

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

RWD44U

UNIVERSAL HEAT PUMP TEMPERATURE CONTROLLER

Used with the applicable RWD44U configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens technical documentation for RWD44U

RWD44U

Temperature Controller (Heat Pump)



Description

The RWD44U Controller is a stand-alone, electronic, programmable controller with pre-configured temperature control applications. It is intended for heating, ventilating, and air conditioning systems, including one, two or three-stage compressor, heat pumps or single or dual stage heating and/or cooling equipment. This 24 Vac operating voltage controller switches four, on/off outputs. It has two universal inputs, for Siemens Nickel 1000, Platinum 1000 or active 0 Vdc to 10 Vdc signals.

The RWD44U Controller performs both primary and auxiliary functions. The input X1 detects the actual temperature and compares it with the setpoints. Depending on the deviation, the controller acts with its outputs to achieve the desired setpoints.

An LCD display provides viewing application and parameter adjustments as well as setpoint and thermometer function. Parameters can be changed using the three buttons on the controller's front or with the Siemens RWD programming software tool. A computer connection is provided on the controller for downloading pre-configured applications.

This controller is UL 916 approved for safety, and intended to be mounted inside an optional enclosure, on a DIN rail, or perforated sheet with screws.

NOTE: For complete supporting technical documentation, including training presentations, see www.us.sbt.siemens.com/hvp/components.

Product Number	RWD44U
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Functions Summary

- Universal input X1 for the main temperature sensor.
- Universal input X2 for the following auxiliary functions:
 - On/Off (Standby)
 - Remote setpoint
 - Alarm
 - Filter alarm
 - Setpoint compensation
 - Sensor averaging
 - Winter/Summer setpoint changeover
 - Sensor select
- Digital input D1 for the following functions:
 - Day/night changeover setpoint
 - On/Off (Standby)
 - Alarm
 - Filter alarm

Accessories	ARG62.21	Protective enclosure for wall mounting.
	SEH62.1U	Program Clock
	SEM62.2U	Transformer (30 VA)
	125-3481	RWD Controller Programming Tool (CD)
	RWDTKU	Tool Kit
Warning/Caution Notations	CAUTION: 	Equipment damage may occur if you do not follow a procedure as specified.
Specifications	Operating voltage	24 Vac $\pm$ 20%
Power Supply	Frequency	50/60 Hz
	Power consumption	4.5 VA
LCD	Actual and nominal values	4 digits
Display resolution (these values do not relate to the controller's accuracy)	Siemens Ni 1000 Ω	1°F (0.5°C)
	Pt 1000 Ω	1°F (0.5°C)
	Active sensor (0 to 10 Vdc)	Depends on the sensing range
Environmental Conditions	Storage and transport	
	Temperature	-13°F to 158°F (-25°C to 70°C)
	Humidity	<95% rh
	Operation	
	Temperature	32°F to 122°F (0°C to 50°C)
	Humidity	<95% rh
Regulatory Approvals	CE UL	Conforms to  requirements UL listed to 916 Energy Management Equipment
Terminals	Screw terminals, min./max. conductors	Minimum 24 AWG (1) Maximum 16 AWG (2), or 14 AWG (1)
Weight		0.75 lb (0.300 kg)
Analog inputs X1, X2 (Siemens Ni 1000 Ω at 32°F [0°C])	Controller setpoint range	-58°F to 302°F (-50°C to 150°C)
	Maximum cable length for 14 AWG	984 ft (300 m)
Pt 1000 Ω at 32°F (0°C)	Controller setpoint range	4°F to 356°F (-20°C to 180°C)
	Maximum cable length for 14 AWG	984 ft (300 m)
Analog voltages (for measured variables in °F, °C, % or without unit)	Range	0 to 10 Vdc corresponding to adjustable range from -100 to 2400
	Maximum cable length for 14 AWG	984 ft (300 m)
Remote setpoints X2 (for measured variables in °F, °C, % or without unit)	Range	0 to 10 Vdc corresponding to adjustable range from -100 to 2400
	Maximum cable length for 14 AWG	984 ft (300 m)
Digital input D1	Polling voltage for control commands (D – M)	15 Vdc
	Current consumption	<10 mA
Digital output Q1 through Q4	Relay contacts (potential-free)	
	Voltage	24 Vac
	Maximum rating	24V to 240V, 5A Res/5 FLA/30LRA/ 1/2 HP
	Minimum rating	19.2 Vac, 20 mA 5 Vdc, 100 mA

Applications, Continued

Three-stage Compressor with Reversing Valve in Cooling Demand

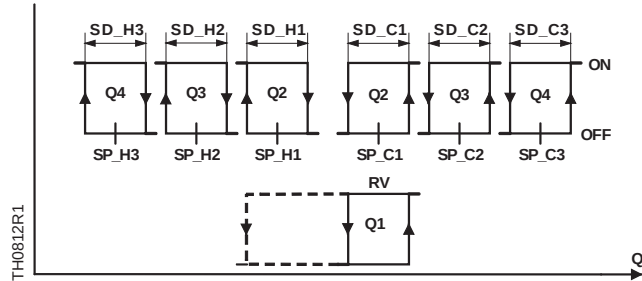
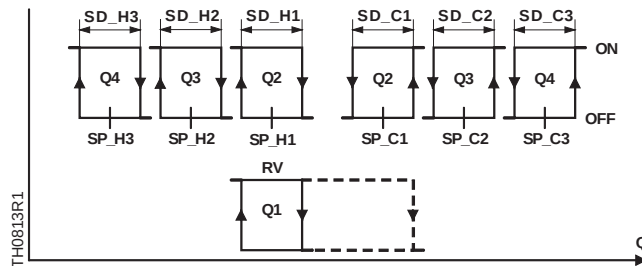


Figure 3. Applications 20 through 29.

Three-stage Compressor with Reversing Valve in Heating Demand



SP_H...	Setpoint heating stage...	Q1	Reversing valve
SP_C...	Setpoint cooling stage...	Q2	Compressor 1
SD_...	Switching differential...	Q3	Compressor 2
Q	Load	Q4	Compressor 3

Figure 4. Applications 30 through 39.

Reversing valve (RV)

The reversing valve can be energized in cooling or heating demand depending on the heat pump internal equipment circuitry. The reversing valve can be set to switch ON or OFF during "no demand" as shown on the above diagrams.

Universal input X1

The universal input X1 is used as the primary input for Siemens Ni 1000 sensor, Pt 1000 sensor or a 0 to 10 Vdc active input.

Universal input X2

The universal input X2 is used as the secondary input for Siemens Ni 1000 sensor, Pt 1000 sensor, digital input, active/passive remote setpoint transmitter or a 0 to 10 Vdc active input.

Digital input D1

The digital input D1 is used to enable the digital functions. Changeover occurs via potential-free contact between terminals D1-GND.

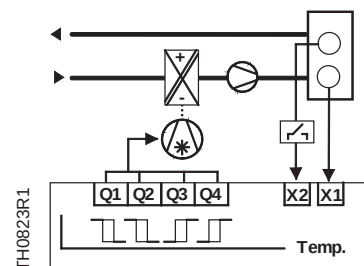
Delay times

The controller has adjustable output delay times to protect equipment from switching on/off too frequently.

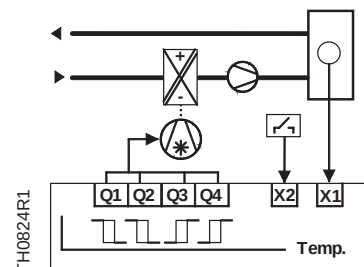
Delay	Range
Minimum On time	0 to 4096 seconds
Minimum Off time	0 to 4096 seconds
Inter-stage delay (stage 1 ⇒ stage 2 ⇒ stage 3)	0 to 4096 seconds
Changeover delay (heating demand ⇔ cooling demand)	0 to 4096 seconds
Winter ⇔ Summer setpoint changeover	0 to 23 Hours 59 minutes

Auxiliary and Digital Functions, Continued

Two sensors connected to X1 and X2. A switch on the wall is used to select the controlling sensor. When the switch breaks, the controller selects X1 as the controlling signal.

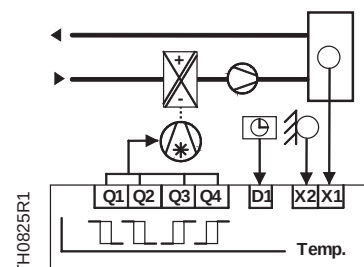
**Figure 14. Sensor Select.**

Default value for X1 is active 0 to 10 Vdc and X2 is the Standby mode input.

**Figure 15. Main Loop, Active.**

A switch contact between D1-M can be used to implement setpoint changeover for day/night operation. When contact is open, the setpoints for day operation are selected. When contact is closed, the setpoints for night operation are selected.

During night operation, the remote setpoint and setpoint compensation functions are not applicable.

**Figure 16. Day/Night Setpoint.****Mechanical Design****Protective Housing
ARG62.21**

- This UL-approved plastic housing protects the controller when mounted outside a control panel, such as on ducts, walls and in mechanical rooms. This housing also prevents inadvertent contact with voltage supplying parts such as the connecting terminals.
- The RWD44U clips into the protective housing.
- The cable entries are located at the top and the bottom of the protective housing.
- The front has an opening for the LCD display and the programming buttons.

Housing

NEMA 1 protection

Mounting Options

The RWD44U Universal Controller can be mounted as follows:

- In a standard electrical control cabinet
- Wall-mounted in a protective housing
- Front-mounted with standard available installation elements

Terminals

Plug-in screw terminals

**Mechanical Design,
Continued**

**Operating and Display
Elements**

The buttons on the controller front operate the RWD44U. Additional tools are not necessary. The controller can also be programmed via the software tool, which plugs into the nine-pin port.

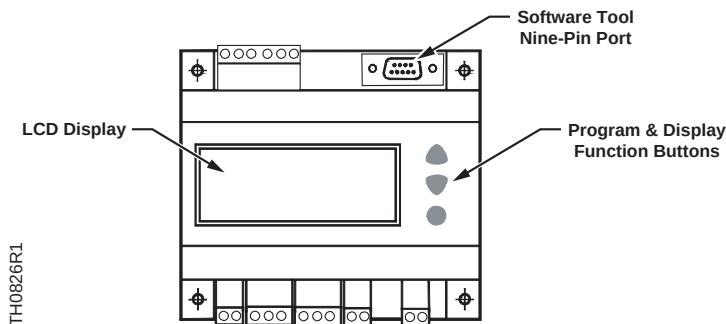


Figure 17. RWD44U Temperature Controller.

LCD

The LCD shows the following information for normal operation:

- Current operating values (maximum four digits)
- Current setpoints (day/night)
- Application number
- Output status
- Auxiliary input value
- Selected auxiliary function

Operating Buttons

The controller has three operating buttons for the following functions:

SEL ●

The SEL ● button is used to enter or save the value adjustment. This button also acts as a manual on/off button.

+ ▲

— ▼

The ▲ ▼ operating buttons are used for viewing and adjusting parameters.

The screen will default back to the main screen if no selection has been made for 60 seconds while in the setting mode.

Parameter Setting

To configure the controller, follow the instructions supplied with the controller.

Software Tool

An optional, user-friendly, Windows® 95 (or above) based software tool for controller application selection and parameter adjustment is available. It provides you with a print-out of the controller settings. This tool allows controller programming prior to installation.

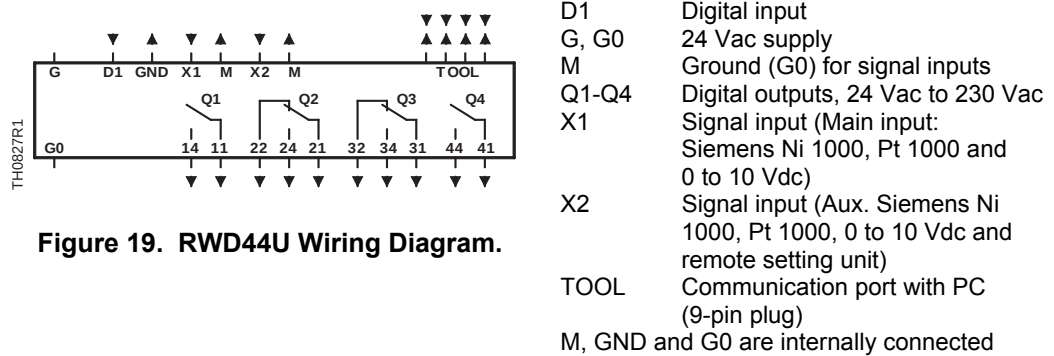
Commissioning Notes

A commissioning booklet is included with the RWD44U Controller.

Observe the following:

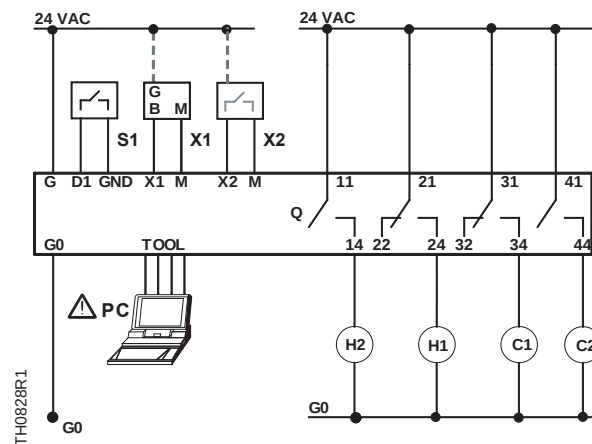
- The controller must be configured for application-specific operation using the standard application number.
- Application-specific fine-tuning can be performed if required (see the commissioning booklet).
- Power supply to the controller and the connected devices must be guaranteed.
- Values and settings entered remain available even on power failure.

Wiring Terminals



Wiring Diagrams

- CR1 Compressor 1
- CR2 Compressor 2
- RV Reversing valve
- H1 Heat 1
- H2 Heat 2
- C1 Cool 1
- C2 Cool 2
- X1 Main temperature sensor
- X2 Auxiliary sensor or switch
- S1 Time clock or switch (optional)
- PC Personal computer



Dimensions

In Inches (Millimeters)

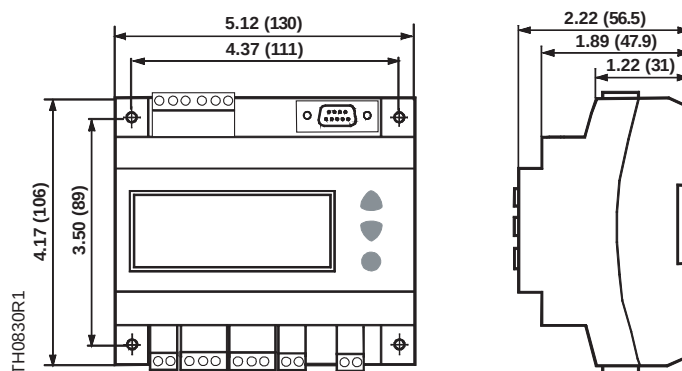


Figure 22. RWD44U Controller.

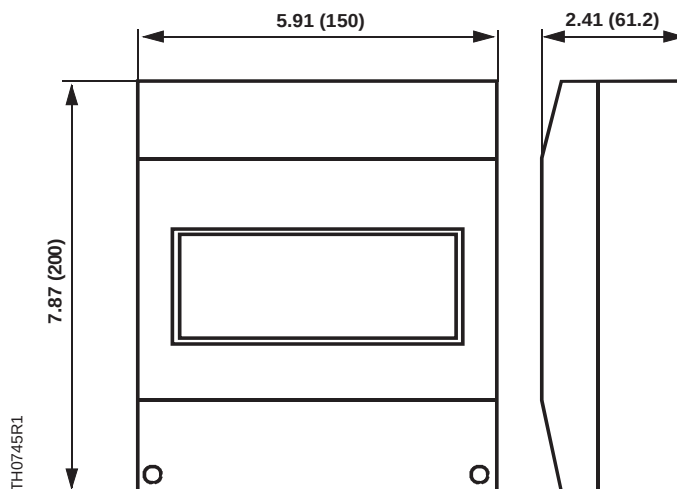


Figure 23. ARG62.21 Enclosure.

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