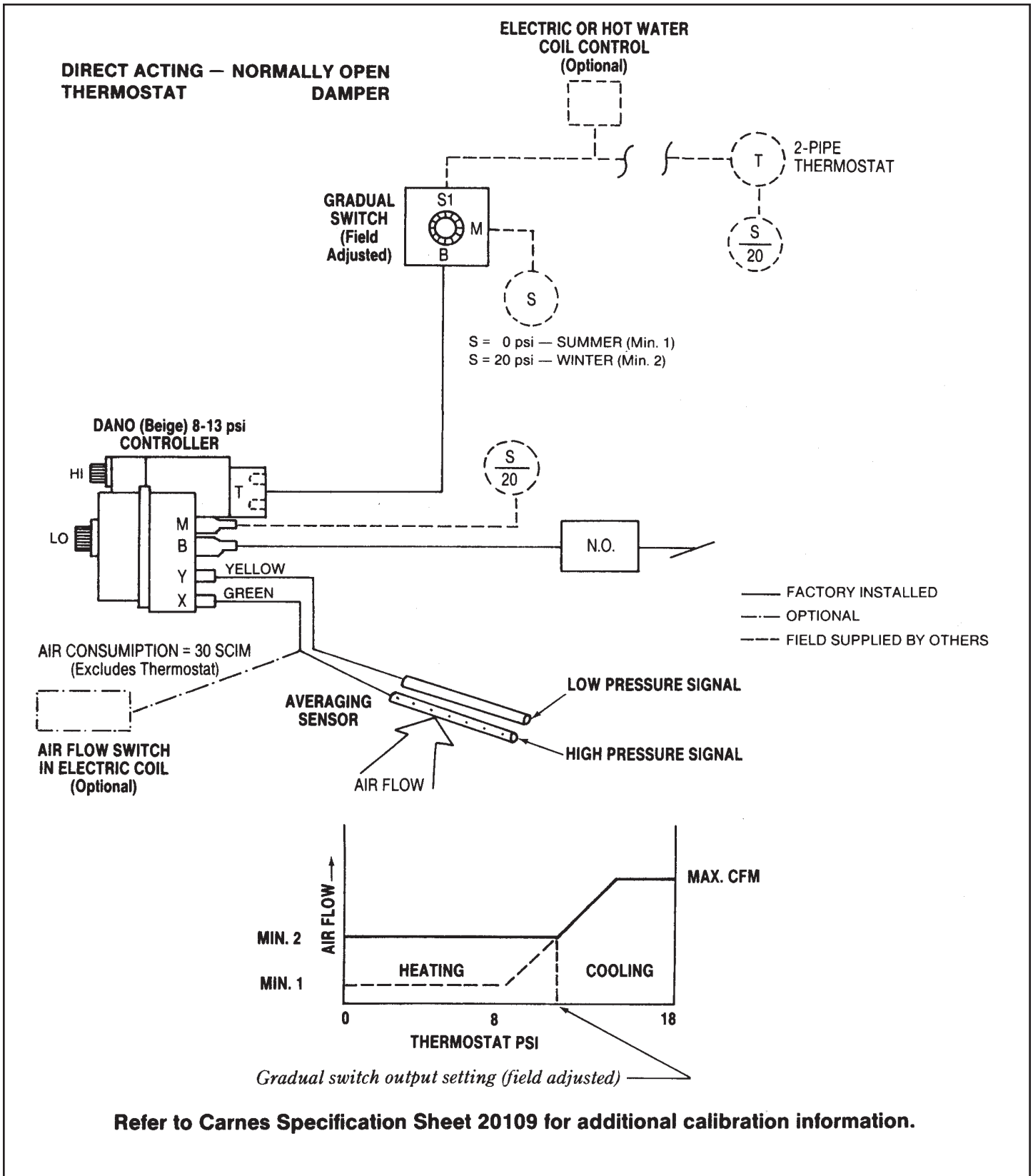


SPECIFICATION SHEET SINGLE DUCT THROTTLING UNIT W/HEATING COIL Dual Minimum Sequence — Option A Separate Switching Signal

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Refer to Carnes Specification Sheet 20109 for additional calibration information.

**SINGLE DUCT THROTTLING UNIT W/HEATING COIL
DUAL MINIMUM AIR FLOW — OPTION A
SEQUENCE OF OPERATION**

SUMMER OPERATION (S = 0 psi):

A. SPACE IS HOT (*gradual switch is de-energized*)

Thermostat pressure is high. The Gradual Switch perform like a high pressure selector relay and allows the thermostat signal to pass through to the "T" port of the D.A.N.O. velocity reset controller. High thermostat pressure to the D.A.N.O. velocity reset controller corresponds to the maximum air flow setting. Maximum CFM is being delivered for cooling.

B. SPACE IS COLD (*MIN 1 - gradual switch is de-energized*)

Thermostat pressure is low. The thermostat signal passes through the gradual switch to the "T" port of the velocity reset controller. Low thermostat pressure to the D.A.N.O. velocity reset controller corresponds to the minimum air flow setting. Minimum CFM (MIN 1) is being delivered.

WINTER OPERATION (S = 20 psi):

A. SPACE IS HOT (*gradual switch is energized*)

Thermostat pressure is high. The Gradual Switch performs like a high pressure selector relay and allows the thermostat signal to pass through the "T" port of the D.A.N.O. velocity reset controller. High thermostat pressure to the D.A.N.O. velocity reset controller corresponds to the maximum air flow setting. Maximum CFM is being delivered for cooling.

B. SPACE IS COLD (*MIN 2 - gradual switch is energized*)

The Gradual Switch performs like a high pressure selector relay and is field adjusted to maintain a minimum output signal to the "T" port of the velocity reset controller. This allows an alternate minimum heating CFM (MIN 2) less than or equal to the calibrated maximum cooling CFM but greater than the summer minimum CFM (MIN 1) setting. The normally open hot water heating valve is fully open or electric coil is energized to provide maximum heat.

Modulated positions between extremes are shown on the accompanying graphs. Refer to Carnes Specification Sheet 20109 for additional calibration information.

SETTING PROCEDURE FOR GRADUAL SWITCH

1. Provide the gradual switch with 20 psig supply air at the "M" port.
2. Turn the zone thermostat to full heat.
3. Measure the air flow.
4. Turn the adjustment knob clockwise to increase the air flow if it is lower than the desired CFM. Turn the adjustment knob counter-clockwise to decrease the air flow if it is higher than the desired CFM

NOTE: The knob has stops for 300 degree rotation. The switch has a span corresponding to 3.5 turns. It may be necessary to remove and reposition the knob to make adjustments if the desired setting can not be obtained as installed.

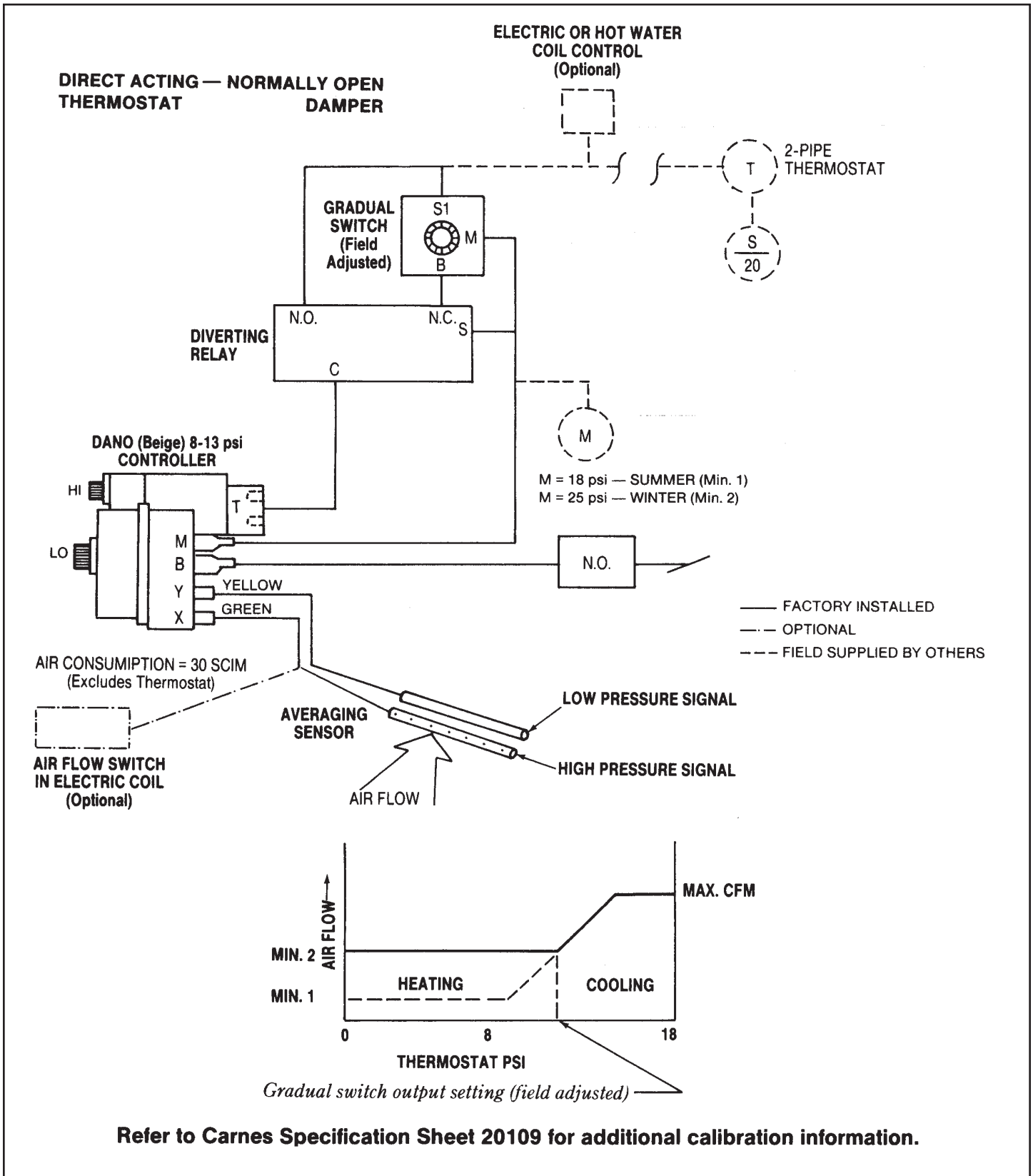
SPECIFICATION SHEET

SINGLE DUCT THROTTLING UNIT W/HEATING COIL

Dual Minimum Sequence — Option B

Two Pressure Main

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Refer to Carnes Specification Sheet 20109 for additional calibration information.

**SINGLE DUCT THROTTLING UNIT W/HEATING COIL
DUAL MINIMUM AIR FLOW — OPTION B
SEQUENCE OF OPERATION**

SUMMER OPERATION (M = 18 psi):

A. SPACE IS HOT

The normally open (NO) and common (C) ports of the diverting relay are active. Thermostat pressure is high. The thermostat signal passes through the normally open (NO) port of the diverting relay to the "T" port of the D.A.N.O. velocity reset controller. High thermostat pressure to the D.A.N.O. velocity reset controller corresponds to the maximum air flow setting. Maximum CFM is being delivered for cooling.

B. SPACE IS COLD (MIN 1 is activated)

Thermostat pressure is low. The thermostat signal passes through the normally open (NO) port of the diverting relay to the "T" port of the velocity reset controller. Low thermostat pressure to the D.A.N.O. velocity reset controller corresponds to the minimum air flow setting. Minimum CFM (MIN 1) is being delivered.

WINTER OPERATION (M = 22 psi):

A. SPACE IS HOT

The normally closed (NC) and common (C) ports of the diverting relay are active. Thermostat pressure is high. The Gradual Switch performs like a high pressure selector relay and allows the thermostat signal to pass through the gradual switch and the normally closed (NC) port of the diverting relay to the "T" port of the D.A.N.O. velocity reset controller. High thermostat pressure to the D.A.N.O. velocity reset controller corresponds to the maximum air flow setting. Maximum CFM is being delivered for cooling.

B. SPACE IS COLD (MIN 2 is activated)

The Gradual Switch performs like a high pressure selector relay and is field adjusted to maintain a minimum output signal to the normally closed (NC) port of the diverting relay. This field adjusted output signal goes through the diverting relay and sets up a minimum thermostat input signal to the "T" port of the velocity reset controller. This allows an alternate minimum heating CFM (MIN 2) less than or equal to the calibrated maximum cooling CFM but greater than the summer minimum CFM (MIN 1) setting. The normally open hot water heating valve is fully open or electric coil is energized to provide maximum heat.

Modulated positions between extremes are shown on the accompanying graphs. Refer to Carnes Specification Sheet 20109 for additional calibration information.

SETTING PROCEDURE FOR GRADUAL SWITCH

1. Provide the gradual switch with 22 psig supply air at the "M" port.
2. Turn the zone thermostat to full heat. Diverting relay must be activated (22 psi) normally closed (NC) to common (C)
3. Measure the air flow.
4. Turn the adjustment knob clockwise to increase the air flow if it is lower than the desired CFM. Turn the adjustment knob counter-clockwise to decrease the air flow if it is higher than the desired CFM

NOTE: The knob has stops for 300 degree rotation. The switch has a span corresponding to 3.5 turns. It may be necessary to remove and reposition the knob to make adjustments if the desired setting can not be obtained as installed.