SCC Inc.

Specifications

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RWF55 Control

Product Description

The RWF55 is a modulating burner/boiler control designed and engineered specifically for burner/boiler applications. The RS-485 Modbus RTU communications port allows the RWF55 control to communicate with a Building Management System (BMS) or function as an integral part of a PLC or BMS based lead/lag boiler room management system.

Sample Specification

1. The control shall have a four character, bright red LED, continuous display of process variable and a four character, bright green LED, continuous display of process setpoint. Either display shall be configurable to show analog input 1, 2, or 3, output, or thermal shock end value.
2. Active Modbus communication shall be indicated by a flashing green LED.
3. Burner enabled indication shall be indicated by a steady green LED.
4. Three-position output status shall be indicated by two orange LED's.
5. Two-stage operation status shall be indicated by an orange LED.
6. Alarm relay activation shall be indicated by a red LED.
7. Active thermal shock protection shall be indicated by an orange LED.
8. The control shall be equipped with an integral 24 VDC/30 mA power supply.
9. The control shall be configurable to accept the following process variable inputs:
    - Pt100, 2-wire or 3-wire
    - Pt1000, 2-wire or 3-wire
    - LG-Ni1000, 2-wire or 3-wire
    - B, J, K, N, R, S, or T-type thermocouples
    - 0-20 mA or 4-20 mA
    - 0-5 VDC, 1-5 VDC, or 0-10 VDC
    - 0-135 Ω

10. The control shall function as a continuously modulating control and provide one of the following selectable output signals:
    - Three-position, floating (bumping)
    - 0-20 mA or 4-20 mA
    - 0-10 VDC
11. The control shall be configurable, via a digital input, to function as either a PID control or two-stage (high/low) control.
12. The control shall provide the burner enable function.
13. The control shall function as a PID control with the following adjustable parameters:
    - Proportional band (Pb.1)
    - Integral action time (rt)
    - Derivative time (dt)
    - Dead band (db)
    - Actuator running time (tt)
14. The control action shall be selectable as either heating (reverse) or cooling (direct).
15. The control shall have a PID “Auto Tune” function that can be enabled to automatically tune the control parameters to the control characteristics of the burner/boiler.
16. The control shall be configurable for one of the following analog input signals to allow remote process setpoint control via BMS or other boiler room management systems:
    - 0-20 mA or 4-20 mA
    - 0-5 VDC, 1-5 VDC, or 0-10 VDC
    - 0-1000 Ω
17. The control shall be programmable with a second setpoint.
18. The control shall be programmable to offset setpoint 1, via digital input contact closure, to provide a dual setpoint.
19. The control shall be programmable with high and low operating limits.
20. The control shall be able to accept either of the following temperature sensing devices to reset the outdoor temperature setpoint:
    - LG-Ni1000, 2-wire
    - Pt1000, 2-wire

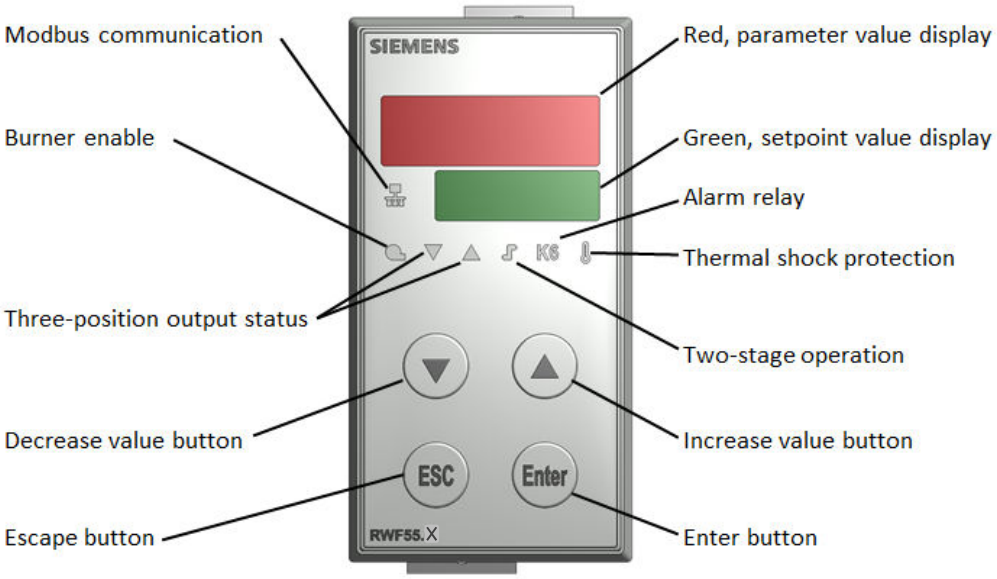
21. The control shall allow for time-averaged readings of outdoor temperatures, and configurable parameters for adjusting the slope of the outdoor temperature reset curve.
22. The control shall include adjustable high and low process setpoint limits to prevent the process setpoint from being programmed outside of the defined range by any of the following methods:
    - Manually using a keypad
    - Remotely via the analog process setpoint control input
    - Remotely via Modbus
23. The control shall include thermal shock protection providing configurable field parameters to adjust the slope and tolerance band.
24. Temperature process variables shall be displayed in ˚F or ˚C.
25. The process variable shall be displayed with zero, one, or two digits after the decimal point.
26. The control shall have a manual control feature. The display should alternate between "HAnd" and the output percentage when in manual control mode.
27. The control shall have an intelligent and configurable burner on-off cycle minimizing feature with the following functionality:
    - When demand on the boiler is less than low fire, the control will hold the burner at low fire.
    - When the demand on the boiler increases, the control will release the burner to modulate.
28. The control shall have a configurable alarm relay in relation to any of the analog inputs with the following features:
    - Can be programmed relative to an absolute value, or in relation to the setpoint
    - Configurable to break open or closed
29. The control shall be configurable to retransmit analog input 1, 2, or 3 to the analog output. The analog input can be scaled to produce varying analog outputs.
30. The control shall have three lockable levels of programming access:
    - Configuration menu
    - Parameter and configuration menus
    - Keyboard

31. The control front panel shall be IP66 rated.
32. The control's configuration data shall be stored in EEPROM, ensuring power failure protection.
33. The control shall utilize universal voltage inputs of 110-240 VAC, 48-63 Hz.
34. The control shall have a Modbus communications port with the following features:
    a. Standard RS-485 Modbus RTU communication protocol
    b. Selectable baud rate (4800-38400)
    c. Programmable Modbus address (1-254)
    d. Ability to apply analog inputs 2 and 3 as read only, to perform the following functions:
        i. Input 2 can be connected to a 0-1000 Ω potentiometer, on a firing rate control motor, to transmit the actual firing rate.
        ii. Input 3 can be connected to a temperature sensor to transmit outdoor temperature, boiler water temperature, or stack temperature.
    e. Remote control functions:
        i. Unfiltered, direct reading of analog inputs 1, 2, and 3
        ii. Programmable timer function for fail-safe return to local control, if communications fail
        iii. Burner shutdown capability
        iv. Manual control (floating or analog output)
        v. Control of the alarm relay
35. The control shall return to displaying the process variable and setpoint if none of the buttons on the front panel have been pressed for the duration of a programmable amount of time.
36. The control shall have associated software available to save, adjust, or upload parameter settings.

Technical Specifications

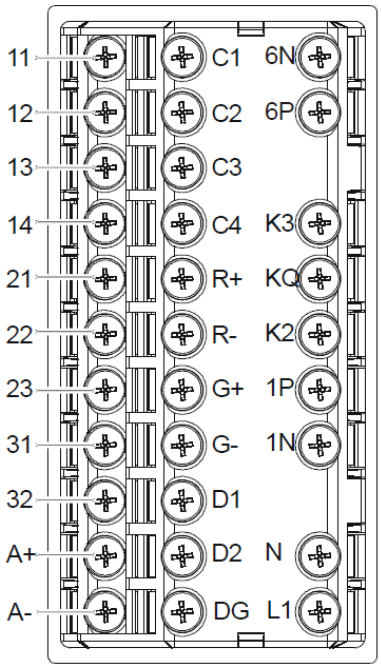
Input Voltage	110-240 VAC (+10/-15%), 48-63 Hz
Power Consumption	Max 20 VA
Operating Temperature	-20 to 50 °C, -4 to 122 °F
Enclosure Rating	IP66 keypad display, rel. humidity <95% (non-condensing)
Aux. DC Power Output	24 VDC, 30 mA
Output Relay Contact Rating	24-240 VAC, 2 A max
Analog Output Rating	0-10 VDC (500 Ω load min), 0-20 mA or 4-20 mA (500 Ω load max)
Modbus RTU Port	Configurable baud rate (4800, 9600, 19200, 38400) Address 1-254
Size	1/8 DIN, 122 mm mounting depth
Data Storage	Non-volatile EEPROM
Approvals	UL, CSA, CE

Front Display Features



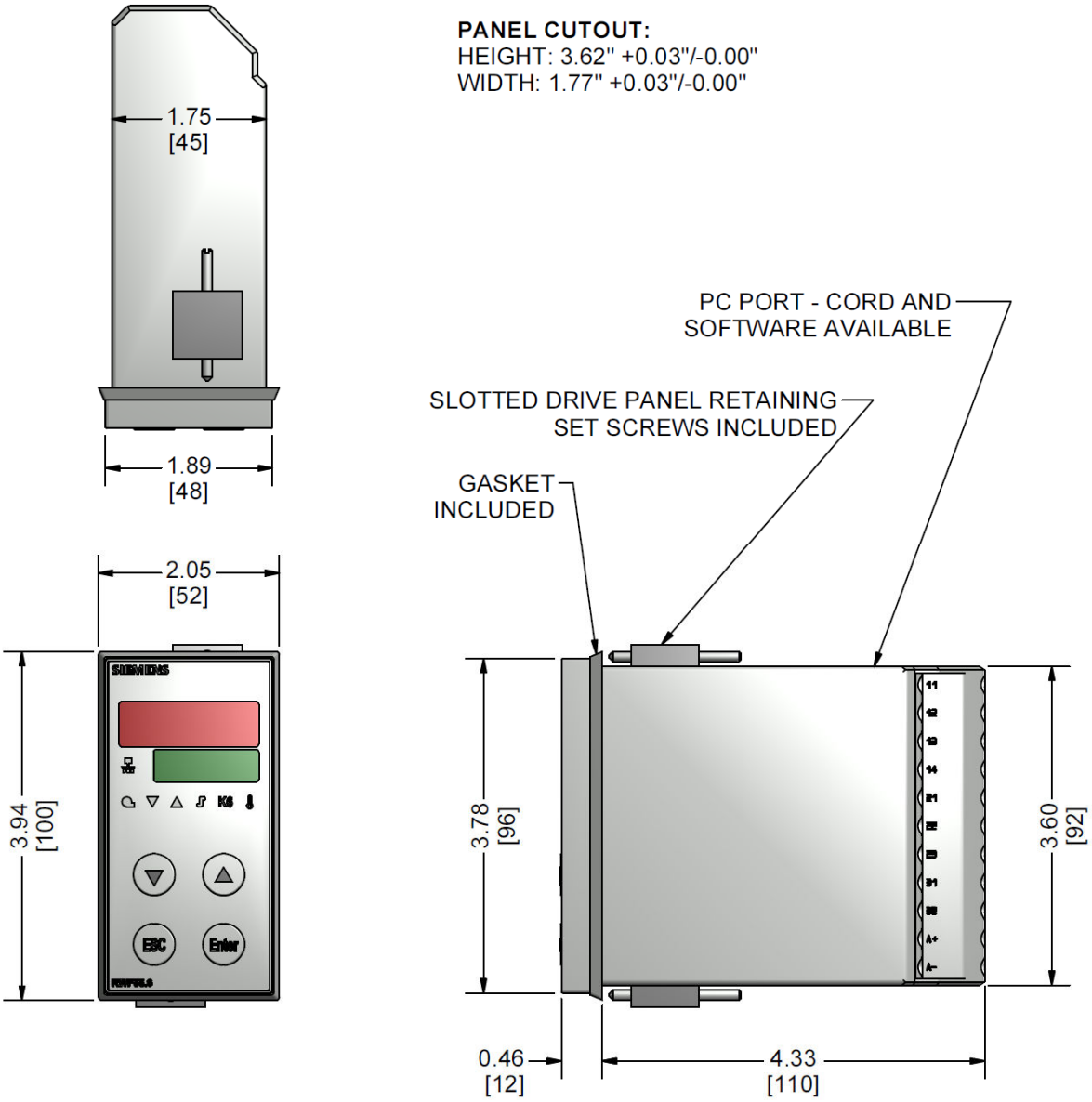
Terminals

Terminal Number	Terminal Group	Terminal Description
11	Analog Input 1	2-wire or 3-wire RTD
12		3-wire RTD Thermocouple (+) Current input signal (+)
13		Voltage input signal (+)
14		2-wire or 3-wire RTD Thermocouple (-) Signal ground (-)
21	Analog Input 2	2-wire RTD Current input signal (+)
22		Voltage input signal (+)
23		2-wire RTD Signal ground (-)
31	Analog Input 3	2-wire RTD
32		2-wire RTD
A+	Analog Output	Signal (+)
A-		Signal (-)
C1	Not Used	Not Used
C2		
C3		
C4		
R+	Modbus	RS-485 (+)
R-		RS-485 (-)
G+	24 VDC Power Supply	Power supply (+)
G-		Power supply (-)
D1	Binary Inputs	Binary input 1
D2		Binary input 2
DG		Binary input common ground
6N	Alarm Relay	NO contact
6P		Common
K3	3-Position Output	NO contact for CLOSE controlling element
KQ		Common
K2		NO contact for OPEN controlling element
1P	Burner Enable	Common
1N		NO contact
N	Main Power	Neutral
L1		Line



Dimensions

Dimensions in inches; millimeters in brackets



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