



T8205B,C, TS8205B,C Electronic Pool, Spa Control Systems; T8205A,H, TS8205A Control Modules; Q8205A-C Setpoint Panels and Sensor Assembly

PRODUCT DATA



T8205C

T8205A

TS8205B

Q8205A

APPLICATION

T8205B,C and TS8205B,C Electronic Pool and Spa Control Systems are used in pool, spa, and hot tub applications to control water temperature. T8205B,C and TS8205B,C Control System components include a T8205A,H or TS8205A Control Module and Q8205A-C Setpoint Panel. Sensor Assembly is purchased separately. The T8205A and TS8205A Control Modules and Q8205A-C Setpoint Panels can be purchased separately. The T8205H Control Module is for use with heat pump systems only. Q8205A-C Setpoint Panels can be used for remote applications.

FEATURES

- T8205 requires 24 Vac power supply; TS8205 is used in a 750 mV self-generating system.
- T8205B,C and TS8205B,C include an electronic control module and setpoint panel packaged together to simplify installation. The sensor must be ordered separately.
- T8205A and TS8205A Control Modules are used with a sensor and Q8205A-C Setpoint Panel.
- T8205H Control Module is for use with heat pump systems only and has 1/4 in. quick connect terminals.
- Module controls within 1.5°F (0.8°C) at setpoint of 106°F (41°C).
- Models available for single control or dual control of combination pool and spa.
- Isolated relay contacts in electronic control modules operate gas control or ignition module.
- Male quick-connect wiring terminals provided on electronic control modules.
- Sensor with 3/16 in. female quick connects on 42 in., 48 in., 50 in., or 96 in. leadwires can be directly immersed or mounted in well.
- Setpoint panel can be remotely mounted.
- Plastic potentiometers and selector switches provide increased protection from humidity and chlorine.
- Combination of 1/4 in. and 3/16 in. quick connect terminals provide ANSI miswiring compliance, except T8205H Control Module.

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SPECIFICATIONS

IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.

Models:

T8205B,C and TS8205B,C Electronic Pool, Spa and Hot Tub Control Systems provide single or dual water temperature control in pool, spa, or hot tub applications. Order Sensor Assembly separately. See Table 5.

T8205B,C and TS8205B,C include electronic control module and setpoint panel with one or two potentiometers with selector switch, and on select models, an LED Heat-On display. See Tables 1 through 3.

T8205A,H, TS8205A Control Modules available separately. See Table 3.

T8205H is for use with Heat Pump Systems only. Q8205A,B,C Setpoint Panels available separately for remote applications. See Table 4.

Separate Components:

To order components separately, see Tables 3 through 5.

Table 1. T8205B,C 24 Vac Control Systems.

Control System	Control Rating	Potentiometers	Switch Positions	Heat-On LED	LED Terminal	N.C. Contacts
T8205B	24 Vac	1	On-Off	Yes	Yes	Yes
T8205B	24 Vac	1	On-Off	No	No	No
T8205C	24 Vac	2	Pool-Off-Spa	No	No	No
T8205C	24 Vac	2	Pool-Off-Spa	No	Yes	No
T8205C	24 Vac	2	Pool-Off-Spa	Yes	Yes	No
T8205C	24 Vac	2	Pool-Off-Spa	Yes	Yes	Yes

Table 2. TS8205B,C Millivolt Control Systems.

Control System	Control Rating	Potentiometers	Switch Positions
TS8205B	750 mV	1	On-Off
TS8205C	750 mV	2	Pool-Off-Spa

Table 3. T8205A/TS8205A Control Modules.

Control System	Control Rating	Potentiometers	Switch Positions
T8205A	24 Vac	N.C.—optional	Optional
T8205H	24 Vac	N.O./N.C.	Not Available
TS8205A	750 mV	Not Available	Not Available

Table 4. Q8205A-C Setpoint Panels.

Panel	Potentiometers	Switch Positions	LED
Q8205A	1	None	None
Q8205B	1	On-Off	None
Q8205C	2	Pool-Off-Spa	Optional

Electrical Ratings:

T8205 Power Supply: 18-30 Vac, 60 Hz.

T8205 Power Consumption: 3 VA at 24 Vac.

TS8205 Power Supply: 750 mV, dc.

Relay Contacts: Inductive: 2A full load, 10A locked rotor.

Resistive: 2A.

Temperature Setting Range:

61° to 106°F (16° to 41°C).

Setpoint Adjustment:

10K ohm, one-turn potentiometer.

Setpoint Accuracy:

±1.5°F (0.8°C) at 106°F (41°C).

Ambient Temperature Range at Module:

T8205: -40° to +175°F (-40° to +80°C).

TS8205: 0 to 175°F (0° to 80°C).

Differential (Not field adjustable):

1°F (0.7°C) maximum at 106°F (41°C), subtractive.

Sensor:

NTC thermistor sensor is imbedded in a copper bulb. Includes leadwires with 3/16 in. female quick connects. See Table 5.

Mounting:

T8205B,C and TS8205B,C Control Systems are mounted on the appliance through mounting holes on the device. Sensors are mounted directly into the header or in a well.

IMPORTANT

T8205A,H, TS8205A Control Modules and Q8205AC Setpoint Panels must be mounted to allow adequate electrical spacing according to approval agency requirements.

T8205A,H and TS8205A Control Modules mount on any flat surface using no. 6 screws (obtained locally) through mounting holes.

Q8205A-C Setpoint Panels mount through holes on board using no. 6 screws (obtained locally).

Sensing Bulb:

Can be mounted in immersion well or directly immersed, using fittings to prevent leakage. Well or fitting supplied by heater manufacturer.

Approvals:

International Approval Services (American Gas Association and Canadian Gas Association) (IAS)
Certificate: C2030021.

Meets ANSI Standard Z21.23-1993.

Accessory:

Part no. 107408 Heat Conductive Compound in 4 oz. can.
Use when mounting sensor in a well.

Dimensions:

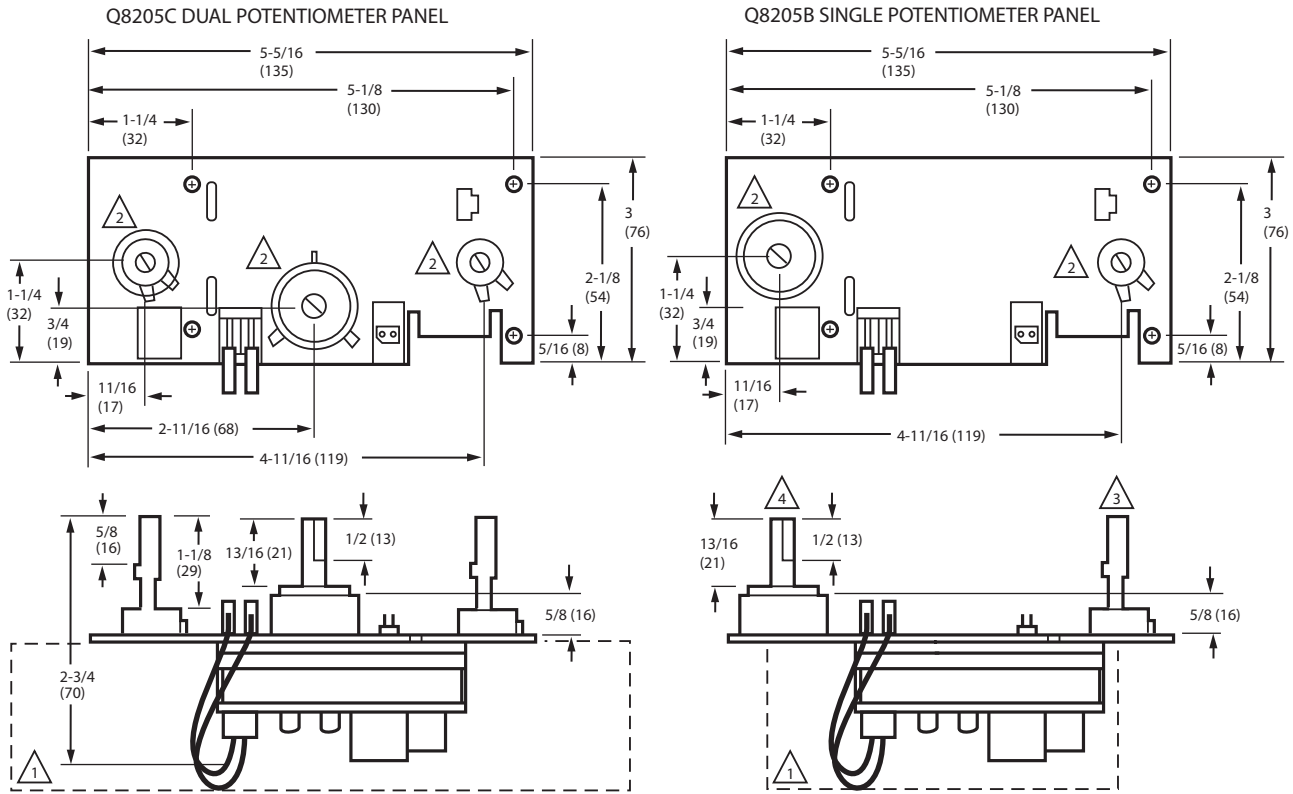
See Fig. 1 for T8205B,C; TS8205B,C; Q8205A; T8205A,H;
TS8205A dimensions. See Table 5 for sensor dimensions.

Optional Features:

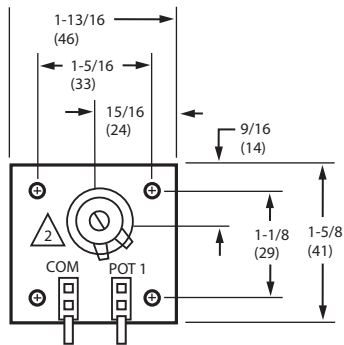
T8205B,C: LED indicator available for Heat-On indication.
Specify when ordering.

Table 5. Sensors.

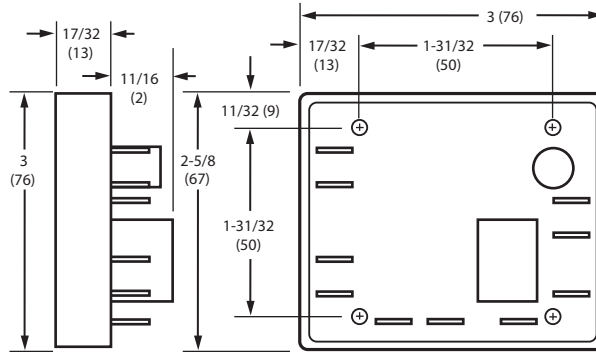
Sensor	Termination	Lead Length	Diameter	Capsule Length	Mounting	Material
198799E	3/16 in. quick connect	42 in. (1067 mm)	3/8 in. (10 mm)	2 in. (51 mm)	Compression	Copper
198799F	1/4 in. quick connect	48 in. (1219 mm)	3/8 in. (10 mm)	3 in. (76 mm)	Compression	Copper
198799H	3/16 in. quick connect	42 in. (1067 mm)	3/8 in. (10 mm)	2-5/8 in. (67 mm)	Spud	Copper
198799K	3/16 in. quick connect	42 in. (1067 mm)	3/8 in. (10 mm)	2 in. (51 mm)	Compression	Monel
198799R	3/16 in. quick connect	48 in. (1219 mm)	3/8 in. (10 mm)	3 in. (76 mm)	Compression	Copper
198799S	3/16 in. quick connect	96 in. (2438 mm)	3/8 in. (10 mm)	2-5/8 in. (67 mm)	Spud	Copper
198799W	3/16 in. quick connect	50 in. (1270 mm)	3/8 in. (10 mm)	2 in. (51 mm)	Compression	Copper



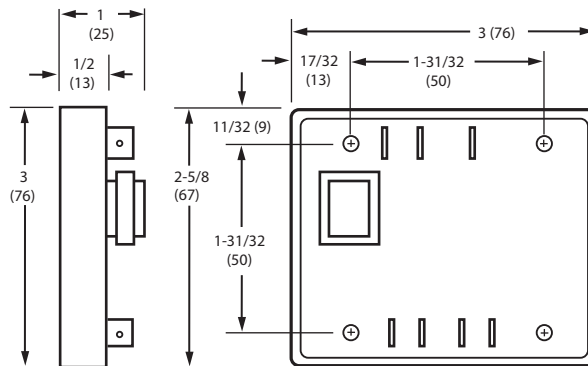
Q8205A SETPOINT PANEL



T8205A,H POTTED CONTROL MODULE



TS8205A POTTED CONTROL MODULE



- 1 THIS SECTION ON T8205B,C MODELS ONLY.
- 2 3/8 IN. (10 MM) RECOMMENDED FOR SHAFT CLEARANCE HOLE.
- 3 POTENTIOMETER SHAFT DIAMETER .24 IN. (6 MM).
- 4 SWITCH SHAFT DIAMETER .25 IN. (6 MM).

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Fig. 1. T8205B,C; TS8205B,C; Q8205A; T8205A,H; TS8205A dimensions in in. (mm).

INSTALLATION

When Installing this Product...

1. Read these instructions carefully. Failure to follow them could 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 installation is complete, check out product operation as provided in these instructions.

WARNING

Explosion Hazard.
Can cause property damage, severe injury or death.
 This product is for use only in a system with a pressure relief valve.

WARNING

Burn Hazard.
Can cause severe personal injury.
 Always use a separate high limit temperature control to prevent possible overheating of pool or spa water.

CAUTION

Electrical Shock Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power supply before beginning wiring.

IMPORTANT

Sensor leadwires can be damaged by bending or pulling when exposed to below-freezing temperatures. Install only when temperature is above 32°F (0°C).

Location and Mounting

Sensor

Locate the sensor in the return water header of the heater at a point where average pool, spa, or hot tub water temperature can be measured. The sensor can be installed in an immersion well, or directly immersed.

If an immersion well is used, fit the bulb snugly touching the bottom of the well for best temperature response. Use heatconductive compound (available from Resideo in a four ounce can as part no. 107408). Make sure the bulb is held firmly in the well.

If the bulb is directly immersed, use a 3/8 in. x 1/2 in. compression to MIP coupling or O-ring and clamp to prevent leaks and keep the sensor leadwires dry.

Wells and fittings must be supplied by the heater manufacturer.

Control Systems

IMPORTANT

TS8205A Control Module and Q8205A-C Setpoint Panels must be mounted to allow adequate electrical spacing according to approval agency requirements.

The T8205B,C and TS8205B,C Control Systems can be mounted on the appliance through mounting holes on the device. Mount in a location that is below high temperature limits but within range of the sensor leadwires. Mount the Setpoint Panels through holes on the board.

T8205A,H and TS8205A Control Modules mount on any flat surface using no. 6 screws (obtained locally) through the mounting holes.

Setpoint Panel

For remote mounting, the Q8205 Setpoint Panel can be mounted in any convenient location for reading and changing the temperature setting. Mount through holes on the board using no. 6 screws (obtained locally). T8205A,H and TS8205A Control Modules and Q8205A-C Setpoint Panels must be mounted to allow adequate electrical spacing according to approval agency requirements.

Wiring

WARNING

Burn Hazard
Can cause severe personal injury.
 Always use with a separate high limit temperature control to prevent possible overheating of the pool or spa water.

IMPORTANT

For most reliable operation, run the sensor leadwires separately from any other current-carrying wires.

The T8205C is a combination of the T8205A and the Q8205C. Fig. 2 shows the T8205A,H Control Module latched into the back side of the Q8205C Setpoint Panel. See Fig. 4 and 5 for system wiring diagrams.

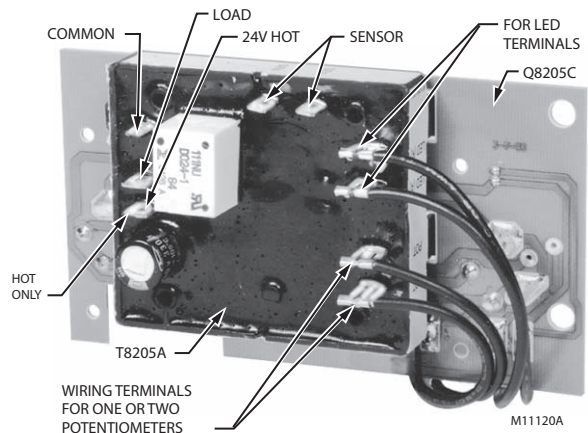


Fig. 2. T8205C: T8205A Control Module and back side of Q8205C Setpoint Panel.

The TS8205B is a combination of the TS8205A and Q8205B. Fig. 3. shows the TS8205 Control Module latched into the back side of the Q8205B Setpoint Panel. See Fig. 6 for system wiring diagram.

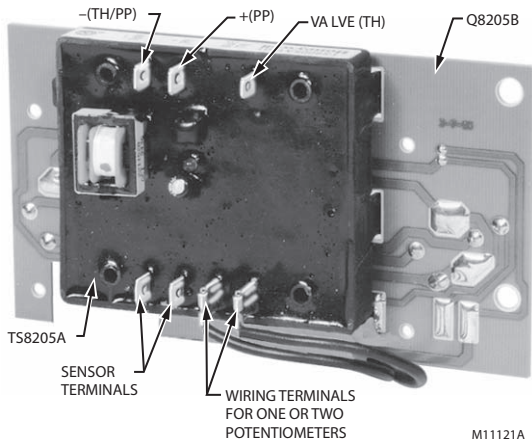


Fig. 3. TS8205B: TS8205A Control Module and back side of Q8205B Setpoint Panel.

All wiring must comply with local codes and ordinances. Disconnect power supply before beginning wiring. Wire according to instructions provided by the heater manufacturer, or connect as shown in Fig. 4 through Fig. 8.

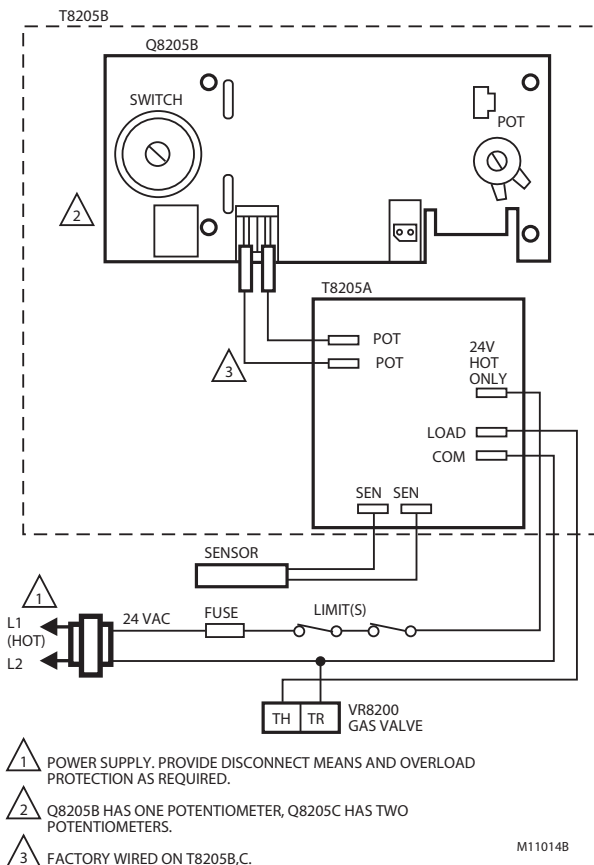


Fig. 4. T8205B,C (TS8205B,C has similar wiring configuration) wired to 24V gas control to control water temperature in pool, spa, or hot tub (T8205B shown).

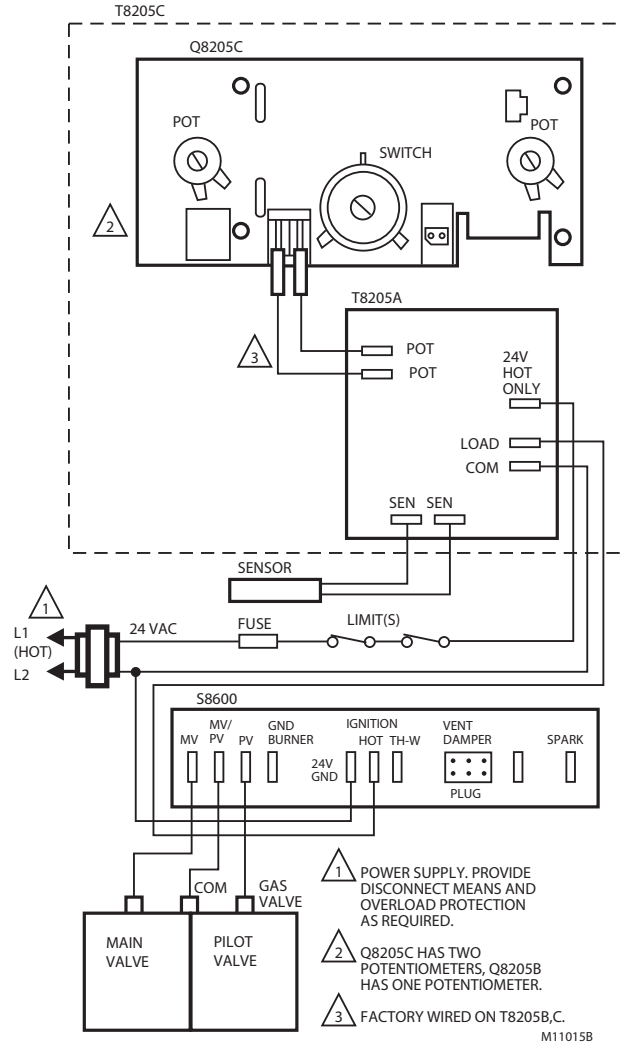


Fig. 5. T8205B,C (TS8205B,C has similar wiring configuration) wired to ignition module to control water temperature in both pool spa, or hot tub (T8205C shown).

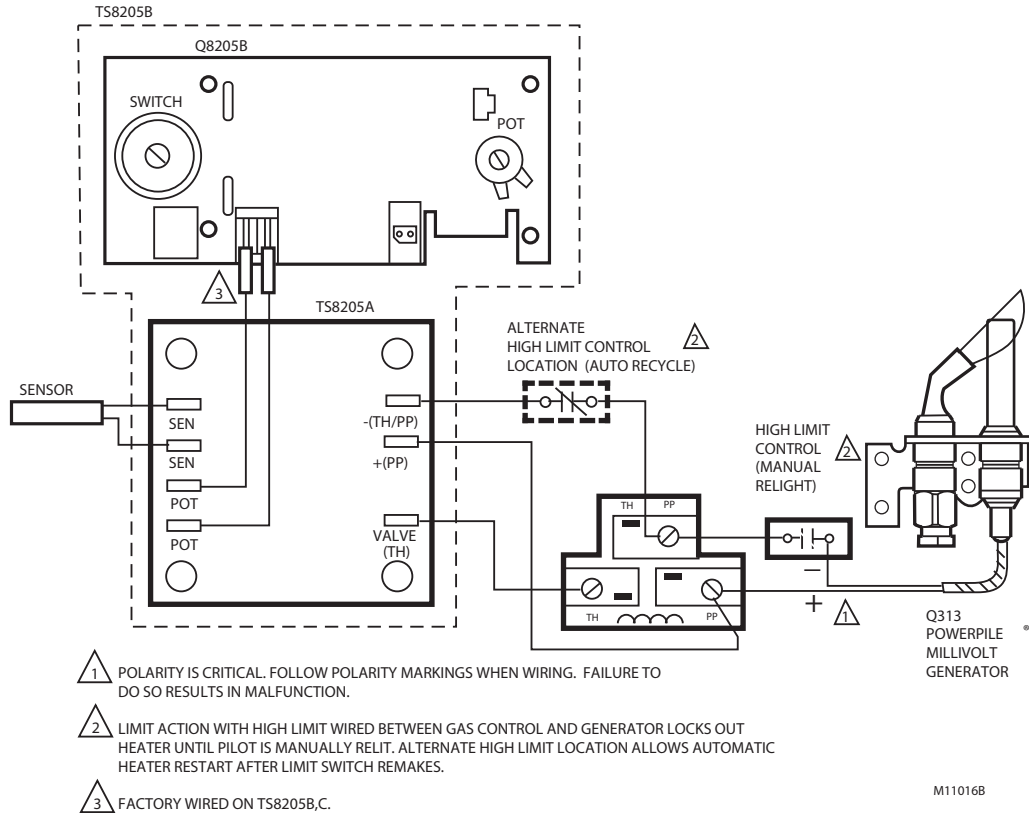


Fig. 6. TS8205B,C wiring connections for high limit control (TS8205B shown).

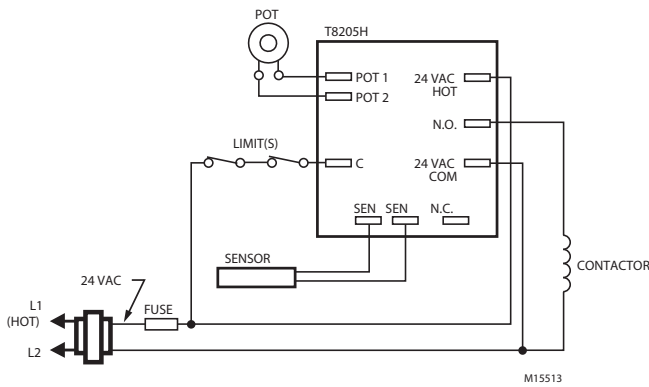


Fig. 7. T8205H wiring connections for heat pump heating applications.

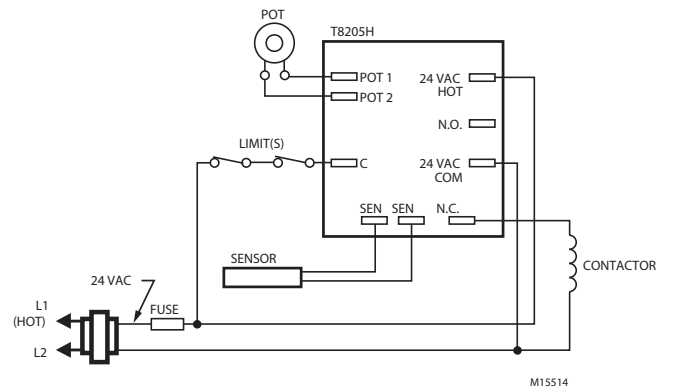


Fig. 8. T8205H wiring connections for heat pump cooling applications.

SETTINGS

Select Control Temperature

The control temperature is set by turning the setpoint potentiometer. The limit of clockwise rotation with the shaft toward you represents the maximum 106°F (41°C) setting. Turning the potentiometer counterclockwise through its full rotation moves the setting to the minimum limit. On models with two potentiometers, one potentiometer is used to set the pool temperature, and the other is used to set the spa temperature. See Fig. 9 for a setting guide.

CHECKOUT

Check out the system by observing it through at least one complete cycle, making sure it operates as desired. Check the sensor by comparing its resistance to the temperature as measured by an accurate thermometer. The resistance of the sensor increases as its temperature drops. The troubleshooting chart, Fig. 10, shows the relationship between sensor resistance and temperature.

OPERATION

The T8205A,H and TS8205A Control Modules use a potentiometer to set the operating temperature and an external sensor assembly to sense the actual water temperature. The T8205A,H and TS8205A are used with the Q8205A-C. The T8205B,C and the TS8205B,C include the Q8205B,C. The setpoint potentiometer on the Q8205 is used to set the operating temperature. On models with two potentiometers, one is used to set the pool temperature, and the other is used to set the spa temperature.

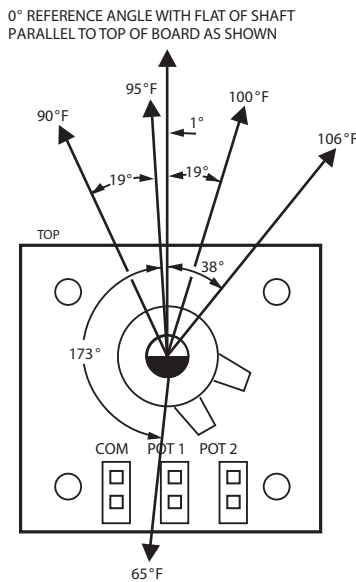
Relay contacts in the module close to turn on the gas control or ignition module when the temperature at the sensor drops 1°F (0.5°C) below the setpoint. When the temperature rises to the setpoint, the relay contacts open, turning off the gas control or ignition module.

Control range is 61° to 106°F (16° to 41°C) with a fixed subtractive differential of 1°F (0.7°C) maximum at 106°F (41°C).

TROUBLESHOOTING

The following procedures describe methods for troubleshooting the T8205 and TS8205 Control Systems when the pool/spa/hot tub are too hot or too cold.

- When the pool/spa/hot tub water is too cold, use Fig. 10 to troubleshoot the system.
- When the pool/spa/hot tub water is too hot, use Fig. 11 to troubleshoot the system.



DIVIDE POTENTIOMETER ROTATION INTO SEGMENTS TO DETERMINE SETPOINT. USE LINE THROUGH CENTER OF SHAFT PERPENDICULAR TO FLAT AS REFERENCE.

TEMPERATURE SETTING	°F	65	90	95	100	106
TEMPERATURE SETTING	°C	18	32	35	38	41
TOLERANCE	°F	±3	±3	+5	+3	±1.5
				-2	-4	

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Fig. 9. Relationship between potentiometer position and temperature setting.

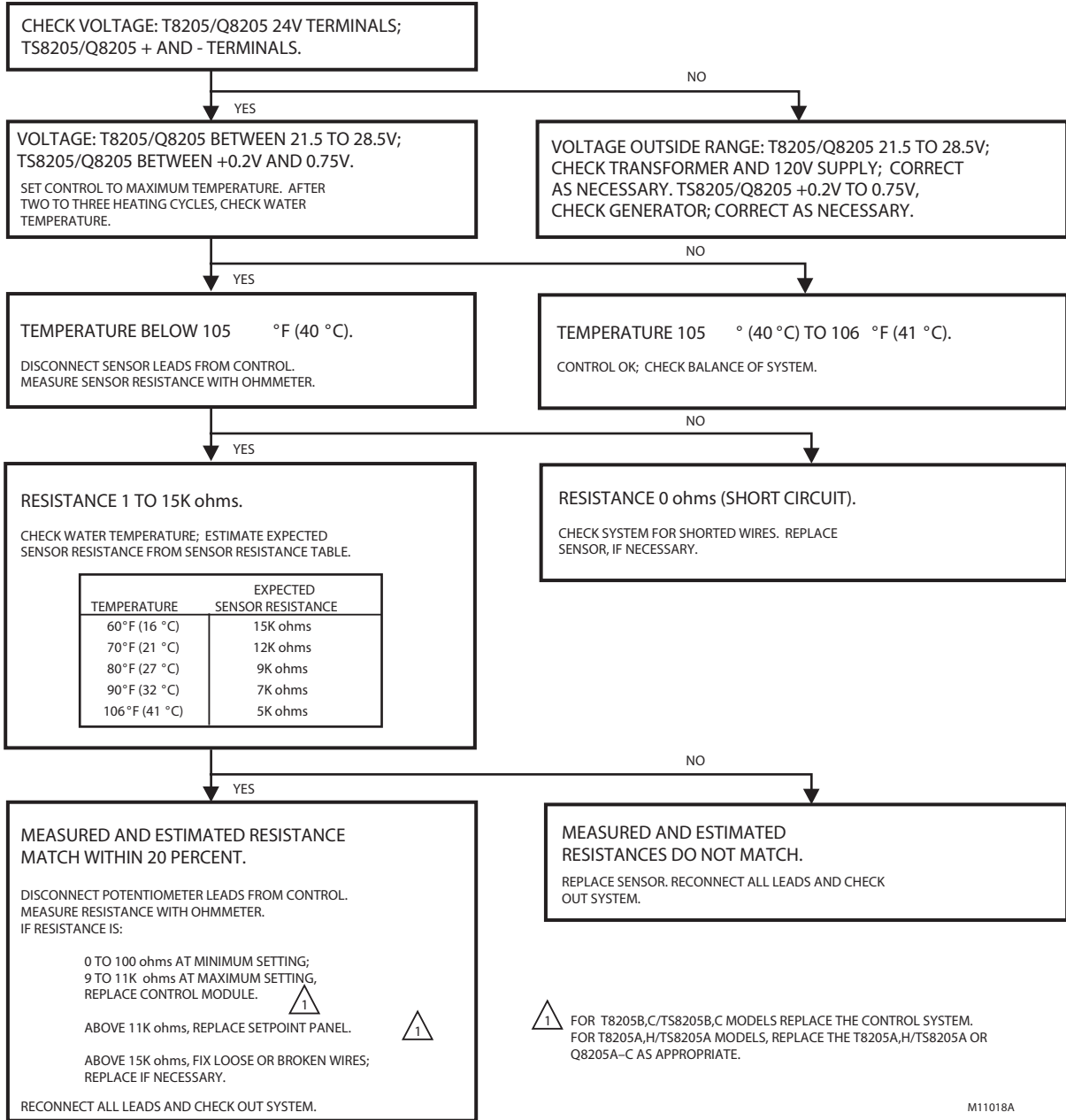


Fig. 10. Troubleshooting procedure when water is too cold.

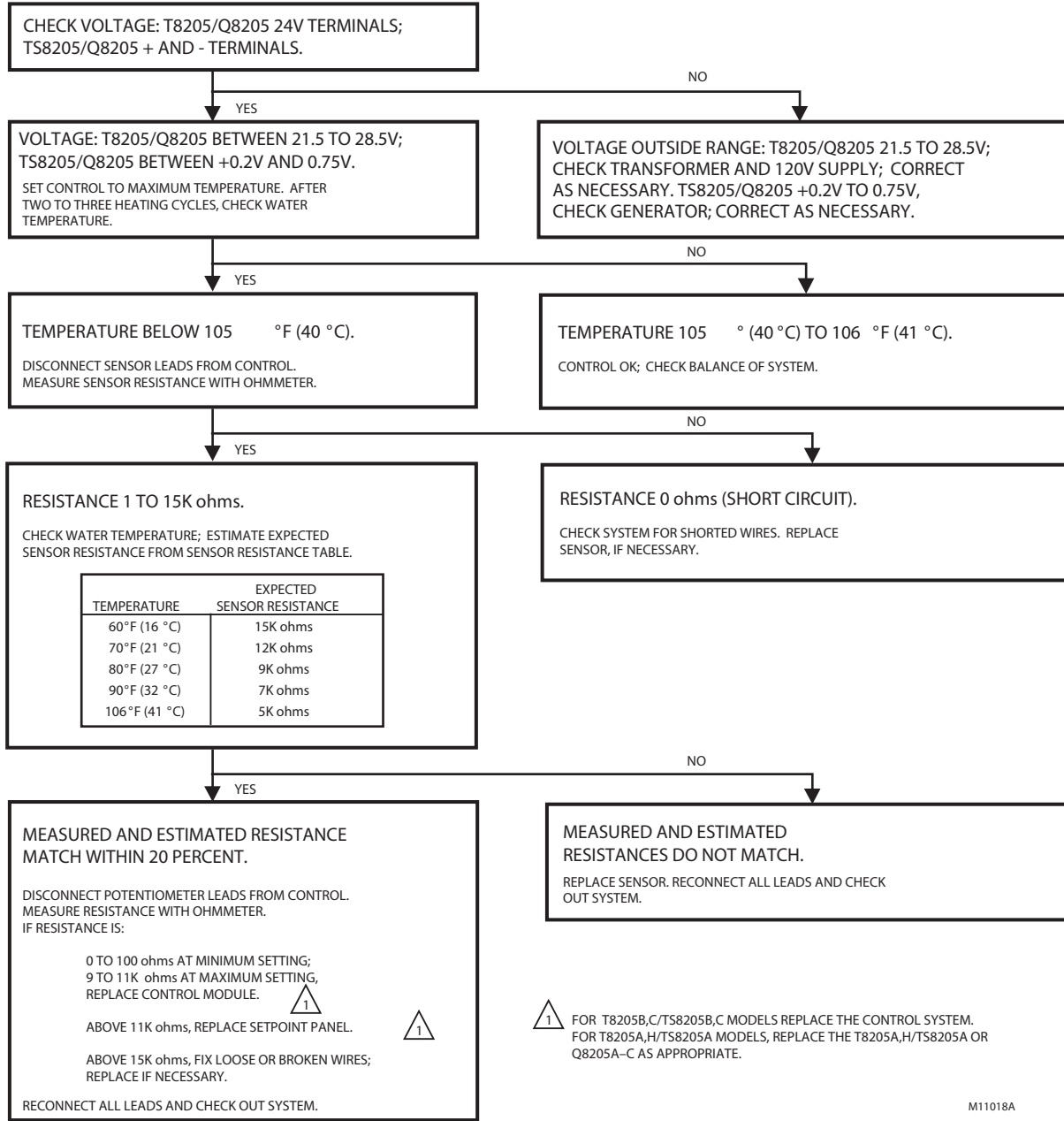


Fig. 11. Troubleshooting procedure when water is too hot.



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