September 2018

Valve Drive Controller and more

Webinar – Competence Center Europe – Building Automation

Ilija Zivadinovic, Martin Wichary, Juergen Schilder, Thorsten Reibel & Stefan Grosse
Webinar “Valve Drive Controller and more”

Agenda

ClimaECO – new Devices

- Valve Drive Controller VC/S
- Heating/Cooling Circuit Controller HCC/S
- Boiler/Chiller Interface BCI/S
Webinar “Valve Drive Controller and more”

Management & Automation

HVAC Room Automation

Central HVAC Automation

Heating/ Cooling Circuit Controllers
HCC/S

Boiler/ Chiller Interface
BCI/S

Building Automation Controller KNX
BAC/S

Application Controllers
AC/S

User Operation

ClimaECO Sensors
SBS/U

Room Control Units
SAR/A and SAF/A

Fan Coil Controllers
FCC/S

Valve Drive Controllers
VC/S

Split Unit Gateway
SUG/U

Air quality sensor
LGS/A

Controllers

Availability: July – October 2018

A holistic HVAC Building Automation System, over 30 new devices
Webinar “Valve Drive Controller and more”

ClimaECO: ABB i-bus® KNX HVAC Solutions
Valve Drive Controller and more
Valve Drive Controller VC/S
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

Applications Valve control

- Radiator
- Cooling Ceiling
- Floor Heating
- Thermoelectric Valve Drive
- PWM, 2-point
- Valve Drive Controller VC/S
- Room Control Unit
- RTC
- …
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

**Motivation – New Features**

- Two devices for valve control
- With and without manual operation
- Four channels for electrothermal valve drives
- 12 inputs (binary and analogue, 3 each channel), for temperature measurement, dew point sensor, window contact, etc.
- Integrated room temperature controller for conventional Room Control Units (RCU)
- Parametrizable as actuator or controller/actuator
- ABB i-bus Tool support
- Existing valve actuators will be not replaced
- Please note: For connecting motor valve drives electronic actuator ES/S to be used
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

ETS

- Function controller/actuator or only actuator adjustable
- Unified RTC with basic and additional stage heating/cooling
- Forced operation with defined valve position
- PWM or open/close signal
- Valve purge
- Temperature limitation via separate sensor, e.g. to protect a floor against over temperature
- Inputs for temperature sensor, window contact, dew point sensor, fill level sensor or binary contacts parametrizable
# Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

## VC/S 4.2.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Inputs (a, b, c, d, e, f)
7. Inputs (g, h, i, j, k, l)
8. Valve output (A, B, C, D)
9. Button/LED Reset /Failure valve output (A...D)
10. Button/LED activate manual operation
11. LED status display inputs (a, b, c, d, e, f, g, h, i, j, k, l)
12. Button/LED switch/status display valve outputs
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

**Family VC/S 4.x.1 – Functional Overview**

<table>
<thead>
<tr>
<th>Function/Device</th>
<th>VC/S 4.1.1</th>
<th>VC/S 4.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated RTC</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Type of valve control</td>
<td>PWM ON/OFF</td>
<td>PWM ON/OFF</td>
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<tr>
<td>Inputs for binary contacts per channel</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Inputs for temperature per channel</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Connection Room Control Unit (RCU)</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Manual operation</td>
<td>-</td>
<td>X</td>
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</tbody>
</table>
### Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>VC/S 4.x.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Width</strong></td>
<td>8 Modules</td>
</tr>
<tr>
<td><strong>Valve Output</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Nominal Current per channel</strong></td>
<td>0.25 A</td>
</tr>
<tr>
<td><strong>Inrush current</strong></td>
<td>1.6 A for 10 s</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>24 … 230V AC</td>
</tr>
<tr>
<td><strong>Binary Input</strong></td>
<td>12</td>
</tr>
<tr>
<td><strong>Scanning voltage</strong></td>
<td>12V</td>
</tr>
<tr>
<td><strong>Scanning current</strong></td>
<td>1mA</td>
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<tr>
<td><strong>Cable length</strong></td>
<td>&lt; 100m</td>
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<tr>
<td><strong>Analogue Inputs (Temperature)</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>PT100, PT1000</strong></td>
<td>2 wires</td>
</tr>
<tr>
<td><strong>KT, KTY, NI, NTC,</strong></td>
<td>Various resistances</td>
</tr>
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</table>

**Webinar "Valve Drive Controller and more"**

Valve Drive Controller VC/S
# Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

## Type Description

<table>
<thead>
<tr>
<th>V</th>
<th>C</th>
<th>/S</th>
<th>4.</th>
<th>x.</th>
<th>1</th>
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<table>
<thead>
<tr>
<th>1</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No manual operation</td>
</tr>
<tr>
<td>2</td>
<td>Manual Operation</td>
</tr>
<tr>
<td>4</td>
<td>4 channels</td>
</tr>
<tr>
<td>/S</td>
<td>MDRC</td>
</tr>
<tr>
<td>C</td>
<td>Controller</td>
</tr>
<tr>
<td>V</td>
<td>Valve Drive</td>
</tr>
</tbody>
</table>
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Valve Drive Controller VC/S

**Family VC/S 4.x.1**

- VC/S 4.2.1
- 2CDG 110 217 R0011
- List price: 520 Euro
- Availability: September 2018

- VC/S 4.1.1
- 2CDG 110 216 R0011
- List price: 380 Euro
- Availability: September 2018
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Valve Drive Controller VC/S

Comparision VC/S – VAA/S and ES/S

- Integrated temperature controller
- Possibility to connect cost efficient Room Control Units SAR/A
- Integrated inputs
- Part of the ClimaECO solution
- ABB i-bus Tool support

- Valve Drive Actuator VAA/S to be used if more channels are required
- Electronic Switch Actuator ES/S to be used if connection of motor valve drives is required

- VAA/S and ES/S will be **not** phased out!
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

VC/S linked with RCU

VC/S 4.x.1
Working as Controller

Direct link
Set point and room temperature
One way communication

SAR/A
Room Control Unit (non KNX)
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Valve Drive Controller VC/S

Connection VC/S - RCU

4 wires required
- 2 wires for setpoint input a (mandatory)
  - Input in VC/S is parametrized as ‘used as analogue RCU input’
- 2 wires for room temperature input b
  - optional, can come also from another sensor, e.g. presence detector
  - ETS parameter of input in VC/S to be adjusted as temperature sensor
  - Type of temperature sensor NTC, NTC type NTC20
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Valve Drive Controller VC/S

VC/S linked with KNX Room Temperature Controller (RTC)

VC/S 4.x.1
Working as Actuator

KNX link
All option regarding communication
Two way communication

ClimaECO sensor with RTC
or any other RTC
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

VC/S linked with KNX Room Temperature Controller (RTC)

VC/S 4.x.1
Working as Controller

KNX link
All option regarding communication
Two way communication

ClimaECO sensor ‘RTC slave’
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

VC/S linked with ClimaECO sensors with temperature sensor

VC/S 4.x.1
Working as Controller

KNX link
All option regarding communication
Two way communication

ClimaECO sensor/RTC Slave

both with temperature sensor
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Valve Drive Controller VC/S

Assignment Controller - Actuator

VC/S 4.x.1

Parametrized as:
- **ACTUATOR**

Analogue Inputs
(Setpoint/Room temperature)

VC/S 4.x.1

Parametrized as:
- **CONTROLLER**

Analogue Inputs
(Setpoint/Room temperature)

... any KNX RTC

... Temperature sensor, e.g. via analogue input or ClimaECO sensor RTC slave

... Room Control Unit SAR/A or temperature sensor linked to input of VC/S
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Valve Drive Controller VC/S - ABB i-bus tool

- General
  - Channel function
  - Current room temperature
  - Controller channel

- Status
  - Forced operation active
  - Valve purge active

- Heating/Cooling actuating value
  - Basic stage cooling
  - Additional stage cooling
  - Heating/cooling type
    - 4-pipe

- Cyclical monitoring
  - Activated

- Alerts
  - No alerts monitored

- IP devices
  - Supported devices

- Active Heating / Cooling mode
  - Cooling

Above display is status only - no control here
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S - ABB i-bus tool

<table>
<thead>
<tr>
<th>Channel A</th>
<th>Channel B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td><strong>Temperature</strong></td>
</tr>
<tr>
<td>Current room temperature</td>
<td><strong>Set point temperature</strong></td>
</tr>
<tr>
<td><strong>Active Heating / Cooling mode</strong></td>
<td><strong>Control values settings</strong></td>
</tr>
<tr>
<td><strong>Current operating mode</strong></td>
<td><strong>Heating/Cooling actuating value</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value overwritten</strong></td>
<td></td>
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</tbody>
</table>
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S - ABB i-bus tool
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S - ABB i-bus tool
Webinar "Valve Drive Controller and more"

Valve Drive Controller VC/S

Technical documents

[www.abb.com/KNX]

→ Product category
  → Heating, Ventilation, Air Conditioning
  → VC/S

→ Product Manual
→ Technical datasheet
→ Installation and operating instructions
→ Specification Text
→ ETS Application
→ Application Note
→ CE declaration of conformity
→ ...
Valve Drive Controller and more
Heating/Cooling Circuit Controller HCC/S
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

Why Heating Cooling Circuits in a Heating/Cooling System?

In a heating/cooling system the hot/cold water has to be distributed to various units in a building.

Units can be separate flats in a residential building, individual departments/shops in a commercial building, particular circuits for radiator or floor heating/cooling ceiling and more.

Requirements of these units: Individual consumption and measurement, different water temperature and pressure or pipes, turn off of the circuit (pump off and valve closed) and more.

A Heating Cooling circuit Controller together with the valve, pump and temperature sensors can handle these requirements.

→ For a holistic and energy efficient approach HCC/S 2.x.x.1 from ABB based on KNX.
Principle Heating/Cooling Circuit

Heating/cooling distribution circuit

Measurement flow temperature

Measurement return flow temperature

Distribution circuit circulation pump

3-way mixing valve

Distributor

Collector

Boiler/Chiller Unit
Example: Heating System with Heating Circuits
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Heating/Cooling Circuit Controller HCC/S (Chiller Control)

Outside Temperature (ASM/WebUI/BACnet input)

Module Cooling Distribution Circuit in Application Contr.

- Adjustable curve
- Minimum supply temp.
- Switch off if no room demand
- Status
- Override by WebUI

Flow temperature dep. on outside temp.

Set Point Flow Temperature

Heating Cooling Circuit Controller HCC/S

- PI controller
- Pump ON/OFF
- Temperature Measurement
- Status/Failure

Control Value Valve
(0-10V or open/close contacts)

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Heating/Cooling Circuit Controller HCC/S (Boiler Control)

Flow temperature dep. on outside temp.

Room demand optimization depending on max. room control value
- Increase supply temperature
- Decrease supply temperature
- Switch off
- ...

Outside Temperature (ASM/WebUI/BACnet input)

- Adjustable curve
- Radiator Exponent DIN4703
- Eco Mode depending on Scheduler or current room set points

Module Heating Circuit Controller in Application Controller

Set Point Flow Temperature

- PI controller
- Pump ON/OFF
- Temperature Measurement
- Status/Failure

Heating Cooling Circuit Controller HCC/S

Control Value Valve (0-10V or open/close contacts)

Boiler
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

Motivation – Features

- Control of Heating/Cooling Circuits
- Expansion of ABB i-bus KNX to the Automation level
- Expansion of ABB i-bus KNX to the Distribution level
- Necessary for a holistic approach of a HVAC solution completely with ABB i-bus KNX (Automation- and Distribution level)
- Control of 3-way valves for 0 - 10 V motor
- Control of 3-way valves for 3 point motor
- Control of pump of the heating cooling circuit
- Control of pump depending on control value
- Measurement of flow- and return flow temperature via analogue inputs
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

Motivation – Features

- 3 binary inputs each channel for status messages pump or other functions
- Integrated PI-controller
- Controller or actuator
- Forced operation
- With or without manual operation
- Two independent channels in one HCC/S:
  - two heating/cooling circuits
  - One heating/cooling circuit with double pump mode (Redundancy)
- 4 devices with/without manual operation and for 0-10V/3-point mixing valve drives
- ABB i-bus Tool support
## ETS features

- Function controller or actuator adjustable
- Programmable PI-controller for mixing valve
- Adjustable temp. accuracy and valve movem.
- Forced operation (valve position/pump status)
- Valve purge
- Control of pump depending on control value, e.g. pump off when control value below 5 %
- Run-on time for pump
- Close valve when pump shut down
- Double pump with dedicated parameters
- Inputs for pump status or free use
- Safety shut down, e.g. to limit the temperature of a floor
- Valve signal 0-10V, 1-10V, 2-10V, 10-0V
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

**Family HCC/S 2.x.x.1**

<table>
<thead>
<tr>
<th>Model</th>
<th>Channels</th>
<th>Valve Drive</th>
<th>Temp. Inputs/Channel</th>
<th>Binary Inputs/Channel</th>
<th>Manual Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCC/S 2.1.1.1</td>
<td>2</td>
<td>0-10 V</td>
<td>2</td>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>HCC/S 2.1.2.1</td>
<td>2</td>
<td>0-10 V</td>
<td>2</td>
<td>3</td>
<td>Manual</td>
</tr>
<tr>
<td>HCC/S 2.2.1.1</td>
<td>2</td>
<td>Motor</td>
<td>2</td>
<td>3</td>
<td>No</td>
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<tr>
<td>HCC/S 2.2.2.1</td>
<td>2</td>
<td>Motor</td>
<td>2</td>
<td>3</td>
<td>Manual</td>
</tr>
</tbody>
</table>
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

HCC/S 2.2.x.1 (Motor Valve Drive)

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Relais output (Pump) channel A
7. Temperature inputs channel A
8. Binary inputs (Pump) channel A
9. Valve output channel A
10. Relais output (Pump) channel B
11. Temperature inputs channel B
12. Binary inputs (Pump) channel B
13. Valve Output channel B
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

HCC/S 2.1.x.1 (0-10 V Valve Drive)

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Relais output (Pump) channel A
7. Temperature inputs channel A
8. Binary inputs (Pump) channel A
9. Valve output channel A
10. Relais output (Pump) channel B
11. Temperature inputs channel B
12. Binary inputs (Pump) channel B
13. Valve Output channel B
## Family HCC/S 2.x.x.1 – Functional Overview

<table>
<thead>
<tr>
<th>Function/device</th>
<th>HCC/S 2.1.1.1</th>
<th>HCC/S 2.1.2.1</th>
<th>HCC/S 2.2.1.1</th>
<th>HCC/S 2.2.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated temperature controller for heating or cooling mixing circuits</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type of valve actuation</td>
<td>0-10 V</td>
<td>0-10 V</td>
<td>3-point (motor-driven)</td>
<td>3-point (motor-driven)</td>
</tr>
<tr>
<td>Inputs for sensors per channel</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Inputs for temperature measurement</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Inputs for pump status</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Pump output per channel</td>
<td>1</td>
<td>1</td>
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<td>1</td>
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<tr>
<td>Relay (5 A)</td>
<td></td>
<td>x</td>
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<tr>
<td>Manual operation</td>
<td></td>
<td></td>
<td>-</td>
<td>x</td>
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</table>
## Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

### Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>HCC/S 2.x.x.1</th>
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</thead>
<tbody>
<tr>
<td><strong>Width</strong></td>
<td>6 Modules</td>
</tr>
<tr>
<td>Valve Output (Motor, 3point)</td>
<td>2</td>
</tr>
<tr>
<td>Nominal Current per channel</td>
<td>0.25 A</td>
</tr>
<tr>
<td>Inrush current</td>
<td>1.6 A for 10 s</td>
</tr>
<tr>
<td>Voltage</td>
<td>24 ... 230V AC</td>
</tr>
<tr>
<td>Valve Output (0-10V DC)</td>
<td>2</td>
</tr>
<tr>
<td>Load</td>
<td>&gt; 10 kOhm</td>
</tr>
<tr>
<td>Current (limited)</td>
<td>&lt; 1.5 mA</td>
</tr>
<tr>
<td>Output Pump</td>
<td>2</td>
</tr>
<tr>
<td>Current (resistive load)</td>
<td>5 A</td>
</tr>
<tr>
<td>Binary Input</td>
<td>6</td>
</tr>
<tr>
<td>Scanning voltage</td>
<td>12V</td>
</tr>
<tr>
<td>Scanning current</td>
<td>1mA</td>
</tr>
<tr>
<td>Cable length</td>
<td>&lt; 100m</td>
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<tr>
<td>Analogue Inputs (Temperature)</td>
<td>4</td>
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<tr>
<td>PT100, PT1000</td>
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<td>KT, KTY, NI, NTC,</td>
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</tbody>
</table>
### Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

<table>
<thead>
<tr>
<th>Type Description</th>
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<tbody>
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<td><strong>H</strong></td>
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<tr>
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</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

/\ **/S** MDRC

/\ **C** Controller

/\ **C** Cooling

/\ **H** Heating
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Heating/Cooling Circuit Controller HCC/S

**Family HCC/S 2.x.x.2**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>List Price</th>
<th>Availability</th>
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<tbody>
<tr>
<td>HCC/S 2.1.1.1</td>
<td>2CDG 110 218 R0011</td>
<td>480 Euro</td>
<td>available</td>
</tr>
<tr>
<td>HCC/S 2.1.2.1</td>
<td>2CDG 110 219 R0011</td>
<td>580 Euro</td>
<td>available</td>
</tr>
<tr>
<td>HCC/S 2.2.1.1</td>
<td>2CDG 110 220 R0011</td>
<td>480 Euro</td>
<td>available</td>
</tr>
<tr>
<td>HCC/S 2.2.2.1</td>
<td>2CDG 110 221 R0011</td>
<td>580 Euro</td>
<td>available</td>
</tr>
</tbody>
</table>
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

HCC/S linked in KNX with …

AC/S
Application Controller

Set point
(from Application controller AC/S or from outside (BMS/BACnet))

HCC/S 2.x.x.1
Working as Controller

Various telegrams
(e.g. switching heating/cooling, Reset fault, valve purge, …)

Various telegrams
(Status and fault information, temperature value, …)
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Heating/Cooling Circuit Controller HCC/S

HCC/S linked in KNX with …

AC/S
Application Controller

Controller

Set point

Control value

HCC/S 2.x.x.1
Working as Actuator

Various telegrams
(e.g. switching heating/cooling, Reset fault, valve purge, …)

Various telegrams
(Status and fault information, temperature value, …)

e.g. Logic Controller ABA/S
or ASM Automation in AC/S
or Building Automation Controller
BAC/S or via BACnet
**Webinar "Valve Drive Controller and more"**

**Heating/Cooling Circuit Controller HCC/S**

**Single pump**

One pump per Heating/Cooling Circuit (standard)

- Operation via relay contact in HCC/S
- If available from the pump, connected via binary input of HCC/S:
  - Pump running (Status pump)
  - Pump fault
  - Repair switch pump (pump manually switched)
- ETS parameter: pump running depending on control value threshold, follow up time, closing valve when pump off
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

**Double pump**

Two pumps per Heating/Cooling Circuit (Redundancy)
- Operation via relay contacts in HCC/S
- Channel 1 main pump, channel 2 backup pump or vice versa
- **Change of running pump** in case of failure takes place automatically
- **Weekly change** between both pumps possible
- Manual change via telegram anytime possible

- **In case of double pump:**
  - Channel 2 only inputs and relay
  - Only one controller, only one heating/cooling circuit left
Webinar "Valve Drive Controller and more"
Heating/Cooling Circuit Controller HCC/S - ABB i-bus Tool
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S - ABB i-bus Tool
Webinar "Valve Drive Controller and more"

Heating/Cooling Circuit Controller HCC/S

Technical documents

www.abb.com/KNX

→ Product category
   → Heating, Ventilation, Air Conditioning
      → HCC/S

- Product Manual
- Technical datasheet
- Installation and operating instructions
- Specification Text
- ETS Application
- Application Note
- CE declaration of conformity
- ...
Valve Drive Controller and more
Boiler/Chiller Interface BCI/S
**Why Boiler/Chiller Control in a Heating/Cooling System?**

In a heating/cooling system hot/cold water has to be generated with the right amount and temperature to be distributed to various circuits/units in a building.

A boiler or chiller produces the tempered water but has to be controlled depending on the demand of the total heating/cooling system.

→ For a holistic and energy efficient approach, Boiler Chiller Interface BCI/S 1.1.1 from ABB based on KNX
How does the Boiler/Chiller Interface function in a Heating/Cooling System?

A boiler or chiller offers typically 0-10V interface in order to control the water temperature or power.

- **Standard solution on the market:**
  - Connection of outdoor temperature sensor, boiler/chiller temperature to be adjusted depending on outside temperature
  - Connection of indoor temperature sensor in a reference room

- **Both solutions do not consider the real Heat/Cool demand of the complete system**

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Boiler/Chiller Interface BCI/S

How does the Boiler/Chiller Interface function in a Heating/Cooling System?

- The BCI, supported by the Application Controller AC/S, is able to control the temperature/power of the boiler/chiller depending on the real demand.
- Beside the provision of 0-10V for boiler/chiller temperature or power BCI/S controls the pump (depending on actuating value to the boiler/chiller), transmits status information (pump) and temperature values (Flow/Return flow).
- The main intelligence (especially to provide the right control value) is located in the Application Controller AC/S (ASM‘s Boiler Heat generator and Chiller).
  - It means, no controller inside boiler/chiller interface.
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Boiler/Chiller Interface BCI/S (Heating Control)

1. **Without Heating Circuit control:** Outside Temperature (or ASM/WebUI/BACnet input)

2. **With Heating Circuit control:** Maximum Control Value from the actuators in the rooms

- **Flow temperature dep. on outside temp.**
  - Adjustable curve
  - Radiator Exponent DIN4703
  - Eco Mode depending on Scheduler or current room set points

- **Room demand optimization depending on max. room control value**
  - Increase supply temperature
  - Decrease supply temperature
  - Switch off
  - …

- **Control Value Boiler Power or Temperature**
  - Boiler ON/OFF
  - Pump ON/OFF
  - Temperature Measurement
  - Status/Failure

- **Boiler Chiller interface BCI/S**

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Webinar "Valve Drive Controller and more"

Boiler/Chiller Interface BCI/S (Cooling Control)

1. Without Cooling Circuit control: Outside Temperature (or ASM/WebUI/BACnet input)
2. With Cooling Circuit control: Maximum Control Value from the actuators in the rooms
Webinar "Valve Drive Controller and more"

Boiler/Chiller Interface BCI/S

**Motivation – Features**

- Control of a Boiler/Chiller and main pump
- Expansion of ABB i-bus KNX to the Automation level
- Expansion of ABB i-bus KNX to the Generation level
- Necessary for for a holistic approach of a HVAC solution completely with ABB i-bus KNX (Automation- and Generation level)
- Control of necessary water temperature (set point) in the boiler/chiller via 0-10V
- Turn on/off of boiler/chiller
- Turn on/off of pump of the main heating/cooling circuit
- Measurement of flow- and return flow temperature
Webinar "Valve Drive Controller and more"

Boiler/Chiller Interface BCI/S

Motivation – Features

- 0-10 V output for control value boiler/chiller
- Two relay outputs for boiler/chiller and pump
- Binary inputs for status or other functions
  - 2 binary inputs failure, status boiler/chiller
  - 3 binary inputs failure, status, repair switch pump
  - 2 analogue inputs for flow- and return flow temperature
- One device without manual operation
- → I/O device for boilers and chillers with dedicated functions for it’s purpose
- No controller inside, it’s an interface, therefore no interference with the internal safety mechanism of the boiler or chiller unit
- ABB i-bus Tool support
**ETS features**

- Forced operation with defined control value (power or temperature for boiler/chiller) and pump status
- Control of pump depending on control value, e.g. pump off when value below 2 %
- Run-on time for pump
- Control value zero when pump shut down
- Start- and exit flow temperature for boiler/chiller control
- Inputs for pump or boiler/chiller status or free use
- Adjustable 0-10V output for boiler/chiller control value
BCI/S 1.1.1

1. Label carrier
2. KNX programming button
3. KNX programming LED (red)
4. KNX connection
5. Cover cap
6. Binary inputs (c, d, e, f, g)
7. Relay output A (Pump)
8. Relay output B (Boiler/Chiller)
9. Boiler (Heat Generator)/Chiller
10. Analog Output C (Set point to Boiler/Chiller)
11. Temperature input (a, b)
## Technical Data

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### Webinar "Valve Drive Controller and more"

Boiler/Chiller Interface BCI/S

#### BCI/S 1.1.1 – Type Description

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Boiler/Chiller Interface BCI/S

BCI/S 1.1.1
- Ident No. 2CDG 110 222 R0011
- List price: 380 Euro
- Availability: October 2018
Webinar "Valve Drive Controller and more"

Boiler/Chiller Interface BCI/S

BCI/S linked in KNX with ...

**AC/S**
Application Controller

Temperatur Value for Generator
(from ASM HeatGenerator or Chiller in AC/S)

BCI/S 1.1.1

Various telegrams
(e.g. switching relay, forced operation, ...)

Various telegrams
(Status and fault information, temperature value, ...)

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KNX Certified Training
Certified KNX Courses in Heidelberg
- Tutor Course 09th to 13th Oct.
- Basic Course: 05th to 09th Nov.

And many more training courses in the calendar “International Training Dates 2018”

www.abb.com/knx or https://go.abb/ba-training
Webinar "Valve Drive Controller and more"

Next Webinar

**EQmatic – Energy Analyzer QA/S**

- Energy Analyzer
  - M-Bus QA/S 3.x.1
  - Modbus QA/S 4.x.1 – new!
- New Firmware-Update
  - Modbus/TCP (for data transfer to other systems)
  - Scheduled data sending

**Wednesday 19th September 2018**

- Morning 09:00 am Europe Time (Berlin, UTC + 2h)
- Afternoon 03:00 pm Europe Time (Berlin, UTC + 2h)
Webinar "Valve Drive Controller and more"

Next Webinar

ClimaECO – Devices

New ClimaECO devices:
- Application Controller AC/S 1.x.1

The heart of ClimaECO
- Web User- and BACnet interface
- Pre-defined and freely programmable automation functions

Wednesday 10th Oktober 2018
- Morning 09:00 am Europe Time (Berlin, UTC + 2h)
- Afternoon 03:00 pm Europe Time (Berlin, UTC + 2h)
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