SIEMENS

RWG Universal Controller

RWG1.M12D, RWG1.M12, RWG1.M8

For monitor and control in FAU, AHU, heat exchange units, fans, pumps, lighting and other electromechanical equipments.

- High flexibility and economical efficiency
- Inbuilt programmable 192 * 64 Pixel LCD display (RWG1.M12D only)
- Onboard RS485 and ethernet interface for flexible field data acquisition and communication
- Smart and graphical user interface
- Self-explanatory programming language
- Comprehensive Siemens reference application library
- Powerful offline simulator

CE

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Siemens
Building Technologies

Features

- Operating voltage AC / DC 24 V
- 12 universal I/Os
- Onboard RS485 interface, support Modbus RTU master and slave modes
- Onboard Ethernet, support Modbus TCP server mode
- Programmable via Web-based tool
- Field upgrade via USB flash disk
- Fully functional offline simulator
- Onboard programmable LED

Type summary

Type	Stock number (SSN)	Product description
RWG1.M12D	S55370-C170	RWG1.M12D universal controller with Modbus RS485 and TCP communication，12 universal I/Os, inbuilt HMI
RWG1.M12	S55370-C171	RWG1.M12 universal controller with Modbus RS485 and TCP communication，12 universal I/Os, no LCD display and buttons
RWG1.M8	S55370-C172	RWG1.M8 universal controller with Modbus RS485 and TCP communication，8 universal I/Os, no LCD display and buttons

Accessories

Type	Product description
Online help	https://www.ubc.siemens.com.cn

Equipment combinations

Most Siemens sensors and actuators are supported.

For more information, please visit
http://hit.sbt.siemens.com/RWD/app.aspx?RC=AP&lang=en&MODULE=Product&ACTION=ShowGroup

Product documentation

Topic	Title	Document ID
Mounting and installation	Mounting instructions	A6V10733748
Engineering and commissioning	Online help	https://www.ubc.siemens.com.cn/help/
Declarations	CE declarations	A5W90001305
Environmental compatibility	Environmental declarations	A5W90001027

The documents can be downloaded from http://siemens.com/bt/download.

Notes

Security

⚠ CAUTION

National safety regulations

Failure to comply with national safety regulations may result in personal injury and property damage.

- Observe national provisions and comply with the appropriate safety regulations.

Engineering

Restrictions

All restrictions in this chapter and in “Technical data” must be complied with.

⚠ WARNING

The sections marked with a warning symbol contain technical safety requirements and restrictions. Observe all of these warnings as they directly relate to the protection of personnel and equipment.

Mounting

⚠ WARNING

Wiring, protection and earthing must be installed in compliance with local regulations.

Installation

⚠ WARNING

No internal line protection for supply lines to external consumers

Risk of fire and injury due to short-circuits

Adapt the line diameters as per local regulations to the rated value of the installed fuse.

Commissioning

Please observe the following notes while commissioning：

- Please use Siemens offline simulator to ensure that the program fully meets the onsite requirements.
- The control logic and adjusting performance depend largely on the programming.
- Ensure power supply and correct wiring of the controller and its peripherals.
- The flash-saved parameter will be refreshed immediately once changed.

Operation

The controller must be prepared for use and commissioned by qualified staff with appropriate training.

Maintenance

The controller is maintenance-free, apart from cleaning at regular intervals. Dust and dirt should be removed from system parts in the control panel as part of normal service visits.

Disposal

The device is considered electrical and electronic equipment for disposal in terms of the applicable European Directive and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

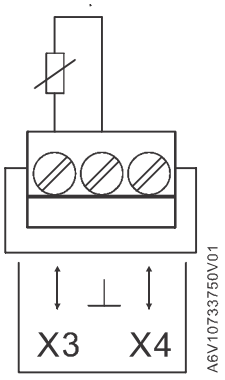
Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Technical data

General	
Operating voltage	AC 24 V (+20%, -20%) DC 24 V (+10%, -15%)
Frequency	48... 63 Hz
Power consumption	7 W / DC 4 V 14 VA / AC 24 V
Internal Fuse	Yes (Recoverable within declared power range, unrecoverable if damaged)
Main processor	Cortex M4
Power-down save	At least 24 hours (at 25 ℃)
Real time clock error	Less than15 minutes / year (at 25 ℃)
Inbuilt HMI (RWG1.M12D only)	192 * 64 pixels LCD
	White backlight, settable backlight time
Buttons	4 buttons (+, - ,OK , ESC)
Onboard LED (green)	- on：in normal working condition - flash: programming
Onboard programmable LED (red)	- 0：off - 1：on - 2：slow flash (1 Hz) - 3： quick flash (5 Hz)

Universal input

NTC 10k	
Temperature range	-30... +130 ℃
Temperature -30 ℃- 0 ℃ 0 ℃ - 50 ℃ 70 ℃ 90 ℃ 100 ℃	Accuracy 1.5 K 1 K 1.5 K 2.1 K 2.9 K
Wiring diagram (for reference only)	

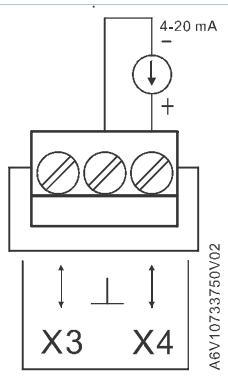
Universal input

NTC 100k	
Temperature range	-10... +130 ℃
Temperature -10 ℃- 0 ℃ 0 ℃ - 50 ℃ 70 ℃ 90 ℃ 100 ℃	Accuracy 1.5 K 1 K 1.5 K 2.1 K 2.9 K
Wiring diagram Please refer to NTC 10k.	

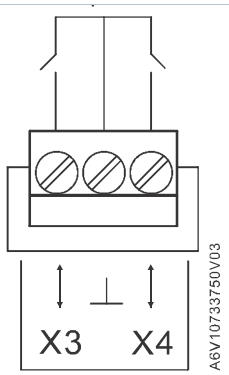
PT 1000 (3850 ppm / K)	
Temperature range	-50... +150 ℃
Temperature -50..150 ℃ 25℃	Accuracy 1 K 0.5 K
Wiring diagram Please refer to NTC 10k.	

LG Ni 1000 (5000 ppm / K)	
Temperature range	-50... +150 ℃
Temperature -50..150 ℃ 25℃	Accuracy 1 K 0.5 K
Wiring diagram Please refer to NTC 10k.	

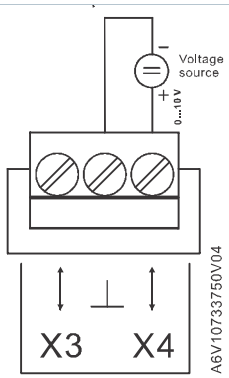
0 (4) ... 20 mA	
Accuracy	+/- 1% F.S. (internal measurement of resistance 440 Ω)
Wiring diagram (for reference only)	⚠ No internal over-current protection!



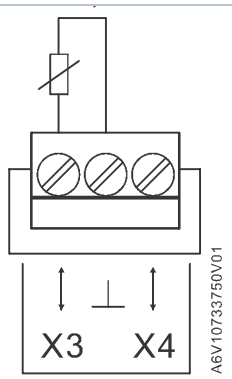
Universal input

Passive digital input	
Sampling voltage	DC 15 V
Sampling current	2 mA (stable) , 5 mA (pulse)
Contact resistance (closed)	Min. 50 kΩ
Contact resistance(open)	Max. 200 Ω
Wiring diagram (for reference only)	

Pulse input	
Voltage range	DC 15 V
Max. pulse frequency	Max. 50 Hz
Min. input pulse width	7 ms
Wiring diagram (for reference only)	

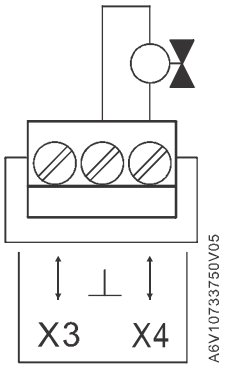
DC 0... 10 V	
Voltage range	0... 10 V
Accuracy	+/- 1% F.S.
Sampling resistance	>100 kΩ
Wiring diagram (for reference only)	

Universal input

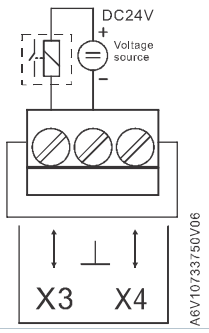
Resistance measurement R_1000	
Resistance range	500...2000 Ω
Measurement accuracy	1.5%
Wiring diagram (for reference only)	

Resistance measurement R_10000	
Resistance range	2 K...100 KΩ
Resistance range 2k-20KΩ 20k-100KΩ	Accuracy 3% 5%
Wiring diagram Please refer to R_1000.	

Universal output

DC 0...10 V	
Voltage range	0...10 V
Accuracy	100 mV
Cable length	Max. 30 m (diameter ≥ 0.75 mm^2 is recommended)
Output current	Max. 1 mA
Wiring diagram (for reference only)	

Universal Output

Passive electronic switch output	
Switching device	MOSFET
Nominal current Output leak current	Max 100 mA 9 mA @ AC 24 V, 1 mA @ DC 24 V
Switch-on resistance	Typical 6 Ω
Compatible Relay	AC/DC 24 V, DC 12 V intermediate relay (reinforced insulation or double insulation in relay contact) **Direct current relay has smaller leakage current, so we recommend to use direct current relay as the external intermediate relay.** **Be cautious when using SSR. Be sure to test whether the leakage current affects the SSR switch.**
Wiring diagram (for reference only)	

Communication interface		
RS485 serial port	General electric characteristics	EIA-485 (RS485)
	Electrical isolation	No electrical isolation
	Connector	+, -, ⊥
	Bus protocol	Modbus RTU
	Baudrate	1200/2400/4800/9600 /19200/38400 bps (software configurable)
	Working mode	Master or slave mode (software configurable)
	Typical cable	Shielded twisted pair (diameter ≥ 0.5 mm^2 is recommended)
	Terminal resistance	No terminal resistance. Please select proper resistance according to your network topology (120 Ω is recommended)
	Max. slave stations (RWG universal controller as master station)	Max. 31 (for better system performance, 10 or less slaves is recommended)
	Communication distance	Max. 50 m (without repeaters); Max. 1000 m (with repeaters)
Network interface	Connector	RJ45

Communication interface		
	Bus protocol	Modbus TCP
	Baudrate	10 Mbps
	Cable length	Max. 50 m (CAT 5E UTP shielded twisted pair)
USB port	Connector	USB type A port
	Bus protocol	USB 2.0，compatible with USB1.0 and USB1.1
	Baudrate	Max. 12Mb/s
	File format	FAT16, FAT32
	Peripherals	USB disk

Tools		
Online programming tool	Website URL	https://www.ubc.siemens.com.cn/
	Operation system and hardware requirement	Windows7 or higher，RAM 2G
	Client browser	IE10/Chrome25/Firefox 33 or higher
	Object file for application upgrade	A logic file can be generated and unzipped to 2 files: Ctrl.bin and hmi.bin.
	Main functions	Controller initialization, logic programming, HMI programming, communication data binding, etc.
Offline simulator	Operating environment	Windows7 or higher (with Microsoft .NET framework 4.0 or higher)
	Operating file	Click “Debug current project”, download the ZIP file, and then run the unzipped UBC.exe.

Connector	
I/O signal	3 pins, spacing 5.08 mm, green
RS485 communication	3 pins, spacing 5.08 mm,black
Power plug	2 pins, spacing 5.08 mm, orange
Single wrapping cable	0.5...2.5 mm^2
Stranded wire (or with wire ferrule)	0.5...1.5 mm^2

Ambient conditions and protection classification	
Operation	IEC60721-3-3
Temperature	-20...50 ℃
Air humidity	<90% r.h. (no condensation)
Air pressure	Min. 700 hPa, 3,000 m above sea level
Transport	IEC 60721-3-2
Temperature	-20...70 ℃
Air humidity	<95% r.h. (no condensation)
Air pressure	Min. 260 hPa,10,000 m above sea level
Mechanical ambient conditions	IEC 60721-3-2 Class 2M2

Standards, directives and approvals	
Protection class	IP20 (EN 60529)
Safety class	Class III
EU conformity (CE)	A5W90001305*)
Environmental compatibility	The product environmental declaration (document number: A5W90001027) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal)

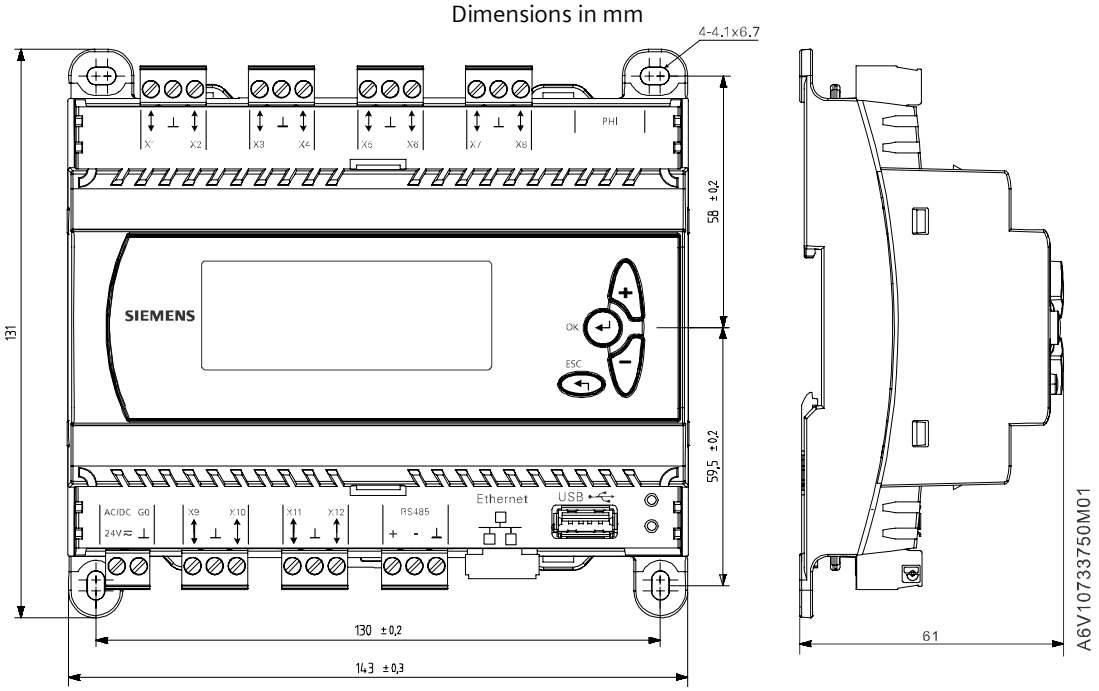
*) All the documentations can be downloaded at the following Internet address: http://siemens.com/bt/download.

General	
Dimensions (L*W*H)	143 mm ×131 mm × 61 mm
Weight	296.9 g
Material	Plastic PC 6485
Color	Housing: Light gray, RAL7035 Base: RAL7001

Diagrams

Dimensions and connection terminals

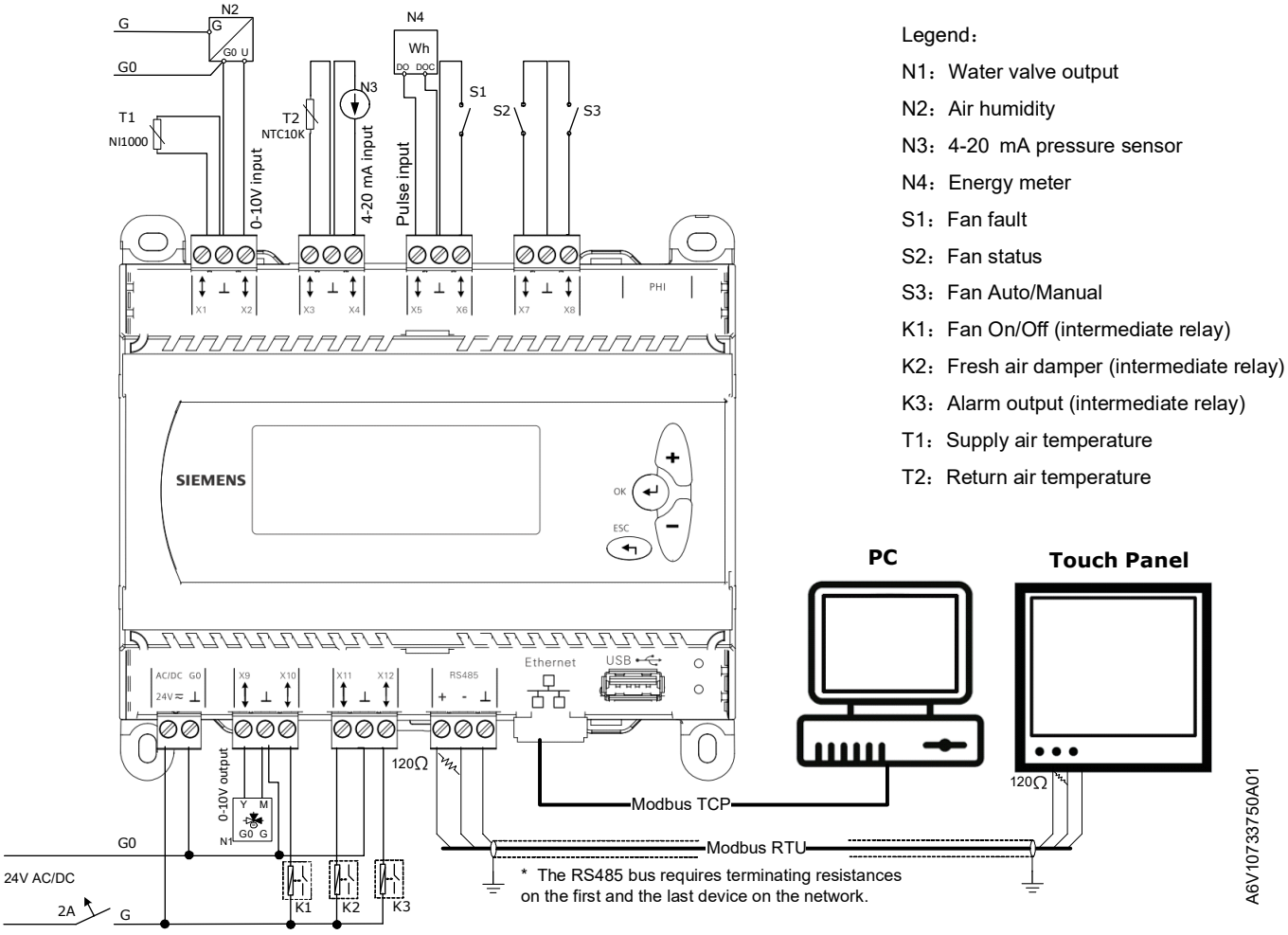
Dimensions in mm



Terminals			
AC/DC 24V, G0 (⊥)	Power supply: AC/DC 24 V Attention: Fuse between G0 and common terminal (Max. 0.56 A)	X1... X12, ⊥	Universal input and output, common terminal
RS485 (+, -, ⊥)	485 serial bus interface (+, -, ⊥)	Ethernet	Ethernet interface (RJ45)
USB	USB interface		

Wiring diagram

The following wiring diagram only serves as a reference of AHU applications. It does not fully match with a real onsite application.



Legend：

N1：Water valve output

N2：Air humidity

N3：4-20 mA pressure sensor

N4：Energy meter

S1：Fan fault

S2：Fan status

S3：Fan Auto/Manual

K1：Fan On/Off (intermediate relay)

K2：Fresh air damper (intermediate relay)

K3：Alarm output (intermediate relay)

T1：Supply air temperature

T2：Return air temperature

Support

- A faulty device shall be returned with a Return Good Note for Service provided by an appropriate Siemens sales office.
- If you have further questions concerning the product, please contact our technical support.

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✉ support.ap.i-bt@siemens.com

- High voltage must be strictly segregated from the AC 24 V safety extra low-voltage (SELV) when wiring the system to protect against electric shock.
- When multiple controllers are connected to one power source, wrong wiring of AC / DC 24V and G0 will lead to damage or destruction of the controller and power supply.
- When DO is connected with an external intermediate relay, RWG universal controller's M port must be connected with the negative port of primary power supply, otherwise the controller will be powered down in case of over current.
- The digital output must be connected with relays with double insulation to protect against electric shock.
- Interconnecting devices with different reference potentials may generate unnecessary current, which will lead to communication error or device damage.
- Please ensure that all the communication devices have the same reference potential , or add insulation devices to avoid unnecessary current.
- Insulation devices need to be added for network stability and protection of communication interface.
- Note: RWG1.M12 and RWG1.M8 doesn't have LCD display and buttons.

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