



Aquazone™ Water Source Heat Pump Commercial Thermostats

Application Data

Part Numbers: 50QE900-220WS, 50QE900-220LA, 50QE900-250FS,
50QE900-511WS, 50QE900-NPWS

GENERAL

This book describes the full line of Aquazone commercial thermostats, including:

- 50QE900-220WS 7-day Programmable
- 50QE900-220LA 7-day Programmable, Light-Activated
- 50QE900-250FS 7-day Programmable Flatstat
- 50QE900-511WS 5+1+1-day Programmable
- 50QE900-NPWS Non-programmable

Thermostats are shown in Fig. 1.

Carrier's Aquazone commercial thermostats are wall-mounted, low-voltage thermostats that maintain room temperature by controlling operation of an HVAC (Heating, Ventilation and Air Conditioning) system. Separate heating and cooling set points and auto-changeover capability are standard on all thermostats.

SPECIFICATIONS

Each 50QE900 series thermostat can be used with any Aquazone WSHP (Water Source Heat Pump) unit to provide effective space temperature control.

All thermostats Comply with FCC Part 15 rules, are UL and UL Canada approved, and meet European Community Standards (Cenelec or CE), and are designed in accordance with IEC (International Electromechanical Commission) standards.

50QE900-220WS — This 7-day programmable thermostat allows four time periods per day, holiday scheduling for up to 99 days, and easy command copying. The thermostat has a large Thermoglow™ display, an LED for heating and cooling

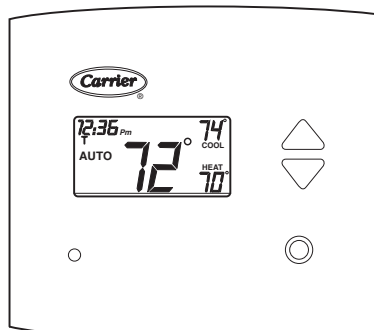
operation, zone temperature control to 1-degree accuracy, four-hour setback override, NEVERLOST™ memory (requiring no batteries), security levels, compressor time guard, service filter indicator, and adjustable heat/cool set point limiting.

50QE900-220LA — This flush-mounted thermostat has all the features of the 50QE-220WS, and is light activated. The built-in light sensor allows the thermostat to be placed in occupied mode only when the lights in the room are on.

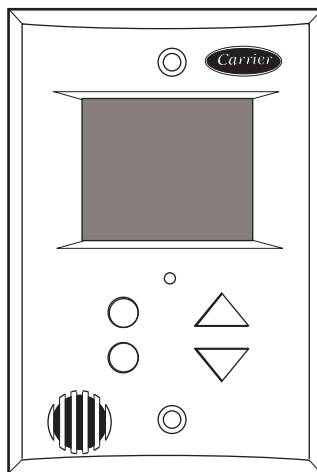
50QE900-250FS — This thermostat has all the features of the 50QE-220WS, plus an external input (dry contact switch), soft start/staggered start, pre-occupancy purge, and remote room temperature sensor capability.

50QE900-511WS — This thermostat is programmable for five days (all alike) plus Saturday and Sunday, with four time periods per day. It has a large Thermoglow display, heating and cooling operation indicator light, zone temperature control to 1-degree accuracy, four-hour setback override, NEVERLOST memory (requiring no batteries), an ExactFit locking cover, compressor time guard, dual heating and cooling set points, accessory backplates, and a display blanking feature.

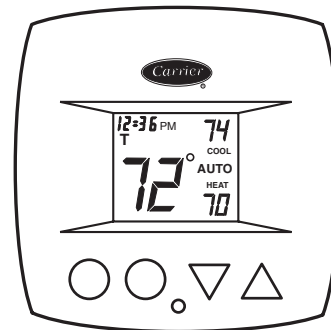
50QE900-NPWS — The non-programmable thermostat works with the WSHP Complete C and Deluxe D controllers. This thermostat has a large Thermoglow display, heating and cooling operation indicator light, zone temperature control to 1-degree accuracy, NEVERLOST memory (requiring no batteries), an ExactFit locking cover, compressor time guard, dual heating and cooling set points, and accessory backplates.



50QE900-220WS,
50QE900-220LA



50QE900-250FS



50QE900-511WS,
50QE900-NPWS



Fig. 1 — Aquazone Thermostats

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

APPLICATIONS

The 50QE900-220WS, 220LA, and 250FS thermostats are all ideal for use in schools and other institutions because they provide 7-day programming with 3 occupied and one unoccupied time period, allowing set points to change during occupied periods. Holiday programming that can extend for up to 99 days is especially useful during extended shutdown periods for both businesses and schools.

The light activation feature of the 50QE900-220LA thermostat maximizes energy savings by placing the thermostat in occupied mode only when the lights in the room are turned on. This feature is the perfect complement to motion sensor lighting installations found in many schools and businesses.

The 50QE900-250FS thermostat has the option for remote temperature sensing, which is ideal for spaces where public access to the thermostat is not desired. These applications may include retail stores and classrooms. With remote temperature sensing, the thermostat is mounted away from the controlled space. A remote room sensor sends a digital signal to the thermostat, and the degree annunciator flashes to indicate that thermostat is using a remote room sensor. Remote sensor options include: duct mounted, wired with override feature, and wireless with a transmitter and receiver. Model numbers are as follows:

- Duct Mounted Sensor — 33CSSEN-DS
- Wired with Override — 33CSCEN-WB
- Wireless — 33CRSFS-RC transmitter and 33CSRFS-RE receiver

Another unique feature of the 50QE900-250FS thermostat is its capability to accept an external signal to switch the

thermostat into Occupied mode. This feature is extremely useful for night setback of each water source heat pump unit. If the entire WSHP system is scheduled by an external time clock, the individual units can be “daisy chained” together to accept a signal from the time clock to schedule unit operation. The signal from the time clock is sent to the Aquazone WSHP units with the Deluxe D control board, which includes a special Night Set Back (NSB) input (that provides individual unit isolation) and associated logic. The accessory relays on the Deluxe D control can be configured to send a signal to the 50QE900-250FS to initiate occupied WSHP unit operation. For application data about this type of operation, refer to the Deluxe D Controller Application Data.

The 50QE900-550WS thermostat’s 5+1+1 programming capability is flexible enough for environments that require varying schedules, without the added capability for extended holidays. Applications for this thermostat would include business and institutions that have varied occupied and unoccupied times during a week, but are open all year without closing for more than a day at a time for a short holiday.

The 50QE900-NPWS non-programmable thermostat is used in applications where only basic scheduling is required. This thermostat provides the user with the ability to separate heating and cooling set points. In addition, deadband is adjustable from 1° to 6° F and in cycles per hour (from 2 to 6) to avoid short cycling and protect equipment.

Refer to Table 1 for thermostat operating ranges, dimensions, and electrical information. Use Table 2 to compare thermostat features. Typical Wiring Diagrams are shown in Fig. 2.

Table 1 — Physical Data

50QE900-	OPERATING TEMPERATURE F (C)	STORAGE TEMPERATURE F (C)	DIMENSIONS (in.)	OPERATING RELATIVE HUMIDITY*	RECOMMENDED WIRING	POWER
220WS	41 - 104 (5 - 40)	-40 - 135 (-40 - 57)	4.80 X 4.30 X 1.10	0 to 95%	22 AWG (36 ft max.) 18 AWG (100 ft max.)	5 va at 24 vac 60 Hz
220LA			4.25 X 2.75 X 1.25			
250FS	32 - 122 (0 - 50)	14 - 140 (-10 - 60)	3.13 X 3.13 X 1.13			
511WS	41 - 104 (5 - 40)	-40 - 135 (-40 - 57)	4.80 X 4.30 X 1.10			
NPWS						

LEGEND

AWG — American Wire Gage

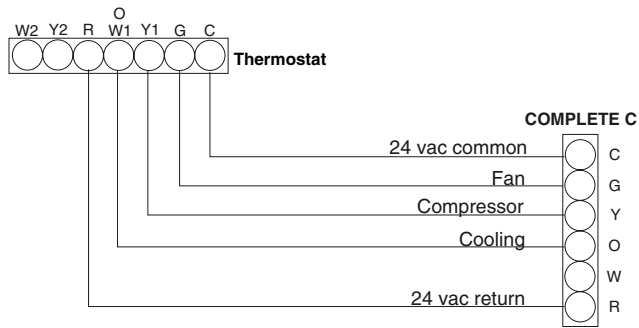
*Non-condensing.

Table 2 — Feature Summary

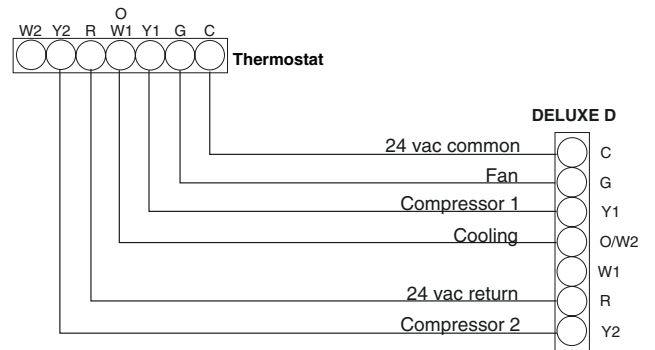
FEATURE DESCRIPTION	50QE900 THERMOSTAT				
	220WS	220LA	250FS	511WS	NPWS
Programmable	Yes	Yes	Yes	Yes	No
Number of Days	7	7	7	5-1-1	—
Number of Periods	4	4	4	4	—
Light Activated	No	Yes	No	No	No
Holiday Programming	Yes	Yes	Yes	No	No
Copy Day Command	Yes	Yes	Yes	No	No
Unoccupied Override	Yes	Yes	Yes	No	No
Three Levels of Security	Yes	Yes	Yes	No	No
Pre-occupancy Purge	No	No	Yes	No	No
Remote Room Sensor Ready	No	No	Yes	No	No
Economizer Output	No	No	Yes	No	No
Dry Contacts	No	No	Yes	No	No
ExactFit Locking Cover	No	No	Yes	yes	Yes
Two Stages of Heat and Cool	Yes	Yes	Yes	Yes	Yes
Large Thermoglow™ Display	Yes	Yes	Yes	Yes	Yes
Bi-colored LED for Heat/Cool	Yes	Yes	Yes	Yes	Yes
NEVERLOST™ Memory	Yes	Yes	Yes	Yes	Yes
Energy Saving Smart Fan	Yes	Yes	Yes	Yes	Yes
Auto-Changeover	Yes	Yes	Yes	Yes	Yes
Keypad Lockout	Yes	Yes	Yes	Yes	Yes
Built-in Time Guards	Yes	Yes	Yes	Yes	Yes
Adjustable Service Filter Warning	Yes	Yes	Yes	Yes	Yes
Temperature Display in F or C	Yes	Yes	Yes	Yes	Yes
50 or 60 Hz Operation	Yes	Yes	Yes	Yes	Yes

WIRING

WATER SOURCE HEAT PUMPS EQUIPPED
WITH 1 COMPLETE C CONTROL BOARD
FOR SINGLE STAGE OPERATION



WATER SOURCE HEAT PUMPS EQUIPPED
WITH DELUXE D CONTROL BOARD(S)
FOR SINGLE OR TWO STAGE OPERATION



WATER SOURCE HEAT PUMPS EQUIPPED
WITH 2 COMPLETE C CONTROL BOARDS
FOR TWO STAGE OPERATION

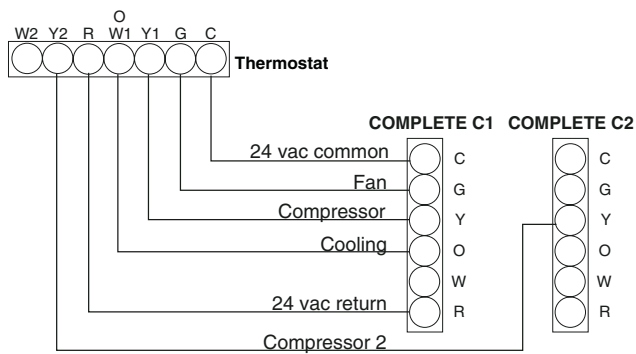


Fig. 2 — Typical Thermostat Wiring

