A70GA and A70HA Temperature Controls Installation Guide

Part No. 997-741 Rev. D
LIT-121115

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Description

The A70GA and A70HA temperature controls are low temperature cutout controls that connect to line voltage and come with a remote bulb.

Figure 1: A70 electric temperature control



Application

The A70 temperature controls use a temperature sensing element to operate electrical contacts. The switching mechanism on the single-pole, single-throw (SPST) models opens the circuit on a temperature increase. On the 4-wire, 2-circuit models, the main load contacts (LINE-M2) open on a temperature increase and simultaneously the auxiliary or alarm contacts (LINE-M1) close.

Use this control as a low temperature cutout device on hot water systems. Users install the element in a location that senses the return water temperature of the coil, the control is usually set at approximately 40°F (4°C). If the temperature of the water drops to the control setting, the circuit opens and the unit fans stop running. When the fans stop, the outdoor air damper closes. Controls are available with manual reset, if you specify this feature when you order.

If it is necessary to remove the bulb without draining the system, a separate bulb well assembly is available.

The FTG13A-600R packing nut is available to install the bulb into a closed tank. You must drain the system before you remove the bulb.

Important: Use the A70 Series controls only as operating controls. Where failure or malfunction of the controls could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the controls.

Installation

To install the control, observe the following guidelines.

Mounting

You can mount the control in any position. Use the two mounting holes in the back of the case to mount the control to a wall surface or panel board. Install the measuring bulb in the return water line in the heating system.

CAUTION

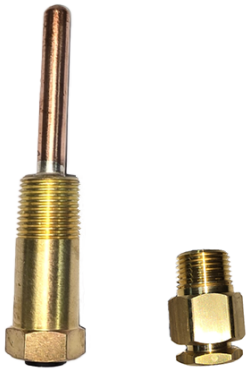
Risk

Locate vapor pressure controls with refrigeration charge (gas) where the ambient temperature at the case and capillary is always warmer than the bulb temperature. The control operates from the coldest spot in the temperature element system. Normally these controls have 3/8 in. diameter and smaller bulbs or bulbs 11/16 in. diameter and less than 3-1/2 in. long.

During the installation, avoid sharp bends or kinks in the capillary tubing. Locate the bulb where there is free circulation and ensure that it does not contact any surface. Coil and secure the excess capillary length. Do not allow the tubing to rest against metal surfaces.

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Figure 2: Bulb well assembly and 1/2 in. packing nut



Note: The 1/2 in. packing nut is not included. You can order the FTG13A-600R packing nut to securely clamp the bulb in place.

Wiring

WARNING

Risk

Disconnect the power supply before wiring connections are made. This avoids possible electrical shock or damage to equipment.

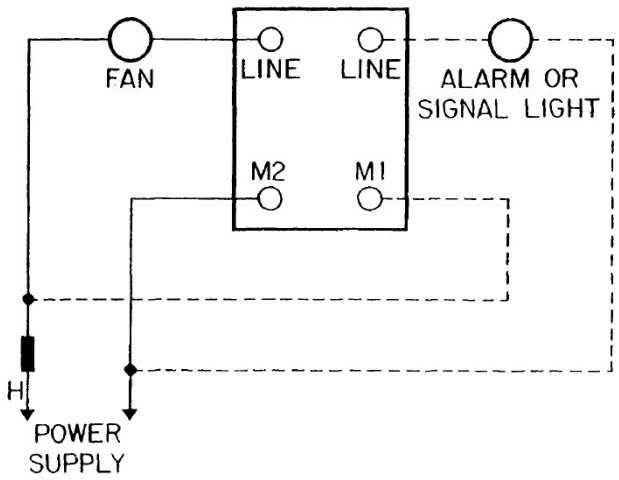
Make all wiring connections using copper conductors only, and in accordance with the National Electrical Code and local regulations. Ensure the control is not installed on equipment to handle loads in excess of its electrical rating. Follow equipment manufacturer's recommendations for wiring.

CAUTION

Risk

Use the 8-32 × 1/4 in. terminal screws supplied in the switch. Longer terminal screws can interfere with the switch mechanism and damage the switch.

Figure 3: Typical wiring for a 4-wire, 2-circuit control



Checkout procedure

Before you leave the installation, observe at least three complete operating cycles to ensure that all components are functioning correctly.

Repairs and replacement

Do not make field repairs except for replacement of the cover, bulb well, and closed tank connector. For a replacement control, bulb well, or closed tank connector, contact the nearest Johnson Controls® distributor.

Electrical ratings

Table 1: A70GA and A70HA electrical ratings

VAC 60 Hz	cULus									
	Line-M2 (main contact)						Line-M1 (auxiliary contacts)			
	120 VAC	208 VAC	240 VAC	277 VAC	480 VAC	600 VAC	120 VAC	208 VAC	240 VAC	277 VAC
Motor full load amperes	16.0	9.2	8.0	—	5.0	4.8	6.0	3.3	3.0	—
Motor locked rotor amperes	96.0	55.2	48.0	—	30.0	28.8	36.0	19.8	18.0	—
AC non-inductive amperes	16.0	9.2	8.0	7.2	—	—	6.0	6.0	6.0	6.0
Pilot duty	125 VA at 24 VAC to 600 VAC. 20 VA at 120 VDC to 300 VDC.									

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Conformity declaration information

Table 2: Conformity declaration information

Information	Description
Purpose of control	Temperature operating control
Method of mounting control	Surface mounted. Permanently attached through usage of a mounting bracket.
Method of earthing control	Wiring binding screw terminal
Type 1 or Type 2 action	Type 2.B (Micro-disconnection) for all model ratings other than 600 V, except as specified below.
	Type 2.C (Micro-interruption) for all models at 600 V rating.
	Type 2.C for all auxiliary (L-M1) SPST N.O. ratings.
Operating value	Setpoint value
External pollution situation	Pollution degree 3
Rated impulse voltage	6,000 V
Deviation and drift	Deviation and drift do not exceed 5%

Technical specifications

Table 3: A70GA and A70HA technical specifications

Specification	Description
Contact action	4-wire, 2-circuit, main (LINE-M2) contacts open on a temperature drop. Simultaneously, the auxiliary contacts close.
Manual reset	The A70HA model features manual reset.
Conduit opening	7/8 in. (22 mm) diameter for 1/2 in. (12.7 mm) conduit
Differential	Adjustable, minimum 3°F (17°C), factory set at 12°F (7°C)
Element	Vapor pressure, 6 ft (1.8 m) capillary
Maximum overrun temperature on bulb	250°F (121°C)
Range	35°F to 80°F (1.7°C to 27°C)

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Single point of contact

APAC	EU	UK	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS VOLTAWEG 20 6101 XK ECHT THE NETHERLANDS	JOHNSON CONTROLS TYCO PARK GRIMSHAW LANE MANCHESTER M40 2WL UNITED KINGDOM	JOHNSON CONTROLS 5757 N GREEN BAY AVE. GLENDALE, WI 53209 USA

Contact information

Contact your local Johnson Controls representative: www.johnsoncontrols.com/locations
Contact Johnson Controls: www.johnsoncontrols.com/contact-us

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