



## SZ2161

Heat Pump  
Water Loop Controller



## Description

The SZ2161 is a microprocessor-based controller designed for water source heat pump plant control applications.

### The SZ2161 features:

- Stand-alone or network operation
- 365-day time clock with two holiday schedules, automatic leap year and daylight savings correction
- No backup battery required for control parameters, schedule or clock
- Supply and return condenser water temperature inputs
- Supply and return loop water temperature inputs
- Outdoor air temperature input
- Boiler supply water temperature input
- Four digital inputs for status
- External time clock input
- Local override and remote override capability
- 12 digital outputs for control of
  - damper
  - spray pump
  - 2 loop pumps
  - 2 boiler pumps
  - 2 fan speed selections
  - 4 boiler stages
- Adjustable offsets and differentials on relay outputs
- Two modulating analog output for speed drive or boiler
- Mixing valve control
- LEDs for monitoring status
- Automatic rotation of pumps
- Automatic rotation of boiler stages

## Specifications

### General

**Accuracy:** +/- 0.5%  
**Programming:** EIA RS485 interface  
**Communications:** RS485, half duplex  
**Memory backup:** Non-volatile EEPROM, no battery required

### Environmental

**Operating temperature:** 32 to 131°F (0 to 55°C)  
**Operating humidity:** 0 to 100% RH, non-condensing  
**Storage temperature:** 14 to 140°F (-10 to 60°C)

### Electrical

**Supply voltage:** 24 VAC +/-20%  
**Inputs:** Six 1000Ω PtRTD, momentary override and five digital (dry contact)  
Range: Loop water supply and return: 20 to 120°F  
Condenser water supply and return: 20 to 120°F  
Boiler water: 40 to 240°F  
Outdoor air temp.: -40 to 160°F  
**Outputs:** 12 digital (SPST dry contact, 24 VAC @ 2A)  
analog and Two 4 to 20 mA DC  
**Max load resistance (analog output):** 600 Ω  
**Common mode rejection:** 100 db @ 60 Hz  
**Power consumption:** 15 VA max.

Specifications subject to change without notice.

# Specification Suggestions

Heat pump water loop controllers shall be microprocessor based with suitable I/O points to execute the required sequences and shall be of the low voltage type.

Heat pump water loop controllers shall have 365-day time clock with vanishing holiday programming, two setback intervals per day and automatic leap year and daylight savings adjustment. Controllers shall accept six platinum RTD inputs for loop water supply, condenser water supply and return temperatures, boiler supply temperature and outdoor air temperature. Controllers shall have two analog outputs for valves and variable speed drive. Other control options shall include fully adjustable reset control, automatic rotation of pumps, automatic rotation of boiler stages and unoccupied outdoor air temp pump start. Controllers shall have two fan speed selections, digital inputs for flow proving and sequences for pump lubrication. Controllers shall have digital output for local alarm. Controller shall have adjustable offsets and differentials on digital outputs. Controller must support non-volatile memory, so that in the event of power loss, all programmed operating parameters shall be unaffected without the use of battery backup. All control functions shall continue in the event of a communications failure.

Communications protocol shall be provided in accordance with EIA RS485 standards. All firmware communications protocol and command codes shall be published, open and non-proprietary. Heat pump water loop control modules shall be model SZ2161 as manufactured by TCS/Basys Controls.

# Ordering Information

Part No.	Description
SZ2161	Heat pump water loop controller

### SZ2161 Accessories

TQ Series	Mounting accessories
TS Series	Platinum RTD temperature sensors
PS Series	Current switches
PT Series	Control transformers
QD1010	RS485 to RS232 communications converter (used for programming)
REVPRO	Revelation Professional software (used for programming)

# Dimensions

Note: inches [mm]

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