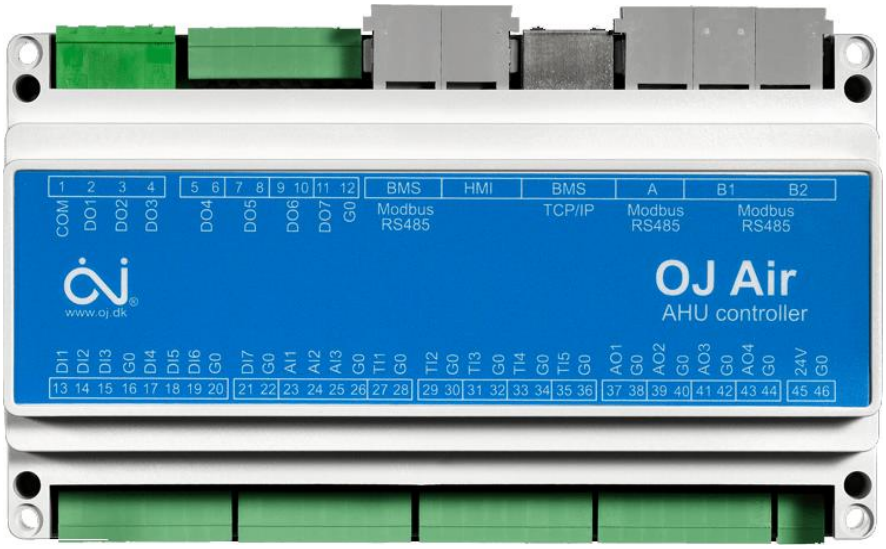
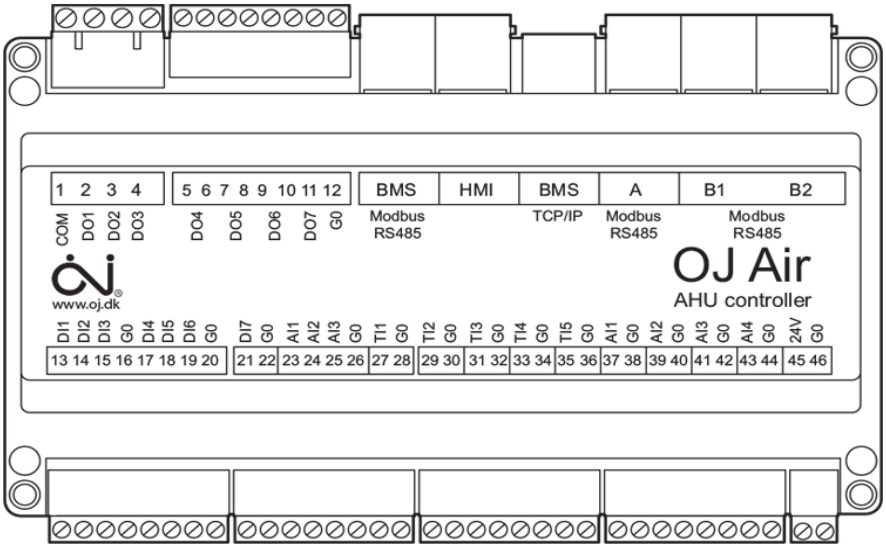
AHC-3000-T


1 2 3 4
COM DO1 DO2 DO3
5 6 7 8 9 10 11 12
DO4 DO5 DO6 DO7 G0
BMS
Modbus RS485
HMI
BMS
TCP/IP
A
Modbus RS485
B1 B2
Modbus RS485
www.oj.dk
OJ Air
AHU controller
DI1 DI2 DI3 G0 DI4 DI5 DI6 G0 DI7 G0 AI1 AI2 AI3 G0 TI1 G0 TI2 G0 TI3 G0 TI4 G0 TI5 G0 AO1 G0 AO2 G0 AO3 G0 AO4 G0 24V G0
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46


1 2 3 4
COM DO1 DO2 DO3
5 6 7 8 9 10 11 12
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BMS
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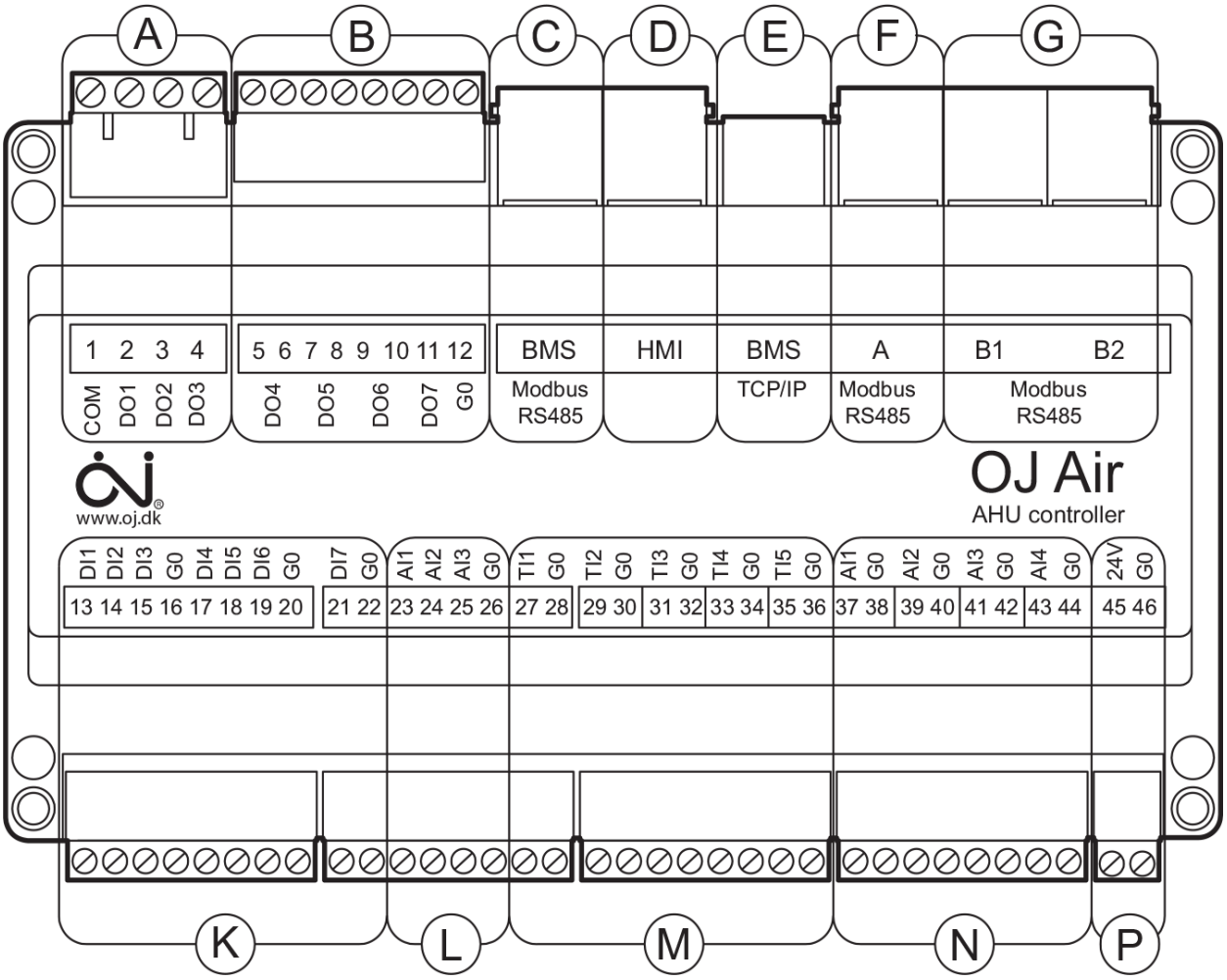
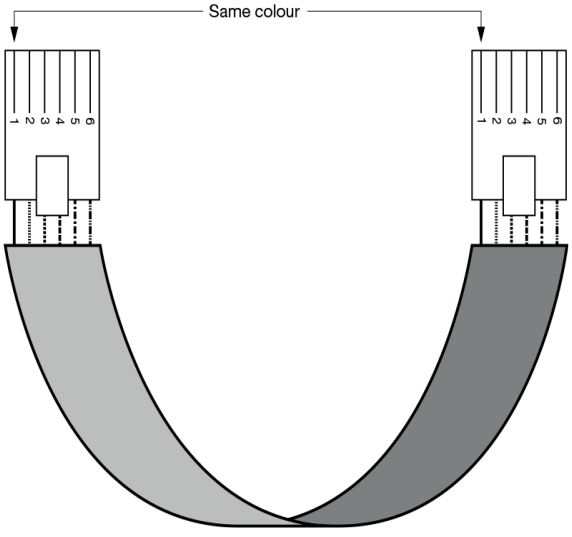
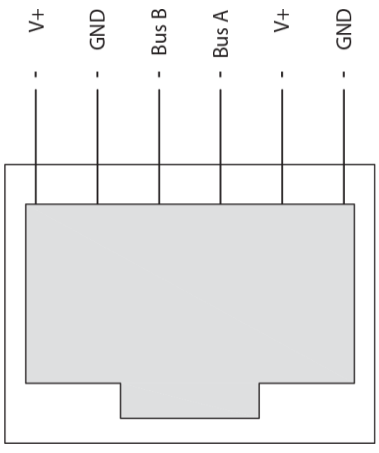
OJ Air
AHU controller
DI1 DI2 DI3 G0 DI4 DI5 DI6 G0 DI7 G0 AI1 AI2 AI3 G0 TI1 G0 TI2 G0 TI3 G0 TI4 G0 TI5 G0 AI1 G0 AI2 G0 AI3 G0 AI4 G0 24V G0
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

Connections overview



Modbus connections





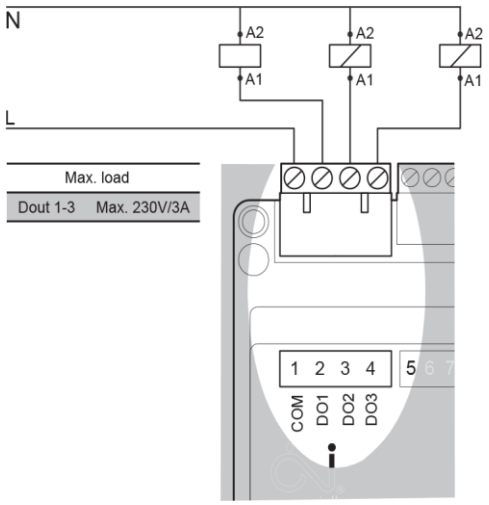
Digital outputs

AHC-3000 is equipped with six potential-free digital relay outputs, and one solid state output.

Digital outputs 1-3

Digital outputs 1 – 3 must be connected to max. 250VAC/3A AC1 DO1, DO2 and DO3 are internally connected to terminal 1 COM.

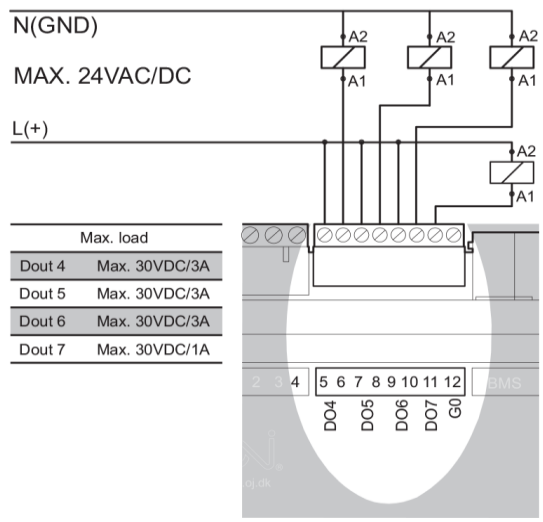
Ⓐ



Digital outputs 4-7

Digital outputs 4 – 6 must be connected to max. 30VAC/3A AC1. See Fig. 12 Digital output 7 must be connected to max. 30 VAC/DC max. 1A.

Ⓑ

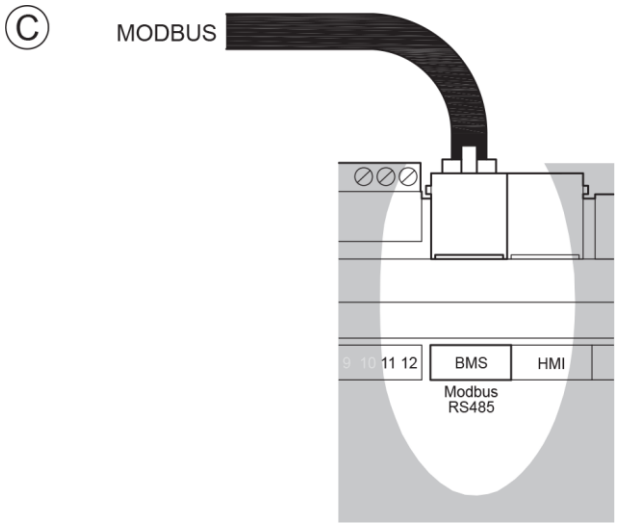


Alternative settings in the table are listed in ( ) and can be edited from the HMI-35T.

Digital outputs		
Description	**Output**	**Default Function**
DO1	Relay connected to COM	Coil 1 Heating, cooling or combi coil heating. Active on
DO2	Relay connected to COM	El-heater coil 2 or combi coil cooling. Active on
DO3	Relay connected to COM	Damper opening. Active on
DO4	Potential-free relay	A alarm. Active on
DO5	Potential-free relay	B alarm. Active on
DO6	Potential-free relay	Supply fan (Heat recovery). Active on
DO7	FET connecting to G0	Exhaust fan. Active on

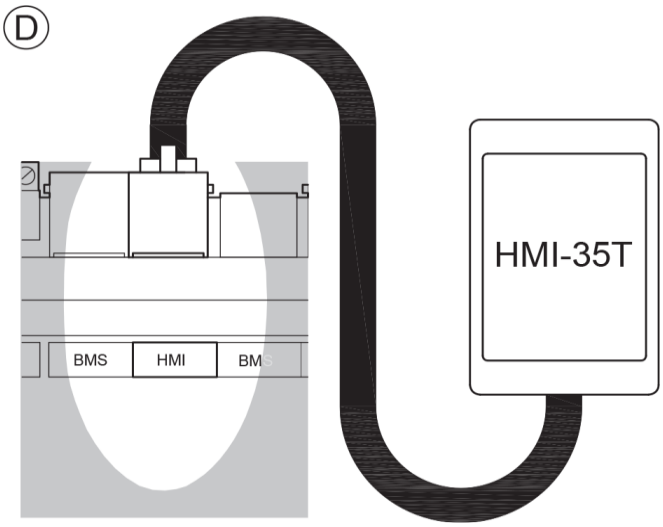
Other configurations can be used depending on the factory configuration. Max. cable length 30 m.

Cable for BMS Modbus connection



The BMS Modbus RS485 RTU is connected to AHC-3000 via the RJ12 port marked BMS MODBUS RS485 on the front. This connection is used for the Modbus RTU BMS interface. If a CAT5 cable is used, and 120-ohm termination resistors are added at both ends, the length can be max. 300m.

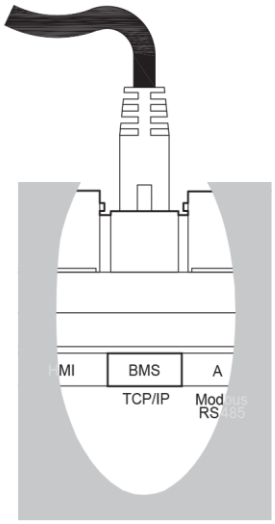
Connections for HMI-35T



The AHC-3000-HMI-35T is connected to AHC-3000 via the RJ12 port marked HMI on the front. This HMI can be used simultaneously with OJ-Air2-HMI-20T if installed. If a CAT5 cable is used, and a 120-ohm termination resistor is added at the HMI-35T end, the length can be max. 100m.

Cable for (BMS) TCP/IP connection

Ⓔ



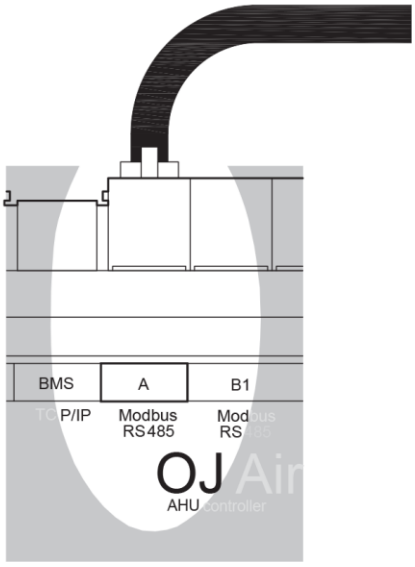
The TCP/IP network cable is connected to AHC-3000 via the RJ45 port marked BMS TCP/IP on the front. This port is only available on AHC-3000-T This connection is used for transmitting data to/from the OJ Air Cloud and Modbus TCP/IP BMS interface.

The IP address in the AHC-3000 can be set to either “DHCP” or “Static” in the HMI 35 T menu. The factory settings are:

Static/Dynamic IP: Static.
IP address: 192.168.1.100
Netmask: 255.255.255.0
Gateway: 192.168.1.1
Primary DNS: 192.168.1.1
Secondary DNS: 192.168.1.1

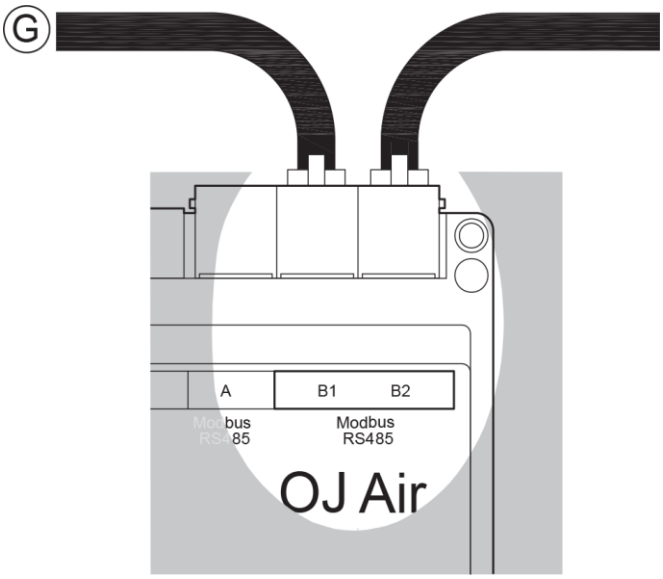
External communication ports

Ⓕ



AHC-3000 can be connected to the following external communication: OJ Cloud, OJ ZoneMaster, BMS.

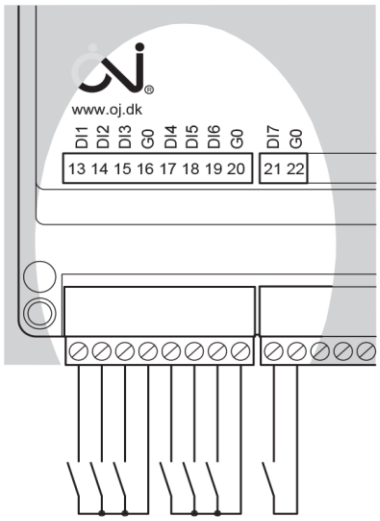
Internal communication ports



Internal Modbus is connected to AHC 3000 via two parallel RJ 12 ports marked port B1 and B2 on the front. The internal Modbus is used for Modbus RS485 connections inside the AHU to other OJ Electronics components such as DRHX drives for rotary heat exhangers, PTH pressure transmitters, HTH humidity transmitters and VTH air quality sensors. The internal Modbus cable shall be MPFK6S or similar and termination resistors shall not be mounted.

Digital inputs

Ⓚ



AHC-3000 is equipped with seven potential-free digital inputs: All inputs range from 0.0-2.0V (low) to 10.0-12.2V (high logic level) Internally pulled up to 12VDC, 1.8mA pull-up current while low. Max. cable length 30 m.

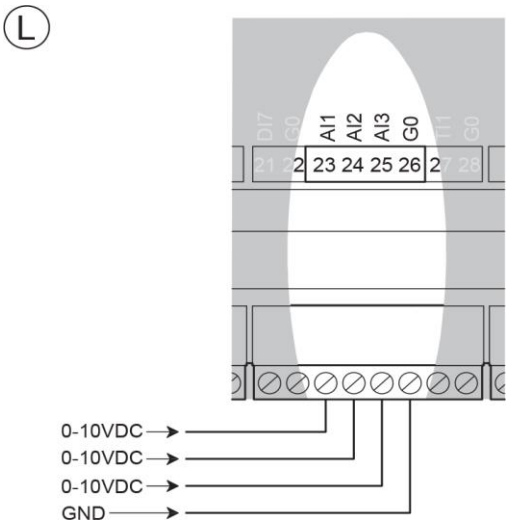
Digital inputs		
Description	**Default Function**	**Active**
DI1	Alarm, supply fan	Closed (Open, Tacho)
DI2	Alarm, exhaust fan	Closed (Open, Tacho)
DI3	Alarm, filter	Closed (Open)
DI4	Smoke	Open
DI5	Start	Closed
DI6	Boost speed	Closed
DI7	Fire	Open

Alternative settings in the table are listed in ( ) and can be edited from the HMI-35T.

The digital inputs can be altered from the HMI-35T to:

Function Active	
Outdoor filter alarm	Closed (Open)
Extract filter alarm	Closed (Open)
Frost alarm	Open
EL-heater alarm	Open
Summer/winter	Closed summer - cooling available, Open winter - heating available.
Cooler alarm	Open

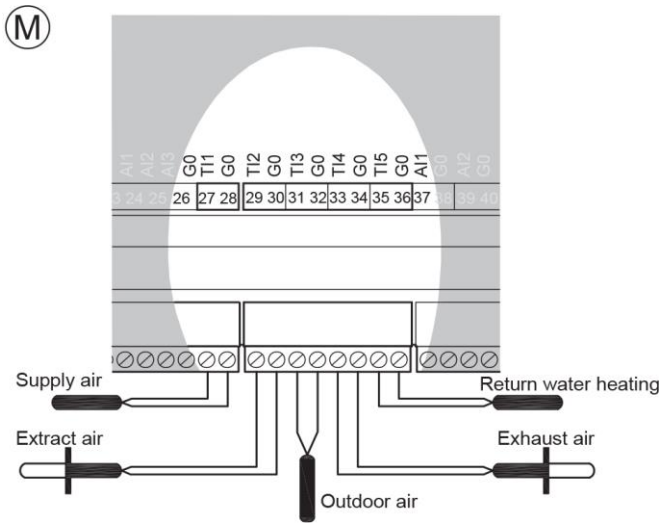
Analogue inputs



AHC-3000 is equipped with 3 analogue inputs for 0-10 V DC signals. Max. cable length 30 m.

Analogue inputs	
Description	**Default Function**
AI1	CO2 0 to 2000 ppm
AI2	Room temperature 0 to +50^{o}C / supply air duct pressure 0 to 500 Pa (20-3000 Pa)
AI3	RH% 0 to 100 %RH / extract air pressure 0 to 500 Pa (20-3000 Pa)

Connections of temperature sensors



AHC-3000 is equipped with following five temperature sensor inputs. All temperature inputs must be connected to max. 30m wire.

Temperature sensor input		
Description	**Specification**	**Default Function**
TI1	NTC/PT1000	Supply air temperature
TI2	NTC/PT1000	Extract air temperature
TI3	NTC/PT1000	Outdoor air temperature
TI4	NTC/PT1000	Exhaust air temperature
TI5	NTC/PT1000	Return water temperature, heater coil

Input type: configurable NTC 12kΩ or PT1000 temperature sensor (NTC 12k @ 25°c) (PT1000 Ω @ 0°C)

Input range: -40°C to +100°C measurement range

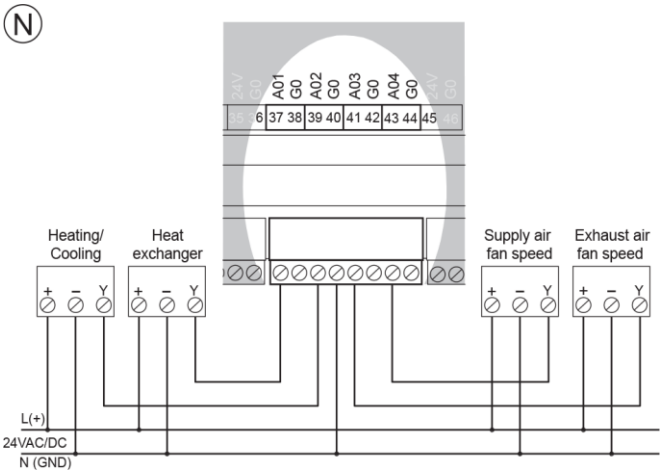
Input accuracy NTC

- ±0.1°C (0°C to 50°C) @ 23±5°C ambient (excluding sensor tolerance)
- ±0.2°C @ all sensor-/ambient temperatures (excluding sensor tolerance)

Input accuracy PT1000

- ±0.1°C (0°C to 50°C) @ 23±5°C ambient (excluding sensor tolerance)
- ±0.4°C @ all sensor-/ambient temperatures (excluding sensor tolerance)

Analogue outputs



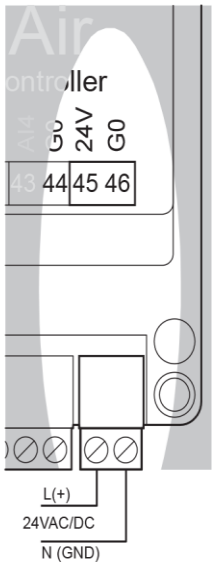
AHC-3000 is equipped with four 0-10 V DC analogue outputs, which can be used to connect control signals for a heat exchanger (rotary heat exchanger or damper motor on cross-flow/counter-flow heat exchanger), heating or cooling coil valves and fans. Each output can be loaded by max. 10mA @ 10V, or min. 1k ohm.

Analogue outputs	
Output no.	**Output function - Factory setting**
AO1	Heat exchanger bypass damper/rotor drive (supply air unit mixing damper).
AO2	Heating or cooling coil valve actuator
AO3	Exhaust air fan speed
AO4	Supply air fan speed

Alternative settings in the table are listed in ( ) and can be edited from the HMI-35T. Max. cable length 30 m.

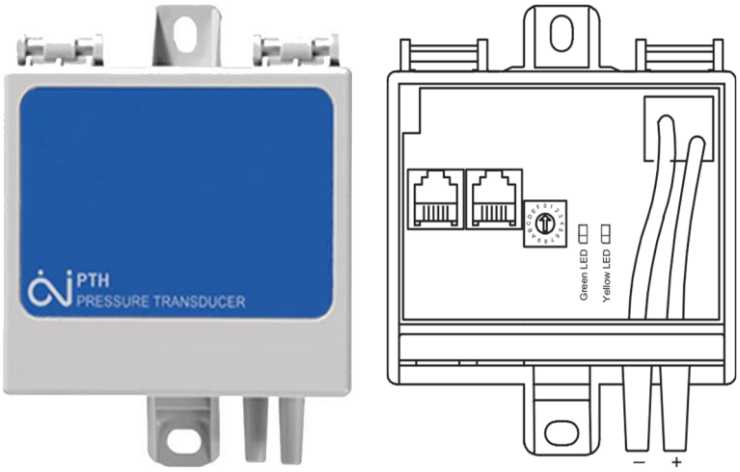
Power supply connections

Ⓟ



A 24 V AC or DC power supply must be connected from a 0.2 - 1.5 mm2 screw terminal Ø45 (+24V) & Ø46 (G0) on AHC-3000. G0 must be ground (GND) in order to use a single 24V AC transformer. All G0 terminals are internally connected in the AHC-3000 and used as GND for connected fans, sensors and valves.

PTH-6202

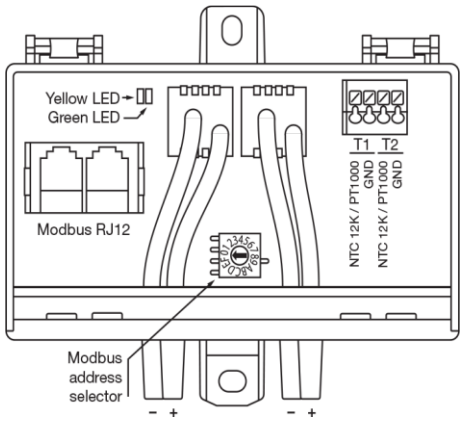


Multiple PTH-6202 pressure transmitter can be used and must be connected to port B1 or B2. Each PTH-6202 must have its own individual address selector setting. It is not allowed to have multiple PTH6202s connected to the same address.

Set the address selectors according to the desired function, see table:

PTH-6202	
Address selector	**Function**
1	Filter, outdoor air
2	Flow, extract/exhaust air
3	Flow, supply air
4	Filter, extract air
5	Reserved
6	Duct pressure supply air
7	Duct pressure extract air
8	De-icing pressure drop across plate heat exchange

PTH-6202-2

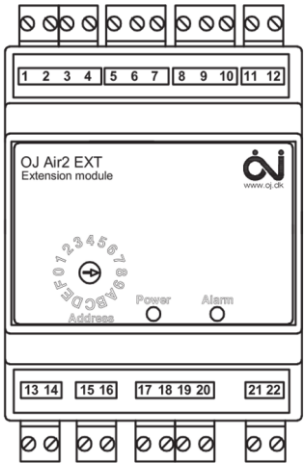


Multiple PTH-6202-2 pressure transmitters can be used and must be connected to port B1 or B2. Each PTH-6202-2 must have its own individual address selector setting. It is not allowed to have multiple PTH-6202s connected to the same address. Temperature sensors connected to PTH-6202-2 have higher priority than sensors connected directly to AHC-3000.

Set the address selectors according to the desired function, see table:

PTH-6202-2		
Address selector	**Input**	**Function**
1	P1	Filter, outdoor air
	P2	Flow, exhaust air
	T1	Outdoor air temperature
	T2	Exhaust air temperature
2	P1	Filter, extract air
	P2	Flow, supply air
	T1	Extract air temperature
	T2	Supply air temperature
3	P1	Duct pressure extract air
	P2	Duct pressure supply air
	T1	Not used
	T2	Not used
4	P1	Filter, outdoor air
	P2	Filter, extract air
	T1	Outdoor air temperature
	T2	Extract air temperature
5	P1	Flow, supply air
	P2	Flow, extract air
	T1	Supply air temperature
	T2	Exhaust air temperature

OJ-Air2Ext



The OJ-Air2Ext must be connected to port B1 or B2 This is used if more inputs/outputs are required than available on the AHC3000 controller. Power supply to the OJ-Air2Ext is supplied from AHC-3000 through the Modbus cable. Only one OJ-Air2Ext is allowed. Temperature sensors must be connected to OJ-Air2Ext and have higher priority than sensors connected directly to AHC-3000.

Set the address selector according to the desired function, see table:

OJ-Air2Ext		
Address selector	**Output**	**Function**
3	**After heating coil**	
	Tin1	Return water temperature
	Tin2	Supply air temperature
	Aout1	Heating valve 0-10V
	Aout2	Not used
	Din1	Not used
	Din2	Frost thermostat
	Dout1	Heating start relay
	Dout2	Not used
4	**After cooling coil**	
	Tin1	Not used
	Tin2	Supply air temperature
	Aout1	Cooling valve 0-10V
	Aout2	Not used
	Din1	Cooling coil alarm
	Din2	Not used
	Dout1	Cooling start relay
	Dout2	Not used