

M1002.XXS Series

Configurable HVAC Controllers

20260415R1

Technical Catalogue



The **Havkon M1002.XS Series Controllers** are designed for **heat recovery ventilation (HRV)** and professional ventilation control applications. The controller series provides flexible and configurable control structure for modern ventilation systems.

The **M1002.XS Series** supports independent **supply and exhaust fan control** with compatibility for **AC fans, EC fans and multi-stage fan applications**. The controller enables stable airflow management and energy-efficient operation for different ventilation system designs.

Advanced control functions include **electric heater control, fresh air and bypass damper management, frost protection, and filter monitoring functions**. Both pre-heater and **post-heater** applications can be controlled independently according to system requirements.

With **configurable universal inputs/outputs, Modbus RTU communication, weekly scheduling**, and flexible ventilation control structure, the M1002.XS Series offers reliable and energy-efficient solutions for professional ventilation applications.

Features

- Flexible & Configurable HVAC Structure
- Advanced AC / EC Fan Control
- Modbus RTU BMS Communication
- Electric Heater and Damper Control
- Weekly Scheduling & Control Functions
- Protection, Alarm & Monitoring Functions
- Compatible with HCP & TCP Control Panels

Order Codes*

M1002.X	Standard Heat Recovery Unit Controller
M1002.XS	Advanced Heat Recovery Unit Controller
IRM.3021	Expansion Relay Module

*Compatible with Havkon HCP and TCP Series Room Control Panels.

Warnings



Before installing and operating the device, carefully read the user manual and the instructions below.

- The user is responsible for any damage, loss, or injury caused by improper use or failure to follow these instructions.
- Do not modify, disassemble, or attempt to repair the device.
- Ensure correct supply voltage before powering the device.
- Disconnect power before installation and wiring.

Failure to comply with these instructions may result in device malfunction and will void the warranty.

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Product Overview

The **M1002.XS Series** provides flexible HVAC control solutions for heat recovery, ventilation, and air handling applications.

With configurable control structure and advanced fan management, the controller series enables reliable and energy-efficient operation for modern HVAC systems with Modbus RTU communication support.

Main Control Functions

Advanced Fan Control

- Independent exhaust and supply fan control
- AC fan and EC fan compatibility
- Multi-stage fan operation
- Adjustable fan control parameters

Heating & Cooling Control

- Staged electric heater control
- Proportional heating/cooling valve control
- Fresh air and bypass damper management
- Compressor control

Smart HVAC Functions

- Weekly scheduling function
- Frost protection operation
- Filter monitoring & alarm management
- Configurable HVAC application structure

Communication & Integration

- Modbus RTU RS-485 communication
- Building management system (BMS) integration
- Flexible universal input / output configuration
- Compatible with Havkon room control panels

HVAC Applications

Heat Recovery Units (HRU)

Air Handling Units (AHU)

Electric Heater Applications

EC Fan Ventilation Systems

Fresh Air & Exhaust Ventilation Systems

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Technical Specifications

Electrical Data	Power Supply	230 VAC ±10%
	Power Consumption	Max. 3 VA
	Connection	Terminal block, 1.5 mm ²
	Communication	Modbus RTU (RS-485)
Environmental Conditions	Operating Temperature	-20 ... +60°C
	Storage Temperature	-20 ... +60°C (without icing and condensation)
	Relative Humidity	Max. 90% RH (non-condensing)
Inputs & Outputs	Universal Inputs	4pcs in M1002.X 8pcs in M1002.XS
	Analog Input	1 pc 0-10V Input
	Analog Outputs	4 pcs 0–10 V Outputs
	Relay Outputs	Configurable Relay Outputs
	Fan Outputs	AC Fan (Max. 8Amper per each output) / EC Fan Compatible
Control Functions	Fan Control	AC / EC Fan Control
	Heating Control	Electric Heater / Water Valve
	Damper Control	Fresh Air & Exhaust Air Dampers
	Scheduling	Weekly Program
	Alarm Functions	Available
	Frost Protection	Available
Communication & Integration	Communication Protocol	Modbus RTU
	BMS Integration	Supported
	Room Panel Support	Havkon HCP / TCP Series
	Application Structure	Configurable Ventilation Control Logic
Protection & Standards	Protection Degree	IP 00
	Standard	EN 60529

Mechanical Specifications

Construction	Electronic Control Board
Mounting	Panel Mount
Dimensions	W122xH132xD31mm (Width x Height x Depth)
Weight	400 g

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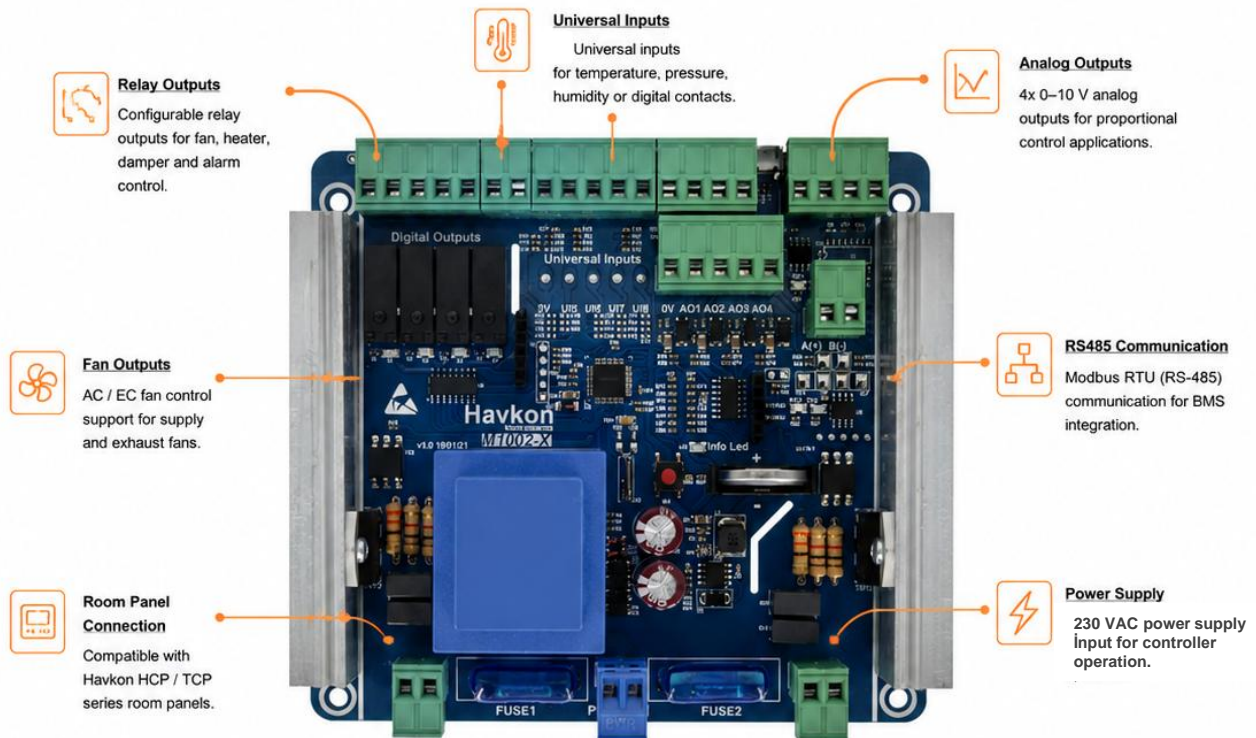
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Controller I/O Structure

The M1002.X Series provides flexible HVAC control architecture with configurable inputs, outputs, fan control interfaces, and Modbus RTU communication support for professional ventilation applications.



Note:

M1002.X models support 4 universal inputs, while M1002.XS models support up to 8 universal inputs.

I/O Interfaces

Terminal Group	Description
Universal Inputs	Supports NTC10K sensors, dry contacts, and configurable sensor inputs for HVAC applications.
Analog Outputs	0–10 V proportional control outputs for valves, dampers, and external HVAC equipment.
Relay Outputs	Configurable relay outputs for fan, heater, alarm, and auxiliary control functions.
Fan Outputs	AC / EC fan control support with multi-stage or proportional operation.
Communication	RS485 Modbus RTU communication for BMS and building automation integration.
Room Panel Interface	Compatible with Havkon HCP and TCP series room control panels.

M1002.X/S Series

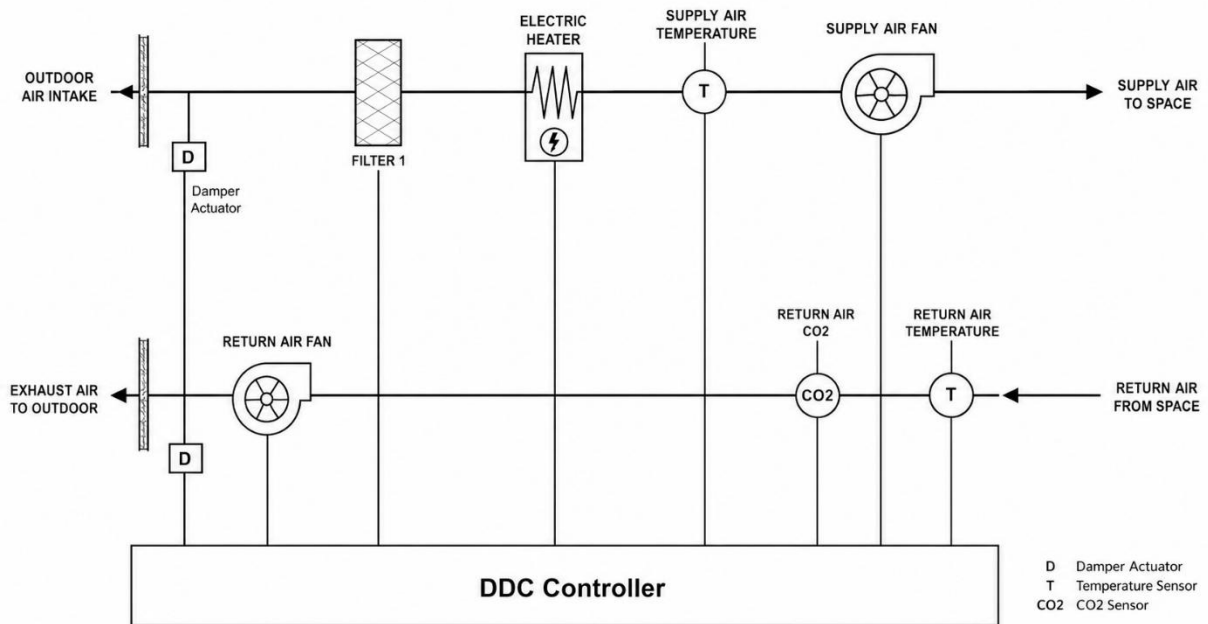
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HVAC Application Examples

Heat Recovery Ventilation System



Application Overview

The M1002.X controller provides advanced control for Heat Recovery Ventilation (HRV) systems.

- Independent supply and exhaust fan control (AC / EC)
- Heat recovery efficiency optimization
- Frost protection and bypass management
- Damper and electric heater control
- Multiple temperature sensor inputs for system monitoring

Note:

The shown diagram is a typical application example. Actual system design may vary depending on project requirements.

M1002.X/XS Series

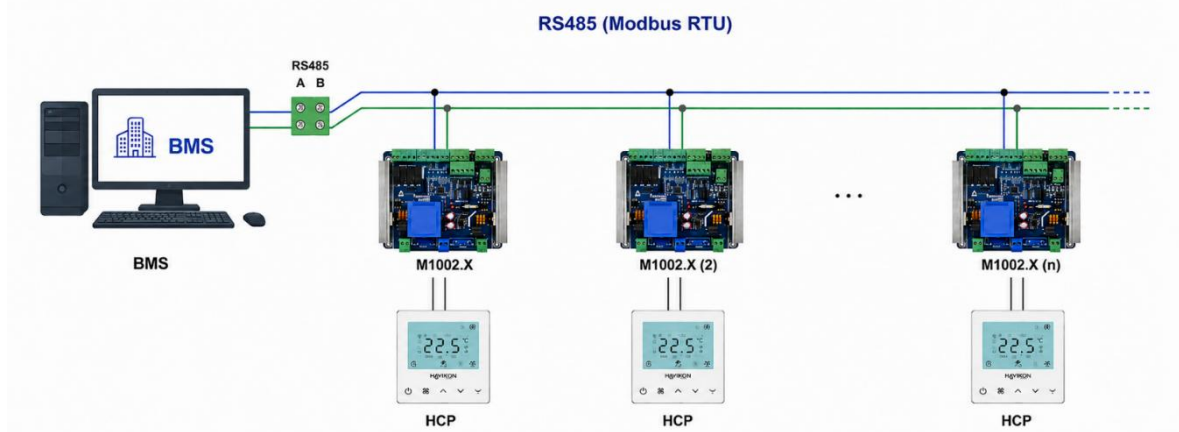
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Modbus RTU Communications

The M1002X Series supports Modbus RTU communication over RS485 interface for integration with building management and monitoring systems.



Communication Specifications

Parameter	Description
Protocol	Modbus RTU
Interface	RS-485
Data Format	8 Data Bits, No Parity, 1 Stop Bit
Baudrate	1200 – 57600 bps configurable
Register Type	Holding Registers

Communication Specifications

- Use shielded twisted pair cable for RS485 communication.
- Recommended cable type: **Min. 2x0.35 mm²** for reliable long-distance communication.
- Install a **120 Ω termination resistor** at both ends of the RS485 line.
- Keep A(+) and B(-) signal polarity consistent throughout the network.
- Avoid star topology. Use **daisy-chain wiring** for stable Modbus RTU communication.
- Maximum recommended number of devices on one RS485 line: **16 pcs M1002.X controllers**.
- Communication quality depends on cable length, grounding, EMC conditions, and baud rate settings.
- Recommended maximum communication distance: **up to 500 meters** under proper installation conditions.
- Keep communication cables away from high-voltage power cables and contactors.
- Connect cable shield to earth ground from one side only to reduce ground loop noise.
- Use the same baud rate, parity, and stop-bit settings for all devices on the network.
- Recommended baud rate for stable operation on long lines: **9600 or 19200 bps**.
- Each M1002.X controller must have a unique Modbus address.
- Excessive polling frequency may reduce communication stability. Sequential polling is recommended.
- HCP room panels are connected directly to their related M1002.X controller with a separate local communication cable.
- For installations in high-noise industrial environments, additional surge and transient protection is recommended.

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Register Address	Offset	Parameter Name	R/W	Range	Description
General Device Control Values					
40001	0	Device Enable	R/W	0...1	0:OFF 1:ON
40002	1	Device Set Temperature	R/W	0...999	280 value means 28 °C.
40003	2	Device Air Conditioning Mode	R/W	0...5	0: Fan Mode, 1: Heating Man, 2: Man. Heating 3: Auto Heating, 4: Auto Cooling, 5: Full Automatic Mode
40004	3	Exhaust Fan Manual Speed Value	R/W	0...6	
40005	4	Supply Fan Manual Fan Speed Value	R/W	0...6	
Device Heat Registers					
40006	5	Application Temperature	R	-400...999	280 value means 28 °C.
40007	6	Panel Ambient Temperature	R	-400...999	It is the Temperature Value on the Panel.
40008	7	Device Fresh Air Temperature	R	-400...999	It shows the temperature of the air drawn in the space.
40009	8	Device Supply Air Temperature	R	-400...999	If there is no temperature value available on the device, the temperature value is seen as "32767".
40010	9	Outdoor Temperature	R	-400...999	
40011	10	Water Coil Temperature	R	-400...999	
40012	11	Evaporator Temperature	R	-400...999	
40013	12	Condenser Temperature	R	-400...999	
40014	13	Heat Exchanger Temperature	R	-400...999	
Device Status Indicator Registers					
40015	14	Bms Input	R	0...1	0: Normal Operation, 1: Device Off
40016	15	Boost Input	R	0...1	0: Normal, 1: Fans Running at Full Speed
40017	16	Exhaust Fan Air Flow Status	R	0...1	Air flow switch status
40018	17	Supply Fan Air Flow Status	R	0...1	Air flow switch status
40019	18	Filter 1 Dirty Status	R	0...1	Filter 1 DPS status
40020	19	Filter 2 Dirty Status	R	0...1	Filter 2 DPS status
40021	20	E. Heater Safety Thermostat Information	R	0...1	Safety Thermostat Information
40022	21	Exhaust Fan Thermal Fault	R	0...1	Exhaust fan fault information
40023	22	Supply Fan Thermal Fault	R	0...1	Supply fan fault information
40024	23	Emergency Stop Button Information	R	0...1	Emergency Stop Button Information
40025	24	Low Pressure Inlet Information	R	0...1	Low Pressure Input
40025	24	Low Pressure Inlet Information	R	0...1	Low Pressure Input
40026	25	High Pressure Information	R	0...1	High Pressure Input
40027	26	Fire Information	R	0...1	Fire Entry
40028	27	Freezing Thermostat Information	R	0...1	Freezing Thermostat Information (In Water Coil application, the valve opens completely and the fans are completely turned off.)

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Register Address	Offset	Parameter Name	R/W	Range	Description
Device Status Indicator Registers					
40029	28	Compressor Thermal Failure Information	R	0...1	Compressor Thermic (If there is a compressor, the compressor turns off.)
40030	29	Phase Fail Information	0...1	Phase Failure Information (The device is completely turned off.)	40030
40031	30	Heat Exchanger Freezing Thermostat	0...1		40031
40032	31	VRF Error	0...1		40032
40033	32	VRF Defrost	0...1		40033
Device Analog Input Registers					
40034	33	CO2 Value	R	0...2000	This value is adjusted according to the analog input calibration parameter between 321 and 340.
40035	34	Air Quality Value	R	0...1000	
40036	35	Humidity Value	R	0...1000	
40037	36	Return Pressure Value	R	0...1000	
40038	37	Blowing Pressure Value	R	0...1000	
40039	38	CO2 Set Value	R/W	0...2000	
40040	39	Humidity Set Value	R/W		
40041	40	Empty			
40042	41	Empty			
40043	42	Empty			
Digital Out Instant Status Registers					
40044	43	Fresh Air / Suction Damper Motor	R	0...1	0: Off 1: On
40045	44	Bypass Damper Motor	R	0...1	0: Off 1: On
40046	45	Heating / Cooling Valve Output	R	0...1	0: Off 1: On
40047	46	Heating Coil Output	R	0...1	0: Off 1: On
40048	47	Cooling Coil Output	R	0...1	0: Off 1: On
40049	48	Compressor Output	R	0...1	0: Off 1: On
40050	49	Compressor 4-Way Valve Output	R	0...1	0: Off 1: On
40051	50	Device Operation Output	R	0...1	0: Off 1: On
40052	51	Device Fault Output	R	0...1	0: Off 1: On
40053	52	Device Warning Output	R	0...1	0: Off 1: On

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Register Address	Offset	Parameter Name	R/W	Range	Description
Digital Out Instant Status Registers					
40054	53	Exhaust Fan Run Output	R	0...1	0: Off 1: On
40055	54	Supply Fan Run Output	R	0...1	0: Off 1: On
40056	55	VRF On/Off Output	R	0...1	0: Off 1: On
40057	56	VRF Heat Mode Output	R	0...1	0: Off 1: On
40058	57	VRF Cool Mode Output	R	0...1	0: Off 1: On
40059	58	Rotary Outlet	R	0...1	0: Off 1: On
40060	59	Humidifier Outlet	R	0...1	0: Off 1: On
40061	60	Instant Exhaust Fan Output Value	R	0...6	Fan and electric heater shows the instantaneous step value..
40062	61	Instant Supply Fan Output Value	R	0...6	
40063	62	Instant Post Electric Heater Value	R	0...3	
40064	63	Instant Pre Electric Heater Value	R	0...3	
Instant Device Equipment Status Indicator Registers					
40065	64	Exhaust Fan Analog Output Value	R	0...100	It shows the proportional output values.
40066	65	Supply Fan Analog Output Value	R	0...100	
40067	66	Proportional Heating Valve Output Value	R	0...100	
40068	67	Proportional Cooling Valve Output Value	R	0...100	
40069	68	Proportional Heating / Cooling Valve Output Value	R	0...100	
40070	69	Proportional ByPass Damper Output Value	R	0...100	
40071	70	Mixing Damper Output Value	R	0...100	
40072	71	VRF Output Value	R	0...100	
Weekly Program Time Setting Parameter Registers					
40073	72	Sunday Start Time (HHMM)	R/W	0...2359	The device operates between the configured start and stop times during the day.
40074	73	Sunday Stop Time (HHMM)	R/W	0...2359	The device stops operating outside the configured time range.
40075	74	Monday Start Time (HHMM)	R/W	0...2359	If the start and stop times are equal, the device operates continuously on that day.
40076	75	Monday Stop Time (HHMM)	R/W	0...2359	
40077	76	Tuesday Start Time (HHMM)	R/W	0...2359	If the start time is greater than the stop time, the device remains off for that day.
40078	77	Tuesday Stop Time (HHMM)	R/W	0...2359	
40079	78	Wednesday Start Time (HHMM)	R/W	0...2359	Example: Parameter value 1210 means 12:10.
40080	79	Wednesday Stop Time (HHMM)	R/W	0...2359	
40081	80	Thursday Start Time (HHMM)	R/W	0...2359	

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Register Address	Offset	Parameter Name	R/W	Range	Description
Weekly Program Time Setting Parameter Registers					
40082	81	Thursday Stop Time (HHMM)	R/W	0...2359	
40083	82	Friday Start Time (HHMM)	R/W	0...2359	
40084	83	Friday Stop Time (HHMM)	R/W	0...2359	
40085	84	Saturday Start Time (HHMM)	R/W	0...2359	
40086	85	Saturday Stop Time (HHMM)	R/W	0...2359	
40087	86	Current Day	R/W	1...31	
40088	87	Current Month	R/W	1...12	
40089	88	Current Year	R/W	0...99	
40090	89	Current Hour	R/W	0...23	
40091	90	Current Minute	R/W	0...59	
40092	91	Current Second	R/W	0...59	
40093	92	Current Day of Week	R/W	1...7	1: Sunday 2: Monday 3: Tuesday 4: Wednesday 5: Thursday 6: Friday 7: Saturday
40094	93	Weekly Program Status	R/W	0...2	0: No Weekly Schedule 1: The device has a weekly program and the device is working. 2: The device is set up weekly weekly and the device is stopped.
40095	94	Empty	R	0...1	
40096	95	Alarm Value	R	0...32767	Active alarm status value.
40097	96	Warning Value	R	0...32767	Active warning status value.
Menu Setting Parameters					
40098	97	Fan Mode Menu Enable	R/W	0...1	0: Hidden, 1: Visible
40099	98	Manual Heating Menu Enable	R/W	0...1	0: Hidden, 1: Visible
40100	99	Manual Cooling Menu Enable	R/W	0...1	0: Hidden, 1: Visible
40101	100	Auto Heating Menu Enable	R/W	0...1	0: Hidden, 1: Visible
40102	101	Auto Cooling Menu Enable	R/W	0...1	0: Hidden, 1: Visible
40103	102	Full Automatic Menu Enable	R/W	0...1	0: Hidden, 1: Visible
Keylock					
40104	103	Keylock	R/W	0...1	0: Key Lock Off, 1: Key Lock On
Fault Parameters					
40105	104	Major Fault Information	R/W	0...1	0: No Fault, 1: Device Shut Down Due to Fault
40106	105	Compressor Failure Information	R/W	0...1	0: No Compressor Fault, 1: Compressor Fault Active

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Register Address	Offset	Parameter Name	R/W	Range	Description
Set Heat Parameters					
40107	106	Minimum Set Temperature	R/W	0...999	Example: 280 = 28.0 °C
40108	107	Maximum Set Temperature	R/W	0...999	Example: 280 = 28.0 °C
Fan Set Parameters					
40109	108	Fan Quantity	R/W	1...2	1: Single Fan, 2: Dual Fan
40110	109	Fan Step Value	R/W	1...6	Fan speed step count
Password Parameters					
40111	110	Service Settings Password	R/W	0...9999	Password required to access service parameters above parameter 120
Building Automation Modbus-RTU Parameters					
40112	111	Modbus ID	R/W	1...254	Modbus slave address
40113	112	Modbus Baudrate	R/W	0...7	Communication baudrate selection
Filter CounterTimer					
40116	115	Filter Time Counter	R/W	0-9999 h	Operating hour counter for the supply fan
40117	116	Device Operating Mode Information	R	0-100	0: Device Off, 1: Damper Opening, 2: Fan Starting, 3: Main Control Loop, 4: Valve Closing, 5: Fan Stopping, 6: Freeze Protection, 7: Defrost Mode, 99: Fault Status
Boost Mod Set					
40118	117	Boost Mode Enable	R	0-1	0: Disabled, 1: Enabled

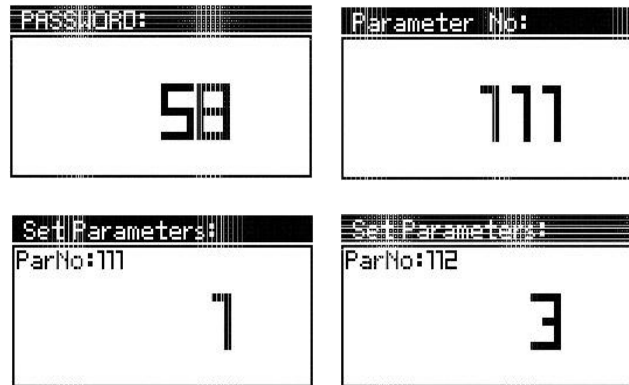
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Modbus Communication Settings



To log in to the user service menu:

Press the **UP ▲** and **DOWN ▼** buttons simultaneously through the panel while the device is energized.

On the screen you see, use the **UP ▲** and **DOWN ▼** buttons to enter the service password and press the **MODE/OK** button. If the password is entered correctly, enter the parameter number you want to change on the display and press the **MODE/OK** button. After changing the parameter, you want to change, register by pressing the **MODE/OK** button and go to the main menu with the **ON/OFF □** button.

For Modbus ID, the "PR" parameter is reached **111**, and using the desired Modbus ID **UP ▲** and **DOWN ▼** buttons, set "ST" and press the **MODE/OK** button.

For Modbus ID, the "PR" parameter is reached **112**, and using the desired Modbus baudrate **UP ▲** and **DOWN ▼** buttons, set "ST" and press the **MODE/OK** button.

Press the **ON/OFF □** button to exit the service menu.

- 0: 1200 Bps
- 1: 2400 Bps
- 2: 4800 Bps
- 3: 9600 Bps
- 4: 19200 Bps
- 5: 38400 Bps
- 6: 57600 Bps

Note1: The service menu password is 58.

Note2: Other Modbus parameters Data bit 8, Data parity bit none (N), Stop bit 1 cannot be changed.

Note3: All Modbus parameters are Holding register.

Note4: All Modbus parameters are Signed Integer16

Note5: The entire Modbus Parameter Table is on the back page.

Warning: Changes made in the Service Settings Menu must only be carried out by authorized technical personnel. All responsibility arising from these changes belongs to the person modifying the device parameters.

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Fault & Warning Lists

The M1002.X Series includes alarm and warning management functions for reliable ventilation system monitoring and protection.

Fault Codes	Description
E0001	Exhaust Fan Failure
E0002	Supply Fan Failure
E0004	Electric Heater Failure
E0008	Exhaust Air Flow Error
E0016	Supply Air Flow Error
E0032	Compressor Failure
E0064	Low Pressure Alarm
E0128	High Pressure Alarm
E0256	Fire Alarm
E0512	Phase Failure
E1024	VRF Error

Warning Codes	Description
W0001	BMS Shutdown
W0002	Boost Mode
W0004	Filter 1 Dirty
W0008	Filter 2 Dirty
W0016	Defrost Mode
W0032	Frost Protection Active
W0064	Emergency Mode

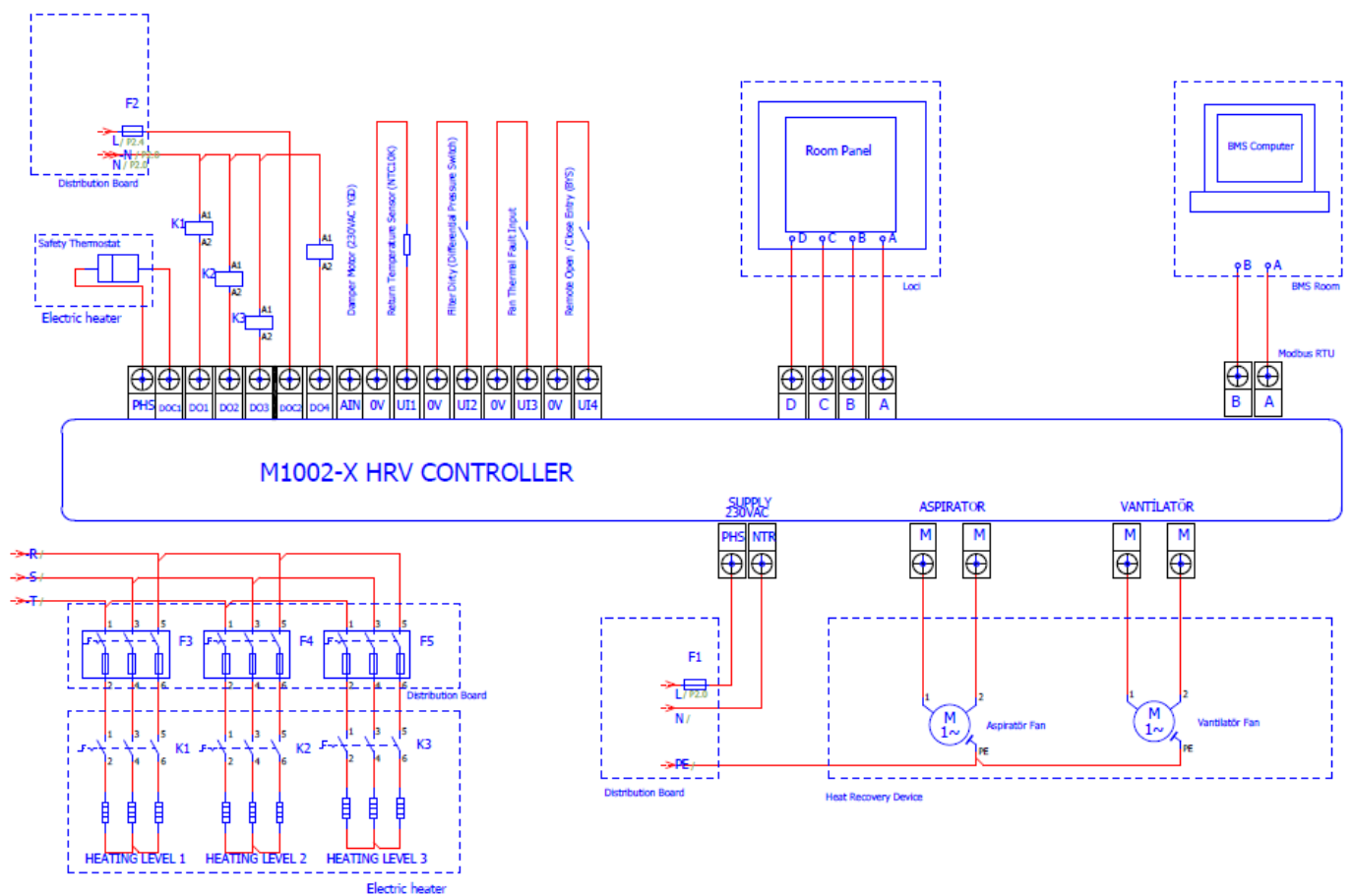
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Wiring Diagram



Connections

The device must be installed and operated in accordance with applicable electrical regulations.

- Ensure the power supply is disconnected before installation and wiring.
- Use appropriate cable cross-sections according to load and installation conditions.
- Do not route signal cables together with power cables. Use shielded twisted pair cable for RS485 communication.
- Protect the device from moisture, dust, and vibration.

Recommended: Use an external fuse protection according to application requirements.

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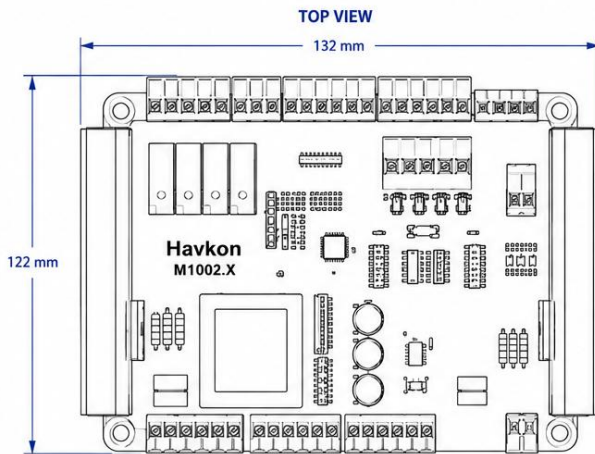
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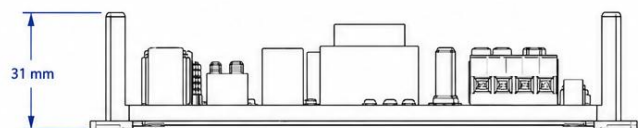
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Dimensions

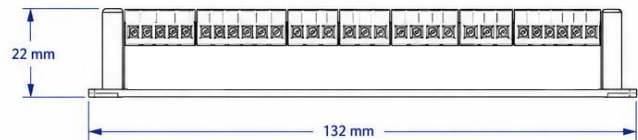
All dimensions are in millimeters (mm).



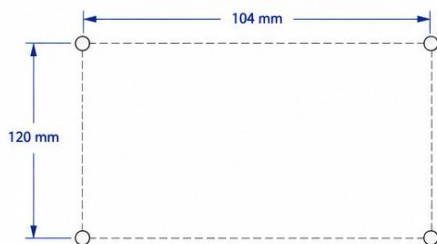
SIDE VIEW



FRONT VIEW

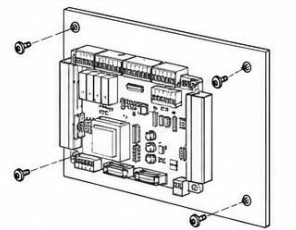


MOUNTING HOLE DIMENSIONS



MOUNTING

- The controller can be mounted using 4 screws.
- Recommended screw type: M4
- Mount the controller on a flat and non-vibrating surface.
- Ensure adequate clearance for wiring and ventilation.



Note: Product dimensions may vary ± 1 mm.

Weight: 400 g.