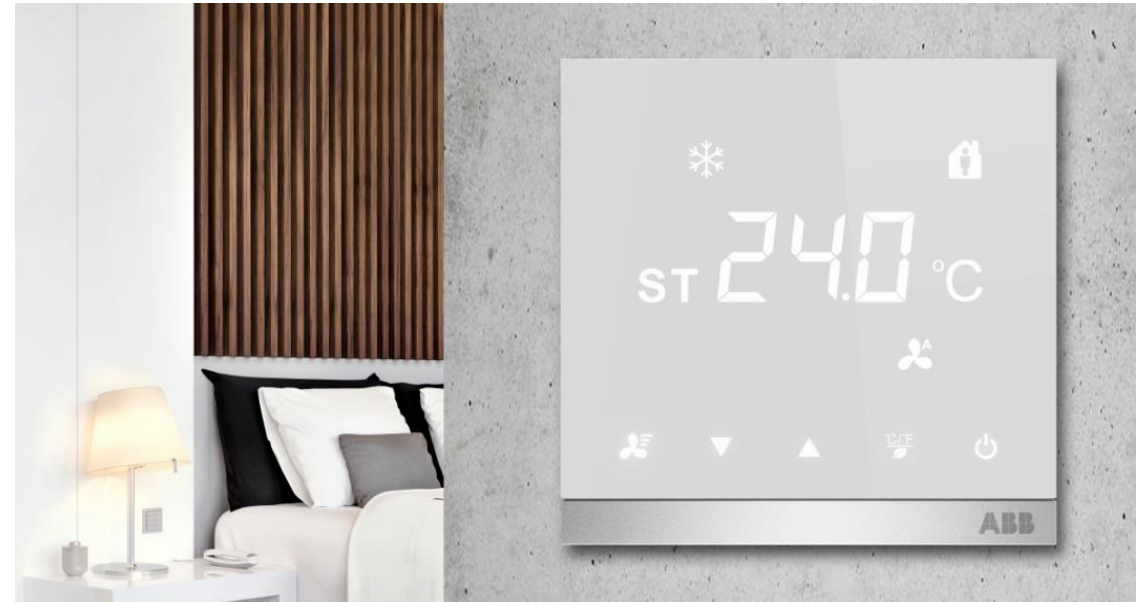


ABB Caldion® Room Temperature Controller

Technical Features and Connection Diagram

ABB Caldion® Room Temperature Controller

Features

ABB Caldion®

- For BS (British Standard) installation
- Frameless design
- Large LED display, illuminated capacitive touch buttons
- Intuitive icons for ease of operating mode identification
- Display and button illumination – efficiency mode (sleep mode when not in use) / constantly on
- Display illumination and button illumination can be activated/deactivated via group object
- °C/°F/ECO button – long press/short press function
- First trigger command – awake device/awake and send command
- On/Off button – long press/short press function
- Recall of last setpoint after On/Off of device



ABB Caldion® Room Temperature Controller

Features

ABB Caldion®

- “In operation” monitor – antitheft and function monitoring
- In built temperature sensor for accurate room temperature measurement
- Lock and unlock of the device via group object to prevent unauthorized adjustment
- Compatible configuration similar to Fan Coil Controller FCC/S, also forced operation, temperature limitation or valve purge, PI-Controller, PWM, ...
- Two Binary inputs – temperature sensor/binary input/window/alarm function selectable
- ABB Caldion® can operate as standalone device without KNX power supply thanks to power connection
- Occupancy presence detection logic: combination of door contact and presence detector to function as keycard holder for room occupancy status

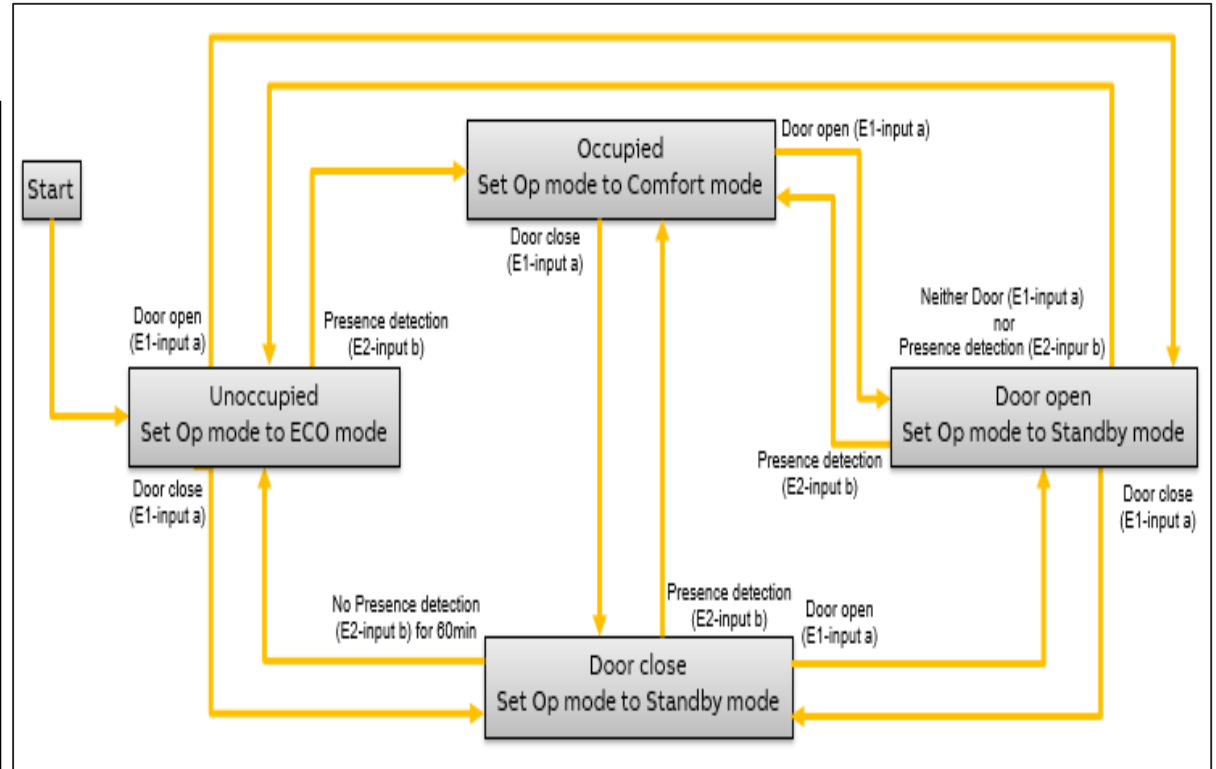


ABB Caldion® Room Temperature Controller

Features

ABB Caldion®

- Occupancy presence detection logic – with the combination of door contact & presence detector signal, ability to determine the status of guests in the room (room occupancy status)
- Change between ECO, Standby and Comfort mode
- Door contact and presence detector signal can either be received by group object or physical input via E1 and E2 binary input
- Detection checking duration is configurable via ETS
- In 2 pipe configuration only, VB/RO output can be configured as an relay output to energize the power for the room (via a external contactor) like keycard holder
- When logic is active and E1 and E2 are not configured as physical input, it can be used for other binary input functions

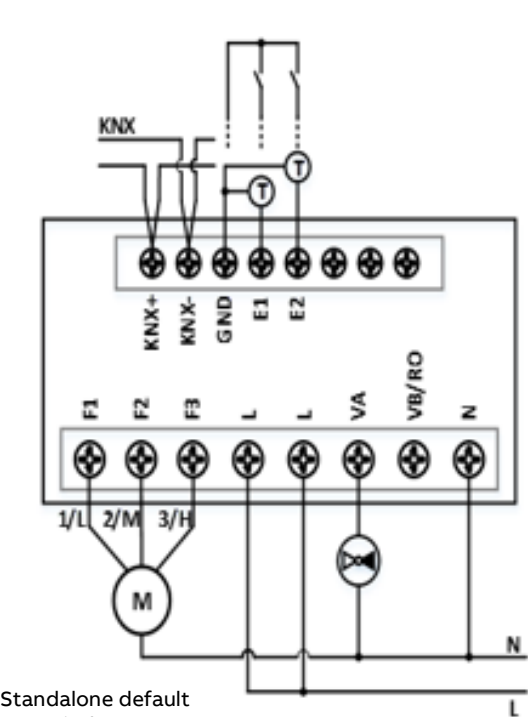


Solution ready for non keycard holder installation in hotel guest rooms

ABB Caldion® Room Temperature Controller

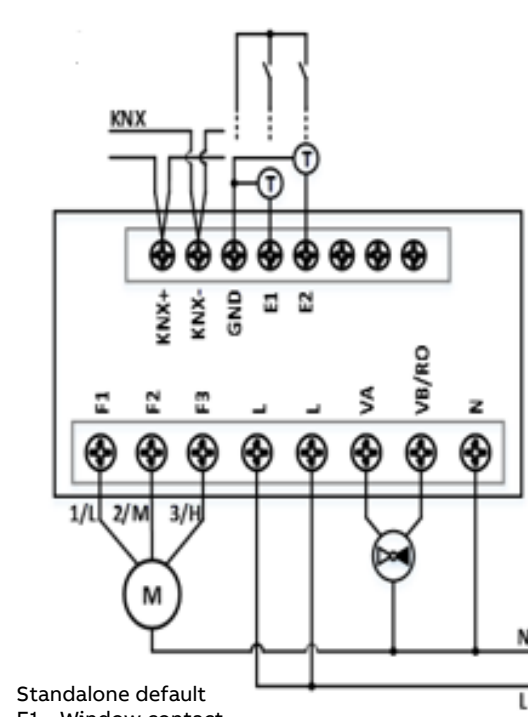
Connection Diagram - On/Off version and 3 step fan

2 pipe/electrothermal valve



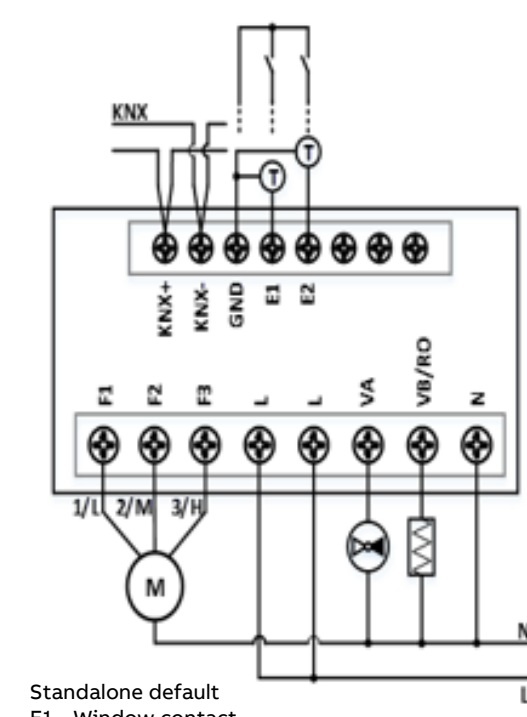
Standalone default
E1 – Window contact
E2 – Temperature sensor NTC 10K

2 pipe/3 point motor valve



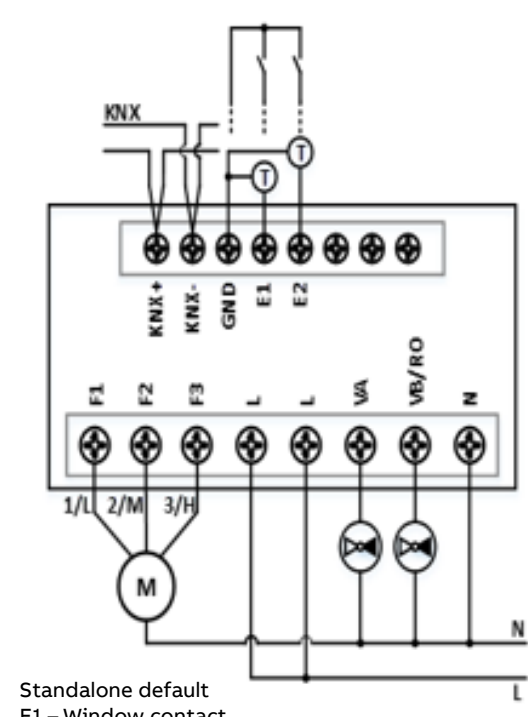
Standalone default
E1 – Window contact
E2 – Temperature sensor NTC 10K

2 pipe/electrical heater



Standalone default
E1 – Window contact
E2 – Temperature sensor NTC 10K

4 pipes

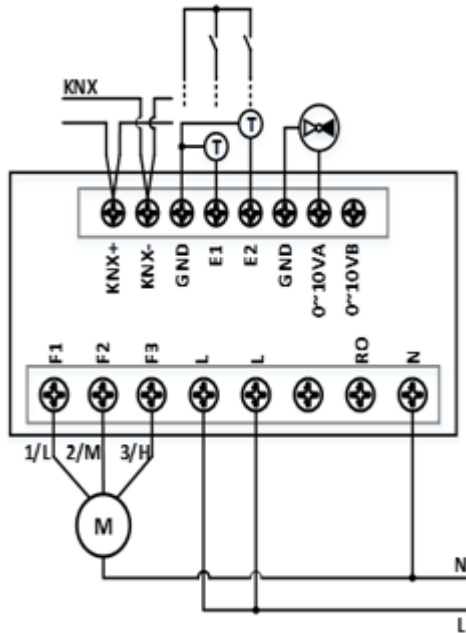


Standalone default
E1 – Window contact
E2 – Temperature sensor NTC 10K

ABB Caldion® Room Temperature Controller

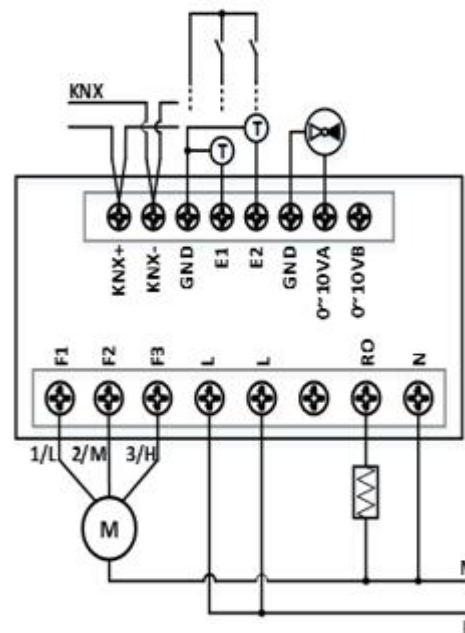
Connection Diagram - 0-10V version and 3 step fan

2 pipe/electrothermal valve



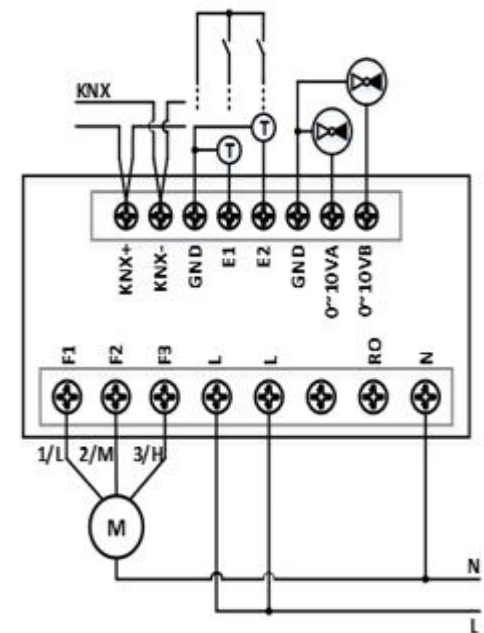
Standalone default
E1 – Window contact
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2 pipe/electrical heater



Standalone default
E1 – Window contact
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4 pipes

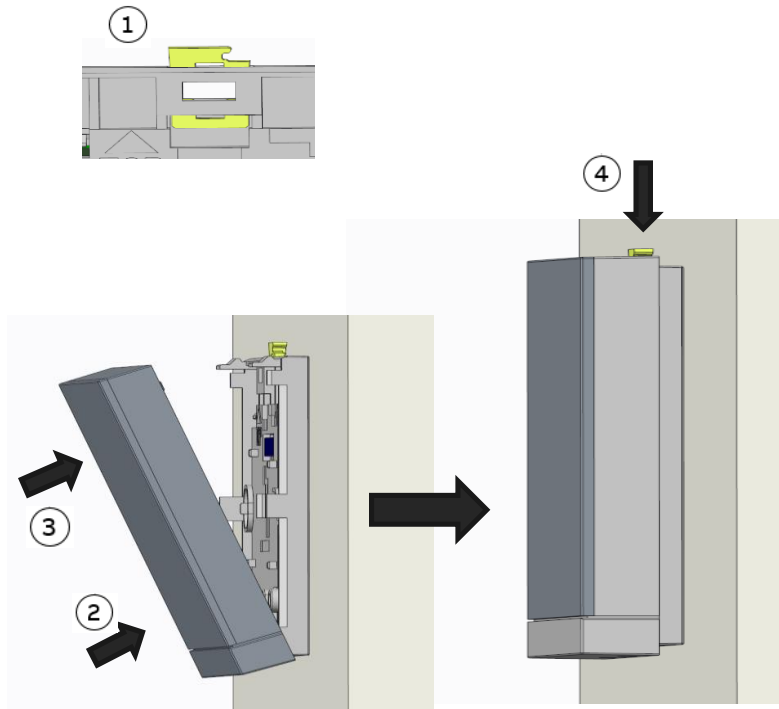


Standalone default
E1 – Window contact
E2 – Temperature sensor NTC 10K

ABB Caldion® Room Temperature Controller

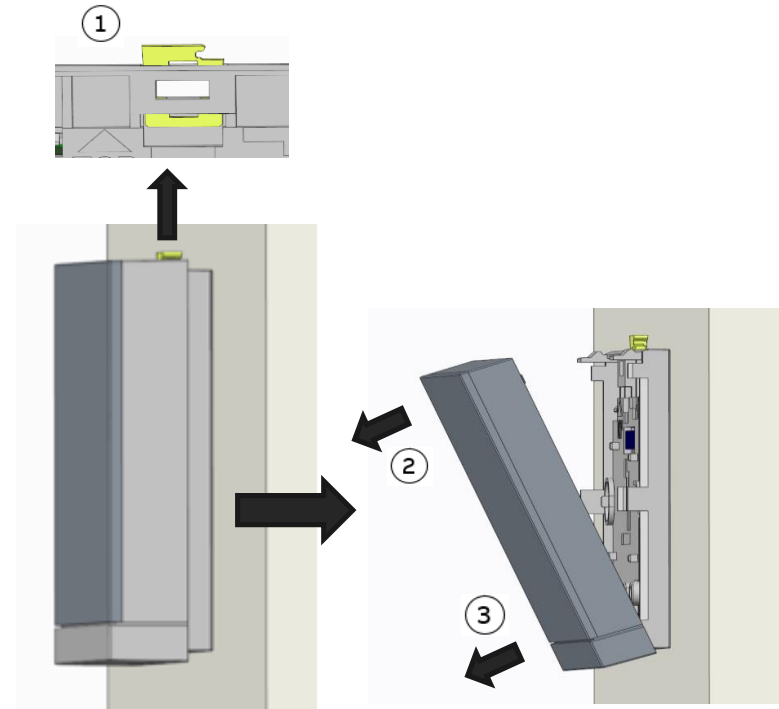
Antitheft concept

To install



1. Use a tool to adjust the antitheft clip to the **correct position** to allow the installation of front cover
2. Secure the front cover starting from the bottom
3. Push the top of the front cover into position
4. Once the front cover is in position, push down the antitheft clip all the way down to secure

To remove



1. Use a tool to adjust the antitheft clip to the **correct position** to allow to remove the front cover
2. Pull the top of the front cover out from the position
3. Once the front cover is out of position, move slightly downward to remove the whole cover

ABB Caldion® Room Temperature Controller

Architecture

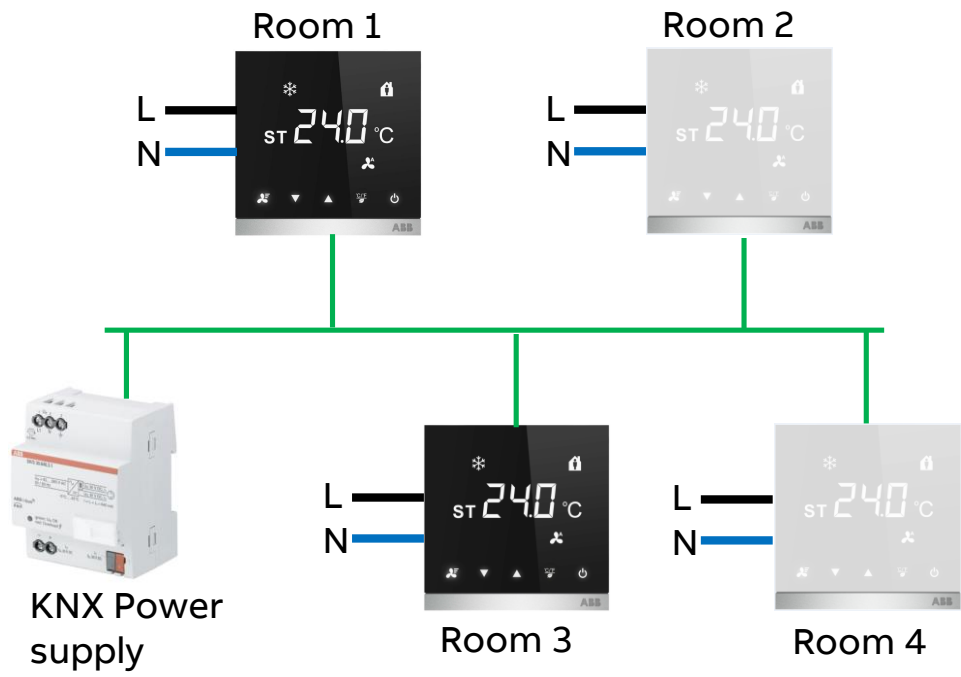
Standalone configuration



- Configuration via DIP switches
- works without KNX power supply
- All options as KNX device with configuration via ETS

DIP Switch	1	2	3
KNX	1	1	1
Cool - 2 pipe (on/off, 0-10v)	1	1	0
Cool - 2 pipe 3pt (on/off)	1	0	1
Heat - 2 pipe (on/off, 0-10v)	0	0	1
Heat - 2 pipe 3pt (on/off)	0	1	0
Heat - 2 pipe w. heater (on/off, 0-10v)	0	1	1
Cool/Heat - 4 pipe (on/off, 0-10v)	0	0	0

KNX configuration



Flexible!! Install as standalone and be future proof to upgrade as system control

ABB Caldion® Room Temperature Controller

Technical Data

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KNX		
Power supply	Rate voltage	AC 230 V (min. AC 110 V), 50/60 Hz
	Power consumption	Max. 3VA
	Maximum allowable input load (fan + valve + electric auxiliary heat) current through phase input (L) terminal	Max. 7A
	KNX bus voltage	21...32VDC
Wire connection	Wiring cross section on L, N, F1, F2, F3, VA, VB	1 x 0.5...2.5mm ²
	Wiring cross section on COM, E1, E2, 0~10VA, 0~10VB, KNX+, KNX-	stranded wires 1 x 0.5...1.5mm ²
Degree of protection	IP 20	EN 60529
Protection class	II	EN 60730-1
Isolation category	Overvoltage category III	EN 60 664-1
	Operating temperature range	-5°C to +50°C
	Transport and Storage temperature	-25°C to +70°C
	Humidity max range	not more than 98%, no dew permissible
Ambient conditions	Maximum air pressure of atmosphere	up to 2000m
	Control output Rating [Resistive(Inductive)] on F1, F2, F3-N; VA/VB -N; RO-N	AC 230 V / Min. 8.3mA, Max. 5(2)A
	Max. total load current through terminal "L" (Fx + Vxx)	Max. 7 A
	Control output load on 0~10VA-COM / 0~10VB-COM	SELV DC 0...10V/ 1.5mA(Max) / > 10kohms
Inputs	Input port E1&E2	10V/1mA
	Input cable length	Maximum 30 m
Exterior	Dimension	86mmL x 86mmW x 16mmD
Standalone		
Inputs	E1	Window contact
	E2	NTC10-01:10K (B-Constant=3936~3976)

Important:

- No internal fuse/External preliminary protection with max. C 10 A circuit breaker in the supply line required under all circumstances
- Caldion require flush mounted installation box with a minimum depth of ≥40mm

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ETS Application

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ETS

ABB Caldion®

ETS Application similar to Fan Coil Controller FCC/S

Parameter block 'General'

– Various parameter for display and buttons

- Display Illumination
- On/Off operation
- Device lock/unlock
- Temperature Display
- ...

2.2.1 CAR/U4 Caldion® Room Temperature Controller, On/Off, FM > General

General	Sending and switching delay after 230V recovery	2 s
– Application	State after sending and switching delay has elapsed	<input checked="" type="radio"/> Last value received <input type="radio"/> Ignore received values
Application parameters	Limit number of telegrams	<input checked="" type="radio"/> No <input type="radio"/> Yes
Device function	Enable group object "In operation", 1-bit	<input checked="" type="radio"/> No <input type="radio"/> Yes
– Temperature controller	Display illumination	<input type="radio"/> Illumination efficiency <input checked="" type="radio"/> Constantly on
+ Temperature controller	Display illumination activate/deactivate by group object	Inactive
+ Setpoint manager	Button icon LED illumination	<input type="radio"/> Illumination efficiency <input checked="" type="radio"/> Constantly on
+ Monitoring and safety	Button icon LED illumination activate/deactivate by group object	Inactive
+ Valve A	Button icon first touch function when device is in standby mode	<input type="radio"/> Awake and send command <input checked="" type="radio"/> Awake device
+ Valve B	Switching on/off control of RTC	<input checked="" type="radio"/> Short press-On/Off, Long press-mode select <input type="radio"/> Short press-mode select, Long press-On/Off
+ Fan output	On/off reaction	<input checked="" type="radio"/> Recovery last setting <input type="radio"/> Default
+ Electric heater relay output	On/Off reaction by group object	Inactive
+ Setpoint adjustment	Device to be lock/unlock by group object	Inactive
+ Input a	Temperature display	<input type="radio"/> Setpoint temp <input checked="" type="radio"/> Actual measure temp
+ Input b	Temperature display units	<input checked="" type="radio"/> °C <input type="radio"/> °F
+ Internal temperature sensor	Switching C/F + ECO control of RTC	<input checked="" type="radio"/> Short press for C/F - Long press for ECO <input type="radio"/> Short press for ECO - Long press for C/F
	Switchover temperature display units via group object	Inactive

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ETS

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- Occupancy presence detection logic (Block Application Parameters)
 - Duration of first checking of presence, e.g. 10 min
 - Duration of second checking of presence before activating ECO mode, e.g. 60 min
 - Presence- and door contact detection via physical device input or group object
 - In 2 pipe configuration only, VB/RO output can be configured as an relay output to energize the power for the room (via a external contactor) like keycard holder

Occupancy presence detection logic	<input checked="" type="radio"/> Activate <input type="radio"/> Deactivate
Door contact detection	<input checked="" type="radio"/> Via physical device-input A <input type="radio"/> Via group object
Duration for first checking of presence	<input type="text" value="00:10:00"/> hh:mm:ss
Duration for second checking of presence before activating ECO mode	<input type="text" value="01:00:00"/> hh:mm:ss
Presence detection	<input checked="" type="radio"/> Via physical device-input B <input type="radio"/> Via group object
To include physical output VB/RO for power energization	<input type="text" value="Deactivate"/>

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Solutions

ABB Caldion® Room Temperature Controller

Possible Solution 1

Standalone , 2 pipe control, with Keycard switch

Input E1: Window contact

- Receiving potential free contact signal indicating that window is open
- RTC will go into building protection operating mode
- Will remain at building protection mode until window is closed
- Default configuration



Input E2: Keycard contact

- Receiving potential free contact signal indicating that guest is in the room
- RTC behavior options:
 1. RTC will change from ECO mode to Comfort mode
 2. RTC will change from Off mode to Comfort mode
- Upon removing potential free contact signal, RTC will go into ECO or Off mode
- Default setpoint for Comfort, ECO mode can be adjusted in ETS
- RTC behavior can be adjusted in ETS
- Keycard contact function need to be configured in ETS

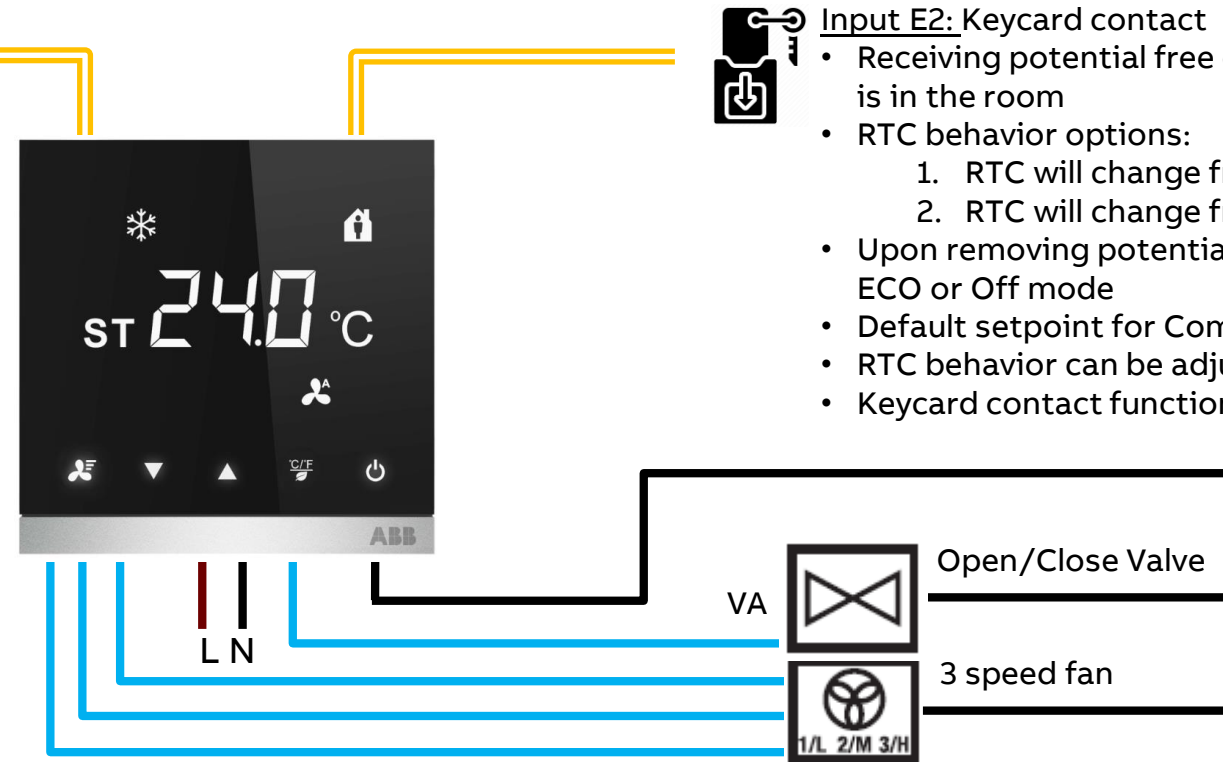


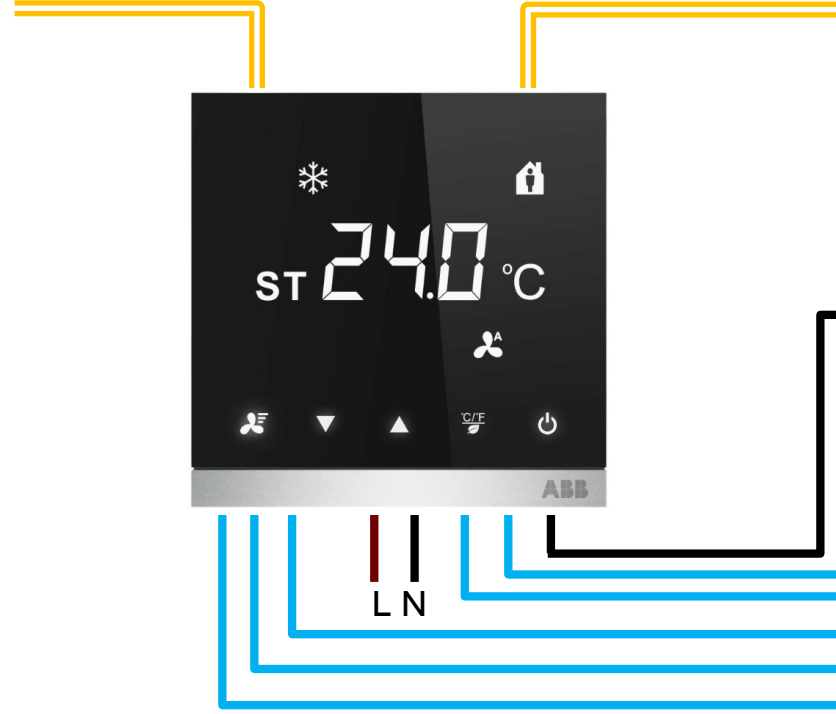
ABB Caldion® Room Temperature Controller

Possible Solution 2

Standalone , 2 pipe control, without keycard switch, using door contact and presence detector

Input E1: Door contact

- Receiving potential free contact signal indicating that guest enters the room
- RTC will go into standby mode
- Remains in standby mode to check for guest presence confirmation from signal by presence detector
- Received contact signal again will retrigger the guest presence confirmation logic
- Door contact function needs to be configured in ETS



Input E2: Presence detector

- Receiving potential free contact signal indicating guest presence confirmation
- RTC behavior options:
 1. RTC will change from ECO mode to Comfort mode
 2. RTC will change from Off mode to Comfort mode
- Default setpoint for Comfort, ECO mode can be adjusted in ETS
- RTC behavior can be adjusted in ETS
- Presence detector function need to be configured in ETS

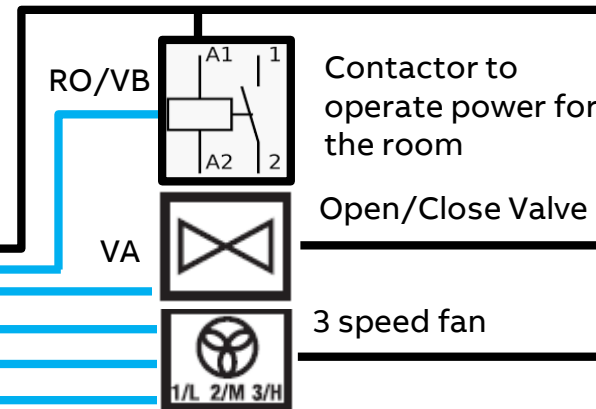


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Possible Solution 3

KNX connection, 2 pipe control, without keycard switch, using door contact and presence detector

Input E1: Options:

1. Receive door contact via group object
 2. Receive door contact via physical contact signal
- Receiving contact signal indicating that guest enters the room
 - RTC will go into standby mode
 - Remains in standby mode to check for guest presence confirmation from presence detector
 - Received contact signal again will retrigger the guest presence confirmation logic



KNX network,
communication
with BMS



L N



Input E2: Options:

1. Receives presence detection via group object
 2. Receives presence detection via physical contact signal
- Received contact signal indicating guest presence confirmation
 - RTC behavior options:
 1. RTC will change from ECO mode to Comfort mode
 2. RTC will change from Off mode to Comfort mode
 - Default setpoint for Comfort, ECO mode can be adjusted in ETS
 - RTC behavior can be adjusted in ETS

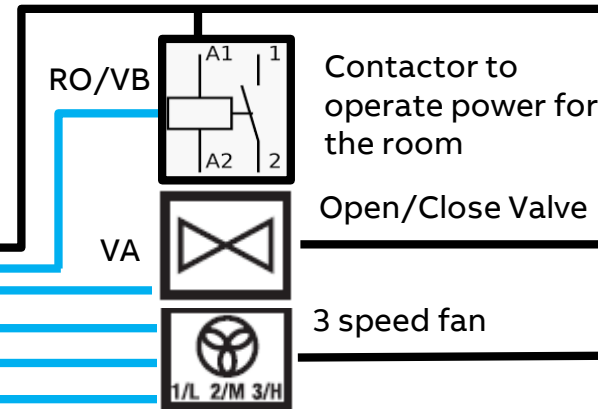


ABB Cالدion® Room Temperature Controller

Commercial and Marketing Aspects

ABB Caldion® Room Temperature Controller

Range

ABB Caldion®

Article Code	Order Code	Type	Colour
CAR/U4.1.1.1-71	2TAZ740010R2001	On/Off valve	Black
CAR/U4.2.1.1-71	2TAZ741010R2001	0 – 10 V valve	Black
CAR/U4.1.1.1-84	2TAZ740010R0001	On/Off valve	White
CAR/U4.2.1.1-84	2TAZ741010R0001	0 – 10 V valve	White

Available in markets with British Standard installation
or countries which allow this installation



ABB Caldion® Room Temperature Controller

Further information

Product Overview

[LINK](#)



Features:

- An integrated (control and actuator) room temperature controller
- One device supports multiple types of application
- Option to select standalone or KNX configurations
- Enhance function configurable via ETS application

Benefits:

- Easy replacement for existing conventional thermostat
- Cost-effective installation
- Intuitive design for ease of controls
- Simple and effective application with option for expansion



Product overview

ABB Caldion®, part of the ABB I-bus® KNX portfolio is a Room-Temperature Controller for fan coil units with either 2 pipes, 2 pipes with electric heater or 4 pipe system application. Flush Mounted, BS standard; it can be installed as a standalone configuration or with built-in integrated bus coupling as a KNX device. It is equipped with a temperature sensor and 2 x binary input for either presence detection, window, dewpoint alarm or condensate alarm. It has an integrated actuator for valve control of on/ off or 0-10V with 3 x fan speed control. It has dedicated capacitive touch control button for intuitive control and mode operation selection. Its frameless design equipped with a large display ensures the ease of viewing and elegance to complement the surrounding.



ABB Caldion®
Black



ABB Caldion®
White

Technical data:	
Rate voltage	AC 230V(min.AC 110V),50/60 Hz
Power consumption	Max. 4 VA
Power supply	Maximum allowable Inputload/fan+valve
	Max. 7 A
KNX bus voltage	21...32 V DC
	1 x 0.5...2.5 mm²
Wire connection	Wiring cross section on L,N,F1,F2,F3,VA,VB
	stranded wires 1x 0.5...1.5 mm²
Degree of protection	IP 20 EN 60529
Protection class	Overvoltage category III EN 60664-1
Ambient conditions	Operating temperature range
	-5°C to +50°C
	Transport and Storage temperature
	-25°C to +70°C
Humidity max range	not more than 98%, no dew permissible
	up to 2000m
Outputs	Control output Rating [Resistive(Inductive)] on F1, F2, F3-N; VA/VB -N; RO-N
	AC 230 V / Min. 8.3 mA, Max. 5(2) A
Inputs	Max. total load current through terminal "L" (Fx + Vxx)
	Max. 7 A
Control output load on 0-10V-A-GND 0-10V-B-GND	SELV DC 0...10 V/ 1.5 mA(Max) / > 10 kohms
	10V/1mA
Input port E1 & E2	10V/1mA
	Input cable length
	Maximum 30 m

Name	Article code	Order code	Type	Colour
ABB Caldion®	CAR/U4.111-71	2TAZ740010R2001	On/off valve	Black
	CAR/U4.211-71	2TAZ741010R2001	0-10v valve	Black
	CAR/U4.111-84	2TAZ740010R0001	On/off valve	White
	CAR/U4.211-84	2TAZ741010R0001	0-10v valve	White

ABB Caldion® Room Temperature Controller

Further information

Product page will all relevant files

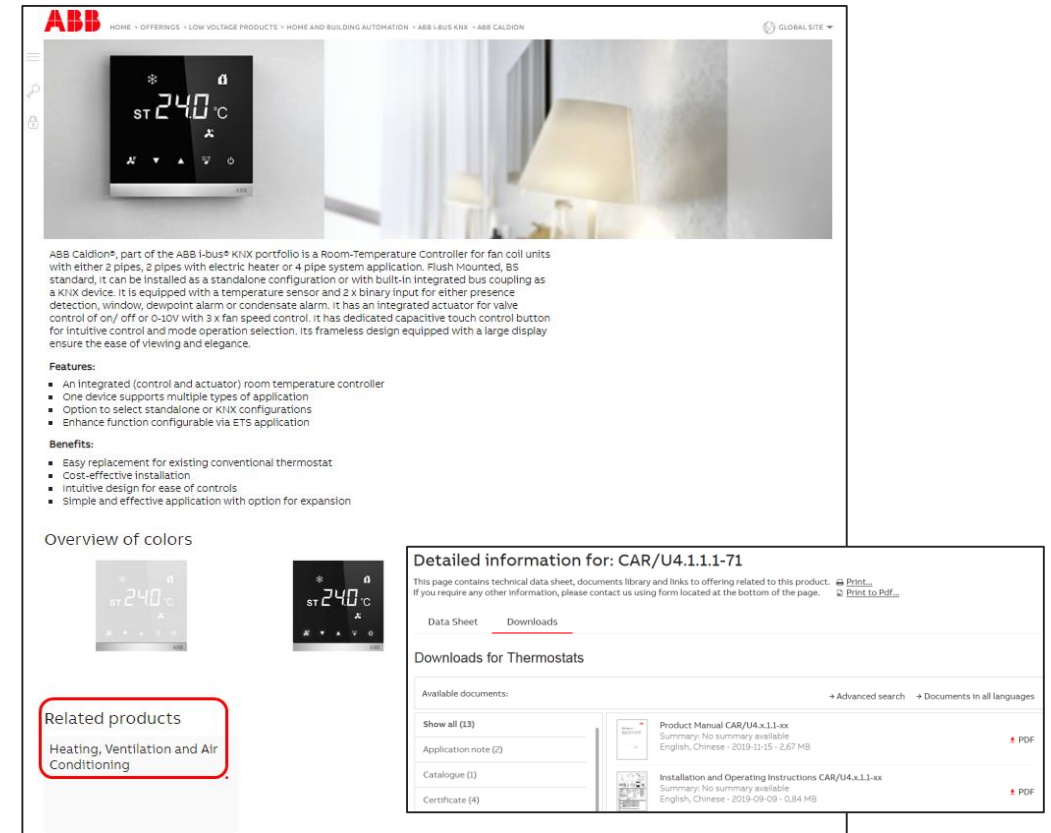
[LINK](#)

Link on this page to *Related Products* (ABB Caldion® Room Temperature Controller” CAR/U) shows all relevant files:

- ETS Application
- Product Manual
- Installation and Operating Instructions
- CE Declaration
- ...

Link works only in countries with availability of this product

Option: Simulate Country via [Country Selector](#)



The screenshot displays the ABB Caldion product page. At the top, the ABB logo is visible alongside a navigation menu with links: HOME, OFFERINGS, LOW VOLTAGE PRODUCTS, HOME AND BUILDING AUTOMATION, ABB-BUS KNX, and ABB CALDION. A 'GLOBAL SITE' dropdown is also present. The main content area features a large image of the Caldion room temperature controller, which has a digital display showing 'ST 24.0 °C'. Below this image, a descriptive paragraph states: 'ABB Caldion®, part of the ABB I-bus® KNX portfolio is a Room-Temperature Controller for fan coil units with either 2 pipes, 2 pipes with electric heater or 4 pipe system application. Flush Mounted, BS standard, it can be installed as a standalone configuration or with built-in integrated bus coupling as a KNX device. It is equipped with a temperature sensor and 2 x binary input for either presence detection, window, dewpoint alarm or condensate alarm. It has an integrated actuator for valve control of on/ off or 0-10V with 3 x fan speed control. It has dedicated capacitive touch control button for intuitive control and mode operation selection. Its frameless design equipped with a large display ensure the ease of viewing and elegance.' Below the text, there are sections for 'Features' and 'Benefits'. The 'Features' section lists: 'An integrated (control and actuator) room temperature controller', 'One device supports multiple types of application', 'Option to select standalone or KNX configurations', and 'Enhance function configurable via ETS application'. The 'Benefits' section lists: 'Easy replacement for existing conventional thermostat', 'Cost-effective installation', 'Intuitive design for ease of controls', and 'Simple and effective application with option for expansion'. Further down, an 'Overview of colors' section shows two color variants of the device. A 'Related products' section is highlighted with a red box, containing the text 'Heating, Ventilation and Air Conditioning'. On the right side, a 'Detailed information for: CAR/U4.1.1.1-71' section provides technical data, documents, and links. It includes a 'Downloads' tab and a list of available documents: 'Show all (13)', 'Application note (2)', 'Catalogue (1)', and 'Certificate (4)'. The 'Product Manual CAR/U4.x.1.1-xx' is listed with a summary: 'No summary available', 'English, Chinese - 2019-11-15 - 2,67 MB', and a PDF icon. The 'Installation and Operating Instructions CAR/U4.x.1.1-xx' is also listed with a summary: 'No summary available', 'English, Chinese - 2019-09-09 - 0,84 MB', and a PDF icon.

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