

# ECH 200 FAMILY

## Chiller-Heat Pump Controller 1 circuit- 2 compressors



### Description

ECH 200 family is a range of compact devices that permit to control air conditioning units of the following types:

- water-air
- air-water
- water-water
- condensing units

single-circuit, with 1 or 2 compressors (stages).

It is possible to control condensation fan speed proportionally for currents of up to 2 A without using external devices.

#### The Main Features of the controllers are:

- Temperature control based on inlet or outlet probe, depending on the type of machine and its configuration
- Condensation control on temperature or pressure
- Automatic change-over on outdoor temperature
- Boiler or supplementary electrical heater control for heating
- Internal fan control up to 3 stages in the air-air application
- Dynamic set point on outdoor temperature
- Dynamic Defrost
- Parameter setting from the keyboard or through a personal computer
- Copy card for uploading and downloading parameter maps
- Remote keyboard (up to 100 m) which may be connected up directly without a serial interface
- 4-20 mA or 0-10 V output (**ECH210A**)
- User interface with a menu featuring 2 different levels of access through password management
- ModBus protocol ("B" Models)
- Televis protocol

- **Adaptive Function to manage Chiller/Heat Pump without water tank (ECH210BD, ECH215BD)**

Using a personal computer with PARAM MANAGER the user has very helpful software tool that guides the configuration of the controller easily and quickly using simple icons or default configuration.

### Models

A series of models and optional DEVICES are available to cover a wide range of different applications and installations.



#### ECH210(B)

Chiller: 1 stage Heat Pump or 2 Cool, Integrated control of fan speed (max 2A) + PWM (+ ModBUS)\*\*



#### ECH210(B)A

Chiller: 1 stage Heat Pump or 2 Cool, Fan speed control with 4-20mA/0-10V+ PWM (+ ModBUS)\*\*



#### ECH211(B)

Chiller: 2 stages Heat Pump, Fan speed control with PWM (+ModBus)\*\*



#### ECH215B

Chiller: 2 stages Heat Pump, Fan speed control only ON/OFF ModBUS



#### ECH210BD

Chiller: 1 stage Heat Pump or 2 Cool, Integrated control of fan speed (max 2A) + PWM, ModBUS + Adaptive Function



#### ECH215BD

Chiller: 2 stages Heat Pump, Fan speed control only ON/OFF, Modbus + Adaptive Function



#### Optional Keyboards



#### EKW200 BLK

Wall Mounting remote keyboard



#### EKW200/S BLK

Wall Mounting remote keyboard with internal temperature sensor

#### Expansion



#### EXP211

Expansion module for ECH200 to control second stage heat pump **DIN RAIL MOUNTED**

**\*\* ModBUS available only on "B" models**



# Features

Keyboards

| Model                                      | ECH 210(B)           | ECH 211(B) | ECH 210(B)A | ECH 215B             | EKW200 BLK |
|--|----------------------|------------|-------------|----------------------|------------|
| Part Number                                | MW320010             | MW320030   | MW320020    | -                    | MW320600   |
| Part Number (B models)                     | (MW320012)           | (MW320032) | (MW320022)  | MW320040             | -          |
| Part Number Adaptive models                | ECH210BD<br>MW320212 | N.A.       | N.A.        | ECH215BD<br>MW320240 |            |
| <b>Application</b>                         |                      |            |             |                      |            |
| Chiller                                    | ••                   | ••         | ••          | ••                   |            |
| Chiller/Heat Pump                          | ••                   | ••         | ••          | ••                   |            |
| Condensing Unit                            | ••                   | ••         | ••          | ••                   |            |
| Packaged Unit                              | •                    | •          | •           | •                    |            |
| Ducted Split                               | •                    | •          | •           | •                    |            |
| <b>Configuration</b>                       |                      |            |             |                      |            |
| Circuits                                   | 1                    | 1          | 1           | 1                    |            |
| Evaporators                                | 1                    | 1          | 1           | 1                    |            |
| Compressors                                | 2*                   | 2          | 2*          | 2                    |            |
| Compressors Stages                         | 1 or 2               | 1 or 2     | 1 or 2      | 1 or 2               |            |
| Fan ON-OFF                                 | 1                    | 1          |             |                      |            |
| Continuous Fan (modulating, proportional)  | •                    | •          | •           |                      |            |
| Water Pumps                                | 1                    | 1          | 1           | 1                    |            |
| Electric Heaters                           | 1                    | 1          | 1           | 1                    |            |
| <b>Input/Output</b>                        |                      |            |             |                      |            |
| Digital Inputs                             | 5                    | 5          | 5           | 5                    |            |
| Temperature Probes                         | 3                    | 3          | 3           | 3                    |            |
| Configurable Probes (Temperature/Pressure) | 1                    | 1          | 1           | 1                    |            |
| Relays                                     | 4                    | 4+1**      | 4           | 5+1**                |            |
| Triac Output 24V~                          | 500 mA               | 500 mA     | 500 mA      | 500 mA               |            |
| Triac Output 230V~                         | 2A max               | 500mA      | 500mA       |                      |            |
| 4...20 mA Outputs                          |                      |            | 1           |                      |            |
| 0...10 V~ Outputs                          |                      |            | 1           |                      |            |
| PWM Outputs (for Fan Speed)                | 1                    | 1          | 1           |                      |            |

EKW200/S BLK

MW320602

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Expansion

EXP211

MW320100

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- compatible
- recommended
- \* only cooling mode
- \*\* with EXP211 external socket

## Features common to all models

| Functions                                | Diagnostic                    | Connectivity      |
|--|-------------------------------|-------------------|
| Heat Pump                                | Faulty Sensor                 | TTL               |
| Balancing Compressor Hours               | High Pressure                 | Modbus            |
| Standard Defrost                         | Low Pressure                  | <b>Mechanical</b> |
| <b>Dynamic Defrost (only "B" models)</b> | Thermal Compressor Protection | Panel Mounting    |
| Dynamic Set Point                        | Thermal Fan Protection        | Plastic Box       |
| Condensing Temperature Control           | Water Flow Protection         | Fast Connectors   |
| Condensing Pressure Control              | Antifreeze Alarm              |                   |
| Auto Change Over                         | High Inlet Temperature        |                   |
| Remote Change Over                       |                               |                   |
| Remote ON-OFF                            |                               |                   |

## User Interface

### KEYS



DOWN key  
Reset Alarms/Switch ON-OFF/DOWN or SCROLL DOWN



UP key mode change  
(e.g. standby-cool-heat-standby/UP or SCROLL UP)



UP/DOWN keys press together  
one level UP/DOWN

### LEDs



LED compressor 1  
ON if compressor 1 active/OFF inactive/BLINK timing count



LED compressor 2  
ON if compressor 2 active/OFF inactive/BLINK timing count



LED cooling  
ON if device in cooling mode



LED heating  
ON if device in heating mode



LED defrost  
ON if def. active OFF ended-disabled/BLINK timing count



LED anti-freeze  
ON if antifreeze-heater-boiler active/OFF if inactive

## Accessories



### Transformers

TF411200: 230/12V - 5VA for ECH200 (protected)



### Probes

NTC probe 103AT, 1,5m (plastic cap, 2wires cable)

NTC probe 6x40, 1,5m (metal cap, silicon or PVC cable)

NTC probe 6x40, 1,5m (plastic cap, PVC cable)



EWPA030, Pressure transducer 4..20mA/0..30bar

Different lengths are available on request

### Fan Speed Controls

- CF-05: Max 2,5A/230V~ (max 500W)

- CF-15: Max 8A/230V~ (max 1500W)

- CF-20: Max 10A/230V~ (max 2200W)

- CF-REL: relay 6A/230V~

- DRV 300: 3 phases 12...20A/420V~ (IP22 or IP55)



### Others

COLV0100 - Connecting cable for signal (inputs or low voltage outputs)

COHV0100 - Connecting cable for power (Outputs)

Copy Card: To copy configuration between devices

## Technical Data

|                        | Typ.     | Min.   | Max.  |
|------------------------|----------|--------|-------|
| Power supply voltage   | 12 V~    | 10 V~  | 14 V~ |
| Power supply frequency | 50/60 Hz |        |       |
| Power consumption      | 5 VA     |        |       |
| Insulation class       | 1        |        |       |
| Operating temperature  | 25 °C    | -10 °C | 60 °C |
| Operating humidity*    | 30%      | 10%    | 90%   |
| Storage temperature    | 25 °C    | -20 °C | 85 °C |
| Storage humidity *     | 30%      | 10%    | 90%   |

\*(non condensing)

### Digital Outputs (see also Features table)

Relays 2(2)A – 250V~ (1/4hp 230V~, 1/8hp 120V~)

• n° 4 Relays **ECH210(B)** and **ECH210(B)A**

• n° 4+1\*\* **ECH211(B)** \*\* with **EXP211** external socket

• n° 5+1\*\* **ECH215B** \*\* with **EXP211** external socket

n° 1 Triac 2 A max – 250V~ (**only ECH210(B)**)

n° 1 Triac 500mA (**only ECH211** and **210(B)A**)

n° 1 Triac open collector output for alarm (max 500mA)

### Analogue outputs

n°1 PWM output

n°1 4...20mA/0...10V output for fan speed (only ECH210A and ECH210BA)

### Analogue inputs

n° 3 Temperature sensors

n° 1 Configurable input: 4...20mA pressure transducer or temperature sensor

• Temperature resolution: 0,1°K

• Temperature accuracy: 0,8°K in the range 0...35°C

• Pressure resolution: 0,1bar

• Pressure accuracy: 1% end scale

### Digital inputs

n° 5 Voltage free digital inputs

### Serial output

n° 1 TTL output for PC or network connection (9600Baud)

**NOTE:** Input and outputs features are configurable by parameters

### Terminal and connectors

n°1 quick coupling 9 -pin connector for high voltage output

n°1 quick coupling 16 -pin connector for low voltage signals

n°1 5 -pin connector for serial output or copy card

n°1 3 -pin connector for remote keyboard

n°1 2 or 3 -pin connector for optional modules

### Installation

Dimensions: 76x34x58 mm.

Housing: PC+ABS plastic resin with V0 extinguishing class.

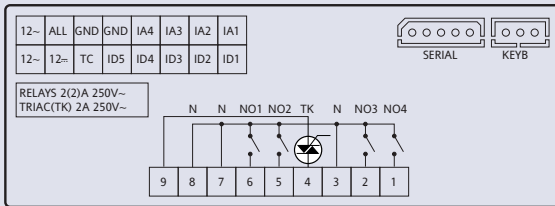
Assembly: Panel, on 71x29 mm hole.

IP protection: IP65 on the front.

## Wiring Diagrams

## Wiring Diagrams

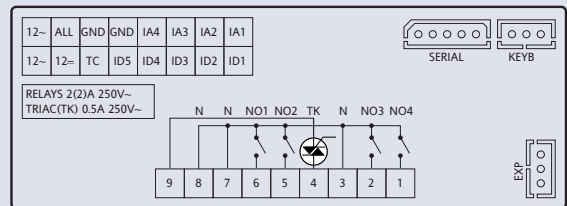
210



210B

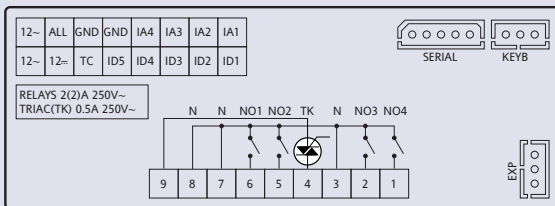
210BD

210A



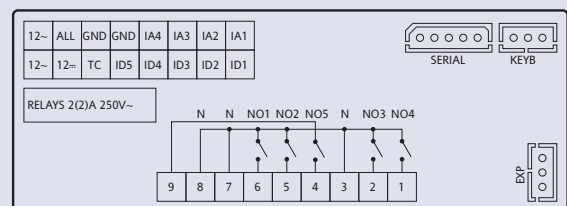
210BA

211



211B

215B



215BD

## Description Wiring Diagram

### Labels

**SERIAL** TTL Serial Connection for Copy Card or PC  
**KEYB** Connection to Remote Keyboard  
**EXP** Connection to Expansion

**IAx** Analogue Input x  
**IDx** Digital Input x  
**12** 12 V~  
**GND** Ground  
**N** Neutral  
**NOx** Digital Output x  
**TC** Output for external fan modules PWM  
**TK** Triac  
**ALL** Alarm  
**NC** Not connected

# eliwell

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**Climate Controls Europe**  
**An Invensys Company**



## Regulations

The product meets the following CEE Directives:

- 73/23/CEE Council directive and subsequent modifications
- 89/336/CEE Council directive and subsequent modifications and meets the requirements of the following Armonised regulations:
- LOW VOLTAGE: EN60730
- EMISSION: EN50081-1 (EN55022)
- IMMUNITY: EN50082-2 (IEC 1000-4-2/3/4/5)