



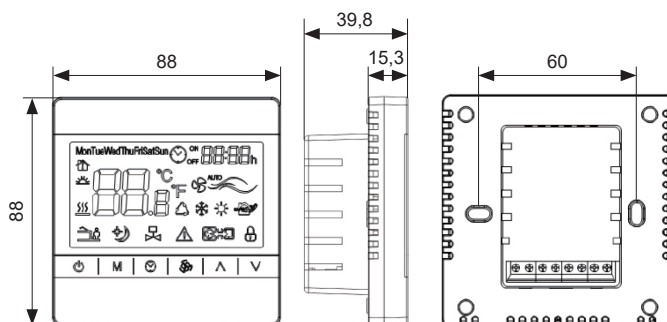
● **ΘΕΡΜΟΣΤΑΤΗΣ**
ModBus Fan Coil Thermostat
TCA2





Application

The TCA2 Series Touch Screen Fan Coil Thermostats control the fan coil with local temperature to get comfortable environment. Select the temperature scales and set points, the modes, and the different values to control the Heating, Ventilating, and Air Conditioning (HVAC) system, maintain the desired room temperature. The optional Occupied/Unoccupied feature saves energy. TCA2 features with microcomputer control, large LCD screen display, and displays the status of work mode (cooling/heating/vent), fan speed, indoor temperature and set temperature etc... Capacitance touch screen enhances the fluency on operation. Keypad includes: Power on / off (⏻), Mode selection (M), Fan Speed selection (⚙️), Clock / Timer (🕒) and two adjustment buttons (▲ ▼).



Application

Install the TCA2 where the occupant can read the display and adjust the set point easily. Situate the thermostat where the temperature is representative of the general room conditions. Avoid installing near cold or warm air drafts, radiant heat, on an outside wall, or in direct sunlight.

Mounting

Mount the TCA2 Series thermostat to a 75 x 75 x 5 mm standard electrical wall box (see Figure 3). Follow the instruction in removing the base and then proceed to the wall mounting and the wiring sections.

Note: All TCA2 series models require two No M x 5 mounting screws (include in the box, screw PWT. 5 x 5x 5.5 is required if missing).

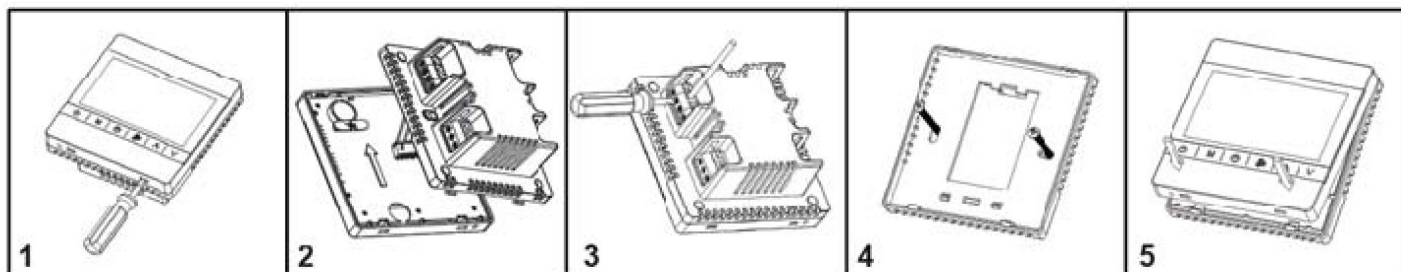


Figure 2 : Installation diagram.

Note : When wiring the TCA2 Series Thermostat use wire nuts to finish and isolate each connection, wire according to Figure 3a & Figure 3b.

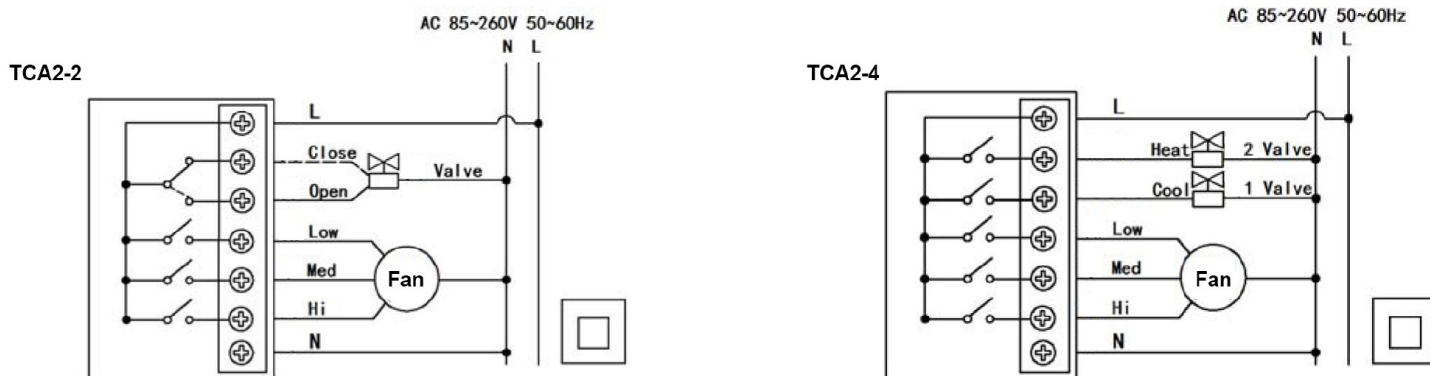
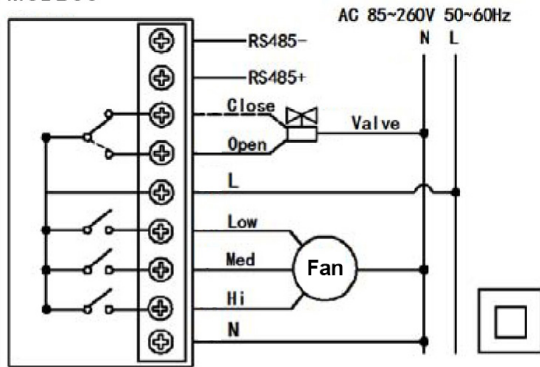


Figure 3a



TCA2-2-MODBUS



TCA2-4-MODBUS

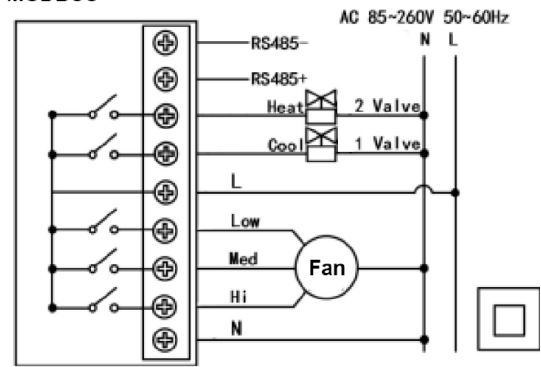


Figure 3b

Instructions

- **On / Off Setting** : Press "⏻" to turn on, press again to turn off, close the fan and valve.
- **Mode Selection** : Press "M" to change the working mode, "❄️" for Cooling, "🔥" for Heating, "🏠" for venting (key "M" is unavailable under auto mode. When setting temperature is more than 1°C higher than indoor temperature, the mode will change to heating automatically, When setting temperature is more than 1°C lower than indoor temperature, the mode will change to cooling automatically.)
- **Temperature Setting** : Press either "▼" or "▲" button to increase or decrease by 1°C.
- **Fan Speed Adjustment** :
Cooling or Heating Mode Operation
 TCA2, has 4 speeds fan control: Auto "🌀^{AUTO}", High "🌀", Middle "🌀", Low "🌀" fan. Short press the "🌀" button switches through the sequence.
- **Fan only Operation**
 TCA2, has 3 speeds fan control: High "🌀", Middle "🌀", Low "🌀" fan. Short press the "🌀" button switches through the sequence.
- **Note** : Fan stops at Floor Heating Mode.
- **Time Adjustment and Time - On / Off Operation** :
Time Adjustment : Continuously press "🕒" button until "mm" in "hh:mm" blinks, then press "▲" or "▼" to adjust the minute. Press "🕒" button again until "hh" in "hh:mm" blinks, then press "▲" or "▼" to adjust the hour. Press "🕒" button again and adjust the weekday by the same method.
Time - On / Off Operation : Continuously press "🕒" button until the "hh:mm", "🕒", "ON" appear, and "🕒", "ON" blink. Press either "▲" or "▼" key to adjust the Time - On by 30 minutes. Press "🕒" button again until "🕒", "OFF" blink. Then adjust the Time - Off by the same method. Time - On / Off setting performs only once within one day.
Time - On / Off Cancel : Cancel : Continuously press "🕒" button until the "hh:mm", "🕒", "ON" appear, and "🕒", "ON" blink. Press either "▲" or "▼" key to adjust the Time - On "00:00". Press "🕒" button again until "🕒", "OFF" blink. Then adjust the Time - Of "00:00" by the same method.
- **Lock function** :
Lock function : If Lock function is enabled, the thermostat will be locked automatically after 30 seconds unused.
Unlock function : Hold down the fan key 3 seconds to unlock.
- **Timer Function** :
 On power on status, hold the "🕒" button for 3 seconds to enter the Timer interface, where the thermostat's accumulated running time is showing.
 On power off status, hold the "🕒" button for 3 seconds to enter the Timer interface, accumulated running time can be cleared by pressing "🌀".
 On power Off status and when room temperature lower than 5°C, heat function will be automatically switched on, "🔥" appears, the electrically operated valves is opened on.
- **Standby Function** :
 The thermostat will change to standby after 30 seconds no pressed, and backlight becomes slightly bright. Quit the standby interface by pressing any key and backlight becomes normal again.



Parameter Setting

On power off status, hold the "⏻" and "▲" keys for 3 seconds to enter parameter setting interface. Press "M" key to select the parameter, and then adjust it by "▲" or "▼" key.

Setting table is as following: (note to operate slowly, especially keep over 1 second interval between each "M" key pressing).

Code	TCA2-2	TCA2-4	TCA2-2 ModBus	TCA2-4 ModBus	Parameter	Default	Function
01	■	■	■	■	Restart after power failure	00	00 : off / 01 : on / 02 : keep last status
02	■	■	■	■	°F / °C	°C	F : Fahrenheit degree (°F) C : Celsius degree (°C)
03	■	■	■	■	Upper limit of set temperature	35,0 °C	Setting range 2 ~ 49,4 °C (4 ~ 99 °F)
04	■	■	■	■	Lower limit of set temperature	5,0 °C	Setting range 0 ~ 47,5 °C (0 ~ 95 °F)
05	■	■	■	■	Keypad lockout	00	00 : No lock 01 : Lock all keys 02 : Lock the keys except fan speed and temperature adjustment keys 03 : Lock the ON / OFF and clock keys
06	■	■	■	■	Screen display	00	00 : Display room temp. / 01 : Display set temp.
07	■	■	■	■	Low temperature protection	00	00 : off / 01 : on
08	■	■	■	■	Temperature differential	00	Setting range -5 ~ 5 °C (-9 ~ 9 °F)
09			■	■	Device address adjustment	01	Setting range 01 ~ 255

Trouble shooting

Problem	Solutions
The thermostat cannot be powered	1. Check the wire connection. 2. Check if the insure fall off. 3. Check if the front / back panel is installed correctly. 4. Check if the 220V AC power is normally supplied.

Fault Alarm

When the sensor is in fault, thermostat will close the fan and valve, and display, "E1" / "E2".

E1 : Sensor short cut alarm.

E2 : Sensor circuit breaker alarm.

Display "HI", temperature > 55°C display "LO", temperature < 0°C.

IMPORTANT :

- Use this TCA2 Series Line Voltage Fan Coil Thermostat only as an operating control. Where failure of malfunction of the TCA2 Series Thermostat could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the TCA2 Series Thermostat.
- Do not install this thermostat in condensing, wet , or damp environments. Moisture may cause damage to the thermostat.
- Do not remove PCB form the enclosure cover. Removing the PCB from the enclosure cover voids the product warranty.
- Make all wiring connections in accordance with local, nation , and regional regulations, Do not exceed the TCA2 Series thermostat's electrical ratings.





WARNING

- **Disconnect power supply before making electrical connections.** Contact with components carrying hazardous voltages can cause electrical shock and may result in severe personal injury or death.
- **Risk of Electrical Shock.** Ground the thermostat according to local, national, and regional regulations. Failure to ground the thermostat may result in electrical shock and severe personal injury and death.
- **Risk of Electrical Shock and Property Damage.** Insulate and secure each unused wire lead before applying power to the thermostat. Failure to insulate and secure each unused wire lead may result property damage, electrical shock, and severe personal injury or death.

Fan Coil Thermostat Modbus Protocol

Communication Interface	RS485
Protocol	ModBus / RTU
Baud rate setting	9600, N, 8, 1
Supported function code	0x03, 0x04 and 0x06

► Input Register (Read, Function Code 0x04)

Variable No.	Variable description	Unit	Variable value	Mapping address
30001	Return air temperature	0,1 °C	0 ÷ 50,0 °C	0 x 00
30002	Fan status	-	0 = Stop 2 = Low 4 = Medium 8 = High	0 x 01
30003	Valve status	-	0 = Stop 1 = Run	0 x 02

► Holding Register (Read, Function Code 0x03; Write, Function Code 0x06)

Variable No.	Variable description	Unit	Variable value	Mapping address
40001	Mode operation	-	1 = Cooling 4 = Ventilation 8 = Heating 16 = Automatic	0x00
40002	Fan speed	-	2 = Low 4 = Medium 8 = High 128 = Automatic	0x01
40003	Temperature Setting	0,1 °C	16,0 ÷ 30,0 °C	0x02
40004	Fan coil status	-	0 = Stop 1 = Run	0x03



EXAMPLE

1) Upper computer reading1 # Thermostat status

(Register 30001 to 30003 > The corresponding communication start address is 0x00 to 0x02)

Master request		Slave response		Parameter
Field Name	(Hex)	Field Name	(Hex)	
Slave Address	01	Slave Address	01	Master station access - slave address
Function Code	04	Function Code	04	The master accesses the function code of the slave input register
Starting Address Hi	00	Byte Count	06	The slave responds to the number of bytes of the primary station
Starting Address Lo	00	Input Reg.00 Hi	01	Reg.00=0X0118, Decimal is 280
Quantity of Input Reg. Hi	00	Input Reg.00 Lo	18	The current return air temperature is 28,0 degrees. (The temperature is amplified by 10 times)
Quantity of Input Reg. Lo	03	Input Reg.01 Hi	00	Reg.00=0X0008
CRC Hi	B0	Input Reg.01 Lo	08	The current fan speed is "High".
CRC Lo	0B	Input Reg.02 Hi	00	Reg.00=0X0001
		Input Reg.02 Lo	01	The current water valve is "Open".
		CRC Hi	01	The current frame data CRC is 0X0142.
		CRC Lo	42	If the data is different, the comparison code will change accordingly.

2) Upper computer reading1 # Thermostat parameter

(Register 40001 to 40004 > The corresponding communication start address is 0x00 to 0x03)

Master request		Slave response		Parameter
Field Name	(Hex)	Field Name	(Hex)	
Slave Address	01	Slave Address	01	Master station access - slave address
Function Code	03	Function Code	03	The master accesses the function code of the slave holding register
Starting Address Hi	00	Byte Count	08	The slave responds to the number of bytes of the primary station
Starting Address Lo	00	Input Reg.00 Hi	00	Reg.00=0X0001
Quantity of Holding Reg. Hi	00	Input Reg.00 Lo	01	The current operating mode is "Cooling".
Quantity of Input Reg. Lo	04	Input Reg.01 Hi	00	Reg.01=0X0008
Quantity of Holding Reg. Lo	44	Input Reg.01 Lo	08	The current fan speed is "High".
CRC Lo	09	Input Reg.02 Hi	00	Reg.02=0X00F0, Decimal is 240
		Input Reg.02 Lo	F0	The current temperature setting is 24,0 degrees. (The temperature is amplified by 10 times)
		Input Reg.03 Hi	00	Reg.03=0X0001
		Input Reg.03 Lo	01	The current state is "Power On".
		CRC Hi	A5	The current frame data CRC is 0XA525.
		CRC Lo	25	If the data is different, the comparison code will change accordingly.



3) Upper computer setting 1 # Thermostat mode parameter
 (Register 40001 > The corresponding communication start address is 0x00)

Master request		Slave response		Parameter
Field Name	(Hex)	Field Name	(Hex)	
Slave Address	01	Slave Address	01	Master station access - slave device address
Function Code	06	Function Code	06	The master rewrites the parameters of the slave holding register
Starting Address Hi	00	Starting Address Hi	00	Holding Reg.Mode address 0X0000
Starting Address Lo	00	Starting Address Lo	00	
Holding Reg. Value Hi	00	Holding Reg. Value Hi	00	Reg.00=0X0008
Holding Reg. Value Lo	08	Holding Reg. Value Lo	08	The mode is rewritten as "Heating".
CRC Hi	88	CRC Hi	88	The current frame data CRC is 0X880C. If the data is different, the comparison code will change accordingly.
CRC Lo	0C	CRC Lo	0C	

4) Upper computer setting 1 # thermostat fan speed parameter
 (Register 40002 > The corresponding communication start address is 0x01)

Master request		Slave response		Parameter
Field Name	(Hex)	Field Name	(Hex)	
Slave Address	01	Slave Address	01	Master station access - slave device address
Function Code	06	Function Code	06	The master rewrites the parameters of the slave holding register
Starting Address Hi	00	Starting Address Hi	00	Holding Reg.Fan speed address 0X0001
Starting Address Lo	01	Starting Address Lo	01	
Holding Reg. Value Hi	00	Holding Reg. Value Hi	00	Reg.00=0X0004
Holding Reg. Value Lo	04	Holding Reg. Value Lo	04	The fan speed is rewritten as "Medium".
CRC Hi	D9	CRC Hi	D9	The current frame data CRC is 0XD9C9. If the data is different, the comparison code will change accordingly.
CRC Lo	C9	CRC Lo	C9	

5) Upper computer setting 1 # thermostat temperature parameter
 (Register 40003 > The corresponding communication start address is 0x02)

Master request		Slave response		Parameter
Field Name	(Hex)	Field Name	(Hex)	
Slave Address	01	Slave Address	01	Master station access - slave device address
Function Code	06	Function Code	06	The master rewrites the parameters of the slave holding register
Starting Address Hi	00	Starting Address Hi	00	Holding Reg.Temperature setting address 0X0002
Starting Address Lo	02	Starting Address Lo	02	
Holding Reg. Value Hi	00	Holding Reg. Value Hi	00	Reg.00=0X00DC, Decimal is 220
Holding Reg. Value Lo	DC	Holding Reg. Value Lo	DC	The temperature is set to 22,0 degrees.
CRC Hi	29	CRC Hi	29	The current frame data CRC is 0X2993. If the data is different, the comparison code will change accordingly.
CRC Lo	93	CRC Lo	93	





6) Upper computer setting 1 # thermostat power ON / OFF status
 (Register 40004 > The corresponding communication start address is 0x03)

Master request		Slave response		Parameter
Field Name	(Hex)	Field Name	(Hex)	
Slave Address	01	Slave Address	01	Master station access - slave device address
Function Code	06	Function Code	06	The master rewrites the parameters of the slave holding register
Starting Address Hi	00	Starting Address Hi	00	Holding Reg.Power on operation address 0X0003
Starting Address Lo	03	Starting Address Lo	03	
Holding Reg. Value Hi	00	Holding Reg. Value Hi	00	Reg.00=0X0001
Holding Reg. Value Lo	01	Holding Reg. Value Lo	01	The thermostat state is "Power On".
CRC Hi	B8	CRC Hi	B8	The current frame data CRC is 0XB80A. If the data is different, the comparison code will change accordingly.
CRC Lo	0A	CRC Lo	0A	

Function 3 read	01 03 00 00 00 04 44 09
	01 03 00 01 00 04 15 C9
	01 03 00 00 00 07 04 08

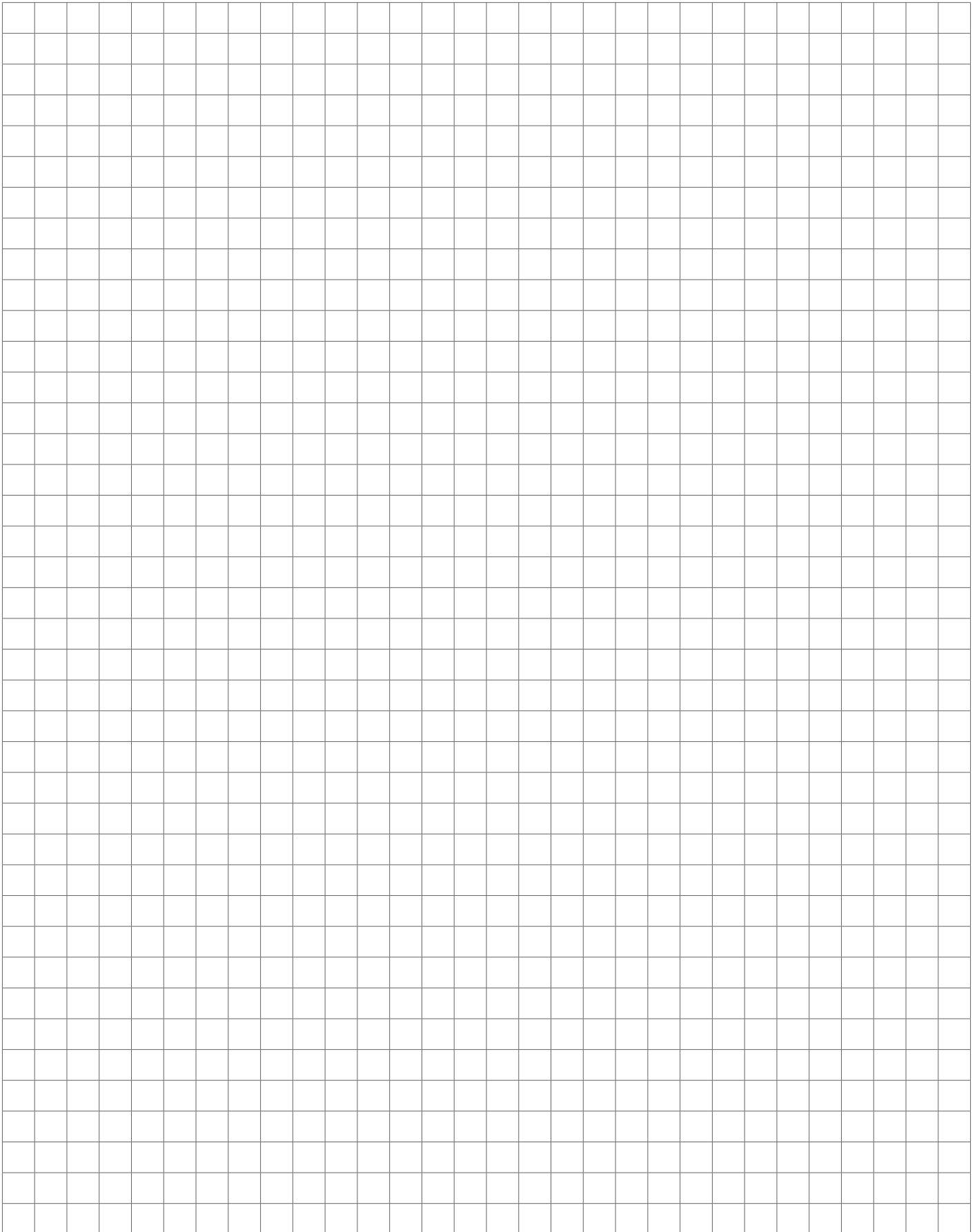
Function 4 read	01 04 00 00 00 03 B0 0B
	01 04 00 01 00 03 E1 CB
	01 04 00 00 00 04 F1 C9

Function 6 write / Mode setting	01 06 00 00 00 01 48 0A	Cooling
	01 06 00 00 00 04 88 09	Ventilation
	01 06 00 00 00 08 88 0C	Heating
	01 06 00 00 00 10 88 06	Automatic

Function 6 write / Fan speed setting	01 06 00 01 00 02 59 CB	Low
	01 06 00 01 00 04 D9 C9	Medium
	01 06 00 01 00 08 D9 CC	High
	01 06 00 01 00 80 D9 AA	Automatic

Function 6 write / Temperature setting	01 06 00 02 00 64 29 E1
	01 06 00 02 00 DC 29 93

Function 6 write / Power On / OFF	01 06 00 03 00 00 79 CA	Power Off
	01 06 00 03 00 01 B8 0A	Power On





ISO 9001:2015



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Management System
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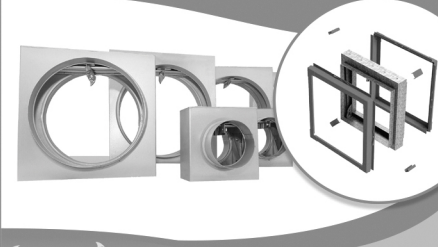


FANS & FAN SECTIONS

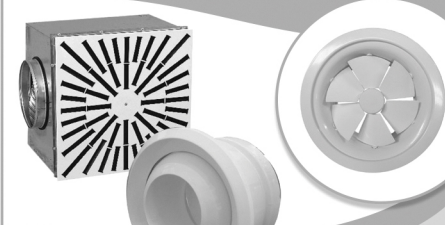


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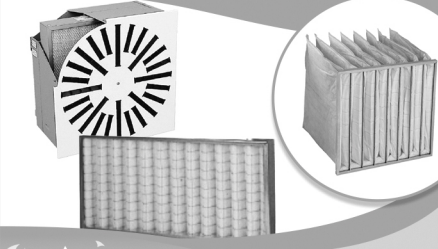


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