P/N 13362
9120 Redundant Probe System (RPS)

USER'S MANUAL

Super Systems Inc.
7205 Edington Drive
Cincinnati, OH 45249
513-772-0060, 800-666-4330
Fax: 513-772-9466
www.supersystems.com

Super Systems Inc. help desk:
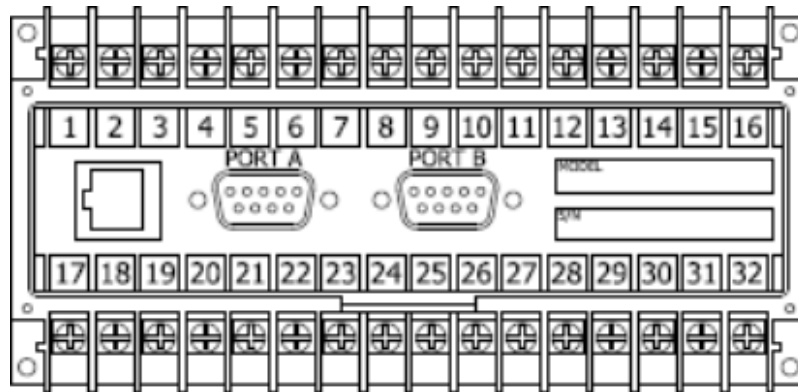*1-800-666-4330*

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Safety:

- *Safety Symbols* - Various symbols are used on the instrument. They have the following meaning:

⚠ Caution (refer to the accompanying documents)

- *Grounding of the temperature sensor shield* - In some installations, it is common practice to replace the temperature sensor while the controller is still powered up. Under these conditions, as additional protection against electric shock, it is recommend that the shield of the temperature sensor be grounded. ***Do not rely on grounding through the framework of the machine***.

- *Installation requirements for EMC* - To ensure compliance with the European EMC directive, certain installation precautions are necessary. When using relay or triac outputs, it may be necessary to fit a filter suitable for suppressing the emissions. The filter requirements will depend on the type of load. For typical applications, it is recommended to use Schaffner FN321 or FN612.

- *Routing of wires* - The wiring for the low voltage DC, and particularly the sensor, input should be routed away from high-current power cables. This will minimize the pick-up of electrical noise. When it is impractical to do this, use shielded cables with the shield grounded at one end.

Wiring Terminals

9120 Wiring Terminations

SUPER SYSTEMS INC.
(800) 666-4330
www.supersystems.com

1 - 24VDC (COM)	12 - RELAY OUT 5	22 - SLAVE 2 RS485 (+)
2 - 24VDC (+)	13 - RELAY OUT 6	23 - SLAVE 2 RS485 (-)
3 - RS485 RT (-)	14 - RELAY OUT 7	24 - 4-20mA OUT 1 (-)
4 - RS485 RT (+)	15 - RELAY OUT 8 NC	25 - 4-20mA OUT COM (+)
5 - SLAVE 1 RS485 (-)	16 - RELAY OUT 8 NO	26 - 4-20mA OUT 2 (-)
6 - SLAVE 1 RS485 (+)	17 - DIGITAL IN 1	27 - ANALOG IN 3 (-)
7 - RELAY COMMON	18 - DIGITAL IN 2	28 - ANALOG IN 3 (+)
8 - RELAY OUT 1	19 - DIGITAL IN 3	29 - ANALOG IN 2 (-)
9 - RELAY OUT 2	20 - DIGITAL IN 4	30 - ANALOG IN 2 (+)
10 - RELAY OUT 3	21 - DIGITAL IN COM	31 - ANALOG IN 1 (-)
11 - RELAY OUT 4		32 - ANALOG IN 1 (+)

About the Model 9120 – RPS:

The Model 9120-RPS is specifically designed to read two SSi Gold Probes, installed in the same furnace. The Model 9120-RPS controller, a 24 VDC power supply, and two 24 VDC relays are mounted and wired on a piece of DIN rail for easy mounting by the customer. Two other components included with the Model 9120-RPS are the operator interface and the cable connecting the operator interface to the Model 9120-RPS.

Electrical Installation:

The Model 9120-RPS comes mounted on a DIN rail, pre-wired and tested. AC power needs to be connected to the 24VDC power supply. See the section *Typical Electrical Drawing* for other required connections.

Model 9120-RPS Function:

 The Model 9120-RPS reads a signal from each of the two oxygen probes located in the furnace. Depending on the 9120-RPS configuration, it will select whichever millivolt reading it has been configured to select and retransmit this millivolt output to the atmosphere controller.

The probe millivolt deviation band and the alarm delay times are set using the operator interface. See the section *Configuration* for more information on how to use the operator interface. When connected per the electrical drawing (section *Typical Electrical Drawing*), the Model 9120-RPS default configuration is set to retransmit the millivolt signal from the probe with the highest millivolt output. As time passes and if/when the other probe's millivolt output becomes greater (dependent on the deviation band), the Model 9120-RPS will switch the output from one probe to the other and send the "new" higher (or lower, depending on the configuration) millivolt signal to the atmosphere controller. The deviation band must be exceeded for the retransmit to occur.

The asterisk (*) on the operator interface display indicates which probe's millivolts are being used by the furnace atmosphere controller. When the Model 9120-RPS switches the output from one probe to the other it indicates a deviation band alarm condition, flashing an **A** on the operator interface. The red light in the upper left corner of the operator interface will be lit as well in an alarm condition. The **A** continues to flash until the probe's output is back within the deviation band.

The operator can manually select the probe that is to be used in the carbon calculation. If this feature is used, the 9120-RPS will use the operator-selected probe, and NOT switch from one probe to the other automatically. See the section *Configuration – Probe (Prb) Select Mode* for more information on how to manually select a probe.

The deviation alarm is disabled if both probes' millivolts drop below 950. This should eliminate the nuisance alarm when the furnace is loaded and the temperature drops.

Using the operator interface shown below you can configure the Model 9120-RPS per these instructions

Configuration
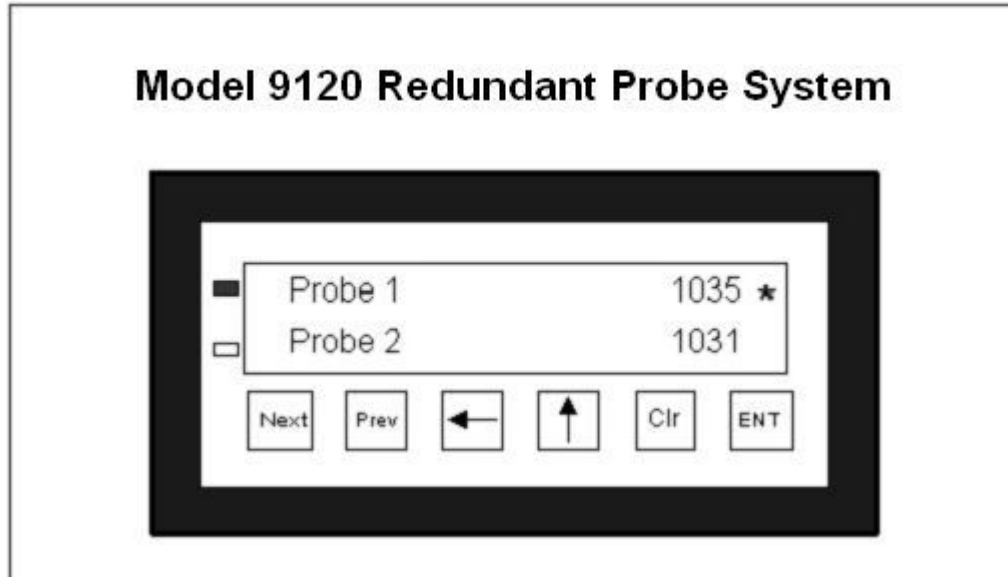
With the initial display screen showing (as in the picture above), pressing the **ENT** key takes you to the second menu item in the Model 9120, *Deviation Band Menu*. Pressing the **NEXT** key takes you to the third menu item, *Alarm Delay Menu*. Pressing the **NEXT** key again takes you to the fourth menu item, *Probe (Prb) Select Mode*. Pressing the **NEXT** key again takes you to the fifth menu item, *Manual Probe (Prb) Select Menu*. Pressing the **NEXT** key again will display the initial display screen.

From the initial display, pressing the **NEXT** key instead of the **ENT** key will display the 800 number for Super Systems Inc. Pressing the **NEXT** key again will display the address information for Super Systems Inc. Pressing the **NEXT** key again will display the initial display.

Note about configuration – values are entered from left to right on the display. For example, to enter the number **15**, the user would press the up arrow key once so that a **1** is displayed. The user would then press the left arrow key once so that a **10** is displayed. Next, the user would press the up arrow key five times so that a **15** is displayed. The number that will be modified will always flash on the display.

Configuration – Deviation Band

The *Deviation Band* menu screen will display the number of millivolts that the deviation band alarm is set for (default = 10 mV). Pressing the **ENT** key will enable the user to modify the deviation band value. Once the **ENT** key is pressed, the rightmost number will begin flashing. Pressing the up arrow key will reset the value to a **1**. Pressing the up arrow key again will increment this value by one. Enter the new value as desired. Pressing the **ENT** key will set the entered value. Pressing the **CLR** key will reset the value to the last set value. Pressing the **NEXT** key will display the *Alarm Delay* menu screen. Pressing the **PREV** key will display the initial display.

Example - The following example will show how to set the deviation band from a value of **50 mV** to a value of **35 mV**. Press the **ENT** key. The **0** in the **50** will begin flashing. Press the up arrow key three times so that a **3** is displayed. Press the left arrow key once so that a **30** is displayed. Press the up arrow key five times so that a **35** is displayed. Press the **ENT** key to set the value. Note about Deviation Band – the valid range of values for the deviation band is 0 to 50 mV. Any value entered over 50 mV will be set to the last set value by default.

Configuration – Alarm Delay

The *Alarm Delay* menu screen will display the number of minutes that an alarm can be delayed before switching the probe output from one probe to the other (default = 20 minutes). To change the value, press the **ENT** key. The rightmost digit will begin flashing. Pressing the **CLR** key will display the value as **0**. Pressing the up arrow key once will display the value as **1**. Pressing the up arrow key once again will increment this value by one. Enter the new value as desired. Pressing the **ENT** key will set the entered value. Pressing the **NEXT** key will display the *Probe Select (Prb) Mode* menu screen. Pressing the **PREV** key will display the *Deviation Band* menu screen.
Note: There is a 950 mV low limit for an alarm. This condition is typically found during a burnoff, so the alarm will not be active when the input drops below 950 mV.
Example – The following example will show how to set the alarm delay from a value of **5 min** to a value of **10 min**. Press the **ENT** key. The **5** will begin flashing. Press the up arrow key once so that a **1** is displayed. Press the left arrow key once so that a **10** is displayed. Press the **ENT** key to set the value. Note about Alarm Delay – the valid range of values for the alarm delay is 0 to 60 minutes. Any value entered over 60 minutes will be set to the last set value by default.

Configuration – Probe (Prb) Select Mode

To select the probe that you want to use to establish the % Carbon on your carbon controller you can do one of two things. One, a three-position selector switch can be installed as shown on the electrical drawings (see *Typical Electrical Drawing*) -the left-position is Probe 1, the middle position is AUTO, and the right-position is Probe 2. Two, press the **ENT** key.   The default selection is **0 – Auto – Highest**.
Once the **ENT** key has been pressed, the left digit will be flashing. This digit represents the mode for the RPS unit. The possible digits/modes are:
> 0 – Auto – Highest *This will select the higher value when one of the probes goes out of band
> 1 – Auto – Lowest   *This will select the lower value when one of the probes goes out of band
> 2 – Manual   *This option allows the user to manually select a probe to use.
Press the up arrow key for the desired option, then press the **ENT** key to set the value. Pressing the **NEXT** key will display the *Manual Probe (Prb) Select* menu option. Pressing the **PREV** key will display the *Alarm Delay* menu screen.
Example – The following example will show how to set the probe selection mode from a value of **0 (Auto – Highest)** to a value of **2 (Manual)**. Press the **ENT** key. The **0** on the left of the screen will begin flashing. Press the up arrow key twice so that a **2** is displayed (The "Auto – Highest" will not be replaced until the new mode has been set). Press the **ENT** key. The screen will now display **2 Manual**. Note about probe selection mode – Although the numbers will cycle from 0 to 9, the only valid values are **0**, **1**, and **2**. Any value higher than **2** will be set to the last set value by default.

Configuration – Manual Probe (Prb) Select

The Manual Probe Select menu option allows the user to select a specific probe to use. The probe selected will override the automatically selected probe. If in **AUTO** mode, the system will continue to select the configured probe when the deviation band is exceeded. To run continuously in **MANUAL** mode, you must first select the **MANUAL** mode from the Probe Select Mode menu (described above). To select a specific probe, press the **ENT** key. The right digit will begin to flash. Pressing the up arrow key will reset the value to **1**. Press the up arrow key until the desired probe is reached. Once the desired probe has been selected, press the **ENT** key to set the value. Pressing the **NEXT** key will display the initial display screen. Pressing the **PREV** key will display the *Probe (Prb) Select Mode* menu screen.
*Example* – The following example will show how to set the manual probe selection from a value of **1 (Probe 1)** to a value of **2 (Probe 2)**. Press the **ENT** key. The **1** in **Probe 1** will begin flashing. Press the up arrow key twice so that **Probe 2** is displayed. Press the **ENT** key to set the value. Note about Manual

Probe Selection – Although the numbers will cycle from 0 to 9, the only valid values are **1** and **2**. Any value entered higher than **2** will be set to the last set value by default.

Typical Electrical Drawing:
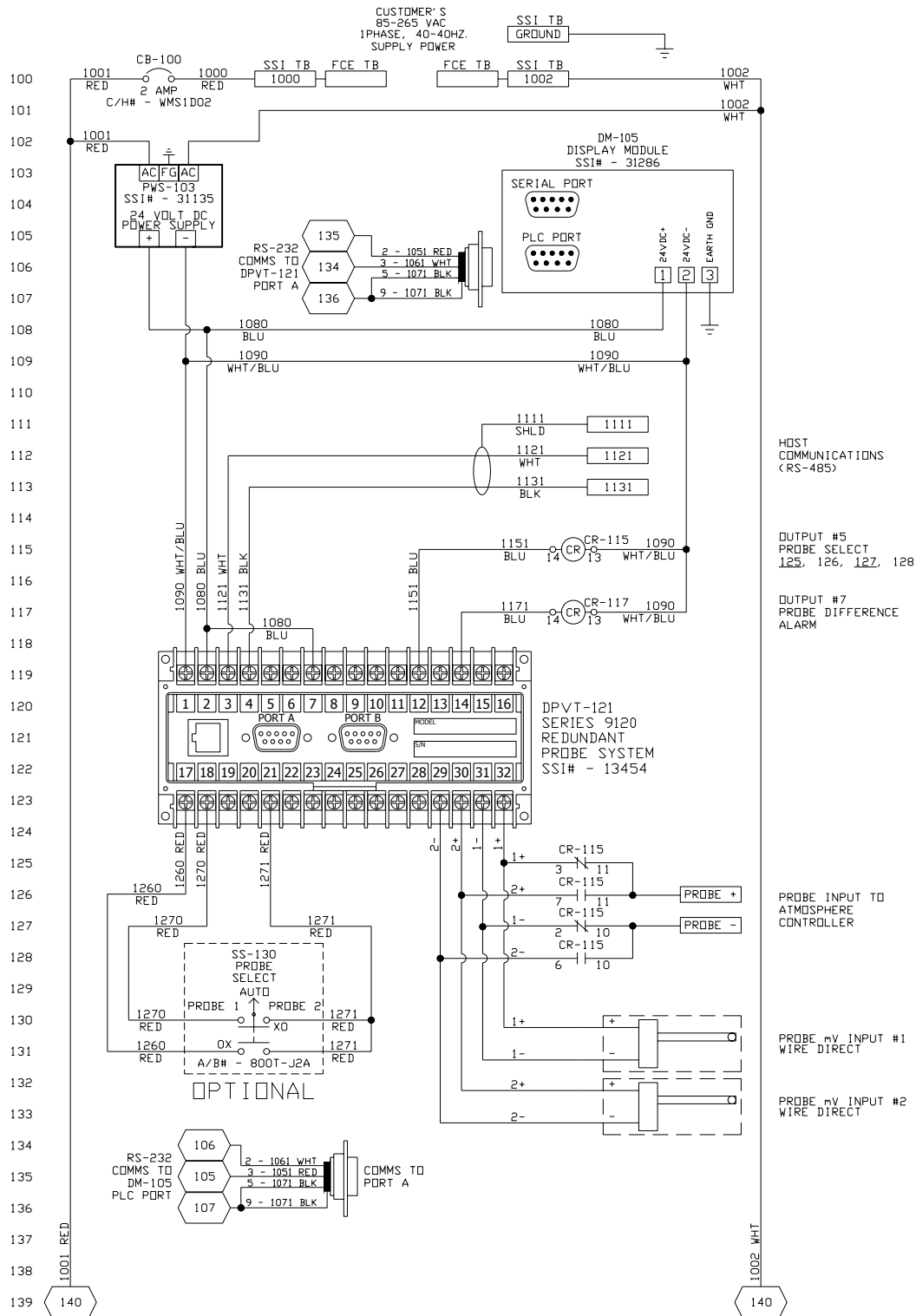
Spare Parts:

Description	Part Number
Power Supply	31135
Gold Probes	Check the current part number of your SSi Probe

Revision History:

Rev.	Description	Date	MCO #
-	Initial Release	07-28-2006	N/A
A	Changed 9100 references to 9120, updated relay terminals, wiring diagrams, updated wiring diagrams, updated alarms section	08-14-2007	2047
B	Page #7: Default alarm delay time needs to be changed from 5 min. to 20 min.; The "Probe difference alarm is energized…" note needs to be removed; Typical electrical drawing modified; Added "MCO #" column to "Revision History" section	01-26-2009	2073