PRODUAL
measure - be sure.

Application note AN007.1

CU-LH: Standard applicaton

Outputs

AD1: 24 Vac PWM, heating (pulse width is 90 s)
AD2: 24 Vac PWM, cooling (pulse width is 90 s)
AO3: 0...10 V, VAV, CO_2 /T (maximum control)
AO4: 0...10 V, EC fan coil, 3-steps

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Inputs

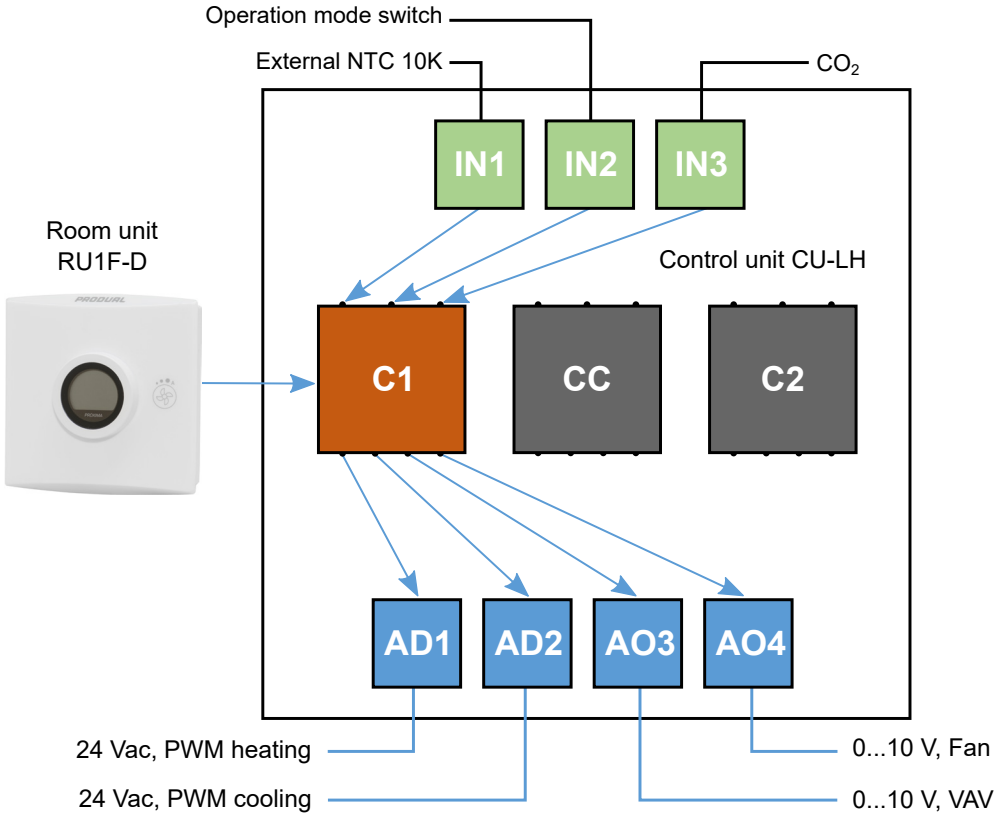
IN1: NTC 10K, external temperature
IN2: Contact switch (NO), operation mode switch
IN3: 0...10 V, external CO_2 transmitter value

Controller (C1)

Dead zone, day	1.0 °C
Dead zone, night	3.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Room units

Setpoint center	21.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K



PRODUAL
measure-be sure.

Application note AN007.2

CU-LH: 6-way valve control

Outputs

AD1: 0...10 V, 0...4.7 V cooling, 7.3...10 V heating
AD2: 0...10 V, 0...4.7 V heating, 7.3...10 V cooling
AO3: 0...10 V, VAV
AO4: 0...10 V, fan coil

Inputs

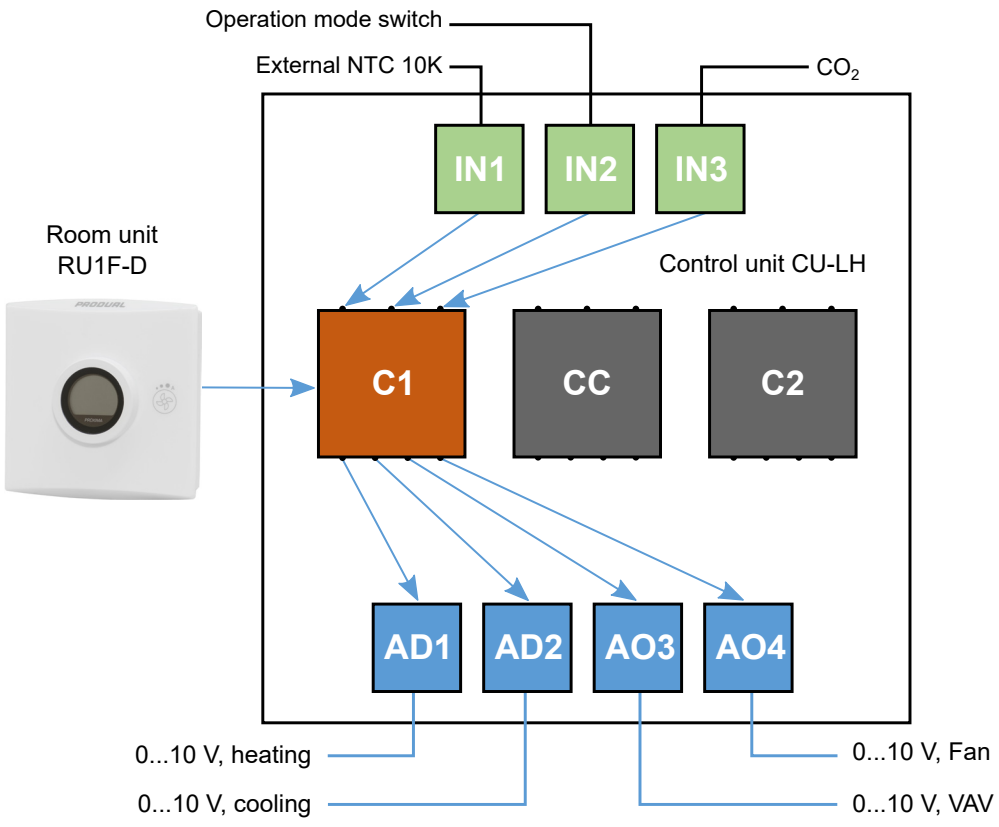
IN1: NTC 10K, external temperature
IN2: Contact switch (NO), operation mode switch
IN3: 0...10 V, external CO_2 transmitter value

Controller (C1)

Dead zone, day	1.0 °C
Dead zone, night	3.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Room units

Setpoint center	21.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K



Application note AN007.3

CU-LH: 3-point heating actuator control, 0...10 V cooling and VAV

Outputs

AD1: 24 Vac, heating, 3-point raise (+), runtime 180 s
AD2: 24 Vac, heating, 3-point lower (-)
AO3: 0...10 V, cooling
AO4: 0...10 V, VAV, CO_2 / T (maximum control)

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Change AD1 to cooling and AO3 to heating if cooling and heating needs to be swapped (requires Produal MyTool® Android application and MyTool Connect Bluetooth dongle, or BMS communication)

Inputs

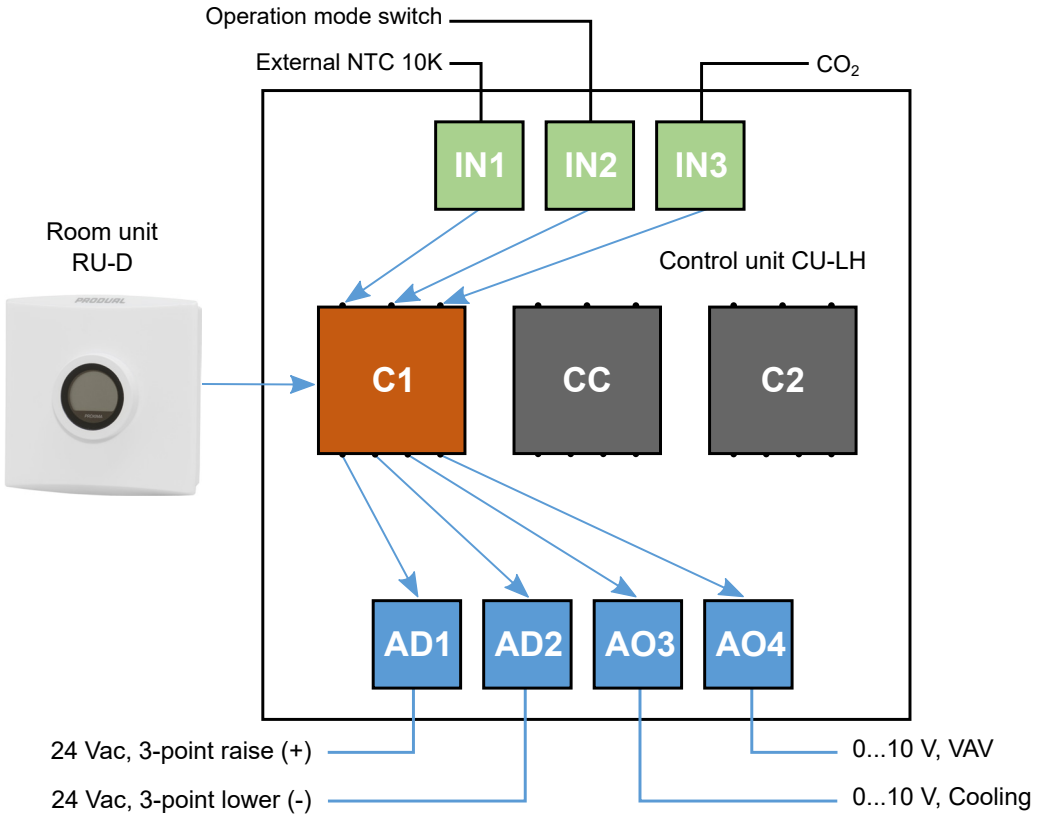
IN1: NTC 10K, external temperature
IN2: Contact switch (NO), operation mode switch
IN3: 0...10 V, external CO_2 transmitter value

Controller (C1)

Dead zone, day	1.0 °C
Dead zone, night	3.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Room units

Setpoint center	21.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K



PRODUAL
measure-be sure.

Application note AN007.4

CU-LH: Hotel room with cooling, heating, fan control and VAV

Outputs

AD1: 24 Vac PWM, heating (pulse width is 90 s)
AD2: 24 Vac PWM, cooling (pulse width is 90 s)
AO3: 0...10 V, VAV, CO_2 /T / RH% (maximum control)
AO4: 0...10 V, EC fan coil, 3-steps

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Inputs

IN1: NTC 10K, external temperature
IN2: Contact switch (NO), operation mode switch
40 minutes off timer from day mode to night mode
IN3: 0...10 V, external CO_2 transmitter value
CO_2 signal will open VAV between 700...1200 ppm

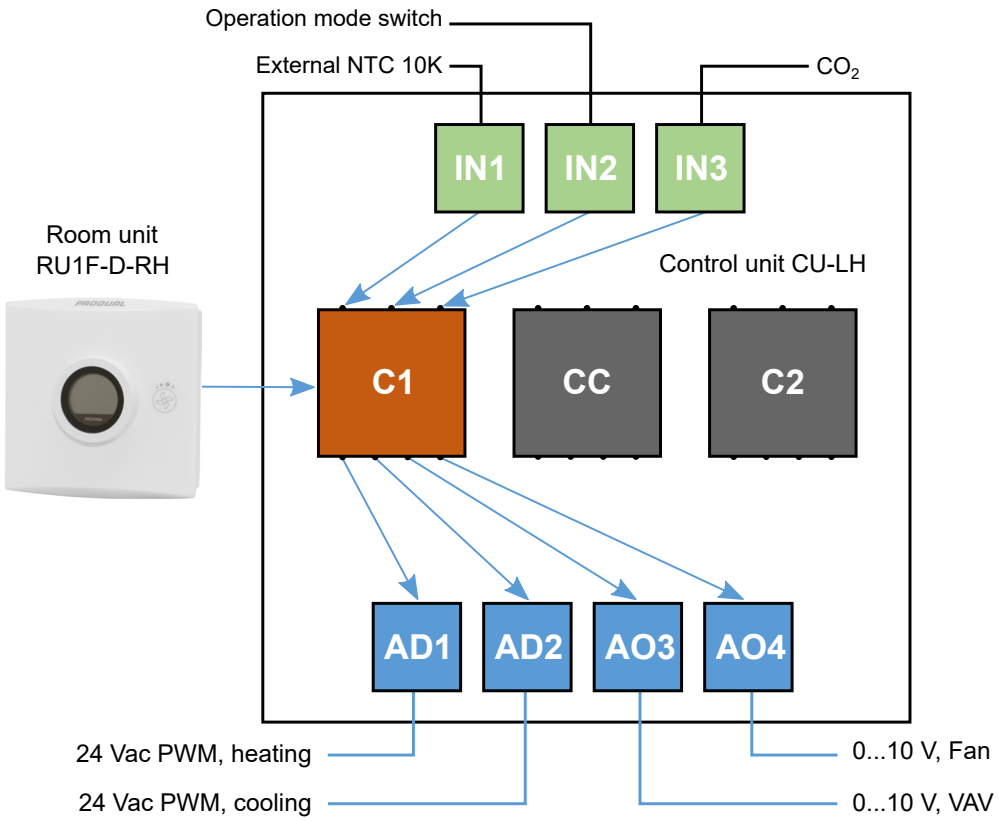
Controller (C1)

Dead zone, day (guest in)	0.5 °C
Dead zone, night (guest out)	1.0 °C
Dead zone, eco (checked out)	2.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Eco mode (unbooked) must be set from BMS, since IN2 switches between day and night modes. When entering eco mode, the setpoint is set to 22.0°C

Room units

Setpoint center	22.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K



Application note AN007.5

CU-LH: Cooling, heating, VAV control, room unit with CO_2

Outputs

AD1: 24 Vac PWM, heating (pulse width is 90 s)
AD2: 24 Vac PWM, cooling (pulse width is 90 s)
AO3: 0...10 V, VAV, CO_2 /T (maximum control)

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Inputs

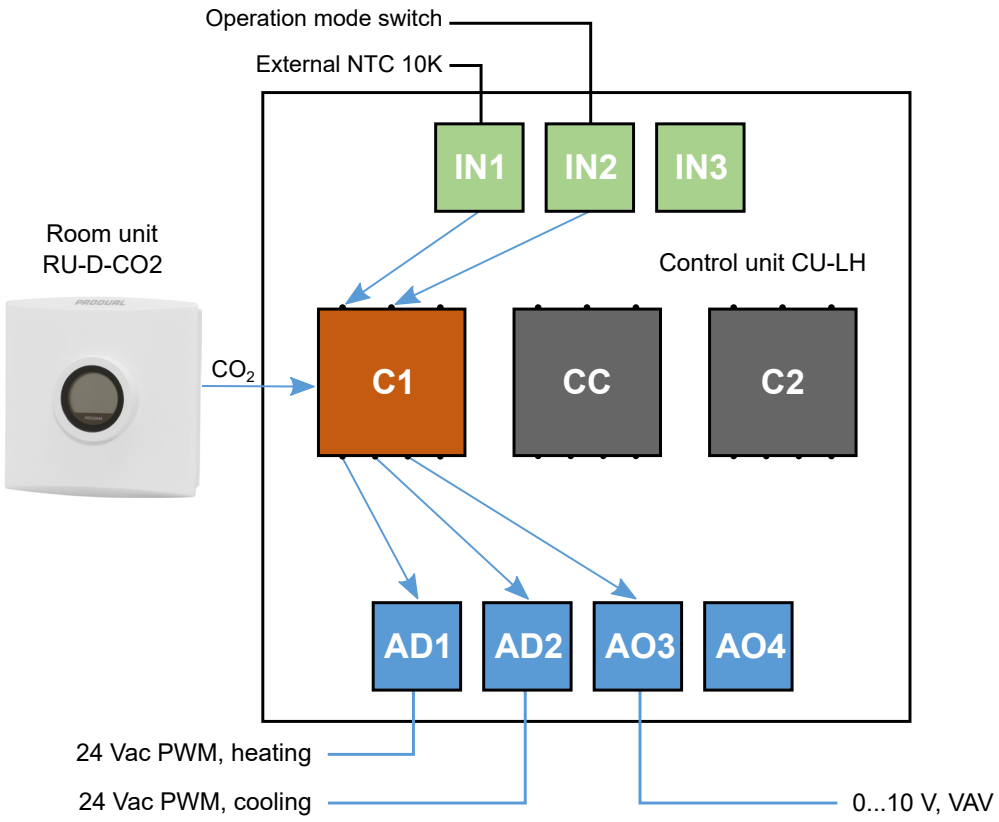
IN1: NTC 10K, for external temperature
IN2: Contact switch (NO), operation mode switch

Controller (C1)

Dead zone, day	1.0 °C
Dead zone, night	3.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Room units

Setpoint center	21.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K
CO_2 range	700...1200 ppm



PRODUAL
measure-be sure.

Application note AN007.6

CU-LH: VAV control with external CO_2, temperature and setpoint

Outputs

AD1: 24 Vac PWM, heating (pulse width is 90 s)
AD2: 24 Vac PWM, cooling 1 (pulse width is 90 s)
AO3: 0...10 V, cooling 2 and VAV, CO_2 /T (maximum control)

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Inputs

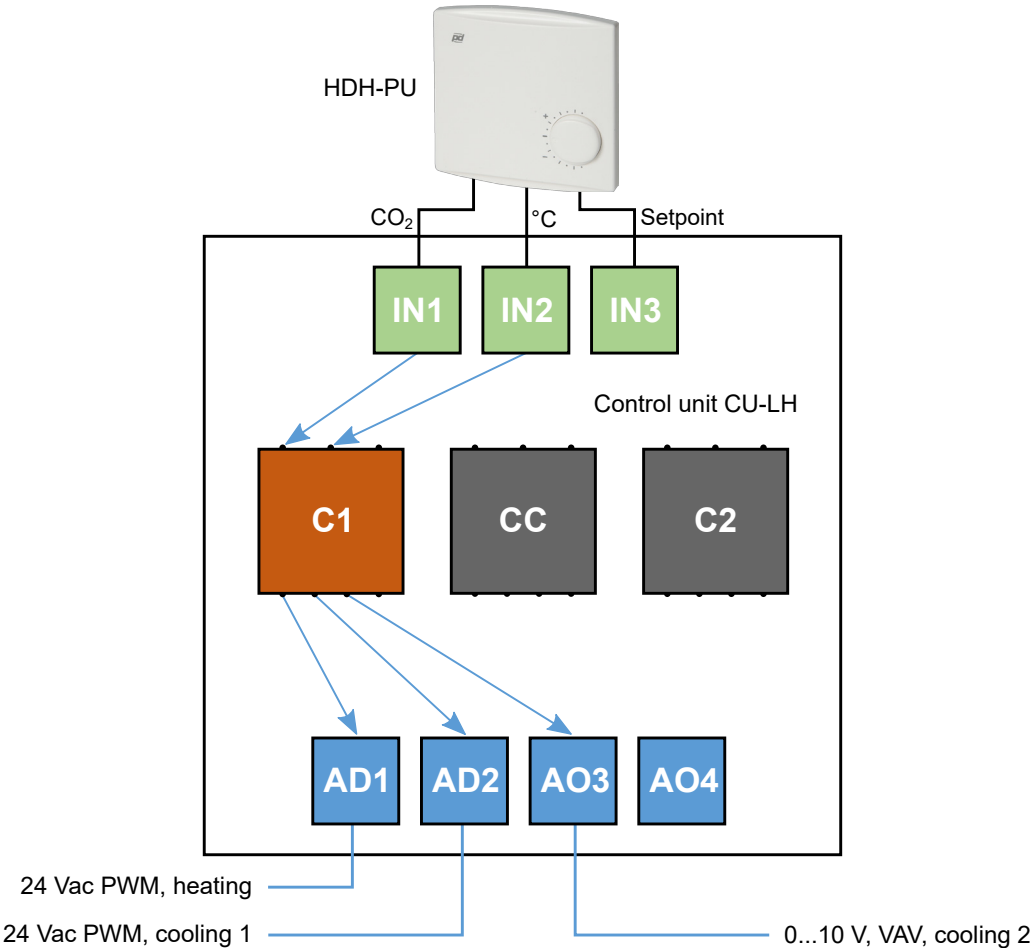
IN1: 0...10 V, CO_2, 0...2000 ppm, 700...1200 ppm control range
IN2: 0...10 V, temperature, 0...50 °C
IN3: 0...10 V, setpoint, 19...25 °C

Controller (C1)

Dead zone, day	1.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s
Setpoint source	IN3
Temperature source	IN2

Cooling sequence

- VAV open on 0...50 % cooling demand or 0...10 V on 700...1200 ppm
- AD2 open on 50...100 % cooling demand



Application note AN007.7

CU-LH: 2 rooms with heating, combined VAV and cooling

Outputs

AD1: 24 Vac PWM, heating room 1 (pulse width is 90 s)
AD2: 24 Vac PWM, heating room 2 (pulse width is 90 s)
AO3: 0...10 V, VAV / cooling room 1, CO_2 / T (maximum control)
AO4: 0...10 V, VAV / cooling room 2, CO_2 / T (maximum control)

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Inputs

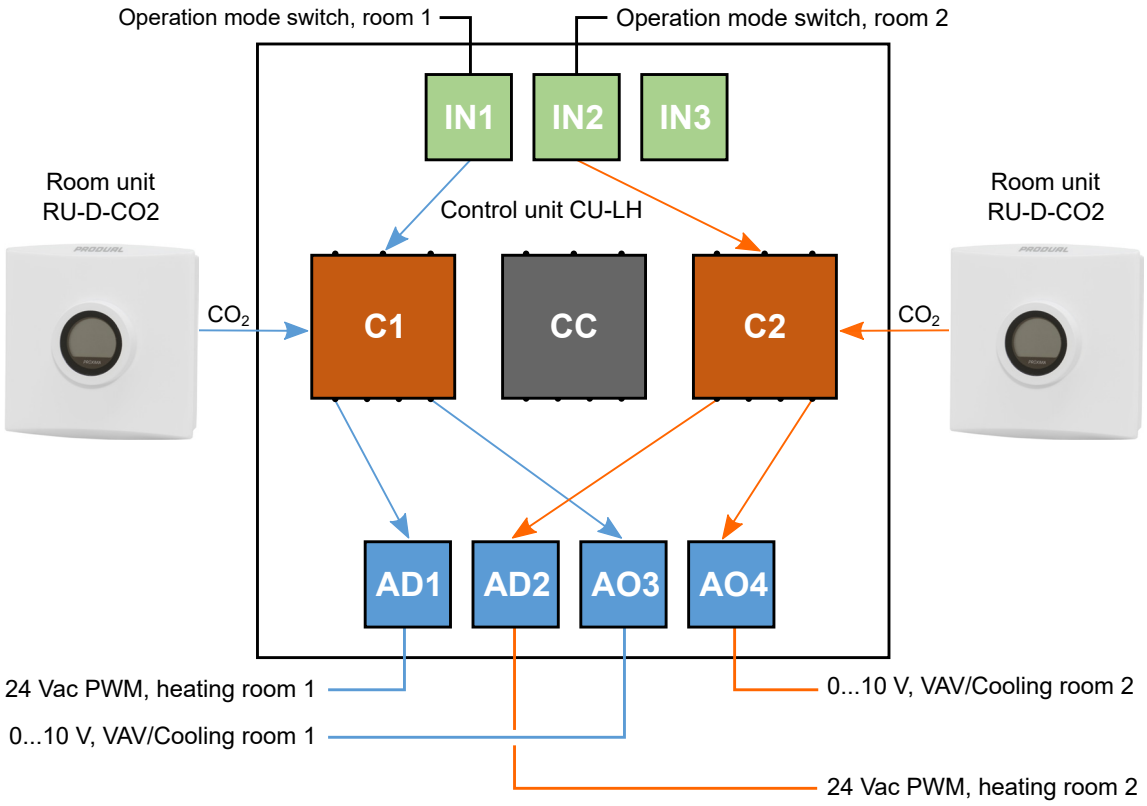
IN1: Contact switch (NO), operation mode switch, room 1
IN2: Contact switch (NO), operation mode switch, room 2

Controller (C1)

Dead zone, day	1.0 °C
Dead zone, night	3.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Room units

Setpoint center	21.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K
CO_2 range	700...1200 ppm



PRODUAL
measure-be sure.

Application note AN007.8

CU-LH: Heating, cooling and fan coil 0...10 V for cooling

Outputs

AD1: 24 Vac PWM, heating (pulse width is 90 s)
AD2: 24 Vac PWM, cooling (pulse width is 90 s)
AO3: 0...10 V, EC fan coil, 3-steps

AD1 and AD2 are controlled with G0. Actuator must be connected between G and the output AD1 or AD2.

Inputs

IN1: Resistive condensation sensor (or relay pulling to G0 at condensation). Blocks the cooling at condensation.
IN2: Contact switch (NO), operation mode switch (night/day). If the switch is not connected, operation mode is day.

Controller (C1)

Dead zone, day (guest in)	0.5 °C
Dead zone, night (guest out)	1.0 °C
Dead zone, eco (checked out)	3.0 °C
P-band, heating	1.5 °C
P-band, cooling	1.5 °C
Integral time	160 s

Eco mode (unbooked) must be set from BMS, since IN2 switches between day and night modes. When entering eco mode, the setpoint is set to 22.0°C

Room units

Setpoint center	22.0 °C
Setpoint steps	0.5 °C
Setpoint range	±3.0 K