ADVANCED MANUAL NO.1
JAKKA CONTROL KIT 6

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1. Basis controller JAKKA CONTROL KIT 6

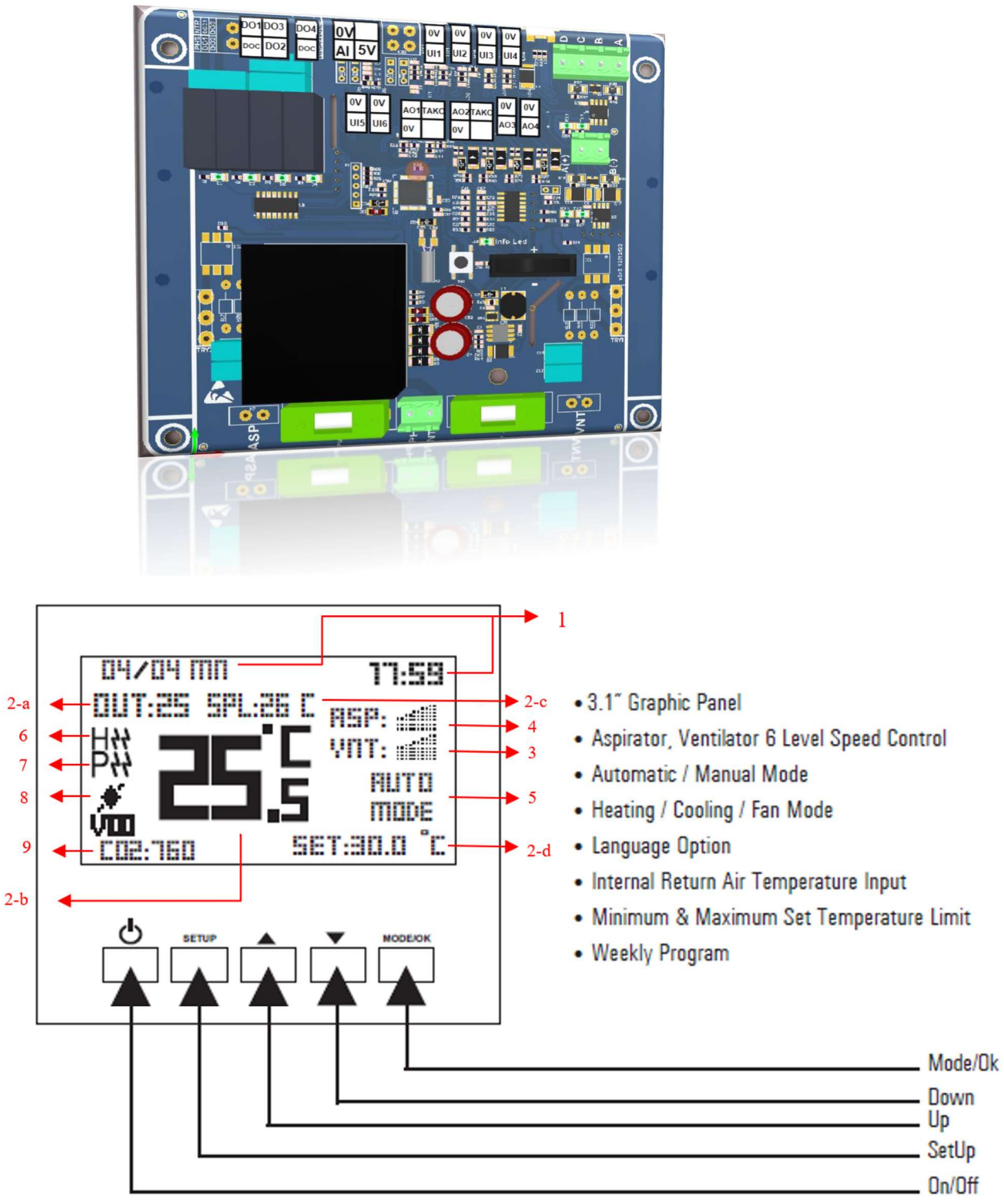

Figure 1: JAKKA CONTROL KIT 6 controller and panel with its elements

1. **Date and Time**: The actual date and time could be shown.
2. **Temperatures**: The value is shown as °C.
   a. Outdoor Air Temperature
   b. Return Air Temperature
   c. Supply Air Temperature
   d. Set Temperature
3. **Supply Fan Speed**: Up to 6 fan speeds or Pressure Set (constant pressure control)
4. **Extract Fan Speed**: Up to 6 fan speeds or Pressure Set (constant pressure control)
5. **Device Mode**: Fan / Cooling / Heating / Auto Modes
6. **Elec. Post Heater**: Actual Running Status (Off-Step1-2)
7. **Elec. Pre Heater**: Actual Running Status (Off-Step1)
8. **Bypass**: Bypass or Exchanger
9. **CO2 or Humidity**: Actual Value (ex., 800ppm or 60% humidity)

NB: Alarms and their codes are given in the "Troubleshooting" document.

2. Communication

Modbus RS485

There is a dual terminal (A(+) and B(-)) on the control PCB. This terminal should be used for Modbus RS-485 slave communication.

The default settings are below:

Modbus ID: 1
Baudrate: 9600
Data Bits: 8
Parity: None
Stop Bit: 1

After changing the default setting, the system should be restarted in case of any connection problems.

BACnet IP

There is a BACnet IP connection option with a 7" touchpanel.

3. Software Scenario

a. System Start Settings

Functional remote control
- Turn On / Off control.
  - ON → The Unit will start how it ends

Note:
- After the energy is cut down, the Unit will continue where it ends.

b. System Modes

Fan Mode: The device works according to fan control; no heating and cooling control is enabled.
Manuel Heat: Heating is active only according to the set temperature and control temperature
Manuel Cool: Cooling is active only according to the set temperature and control temperature
Auto Mode: Heating and Cooling mode is switched with the set temperature and control temperature

Control Temperature (Parameter 118) → 0: Panel temperature
1: Extract Temperature (default)
2: Supply Temperature
3: Outdoor Air Temperature

c. Fan Control

EC fans inside the device are controlled between 0 and 10V.
Fans can be regulated manually up to 6 steps or constant pressure via differential pressure transmitters or CO2 / Humidity transmitters.

- There is an open delay for fans. (Default 10 sec)
- Initially, Fans start on an upper step to take the tacho signal(6. Step). Fan stages are taken to set at intervals of 10 seconds. This function can be deactivated with parameter 124.
- After the unit or fan is turned off, the fans will run for the duration of the closing delay time(Default 10 sec), and then the fan stages are decreased at 10-second intervals.
- If the device is turned off while the electrical heater is running, the Fans will run until up to the total shutdown time and the delay time between stages.
- If the fan alarms occur, the device will shut down and cut off all output signals.
- Fan alarms will occur when there is no tacho signal. The device will reset automatically when the fan alarm disappears.

Note: The Minimum value of fan speeds must be higher than 3 Volts.

1) Constant Pressure Control

The fans are regulated according to the Differential Pressure Sensor of the supply and extract duct, which are connected to the AI1 and UI5 inputs. The pressure sensors should be 0- 10V.
149=0 heater will not be limited according to the fan speed, while the constant pressure control will be

2) Constant Flow Control

The fans are regulated according to the Differential Pressure Sensor of the supply and extract duct, which are connected to the AI1 and UI5 inputs. The pressure sensors should be 0- 10V.

K factors of fans will be set.

861 - Supply K-factor
862 - Extract K-factor

3) CO2 Control

The fans are regulated according to the CO2 Sensor extract air that is connected to the AI1 input. The sensor should be 0- 10V.

- If the CO2 sensor with a 0~10V output is connected, and parameters are enabled.
- Fans will increase or decrease according to the CO2 sensor's actual value when the unit is in full auto mode. After each step change, the controller will wait 5 seconds for the CO2 info.
- The CO2 sensor range will be 0-2000 ppm. (Default CO2 set value: 700 ppm)

Note:
- The CO2 sensor alarm will occur when the CO2 sensor value is 0 ppm, and the device will run on the low step.

The CO2 control can be added by connecting the CO2 sensor to the AI1. Also, for this purpose, the parameter settings should be as below;
When the user wants to control the device according to the CO2 sensor value, the 480th parameter value must be 3. The 3rd scenario has CO2 control parameters as below.

LG CO2	Description	Config Value Range	Default
4	Vent Mode	4	4
38	CO2 set value	0..2000	800
102	Full auto mode	2	2
109	Fan Step Value	0-4	0
114	Analog value screen	1	1
321	Analog Input 1 Min Value	0	0
331	Analog Input 1 Max Value	2000	2000
381	Analog Input 1 Type Selection	1	1
529	CO2 control type	2	2
530	Humidity control Open/Close	0	0

4) Humidity Control

- If the humidity sensor with a 0~10V output is connected, and parameters are enabled.
- Fans will increase or decrease according to the humidity sensor's actual value when the unit is in full auto mode. After each step changes, the controller will wait 5 seconds for the humidity info.
- The humidity sensor range will be 0-100%. (Default humidity set value: 50%)

Note: When the user wants to control the device according to the humidity sensor value, the 480th parameter value must be 4.
The 4th scenario has humidity control parameters as below.

LG Hum	Description	Config Value Range	Default
4	Supply Fan Mod	4	4
39	Humidity set value	0..100	50
102	Full automatic mod	2	2
109	Fan Step Value	0-4	0
114	Analog value screen	1	0
321	Analog Input 1 Min Value	25	25
331	Analog Input 1 Max Value	155	155
381	Analog Input 1 Type Selection	3	3
529	CO2 control type	0	0
530	Humidity control Open/Close	1	1

d. Bypass Control

Note: Bypass Hysteresis is 2 °C by default.
The bypass damper will never open when bypass mode is auto and the supply temperature is lower than 15°C (parameter 893) or above 35°C (parameter 894). Temperature limits are changeable.

- If the Outdoor air temperature is lower than the (default -50°C) parameter 782, the device will be off in case of deicing of the heat exchanger.
- If the Outdoor air temperature is lower than the (default -3°C) parameter 513, the device will be in deicing mode
- Deicing mode can be regulated with preheater/fan unbalancing
- Fan unbalancing: Parameter 518 will select the deicing mode supply fan status (1: shut down supply fan, 2: lower supply fan 2 stages)

e. Pre-Electric Heater Control

- The preheater can be activated if there is an outdoor temperature sensor and value.
  - Outdoor Temp. > SetPH (Parameter 160) Preheater OFF
  - Outdoor Temp. < SetPH Preheater ON
  - Outdoor Temp > SetPH + Hysteresis (Changeable) PreHeater OFF

Note:
- Hysteresis = Default 1 °C. (Changeable parameter 152)
- SetPH = Pre Heater Set temperature. Default 0 °C.

- The opening delay is the default 20 seconds. There is no closing delay time.
- If there is a Ventilator fan alarm, the preheater will not work.
- If the outdoor temperature sensor alarm is on, the Unit will stop.
- If the device turns off while the preheater is running, electrical heaters will turn off as well. Fans will run until to total shutdown time and the delay time between fan stages.
- It is not allowed to turn off the fans while the electrical heater is running. Fans will run at the first step.

f. Post Electric Heater Control

The heater can be controlled by changing the set temperature from the remote control panel. It will be deactivated if the device mode is cooling mode or in auto mode and the set temperature is lower than the control temperature.

A PID controls the post heater and it allows the heater control according to this PID (parameter 524).

Parameter 498 (P value) can be changed to a higher value for faster control.

Note:

Hysteresis = Default 1 °C. (Parameter number is 157)

- The opening delay time is 20 seconds by default. There is no closing delay time.
- If the device is turned off while the electrical heater is running, Fans will run until up to the total shutdown time and delay time between stages.
- In any condition, if one of the fans is not working, the post heater won't operate.

When the supply temperature reaches the max limit value (parameter 505), the electrical post heater PID will be lower and it will close the heater with a supply limit PID.

g. Fire Alarm Control

- There is an internal fire alarm; when the supply or return temperature increases up to 72 °C (779th parameter), the fire alarm occurs and the device stops.
- The external fire alarm can be connected to the fire alarm input with dry contactFilter Control

- There are two filter differential pressure switches inside the device, and they are connected in series. They are connected as a normally closed dry contact and are manually configured according to the pressure drop of the filter type. If the pressure value is more than the configured value, the contact will be opened, and a filter alarm will occur.
- There is a service alarm timer adapted to the supply fan running time. The supply fan running time reaches 1400 (177th parameter) hours, and a service alarm occurs. The 785th parameter can be changed according to service alarm or filter alarm (0:filter alarm, 1:service alarm).

h. *Weekly Schedule*

The weekly timer function is available on the Panel. The unit can be programmed to operate automatically during certain periods of the week.

- While the device is on, press the Setup button for 2 seconds on the panel. While the weekly program is selected, press the Mode/OK button.
- Select the day to be adjusted by using the Up and Down buttons and the Mode/OK button.
- While Start is written, the start time of the device is set. Proceed with the Mode/OK button and set the end time of the device when Stop is written and save with the Mode/OK button.
- The same process steps are repeated for the other days, and the start and end times are adjusted as desired.
- After the weekly program is made, it is returned to the main screen with the On/Off button.

Note 1: If the start time is after the end time, the device remains off during the selected day.
Note 2: If the start time and end time are the same, the weekly program application will not work for the selected day.
Note 3: If the device has a weekly program setting for the current day, the clock logo appears on the screen and operates within the programmed working hours.
Note 4: If the device is programmed weekly for the current day and is within the programmed working hours, the clock stop logo appears on the screen

4. Alarm and Warning List

Alarm Text	Reset	Failure Number	In Case of an Alarm	Delay
Aspirator Fan Error	Man	E01	Device Stops	2s
Ventilator Fan Error	Man	E02	Device Stops	2s
Electrical Heater Error	Auto	E04	E.heater Stops	2s
Aspirator Flow Error	Man	E08	Device Stops	2s
Ventilator Flow Error	Man	E16	Device Stops	2s
Fire Alarm	Man	E256	Device Stops	2s
Device off by BMS	Auto	W01	The device is off by dry contact input.	1s
Boost Active	Auto	W02	Boost the active according to the dry input or panel.	1s
Dirty Filter	Auto	W04	Filter alarm according to the dry contact input	2s
Dirty Filter2	Auto	W08	Filter alarm 2 according to the dry contact input 2	2s
Maintenance Alarm	Man	W4096	Maintenance warning on the screen	2s