RELATIVE HUMIDITY SENSORS

Installation and Commissioning Guide

Model: CRH-D

Model: CRH-S

APPLICABLE MODELS	
HERCULES	PKV1700T to PKV2000T
TRI-CAPACITY	PKY470T to PKY960T
VARIABLE CAPACITY COMMERCIAL (VCC)	PKV720T to PKV960T
GENESIS	PRV72AT to PRV96AT

Please Read This Guide

Congratulations on your purchase of an ActronAir Humidity Sensor. This device has been designed and manufactured with the highest quality standard in mind. We hope that you will be satisfied with your excellent choice.

Please read this guide thoroughly and keep it near the unit for future reference.

ActronAir

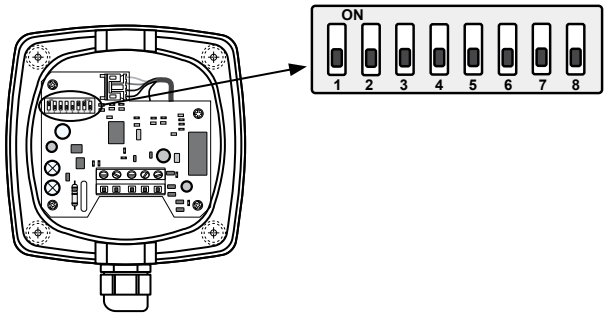
TABLE OF CONTENTS

01. SAFETY PRECAUTIONS

- Read all instructions in this guide before operating the air conditioning unit. Failure to do so may result in damage to the unit and void your warranty.
- Turn-Off power from mains supply by removing fuse or switching the circuit breaker to the Off position before installation or servicing this control interface.
- Follow sound LOCK-OUT/TAG OUT (LOTO) procedures to ensure that power supply is not re-energised accidentally.
- The sensors described in this guide has a power supply of 24 VAC.
- Installation and servicing must be carried out only by a qualified technician.
- Ensure that the unit installation complies with relevant council regulations and building code standards. All electrical wiring must be in accordance with current electrical authority regulations and all wiring connections to be as per electrical diagram provided.
- WH&S rules and regulations must be observed and will take precedence during installation process.
- Only use these sensors with an ActronAir air conditioner as described in this installation guide.

02. GENERAL FEATURES

The CRH-D and CRH-S humidity sensors are utilised in ActronAir Hercules,Tri-Capacity, VCC and Genesis air conditioning systems when the optional Reheat or Economy (Enthalpy) cycle is needed. The CRH-D model is designed for duct mounting to measure and monitor relative humidity in the supply air through the ductwork during the Re-heat cycle; it is installed on the return side when operating in Economy Cycle. Conversely, the CRH-S model is mounted on the wall and measures the indoor humidity relative to the outside air. Both sensors are equipped with 8 DIP switches for mode selection and setting the sensor's address as described below:



DIP 1-5 Address On (128-159)
DIP 6-7 Off-Off = Supervisory CM100
Off-On = Modbus 1,8 N,2
On-Off = Auto (Supv C - Modbus)
On-On = Modbus 1,8 E,2
DIP 8 Off = 19200 Bit/sec
On = 9600 Bit/sec

- Select address (DIP 1-5). The selection is made in 5 Bit binary code.
  Example: Off-Off-Off-Off-Off (128) / On-Off-Off-Off-Off (128 + 1 = 129). See table below.

DIP switch Numbers					Address
1	2	3	4	5	
On	Off	Off	Off	Off	129
Off	Off	Off	Off	Off	128

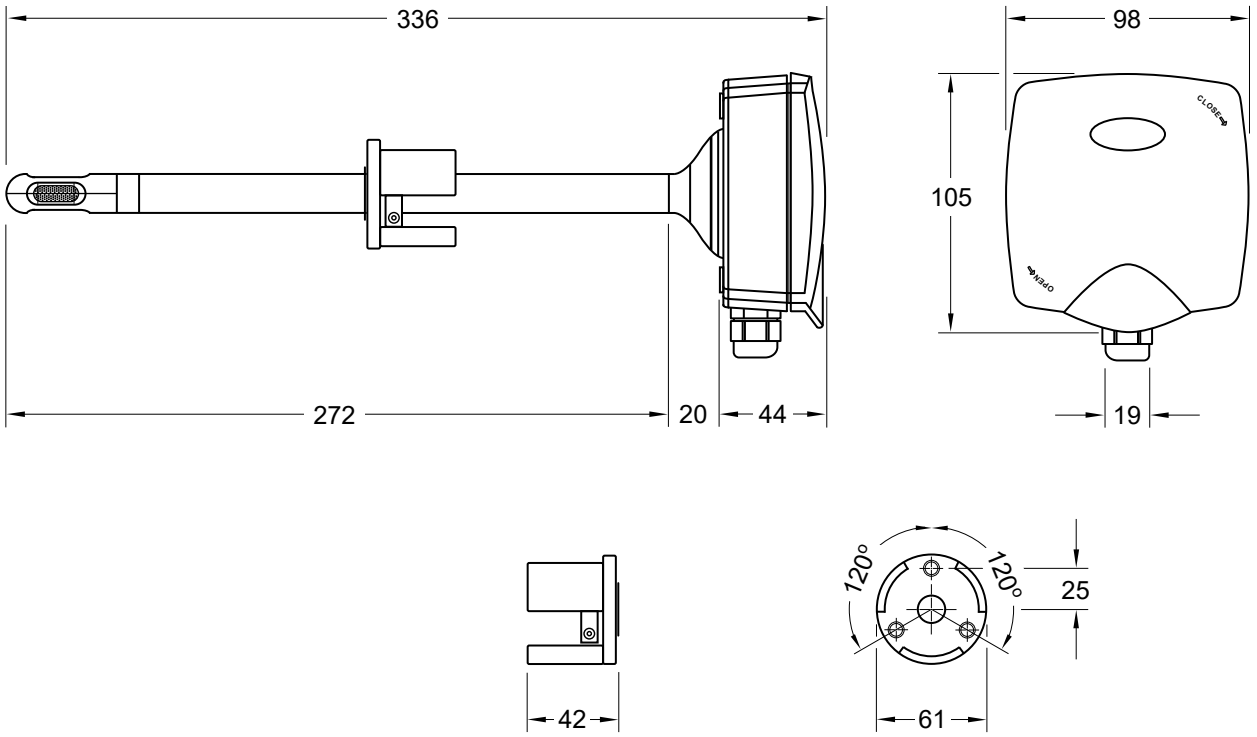
- CM100 / Modbus supervisor protocol (or Auto).
- Serial speed (9600 ... 19200 bit/sec).

NOTE: The default baud rate used with ActronAir system is 19200 Bit/sec.

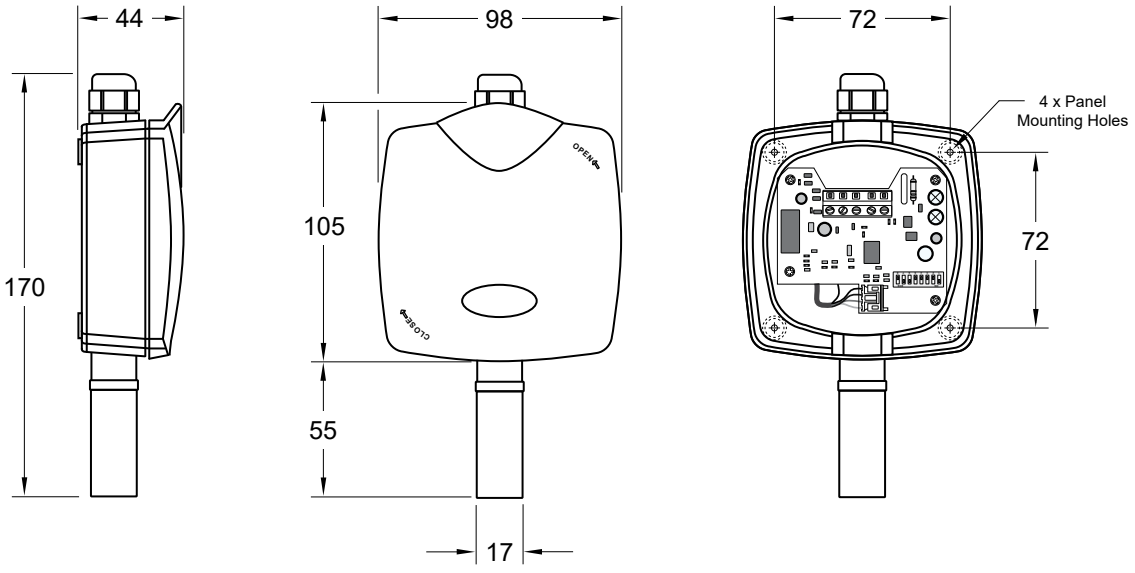
Humidity Sensors Operating Range

Humidity Sensors Operating Range		
Model	**Part Number**	**Range**
CRH-D	2060-201	-10°C to 70°C 10%rh to 90%rh
CRH-S	2060-202	-10°C to 70°C 10%rh to 90%rh

03. (CRH-D) DIMENSIONS (in mm):



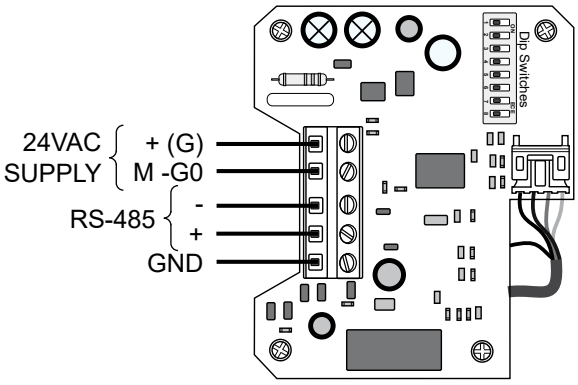
04. (CRH-S) DIMENSIONS (in mm):



05. MOUNTING AND DRILLING HOLES TEMPLATE:

Please see page 15 for template details.

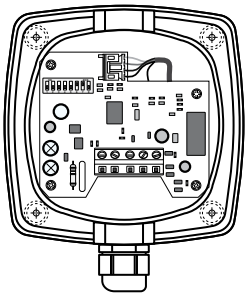
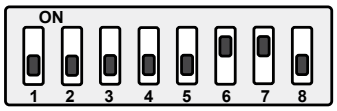
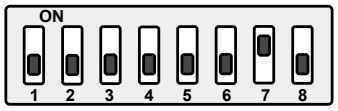
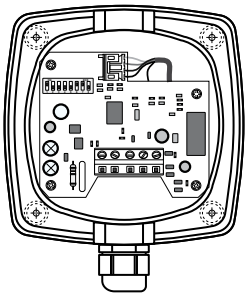
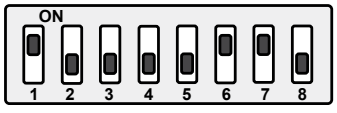
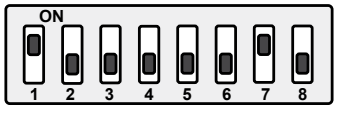
06. CONNECTIONS:



NOTES

- Use a 4 Core (2 Pair) Twisted Pair 0.5 mm² (16/0.20) Shielded Data Cable. Connect the shield to the GND terminal and to an earth if G0-Earth connection is required.
- Do not run serial cables near the 230V or 415V power supply cables or contactor control cables to reduce electromagnetic coupling.
- The maximum connection distance is 100 m between the sensors, 200 in total for two humidity sensors connection.

07. HUMIDITY SENSORS ADDRESS AND DIP SWITCH SETTINGS:

ADDRESS	RELATIVE HUMIDITY (RH) SENSOR	DIP SWITCH SETTINGS	
		HERCULES/VCC	TRI-CAPACITY
Sensor 1	Outside Air RH Sensor 	DIP switch 6 and 7 **ON** 	DIP switch 7 **ON** 
Sensor 2	Room Air RH Sensor 	DIP switch 1, 6 and 7 **ON** 	DIP switch 1 and 7 **ON** 

NOTE: "Room" RH Sensor is also referred to as "Inside" or "Return" RH Sensor

08. ELECTRICAL CONNECTION USING 1 SENSOR:

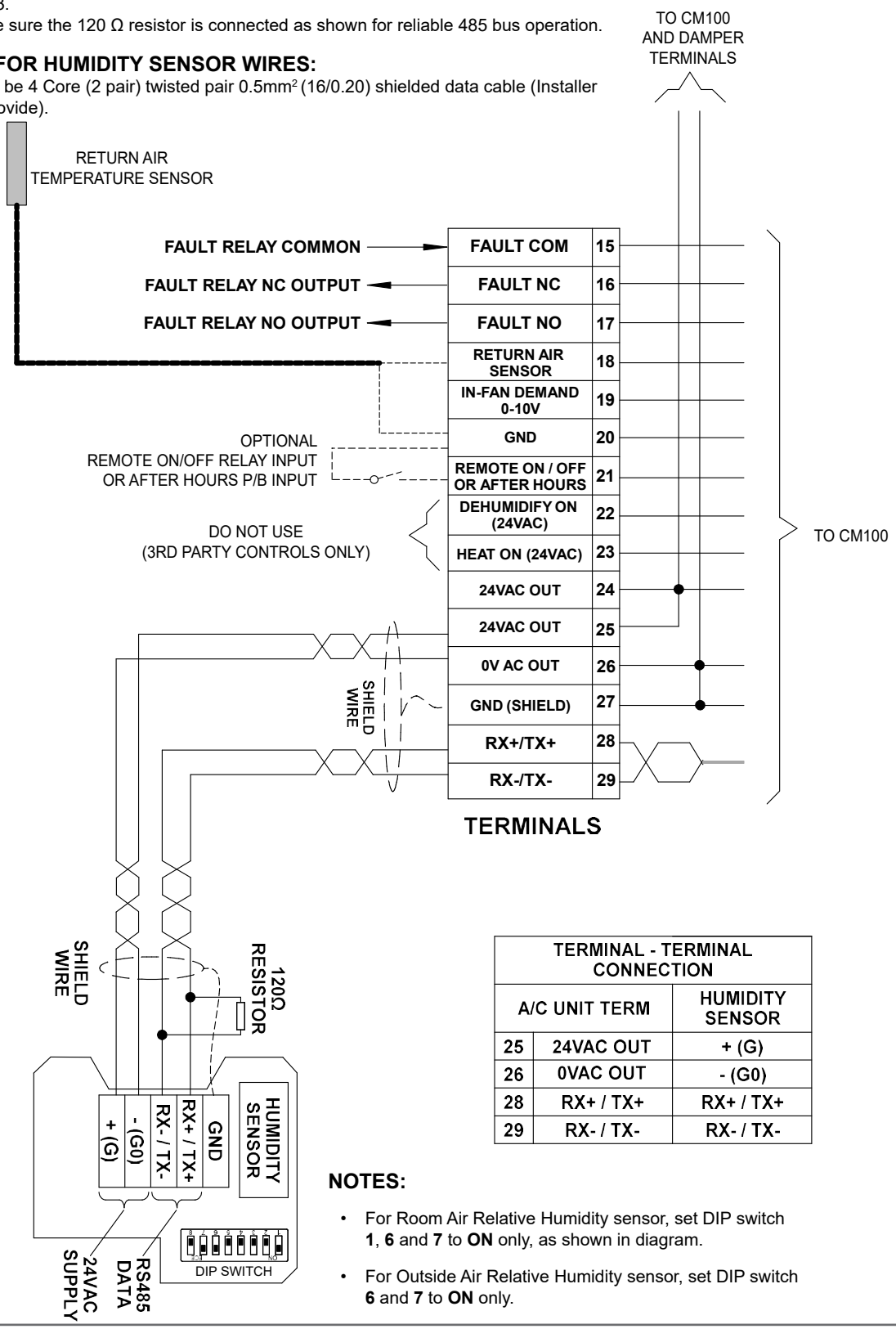
08.01. HERCULES (PKV)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to Hercules Installation and Commissioning Guide (0525-021).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm^2 (16/0.20) shielded data cable (Installer to provide).



TERMINAL - TERMINAL CONNECTION		
A/C UNIT TERM		HUMIDITY SENSOR
25	24VAC OUT	+ (G)
26	0VAC OUT	- (G0)
28	RX+ / TX+	RX+ / TX+
29	RX- / TX-	RX- / TX-

NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1**, **6** and **7** to **ON** only, as shown in diagram.
- For Outside Air Relative Humidity sensor, set DIP switch **6** and **7** to **ON** only.

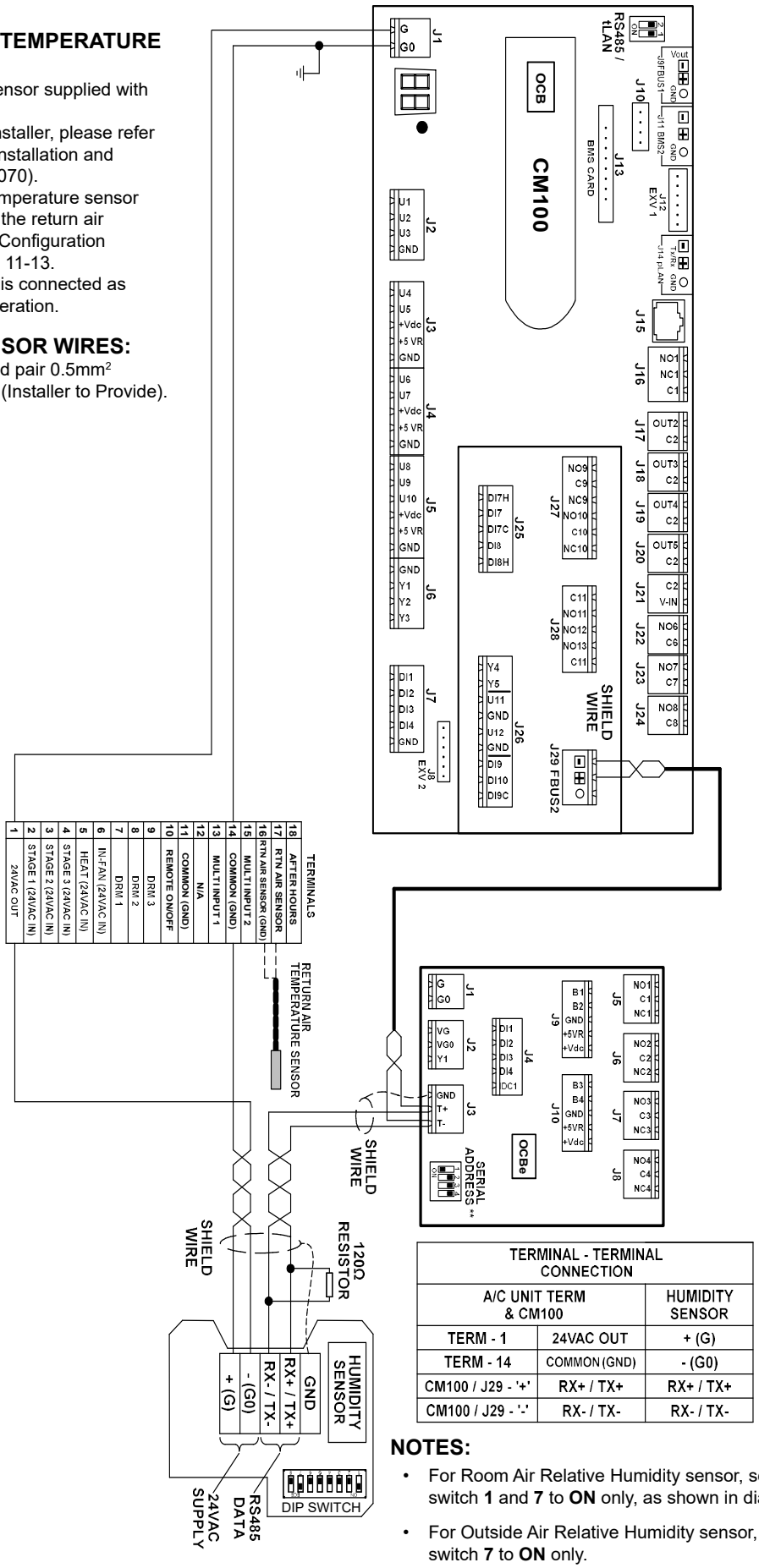
08.02. TRI-CAPACITY (PKY820-960T)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to Tri-Capacity PKY820-960 Installation and Commissioning Guide (0525-070).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm^2 (16/0.20) shielded data cable (Installer to Provide).



TERMINAL - TERMINAL CONNECTION		
A/C UNIT TERM & CM100		HUMIDITY SENSOR
TERM - 1	24VAC OUT	+ (G)
TERM - 14	COMMON (GND)	- (G0)
CM100 / J29 - '+'	RX+ / TX+	RX+ / TX+
CM100 / J29 - '-'	RX- / TX-	RX- / TX-

NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1** and **7** to **ON** only, as shown in diagram.
- For Outside Air Relative Humidity sensor, set DIP switch **7** to **ON** only.

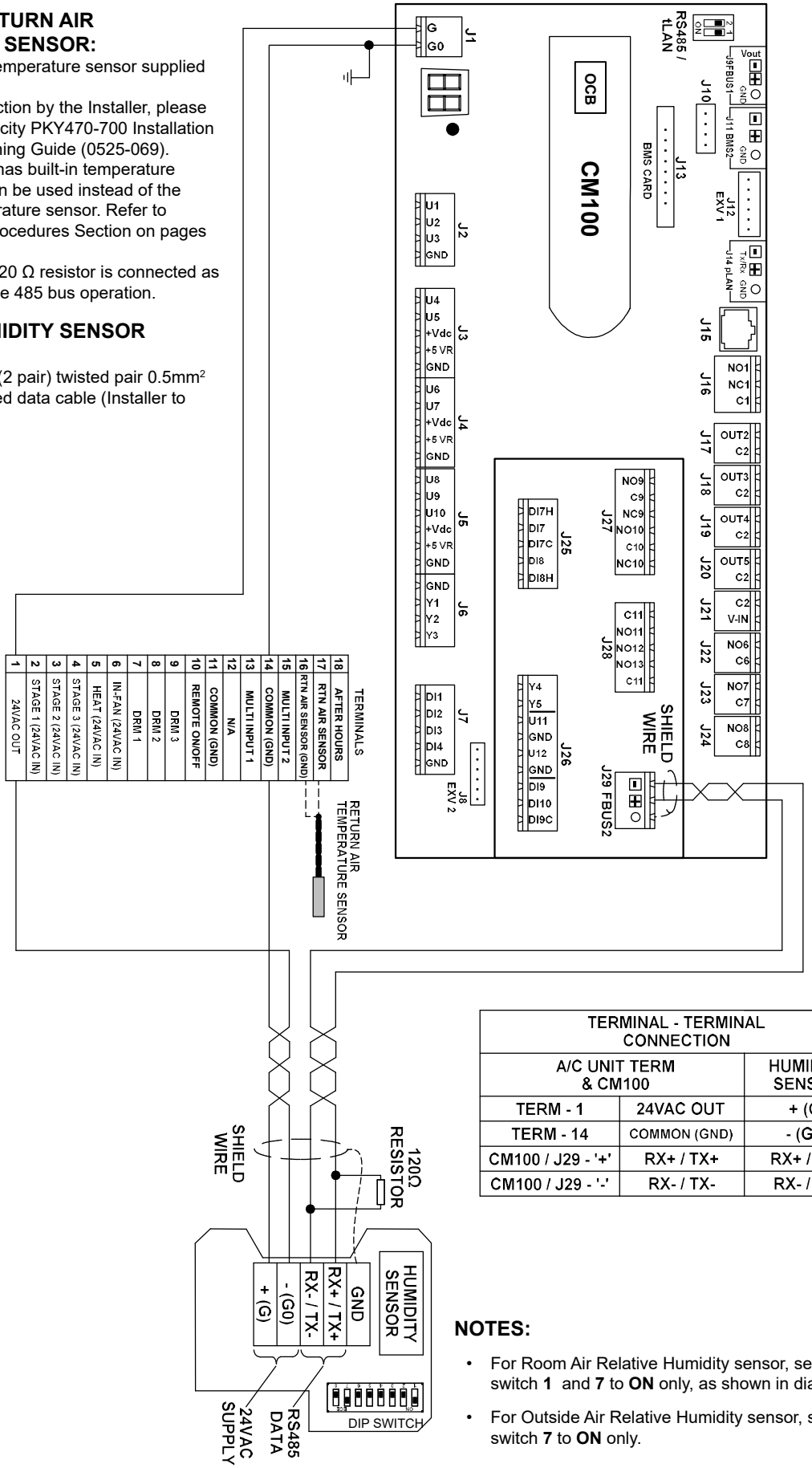
08.03. TRI-CAPACITY (PKY470-700T)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to Tri-Capacity PKY470-700 Installation and Commissioning Guide (0525-069).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm² (16/0.20) shielded data cable (Installer to Provide).



TERMINAL - TERMINAL CONNECTION		
A/C UNIT TERM & CM100		HUMIDITY SENSOR
TERM - 1	24VAC OUT	+ (G)
TERM - 14	COMMON (GND)	- (G0)
CM100 / J29 - '+'	RX+ / TX+	RX+ / TX+
CM100 / J29 - '-'	RX- / TX-	RX- / TX-

NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1** and **7** to **ON** only, as shown in diagram.
- For Outside Air Relative Humidity sensor, set DIP switch **7** to **ON** only.

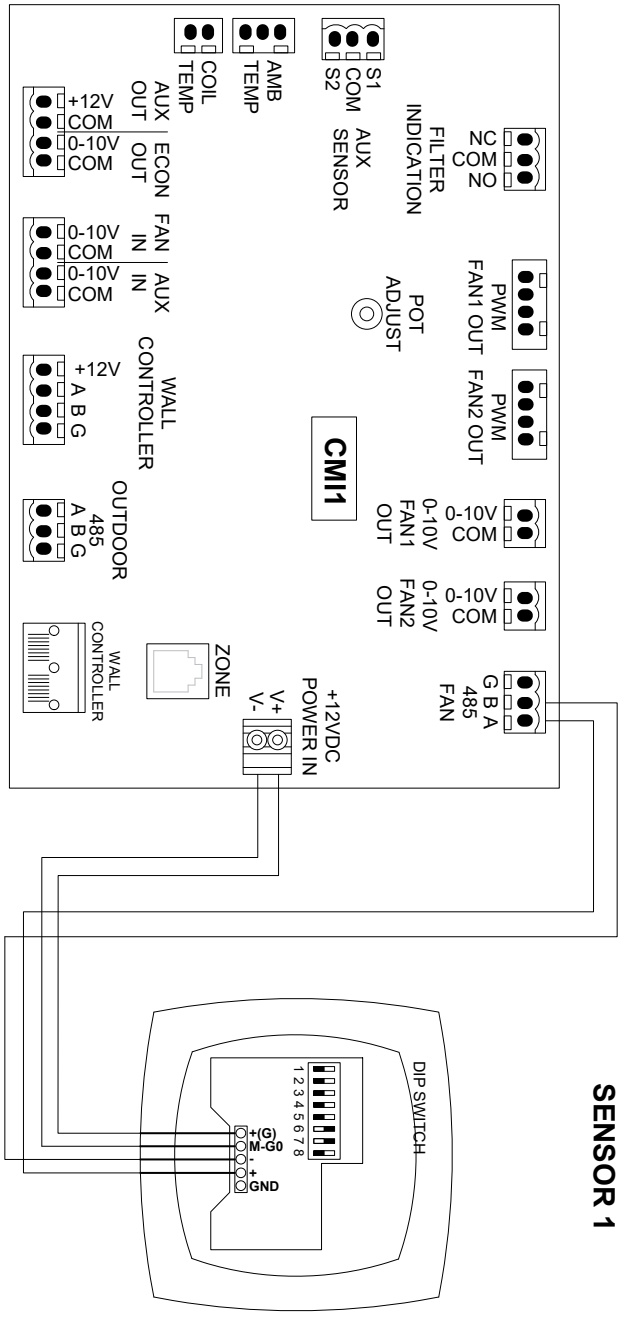
08.04. VCC (PKV) and GENESIS (PRV)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to VCC PKV720-960T Installation and Commissioning Guide (0525-122).
- Requires connection by the Installer, please refer to Genesis PRV72AT-96AT Installation and Commissioning Guide (0525-139).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm^2 (16/0.20) shielded data cable (Installer to Provide).



NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1**, **6** and **7** to **ON** only, as shown in diagram.
- For Outside Air Relative Humidity sensor, set DIP switch **6** and **7** to **ON** only.

09. ELECTRICAL CONNECTION USING 2 SENSORS:

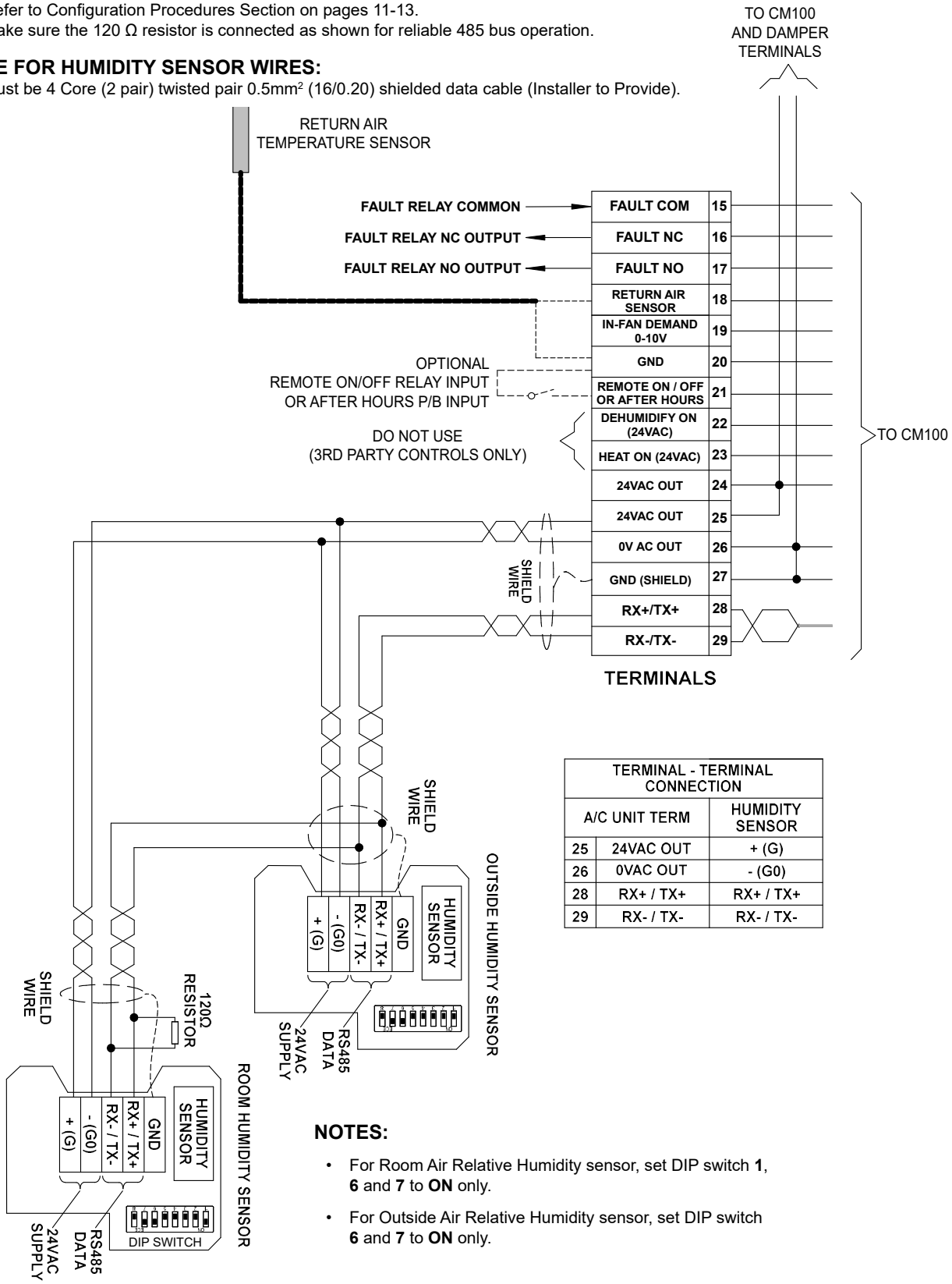
09.01. HERCULES (PKV)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to Hercules Installation and Commissioning Guide (0525-021).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor.
- Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm² (16/0.20) shielded data cable (Installer to Provide).



TERMINAL - TERMINAL CONNECTION		
A/C UNIT TERM		HUMIDITY SENSOR
25	24VAC OUT	+ (G)
26	0VAC OUT	- (G0)
28	RX+ / TX+	RX+ / TX+
29	RX- / TX-	RX- / TX-

NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1**, **6** and **7** to **ON** only.
- For Outside Air Relative Humidity sensor, set DIP switch **6** and **7** to **ON** only.

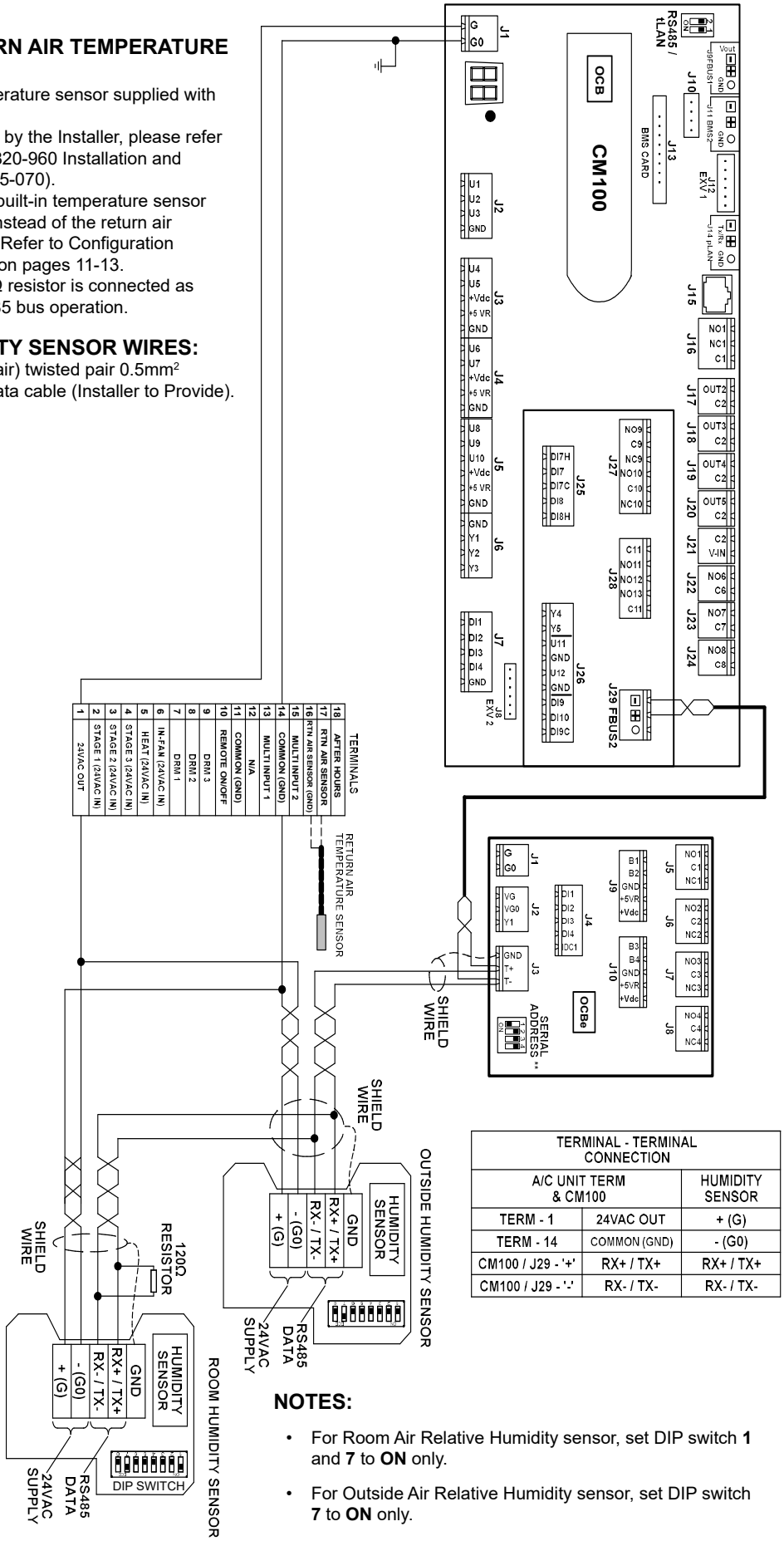
09.02. TRI-CAPACITY (PKY820-960)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to Tri-Capacity PKY820-960 Installation and Commissioning (0525-070).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm^2 (16/0.20) shielded data cable (Installer to Provide).



TERMINAL - TERMINAL CONNECTION		
A/C UNIT TERM & CM100		HUMIDITY SENSOR
TERM - 1	24VAC OUT	+ (G)
TERM - 14	COMMON (GND)	- (G0)
CM100 / J29 - '+'	RX+ / TX+	RX+ / TX+
CM100 / J29 - '-'	RX- / TX-	RX- / TX-

NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1** and **7** to **ON** only.
- For Outside Air Relative Humidity sensor, set DIP switch **7** to **ON** only.

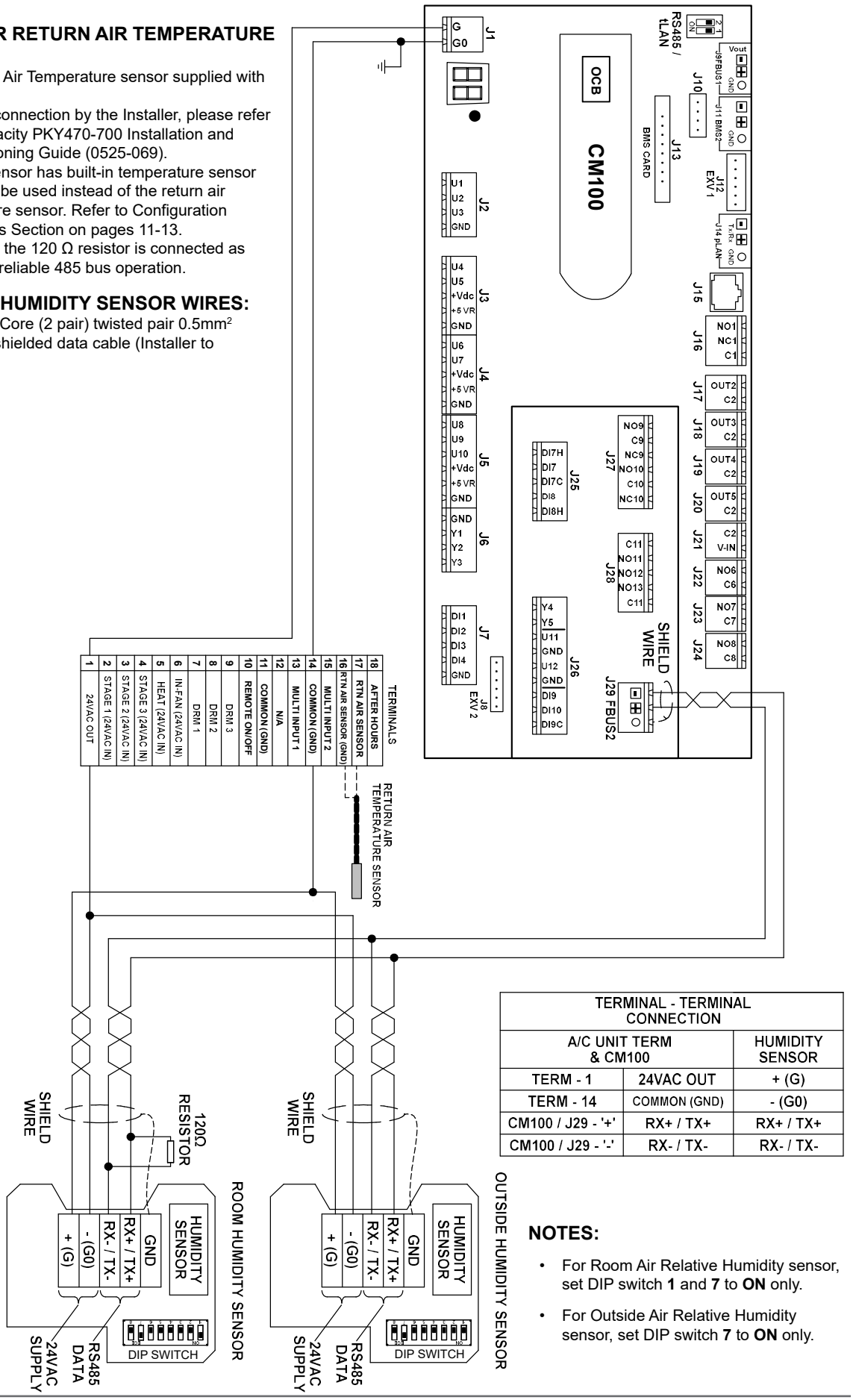
09.03. TRI-CAPACITY (PKY470-700T)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to Tri-Capacity PKY470-700 Installation and Commissioning Guide (0525-069).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm² (16/0.20) shielded data cable (Installer to Provide).



TERMINAL - TERMINAL CONNECTION		
A/C UNIT TERM & CM100		HUMIDITY SENSOR
TERM - 1	24VAC OUT	+ (G)
TERM - 14	COMMON (GND)	- (G0)
CM100 / J29 - '+'	RX+ / TX+	RX+ / TX+
CM100 / J29 - '-'	RX- / TX-	RX- / TX-

NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1** and **7** to **ON** only.
- For Outside Air Relative Humidity sensor, set DIP switch **7** to **ON** only.

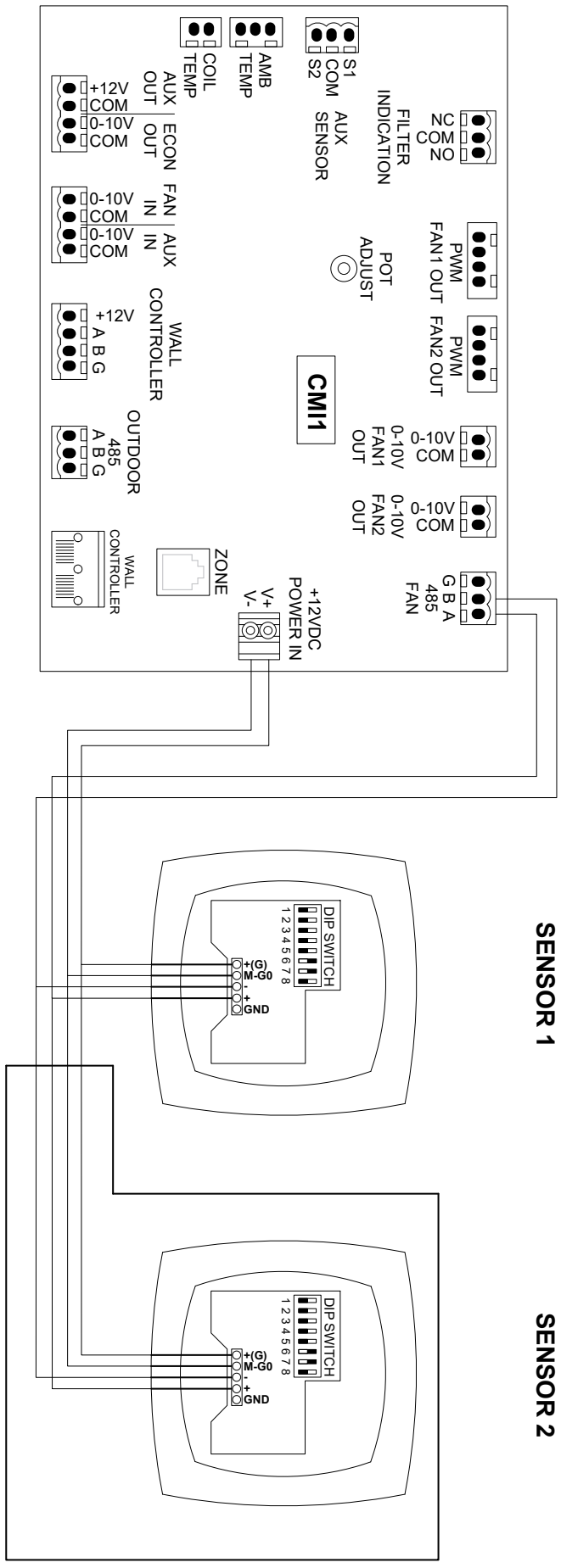
09.04. VCC (PKV) and GENESIS (PRV)

NOTES FOR RETURN AIR TEMPERATURE SENSOR:

- 6m Return Air Temperature sensor supplied with the unit.
- Requires connection by the Installer, please refer to VCC PKV720-960T Installation and Commissioning Guide (0525-122).
- Requires connection by the Installer, please refer to Genesis PRV72AT-96AT Installation and Commissioning Guide (0525-139).
- The RH sensor has built-in temperature sensor which can be used instead of the return air temperature sensor. Refer to Configuration Procedures Section on pages 11-13.
- Make sure the 120 Ω resistor is connected as shown for reliable 485 bus operation.

NOTE FOR HUMIDITY SENSOR WIRES:

- Must be 4 Core (2 pair) twisted pair 0.5mm^2 (16/0.20) shielded data cable (Installer to Provide).



NOTES:

- For Room Air Relative Humidity sensor, set DIP switch **1**, **6** and **7** to **ON** only, as shown in diagram.
- For Outside Air Relative Humidity sensor, set DIP switch **6** and **7** to **ON** only.

10. CONFIGURATION PROCEDURE

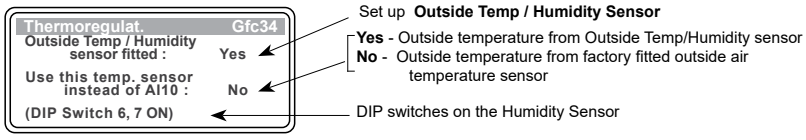
NOTES:
- The sensor (model: CRH-S) is used to measure the Outside or Room Relative Humidity.
- The sensor (model: CRH-D) is used to measure the Supply Air Relative Humidity.

10.01. Outside Air Relative Humidity Sensor Configuration

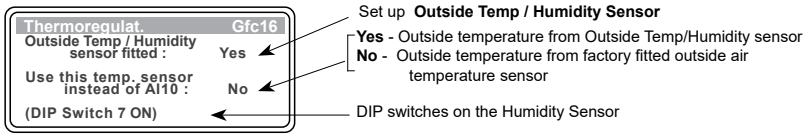
1. Activate the sensor for Outside Air Relative Humidity via Service menu screen:

Menu Progression: Main Menu → G. Service → Gf. Service settings → Gfc. Thermoregulation

Hercules



Tri-Capacity

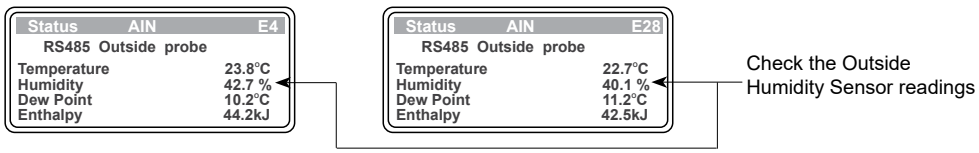


NOTES:
- Thermoregulation is under Service settings sub-menu level, which is password protected.
- Enter the Service Password (7378) using the ⇧ (Up), ⇩ (Down) and ⇦ (Enter) keys in order to gain access to Service menu.
- Use the ⇧ (Up), ⇩ (Down) and ⇦ (Enter) keys to change the prompts from **No** to **Yes**.
- Make sure the DIP switches 6 and 7 on the Sensor 1 are set to **ON**.

2. Check the current reading of the Outside Air Relative Humidity sensor via "Status AIN" screen.

Menu Progression: Main Menu → E. Status

Hercules **Tri-Capacity**



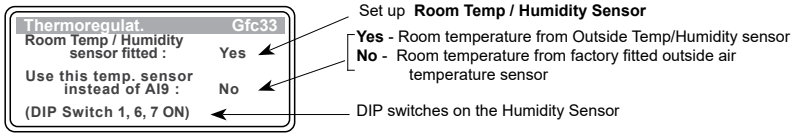
NOTES: If the values are 0, CM100 is not communicating with the Outside Humidity Sensor. Check your wiring connections, DIP switch settings on the sensor and configuration procedure.

10.02. Room Air Relative Humidity Sensor Configuration

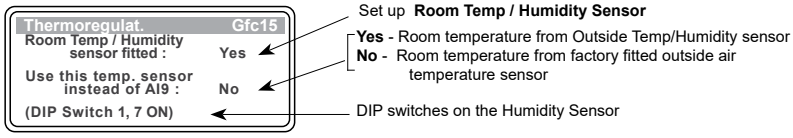
1. Activate the sensor for Room Air Relative Humidity via Service menu screen:

Menu Progression: Main Menu → G. Service → Gf. Service settings → Gfc. Thermoregulation

Hercules



Tri-Capacity



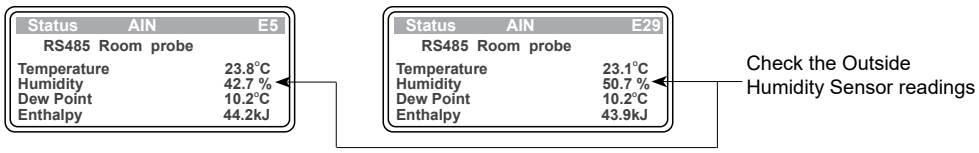
NOTES:

- Thermoregulation is under Service settings sub-menu level, which is password protected.
- Enter the Service Password (7378) using the ⇧ (Up), ⇩ (Down) and ⇦ (Enter) keys in order to gain access to Service menu.
- Use the ⇧ (Up), ⇩ (Down) and ⇦ (Enter) keys to change the prompts from **No** to **Yes**.
- Make sure the DIP switches 6 and 7 on the Sensor 1 are set to **On**.

2. Check the current reading of the Room Air Relative Humidity sensor via "Status AIN" screen.

Menu Progression: Main Menu → E. Status

Hercules **Tri-Capacity**

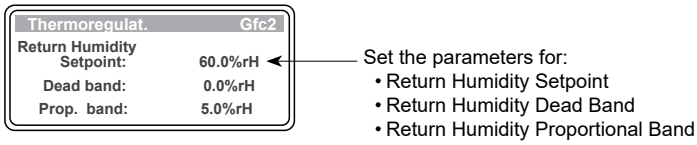


NOTES: If the values are 0, CM100 is not communicating with the Room Humidity Sensor. Check your wiring connections, DIP switch settings on the sensor and configuration procedure.

10.03. Procedure when the Sensor is used as Room Air RH Sensor - Reheat Operation (Hercules models only)

1. Activate the sensor by following steps 2.1 and 2.2 from procedure when sensor is used as Room RH.
2. Set the "Room Humidity" parameters via G. Service menu and then "f. Service settings" (Gf Screen).
3. Go to "c. Thermoregulation" (Gfc Screen) sub-menu and then to "Thermoregulat. Gfc2", to set the Return Humidity parameters.

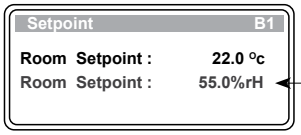
NOTE: "Return Humidity" means "Room Humidity".



NOTE: Use the ⇧ (Up), ⇩ (Down) and ⇦ (Enter) keys in order to change the settings if required.

10.04. Room Air Relative Humidity Setpoint Adjustment (Hercules models only)

Consumer / End User will use screen B1 to adjust Relative Humidity setpoint to suit their desired condition.



10.05. Economy Cycle Settings

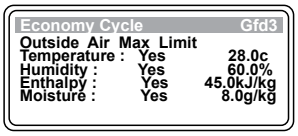
1. **Set-up the Relative Humidity sensor "Economy Cycle" settings via Service menu, as applicable:**

NOTE: For the following settings; outside humidity sensor should be set to Yes.

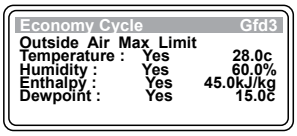
Settings:

Humidity **:** Min = 0.0%, Max = 99.9%, Default = 60.0%
Enthalpy : Min = 0.0kJ/kg, Max = 99.9kJ/kg Default = 45.0kJ/kg
Dew Point : Min = 0.0°C, Max = 99.9°C, Default = 13.0°C
Moisture : Min = 0.0g/kg, Max = 99.9g/kg, Default = 8.0g/kg

Menu Progression: Main Menu → G. Service → Gf. Service settings → Gfd. Economy settings



or

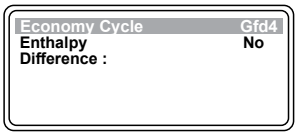


NOTE: For the following settings; room and outside humidity sensor should be set to Yes.

Settings:

Enthalpy Difference : Min = 0.0kJ/kg, Max = 50.0kJ/kg, Default = 10.0kJ/kg

Menu Progression: Main Menu → G. Service → Gf. Service settings → Gfd. Economy settings



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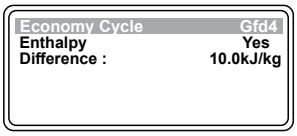


10.06. VCC Economy Cycle

Humidity Sensor may be activated by setting the Outdoor Board. See Installation and Commissioning Guide for details.

Option 1: Single sensor Enable the Outside damper
Set - ECoE - oAdC

Option 2: Two sensors Enable the Outside damper and Economiser control
Set - ECoE - oAdC and ECEo

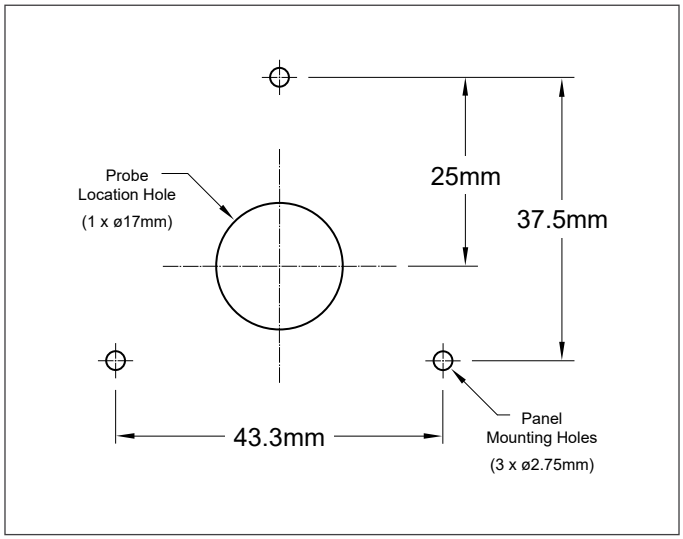
Option 3: Three sensors Enable the Outside damper, Economiser control and Humidity sensor source
Set - ECoE - oAdC, ECEo and EHCS

The table shown below is from the Variable Commercial Capacity Installation and Commissioning Guide (Configuring and Commissioning Setup section) when navigating through the Outdoor board menu.

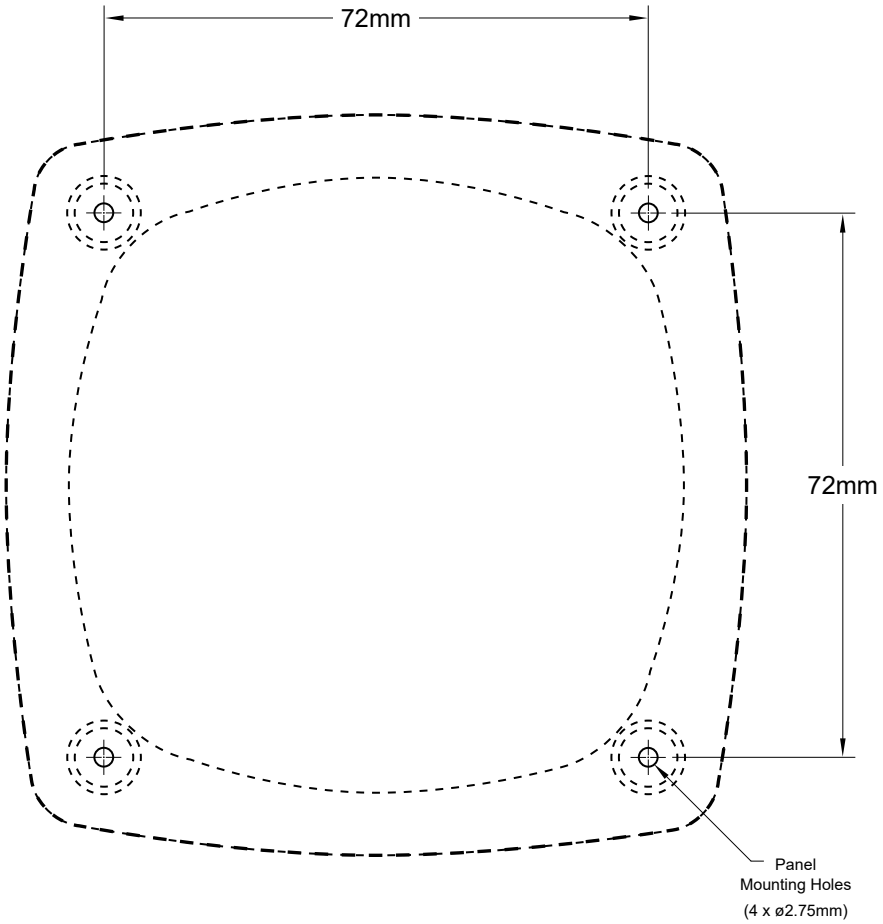
diS (Display)	**Display system's status and settings**	
SEr (Service)	**Service use only**	
	ECoE	**oAdC =** Outside air damper enable
		oAdo = Outside air damper On Off
		ECEo = Economiser control enable
		EHCE = Humidity control enable
		EHCo = Humidity control mode
		EHCS = Humidity sensor source
		CCE = CO_2 control enable

11. MOUNTING TEMPLATE:

(CRH-D)



(CRH-S)



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Relative Humidity Sensors - Dehumidification/Re-Heat/Economy Enthalpy Options
Doc. No. 0525-041 **Ver. 7 250730**