

## Q7300H Series 2000 Commercial Thermostat Subbases

**TRADELINE®**

### INSTALLATION INSTRUCTIONS

### APPLICATION

The Q7300H Thermostat Subbases are used with T7300F Thermostats to provide electronic control of commercial 24 Vac single or multistage heat pump or conventional heating and cooling systems. All models have EB terminals for LONWORKS® network connections.

Terminals are also provided for the T7047 Remote Sensor or the T7147 Remote Sensor and Override Module. See Table 1. Select models are designed for heat applications using a valve and valve actuator combination for hydronic heating with 2-speed fan control. See Table 4. All Q7300 Thermostat Subbases require a common wire to the supply power.

**Table 1. Q7300 Subbase Description.**

Model	Maximum Stages <sup>a</sup>		Hookup Drawing	Applications	Thermostat Required
	Heat	Cool			
Q7300H2003	3	2	10	Heat Pump	T7300F
Q7300H2011	3	2	11		
Q7300H2029	3	3	12	Conventional	
Q7300H2037 <sup>b</sup>	2	1	13		

<sup>a</sup> Depends on model.

<sup>b</sup> Designed for heat applications using a valve and valve actuator (see Table 2).

### IMPORTANT

*The valve does not close unless correct valve and valve actuator combination is used. See Table 2.*

**Table 2. Valve and Valve Actuator Combinations.**

Valve Model	Valve Actuator Model
V5011A,C	ML7984A3019
V5011F,G	ML7984A3001
V5011N, V5013N	ML7984A3019
V5013A,C	ML7984A3019
V5013F	ML7984A3001

**Table 3. Output Relay Maximum Current (at 30 Vac).**

Relay	Maximum Current (in Amps)	
	Inrush	Running
Fan	3.5	2.0
Heat		
Auxiliary (Economizer)		
Cool	7.5	



### MERCURY NOTICE

If this control is replacing a control that contains mercury in a sealed tube, do not place your old control in the trash.

Contact your local waste management authority for instructions regarding recycling and the proper disposal of the old thermostat.

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow the instructions can damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After completing the installation, use these instructions to check out the product operation.



## Location

### Subbase Without Remote-Mounted Temperature Sensor

Install the thermostat about 5 ft (1.5m) above the floor in an area with good air circulation at average temperature. See Fig. 1.

Do not install the thermostat where it can be affected by:

- Drafts, or dead spots behind doors and in corners.
- Hot or cold air from ducts.
- Radiant heat from sun or appliances.
- Concealed pipes and chimneys.
- Uncontrolled areas such as an outside wall behind the thermostat.

### Subbase With Remote-Mounted Temperature Sensors

If only remote-mounted temperature sensors are used to sense and control room temperature, install the thermostat in an area accessible for setting and adjusting the temperature and settings.

If both the subbase and remote-mounted temperature sensor(s) are used to sense and control room temperature, install the subbase about 5 ft above the floor in an area with good air circulation. Install the remote-mounted sensor(s) about 5 ft (1.5m) above the floor in an area with good air circulation at average temperature. See Fig. 1.

Do not mount the sensor(s) where it can be affected by:

- Drafts, or dead spots behind doors and in corners.
- Hot or cold air from ducts.
- Radiant heat from sun or appliances.
- Concealed pipes and chimneys.
- Uncontrolled areas such as an outside wall behind the thermostat.

If more than one remote sensor is required, arrange them in a temperature averaging network consisting of two, three, four, five or nine sensors. See Fig. 2 through 6.

#### IMPORTANT

*To avoid electrical interference, which can cause erratic performance, keep wiring runs as short as possible and do not run thermostat wires adjacent to the line voltage electrical distribution systems. Use shielded cable (Belden type 8762 or equivalent for 2-wire and Belden type 8772 or equivalent for 3-wire). The cable shield must be grounded only at the controlled equipment case.*

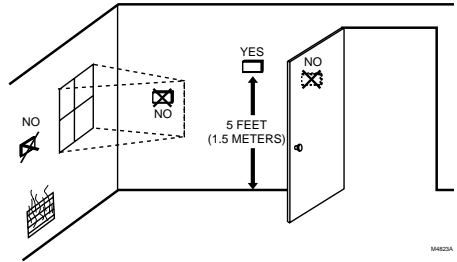


Fig. 1. Typical location of thermostat or remote-mounted sensor.

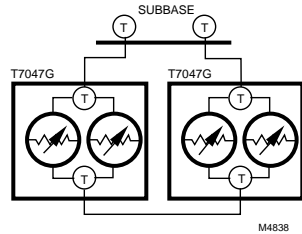


Fig. 2. Two T7047G Sensors providing temperature averaging network for T7300/Q7300 Thermostat/Subbase.

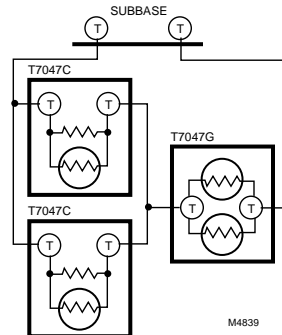
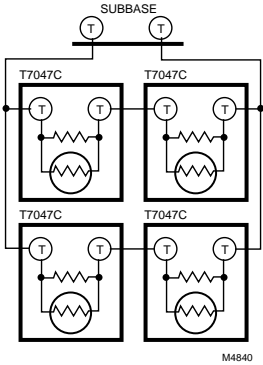
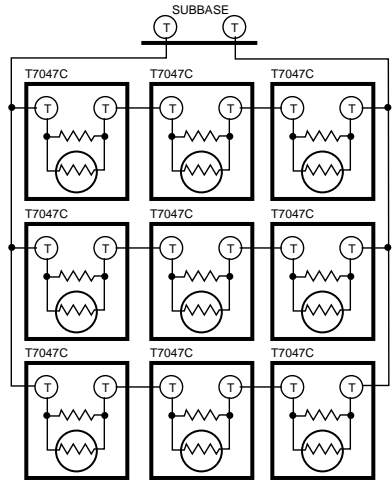


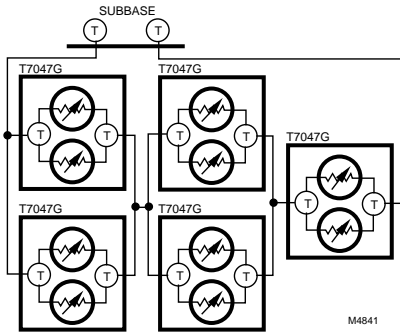
Fig. 3. Two T7047C Sensors and one T7047G Sensor providing temperature averaging network for T7300/Q7300 Thermostat/Subbase.



**Fig. 4. Four T7047C Sensors providing temperature averaging network for T7300/Q7300 Thermostat/Subbase.**



**Fig. 6. Nine T7047C Sensors providing temperature averaging network for T7300/Q7300 Thermostat/Subbase.**

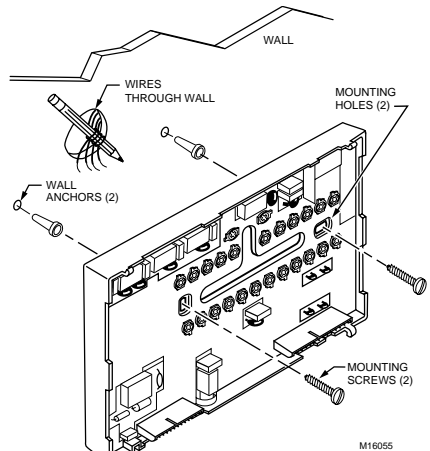


**Fig. 5. Five T7047G Sensors providing temperature averaging network for T7300/Q7300 Thermostat/Subbase.**

## Mount Subbase

Mount the subbase horizontally on the wall or on a 2 in. x 4 in. wiring box:

1. Position and level the subbase or wallplate (for appearance only). The thermostat functions properly even when not level.
2. Use a pencil to mark mounting holes. See Fig. 7.
3. Remove subbase or wallplate from the wall and drill two 3/16 in. holes in the wall (if drywall) as marked. (For firmer material such as plaster or wood, drill two 7/32 in. holes.) Gently tap anchors (provided) into drilled holes until flush with the wall.
4. Position the subbase over the holes, pulling wires through the wiring opening.
5. Loosely insert the mounting screws into the holes.
6. Tighten the mounting screws.



**Fig. 7. Mounting the subbase.**

## Wire Subbase

### CAUTION

**Electrical Shock Hazard.**  
**Power supply can cause electrical shock.**  
 Disconnect power supply before beginning installation.

#### IMPORTANT

- All wiring must comply with local electrical codes and ordinances.
- Use 20 AWG, solid-conductor cable as the normal size (18 AWG maximum) for all wiring **except** the LONWORKS Bus. Refer to the System Performance and Cable Selection section in the LONWORKS Wiring Guidelines, form 74-2865, to get the specific wire type and size for the LONWORKS Bus.

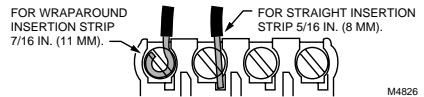
Follow equipment manufacturer wiring instructions when available.

1. Loosen the terminal screws on the subbase and connect the system wires. See Fig. 8.
2. Securely tighten each terminal screw.
3. Push excess wire back into the hole.
4. Plug the hole with nonflammable insulation to prevent drafts from affecting the thermostat.

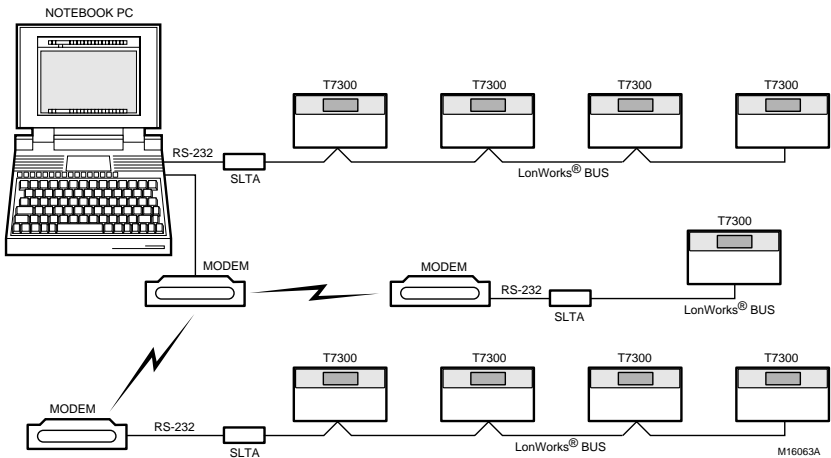
**NOTE:** After wiring, check that all connections are tight and secure. See Fig. 8. Loose or intermittent wire connections can cause inconsistent system operation.

## Typical Wiring Hookups

Refer to Fig. 11 through 13 for typical hookups. A letter code is located near each terminal for identification. See Table 4 for terminal descriptions and system action. For LONWORKS termination, see Fig. 9. For further details on LONWORKS termination, refer to the LONWORKS Bus Wiring Guidelines, form 74-2865 or see Application Steps, Step 3. Lay Out Communications and Power Wiring and the LONWORKS Bus Termination Module, Termination Module subsection, of the W7760 System Engineering Guide, form 74-2969.



**Fig. 8. Proper wiring technique.**



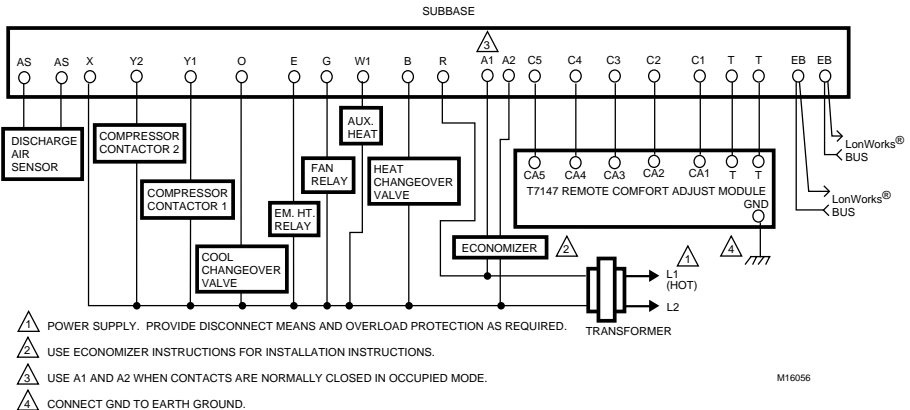
**Fig. 9. Typical wiring diagram for T7300/Q7300 in LONWORKS network.**

**Table 4. Terminal Descriptions and Conditions.**

Standard Terminal Designations	Typical Connection	Function	Terminal Type
A1, A3	Damper control relay. See T7300F Installation Instructions, form 69-1025, Installer Setup 18, for control parameters	Output	Dry Contact
A2	Dry auxiliary contact. (A2 is common to A1,A3).	Input	—
AS, AS	C7150B Discharge Air Sensor connection.		
B	Heating changeover valve.	Output	24V Powered Contact
BM	ML7984 Actuator connection <sup>b</sup> . No call for heat: valve closed; call for stage 1 heat: valve approximately one-half open; call for stage 2 heat: valve full open.	Output	—
C1,C2,C3,C4,C5	Communication input for T7147.	Input/Output	Low Power
E	Emergency heat relay.	Output	24V Powered Contact
EB	LONWORKS <sup>®</sup> network connection.	Input/Output	Communications
FC	Fan control transformer.	Input	—
G	Fan relay.	Output	
GH	High speed fan output. Activated during call for cooling.		
GL	Low speed fan output. Activated on call for heat and fan On selection.		
O	Cooling changeover valve.		
P1, P2	Pump interlock relay. Operates circulator pump in hydronic heat or energizes conventional heat system.	Input/Output	
R	24V system transformer. <sup>a</sup>	Input	
RC	24V cooling transformer. <sup>a</sup>		
RH	24V heating transformer. <sup>a</sup>		
RM	ML7984 Actuator connection. No call for heat: valve closed. Call for stage 1 heat: valve approximately one-half open. Call for stage 2 heat: valve fully open.	Output	
T, T	Remote sensor input for T7047 or T7147.	Input	
W1	Stage 1: heating relay or auxiliary heat relay.	Output	
W2	Stage 2: heating relay.		
W3	Stage 3: heating relay.		
X	Heating transformer common.	Input	
Y	Cool call.	24V Output	
Y1	Stage 1: compressor contactor.	Output	
Y2	Stage 2: cooling compressor (conventional) or compressor contactor (heat pump).		
Y3	Stage 3: cooling compressor.		

<sup>a</sup> European installations must use a safety transformer as defined by IEC60742.

<sup>b</sup> Applies to Q7300L and Q7300H2037 only.



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**Fig. 10. Typical hookup of T7300F/Q7300H in three-stage heat and two-stage cool heat pump system.**

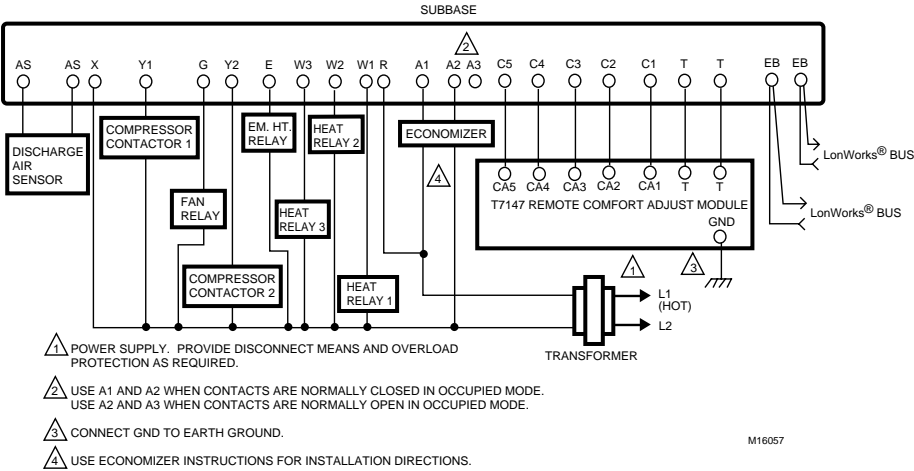


Fig. 11. Typical hookup of T7300F/Q7300H in three-stage heat and two-stage cool heat pump system.

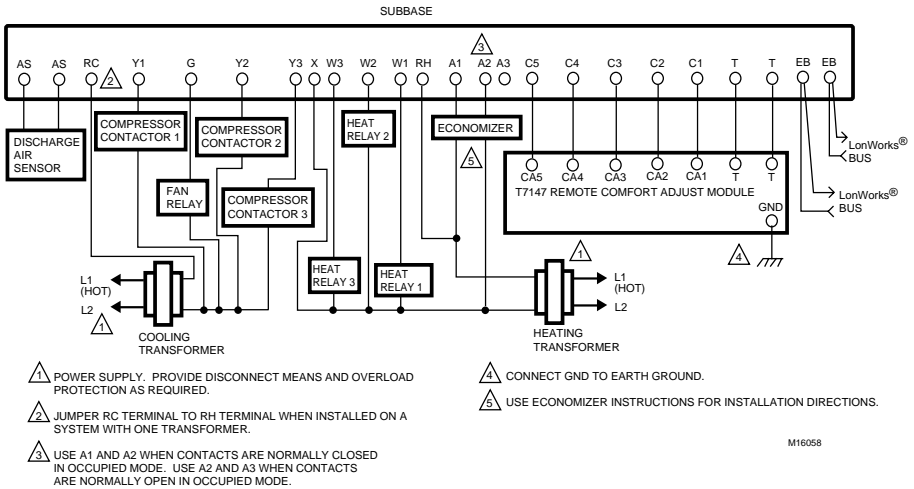


Fig. 12. Typical hookup of T7300F/Q7300H in three-stage heat and three-stage cool conventional system.

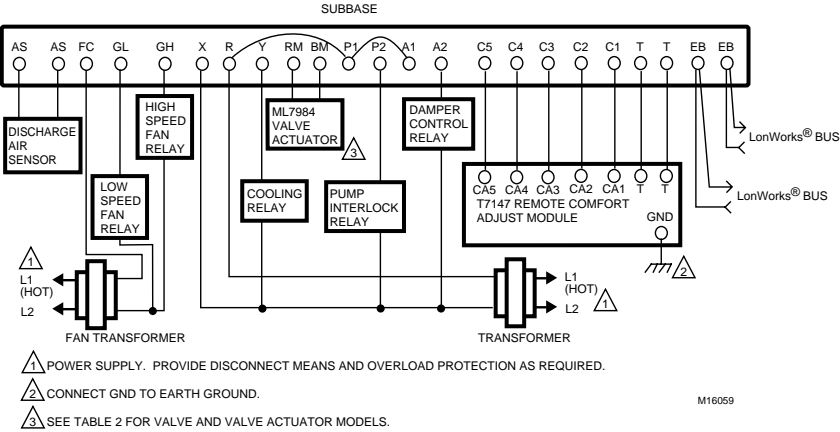


Fig. 13. Typical hookup of T7300F/Q7300H in two-stage heat and one-stage cool conventional system.

### Mount Thermostat on Subbase

After the subbase is installed, mount the thermostat on the subbase:

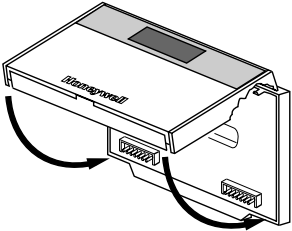
1. Engage the tabs at the top of the thermostat and subbase. See Fig. 14.
2. Press the lower edge of the case to latch.

NOTE: To remove the thermostat from the wall, first pull out the bottom of the thermostat; then remove the top.

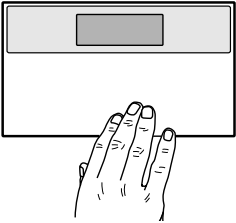
#### IMPORTANT

Refer to the T7300F thermostat installation instructions for Installer Setup, Settings, Installer System Test and Troubleshooting information.

A. ENGAGE TABS AT TOP OF THERMOSTAT AND SUBBASE OR WALLPLATE.



B. PRESS LOWER EDGE OF CASE TO LATCH.



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Fig. 14. Mount thermostat on subbase.

OPERATION

Refer to Table 5 for Q7300H2037 Subbase operation sequence.

Table 5. Q7300H2037 Subbase Operation Sequence.

Mode	System Setting	Fan Setting <sup>a</sup>	Equipment Call	Action	Loads Energized
Occupied	Any	Auto	—	Damper control relay energized.	A2
	—	On	—	Last system dependant . <i>Last system is cool:</i> call is for high speed fan. <i>Last system is heat:</i> call is for low speed fan.	GL or GH
	Heat	Auto	Stage 1 heat	<i>Hydronic applications:</i> ML7984 approximately one-half open. Pump interlock relay activated to energize circulator pump. <i>Conventional applications:</i> stage 1 heat is activated. Low-speed fan is activated.	A2, GL, RM, BM, P2
	Heat	Auto	Stage 2 heat	<i>Hydronic applications:</i> ML7984 is fully open. <i>Conventional systems:</i> no action.	A2, GL, RM, BM, P2
	Cool	Auto	Stage 1 cool	Cooling relay activated. High-speed fan activated.	A2, GH, Y
Unoccupied	Any	Any	—	Damper control relay de-energized.	—
		On	—	System fan operates at appropriate speed with call for heat or cool equipment.	

<sup>a</sup> Low speed fan is activated in the Heat mode and high speed fan is activated in the Cool mode.

Remote Temperature Sensing and Override

The Q7300H Subbase can be used with the T7147 Remote Sensor to sense temperature and provide the Occupied mode temperature. The subbase also can be used with the T7047 Sensor if remote occupied control is not required.

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