



# Manual Supplement

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**Model Number:** 8635-C-N2

**Product/System Title:** Room Pressure Controller with N2  
Communications Protocol

**Contents of this manual supplement include:**

- 1) Sequence of Operation
- 2) Variable map
- 3) Description of software items added
- 4) Software items deleted
- 5) Description of variables
- 6) Wiring Diagrams

N2 communications are installed on the Model 8635-C-N2 room pressure controllers. This document provides the technical information needed for the host DDC system to communicate with 8635-C units. This document assumes the programmer is familiar with the N2 protocol. Further technical assistance is available from TSI if your question is related to TSI interfacing to a DDC system. If you need further information regarding N2 programming in general, please contact Johnson Controls.

<b>Project:</b>
<b>Date:</b>
<b>Page 1 of 11</b> <b>Released 2/15/02</b>



# Manual Supplement

## Sequence of Operation

The Model 8635-C-N2 measures the room pressure differential and receives temperature information from the thermostat. The 8635-C-N2 control algorithm modulates the supply and general exhaust air to provide adequate supply air while maintaining the room pressure differential and temperature control.

Temperature control is provided by a thermostat that provides temperature information to the Model 8635-C-N2 controller and controls the reheat coil. The thermostat will provide a 0-10V signal, corresponding to a 50-85°F temperature. Alternatively, the temperature can be sent to the controller over the N2 bus (Analog Input #3)

In occupied mode, the Model 8635-C-N2 has two supply flow set points: ventilation and temperature. The ventilation setpoint is the minimum supply flow for the space, used when the heating and cooling loads are met. The temperature supply set point is a higher flow, required to meet an increased cooling load in the lab.

Laboratory temperature is continuously transmitted to the Model 8635-C-N2. When the laboratory temperature is satisfied, the ventilation set point is maintained, unless additional supply air is required for the room pressure balance. When the space temperature is more than 1°F above the temperature setpoint, the 8635-C-N2 slowly will increase the supply air volume, to a maximum of the temperature minimum supply flow, until the space temperature returns to setpoint. When the space temperature is more than 1°F below the temperature setpoint, the 8635-C-N2 slowly will decrease the supply air volume, to a minimum of the ventilation minimum supply flow, until the space temperature returns to setpoint. If the supply volume is at the ventilation minimum supply flow, the thermostat will modulate the reheat valve to provide the necessary heating.

In unoccupied mode, the supply flow will remain at the unoccupied supply flow rate.

Supply air volumes will rise above the minimum setpoints, under all conditions, as required to maintain space pressurization. Temperature control and occupied/unoccupied modes will only affect the minimum supply flows, which are used, for example, when fume hood sashes are lowered.

**NOTE:** The 8635-C-N2 will not allow the temperature minimum supply volume to be less than the ventilation minimum supply volume.

<b>Project:</b>
<b>Date:</b>
<b>Page 2 of 11</b> <b>Released 2/15/02</b>





# Manual Supplement

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## Menu Configuration

### SETPOINTS

SETPOINT  
REM SETPOINT  
VENT MIN SET  
TEMP MIN SET  
**UNOCCUPY SET**  
**TEMP SETP**  
ACCESS CODE

### ALARM

LOW ALARM  
HIGH ALARM  
REM LOW ALM  
REM HIGH ALM  
MIN SUP ALM  
ALARM RESET  
AUDIBLE ALM  
ALARM DELAY  
DOOR DELAY  
MUTE TIMEOUT  
ACCESS CODE

### CONFIGURE

DISPLAY AVG  
UNITS  
SUP DCT AREA  
FLO STA TYPE  
TOP VELOCITY  
ACCESS CODE

### CALIBRATION

SENSOR ZERO  
SENSOR SPAN  
SUP FLO ZERO  
ELEVATION  
**TEMP CAL**  
ACCESS CODE

### CONTROL

SPEED  
SENSITIVITY  
CONTROL SIG  
OUTPUT MODE  
Kc VALUE  
Ti VALUE  
Td VALUE  
ACCESS CODE

### INTERFACE

NET ADDRESS  
ACCESS CODE

### DIAGNOSTICS

CONTROL SUP  
CONTROL EXH  
SENSOR INPUT  
SENSOR STAT  
SWITCH INPUT  
SUP FLOW IN  
TEMP INPUT  
LOW ALM REL  
HIGH ALM REL  
ACCESS CODE



# Manual Supplement

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## Software Items Deleted

The following software items have been deleted from the 8635-C-N2:

<u>Menu</u>	<u>Item</u>
SETPOINTS	TEMP LOW TEMP HIGH
CONFIGURE	EXH DUCT AREA ROOM VOLUME
CALIBRATION	EXH FLOW ZERO
INTERFACE	NET PROTOCOL
DIAGNOSTICS	EXH FLOW IN



# Manual Supplement

## Variable Map

NPT	NPA	UNITS <sup>1</sup>	DESCRIPTION
AI	1	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	Room Pressure Value
AI	2	CFM, l/s	Supply Flow Rate
AI	3	°F, °C	Temperature
AI	4	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	Control Setpoint
AI	5	CFM, l/s	Minimum Supply Setpoint
AI	6	#	Supply Control Output
AI	7	#	Exhaust Control Output
BI	1		Low Room Pressure Alarm 0=Normal 1=Low Alarm
BI	2		High Room Pressure Alarm 0=Normal 1=High Alarm
BI	3		Min. Flow Alarm 0=Normal 1=Low Flow Alarm
BI	4		Emergency Mode 0=Normal 1=Emergency Mode
BI	5		Room Mode 0=Main 1=Remote
BI	6		Occupied/Unoccupied Mode 0=Occupied 1=Unoccupied
BI	7		Data Error 0=Normal 1=Data Error
AO	1	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	Low Alarm Setpoint
AO	2	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	High Alarm Setpoint
AO	3	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	Remote Low Alarm Setpoint
AO	4	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	Remote High Alarm Setpoint
AO	5	CFM, l/s	Min. Flow Alarm Setpoint



# Manual Supplement

NPT	NPA	UNITS <sup>1</sup>	DESCRIPTION
AO	6	ft/min, m/s, in. H <sub>2</sub> O, Pa, mm H <sub>2</sub> O	Main Pressure Setpoint
AO	7	CFM, l/s	Remote Pressure Setpoint
AO	8	CFM, l/s	Minimum Ventilation Rate Supply Flow Setpoint
AO	9	CFM, l/s	Minimum Temperature Supply Flow Setpoint
AO	10	CFM, l/s	Unoccupied Mode Minimum Supply Flow Setpoint
AO	11	°F, °C	Temperature Setpoint
AO	12	#	Units 0=Feet per minute 1=Meters per second 2=Inches of H <sub>2</sub> O 3=Pascals 4=millimeters of H <sub>2</sub> O

<sup>1</sup> Units will correspond with choice in UNITS variable (AO #9). Flow rates will either be CFM or l/s, based on whether UNITS variable is set for an english or metric unit type.

## Description of Variables

### **NPT - Network Point Type**

Variables are defined as analog inputs, binary inputs, and analog outputs. Analog inputs are current control parameters and items that the controller is measuring. Binary inputs represent controller states. Analog outputs are the programmable setpoints for the isolation room pressure controller and monitor. These setpoints can be changed through the keypad or by overriding the current setpoint.

### **NPA - Network Point Address**

Address of the desired point.

### **Change of Status (COS) - Room Pressure Analog Input**

The 8635-C-N2 has the ability to change control setpoints locally. The alarm setpoints need to be based on the controller's control setpoint (AI #4). For example the setpoint could go from -0.002 "H<sub>2</sub>O to +0.001 "H<sub>2</sub>O. If the COS alarm setpoints are not changed to accommodate you could get low alarm or low warning messages when the unit is working correctly. If these alarm points are set outside of the negative and positive setpoint values, incorrect alarm messages can be prevented.

### **Override Analog Input Command**

Analog Input values can be set using the override command. These values will be reset to the correct items when the Override is released. There is not a time-out on the override command.

### **Override Binary Input Command**

Overriding a 1 to Emergency binary inputs enables that mode. To release the controller from emergency state, override a 0 to the Emergency input or press either the emergency or reset key. Releasing the override will return the controller to the Normal state. If the 8635-C-N2 had been put into Emergency mode from the keypad, then it cannot be cleared remotely.

Overriding a 1 to Room Mode binary inputs enables Remote mode. To release the controller from remote state, override a 0 to the Room Mode. Releasing the override will return the controller to the Normal state.

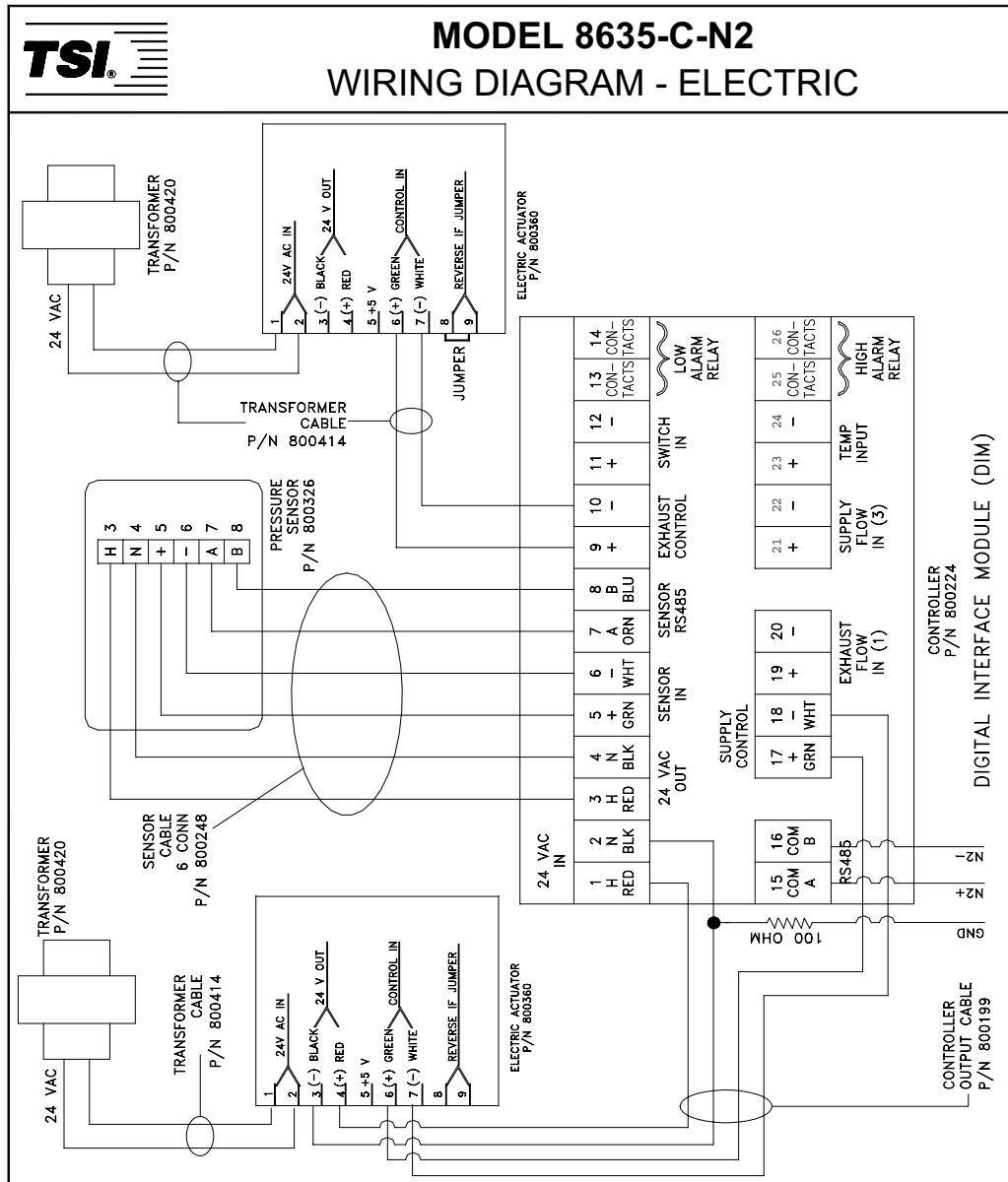
Overriding a 1 to the Occupied/Unoccupied Mode binary inputs enables the unoccupied mode. To release the controller from the unoccupied state, override a 0 to the Occupied/Unoccupied Mode. The Occupied/Unoccupied Mode can only be accessed through N2 communications.

The alarm and data error variables can be overridden, but this will not affect the controller. Overriding the low alarm variable will result in a change of status, but will not put the controller into low alarm mode. The local alarm modes can only be controlled locally. Only override these variables for diagnostic purposes, and release them for normal operation.

<b>Project:</b>
<b>Date:</b>
<b>Page 8 of 11</b> <b>Released 2/15/02</b>



## Wiring Diagrams



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<b>Project:</b>
<b>Date:</b>
<b>Page 10 of 11</b> <span style="float: right;"><b>Released 2/15/02</b></span>

