

MODEL 26700
PROGRAMMABLE TRANSLATOR



REV L080404

MANUAL PN 26700-90

R. M. YOUNG COMPANY

2801 AERO PARK DRIVE, TRAVERSE CITY, MICHIGAN 49686, USA
TEL: (231) 946-3980 FAX: (231) 946-4772

OPERATING INSTRUCTIONS

26700 SERIES PROGRAMMABLE TRANSLATOR

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26700 SERIES PROGRAMMABLE TRANSLATOR / RECORDER



1.0 INTRODUCTION

The 26700 Series Translator is a programmable indicator and translator for use with a wide range of meteorological sensors.

FEATURES:

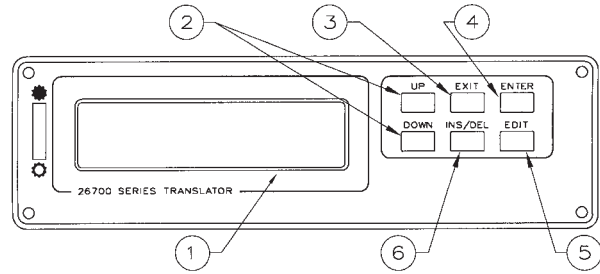
- Modular design
- Multiple sensor inputs
- Expandable using up to 5 plug-in modules
- Illuminated, alpha-numeric display
- 10 available display screens
- Voltage outputs
- Alarm relays
- Current loop outputs
- Printer connection
- 24,000 data point memory
- RS-232 interface
- Battery backed up memory
- Easy, on-screen and remote programming
- Statistical, trigonometric, max, min and many other functions

1.1 PRECAUTIONS

- This device is intended for indoor use only unless operated in a suitable enclosure.
- Always connect ground terminal of 26700 to suitable earth ground.
- Switch power OFF before connecting sensor wires.
- Disconnect power before servicing unit.
- Terminal block openings are deep; make sure wire is fully inserted before tightening. Do not overtighten.
- Operating range is 0°C to 50°C, 0 to 95% RH
- Some sensors may require connection to a proper earth ground to prevent possible sensor damage or malfunction due to static discharge. Follow instructions provided with sensor.

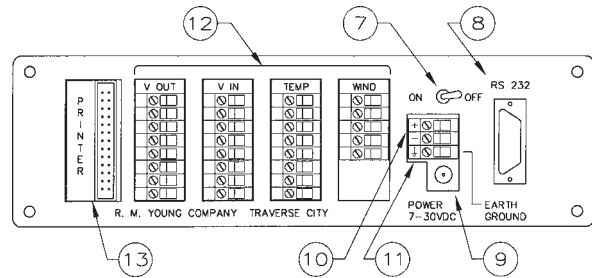
1.2 OPERATING CONTROLS

FRONT PANEL



- | | |
|-------------------|---|
| 1. Screen display | 2 rows x 16 columns |
| 2. UP, DOWN keys | Select screen for viewing, Change menu and editable items. |
| 3. EXIT key | Exit OPERATE mode or current menu. |
| 4. ENTER key | Select menu item displayed or accept character at cursor when in edit mode. |
| 5. EDIT key | Activates edit mode where possible. |
| 6. INS/DEL key | INSert or DELEte a program instruction (Programming Only) |

BACK PANEL



- | | |
|-------------------------------|--|
| 7. ON/OFF switch | Main power switch |
| 8. RS-232 connector | Serial data interface. |
| 9. Power supply jack | Connector for AC wall adapter. |
| 10. Auxiliary Power Terminals | For powering the unit without AC adapter |
| 11. Earth ground connection | Connect to earth ground prior to use. |
| 12. Cable connections | For connection of meteorological sensors, voltage outputs, accessories. Actual configuration may vary. |
| 13. Printer port | Parallel connector for printer. (26731 Printer Interface only) |

1.3 SENSOR INTERFACE MODULES

Sensors and accessories are connected to the 26700 Translator through interface modules. Each module is identified by name (WIND, TEMP, V IN, etc...) and by module number (0,1,2,3). The module number is designated by the first digit appearing at the terminal. For example, a terminal labeled 02 indicates module 0, channel 2; 21 indicates module 2, channel 1; and so on. If more than one of the same type of module are used in one translator unit, each module must be assigned a different module number. New modules can be added at any time; refer to Appendix A for a complete listing of specifications.

1.4 GETTING STARTED

Sensors and power supply adapter should be properly connected before operation of this unit.

```
Turn power switch ON      26700 v4.XX
                          BATTERY BKUP OK

After 1 sec.              M/S 000 000 000
(typical display)        WIND ins avg max
```

The system is now operating. Measured data will be shown on the screen. If multiple sensors are connected, data may be shown on more than one screen.

There are 10 screens available. Not all screens may appear depending on the user program. For more information on screen displays see SET SCREEN TEXT and SET SCROLL in section 2.2, and DISPLAY VAL in section 3.1.

```
To stop operation press:  EXIT

This message appears:    -----EXIT-----
                          ARE YOU SURE? N

To select "Y" press:     UP

Then press:              ENTER
```

This returns to the MAIN MENU.

For some applications the key switches may be locked out. See Section 8.0 Option Jumpers for more information.

2.0 MENU SELECTION

The 26700 interacts with the user through menus presented on the LCD display. Menu selections and data entries are made with the keys on the front panel.

Each location in the menu structure is identified on the top line of the display. The bottom line of the display shows the menu choices. Use the UP and DOWN keys to scroll through the menu list. When you see the menu item you want, use the ENTER key to select it.

```
menu name  ---main--menu---
menu choice      OPERATE
```

If a key is pressed in an area where it does not apply, it will be ignored and a warning beep may sound. You cannot harm the unit by moving through the menu structures or changing parameters.

Key switches can be programmed for special functions while the unit is in OPERATE mode. See IF KEYSWITCH in section 3.1.

The MAIN MENU is at the top of the menu hierarchy and has three items from which to choose: OPERATE, SETUP, and TEST. (A complete map of the menu structure appears in Appendix D.)

2.1 OPERATE

In OPERATE mode, the 26700 executes the instructions in the internal program. The LCD can display up to 10 internal screens. The unit scrolls through them automatically or they may be manually selected using the UP and DOWN keys depending on the state of the SET SCROLL parameter (see SET SCROLL, section 2.2).

Data recording and real-time processes involving more than one sample such as averages, standard deviation, min, and max occur ONLY while in OPERATE mode. When you EXIT the OPERATE mode, all measurements, calculations, and data recording stop. Re-entering OPERATE mode restarts the processes from the beginning.

To leave OPERATE mode and return to the MAIN MENU, press EXIT. Use the UP/DOWN keys to select Y or N then press ENTER.

2.2 SETUP

SETUP is where all programmable parameters and executable instructions are entered, examined, or changed. For many users, it is not necessary to change anything in the SETUP area.

Press the EDIT key to change a value or setting. A cursor will appear under the item being edited.

When editing, use the UP and DOWN keys to scroll through the list of available characters. When the desired character is displayed, press the ENTER key to select it. Press EXIT to return to the previous menu.

The following information describes each SETUP parameter in detail:

SET TIME/DATE shows the current date and time to the nearest minute. The internal clock runs from a lithium battery when power is off. Depending on use, the battery will last up to 10 years. The internal clock automatically accounts for leap years and time is kept in 24-hour format.

SET SAMPLE INTERVAL determines the number of seconds between successive iterations of the user program instructions. The sample interval must be long enough to execute all instructions. If the sample interval is not long enough for all instructions to execute and the STOP ON ERROR parameter is set (see SET ERROR HANDLE, this section), a TIMEOUT ERROR will occur. To eliminate this error, increase the number of seconds in the sample interval or decrease the number of instructions. A sample interval of 00 seconds will run the program at maximum speed with no delay between iterations. If there are any INP FREQ instructions or INP WIND SPD instructions which measure frequency (such as wind sensor types 03xxx and 05xxx), the sample interval must be set to a value greater than 00.

ENT/EDIT PROGRAM shows the program instructions that will be executed in OPERATE mode. Examine the program instructions and parameters using the UP and DOWN keys. For more about program instructions, see section 3.0 PROGRAMMING.

ERASE PROGRAM deletes all program instructions. A YES/NO prompt helps prevent accidental erasure.

SET RECORDER brings up the SET RECORDS MENU. These parameters establish how data is stored in the 26700. See section 4.0, RECORDING DATA and section 5.0, USING RMYCOMM for further information. The SET RECORDS MENU has the following items:

SET HEADER 1 shows the first line of a header that is sent when recorded data is retrieved. The header is transmitted as a single string of 32 characters even though it is shown on the 26700 display as two lines of 16 characters.

SET HEADER 2 shows the second 32 character header line that is sent when recorded data is retrieved.

FIELDS/REC sets the number of data fields per record. The value must be from 1 to 25 and the FIELDS/REC multiplied by the number of RECORDS must be less than or equal to 24,000.

RECORDS determines the number of records to store. The RECORDS multiplied by the FIELDS/REC must be less than or equal to 24,000.

R. M. YOUNG COMPANY 26700 SERIES	header 1
TOWER 2 DATA	header 2

WS WD TEMP	label 1
hr min m/s deg C	label 2

19 46 6.6 136 12.5	records
19 47 5.7 127 12.4	

Sample data showing 3 records with 5 fields.

SET FIELDS brings up the SET FIELDS MENU which consists of:

FIELD NUMBER is the field number of interest ranging from 1 to the value set in FIELDS/REC above. The sub-menu under FIELD NUMBER consists of:

WIDTH determines the width of the number retrieved from this field. Internally, data is always stored with maximum precision; the WIDTH value is used only when records are retrieved.

DECPT determines the number of decimal places for a number retrieved from this field. Internally, data is always stored with maximum precision; the DECPT value is used only when records are retrieved.

LABEL shows the two line label for this field that is sent as part of the header when records are retrieved. The label can only be as wide as the field WIDTH.

CLEAR RECORDS sets all internally stored records to a 0.0 value. A YES/NO prompt helps prevent accidental clearing.

SET SCREEN TEXT sets the text displayed on screens 0 through 9. To create or change screen text, follow these steps:

1. Use UP and DOWN to choose a screen number. Press ENTER to select it.
2. The screen text will appear.
3. Use the UP and DOWN keys to change the character at the cursor. Press ENTER to advance the cursor. Any message or text that fits can be displayed.
4. The "set screen text" menu will reappear when the last character is entered. Go to step 1 to edit other screens or press EXIT to return to the previous menu.

SET SCROLL brings up the SET SCROLL MENU which consists of:

SCROLL determines whether the auto-scroll feature is activated. When the unit is in OPERATE mode and SCROLL is activated, the display automatically changes from one screen to the next at a rate determined by the SCROLL INTERVAL. The last screen to be displayed is designated by the SCROLL END SCREEN value. Choices for the SCROLL parameter are YES and NO. When SCROLL is set to YES and the unit is in OPERATE mode, the screens cannot be selected manually with the UP/DOWN keys.

INTERVAL determines the rate at which the display changes from one screen to the next and is affected by the SAMPLE INTERVAL parameter (See SAMPLE INTERVAL). For example, with a SAMPLE INTERVAL of 1 second and a SCROLL INTERVAL of 3, the display would change screens every 3 seconds. If the SAMPLE INTERVAL were 2 seconds, the display would change screens every 6 seconds. Choices for INTERVAL are 1 to 99.

END SCREEN determines the last screen displayed in the scroll sequence before starting back at the beginning with screen 0. Choices are 0 to 9. This value also limits the range of screens which can be selected with the UP/DOWN keys when the SCROLL parameter is set to NO.

SET COMM brings up the SET COMM MENU which consists of:

BAUD RATE overrides the default baud rate set by the OPTION JUMPERS (see section 8.0). Changes made here only last while the unit is powered up and revert to the default value when power is re-applied. Use this parameter to test different baud rates then set the final value with the OPTION JUMPERS. Unless otherwise requested or used for NMEA applications, the unit is shipped with a default of 9600 baud. Choices for this parameter are 9600, 4800, 2400, 1200, 600, and 300.

DATA BITS determines the number of data bits in the serial output. Choices are 8 and 7.

PARITY determines the parity bit in the serial output. Choices are NONE, EVEN and ODD.

BUFFER LEN determines the length of the buffer used in sending serial data under program instruction control. The contents of this buffer are transmitted when the SERIAL BUFFER OUT instruction is used.

BUFFER END determines the character(s) sent at the end of the serial buffer output string when the SERIAL BUFFER OUT instruction is executed. Choices are NONE, CR, LF, and CRLF. See the information at the SERIAL BUFFER OUT and SERIAL BUFFER TXT instructions (Section 3.1).

ECHO determines whether incoming serial data is echoed (re-transmitted). ECHO is normally set to NO. When a 26700 is used as a slave indicator, receiving data serially, and both transmit and receive lines are connected between the units, ECHO in the slave unit must be set to NO.

LEAD 0s determines if numeric data in the serial output buffer will have leading zeros or not. This option is necessary when programming for serial communication protocols such as NMEA (marine applications). Choices are YES and NO.

INIT STR LEN determines the length of the initialization string. It is primarily used to initialize modems. If the string length is set to 0, no initialization string is sent. If the value is greater than 0, you are prompted to enter the hexadecimal values for the string. (See programming instructions PRN BUF TXT and SER BUF

TXT for an explanation of how to enter the hex codes.) You must know the initialization string values that are required by the device you are using. This string is sent out the port once before going into OPERATE mode.

NUM ONLY INP determines whether incoming serial data for the INP SERIAL instruction will be filtered for number-related characters. When set to YES, only number-related characters (+,-/0123456789) are accepted. This feature is useful for parsing incoming serial strings which may contain control codes or text that would confuse the INP SERIAL instruction. It is also useful for receiving data strings that start with CR-LF (rather than the more normal end-of-line position) since the CR-LF will be ignored. Note that when NUM ONLY INP is set to YES, the 26700 will NOT respond to control commands (like CNTL-R for retrieving records, etc.). The exception is CNTL-X which will continue to allow you to exit OPERATE mode remotely. When NUM ONLY INP is set to NO (this is the default setting), the 26700 will receive all incoming serial characters and all designated control codes will function normally (see section 5.0 Serial Communications). With the NO setting, each line of incoming serial data for the INP SERIAL instruction must end with CR. Use the NO setting for NMEA input also.

MAX SER ERRS sets the maximum number of consecutive INP SERIAL errors that can occur before responding to the error condition. The default setting is 10. See the INP SERIAL instruction for more information.

SET PRINTER brings up the SET PRINTER MENU which consists of:

LINE LENGTH determines the length of line printed under program instruction control. 250 characters max.

PAGE LENGTH determines the number of lines printed on each page under program instruction control.

INIT STR LEN determines the length of the initialization string. It is primarily used to initialize the printer for special modes of operation such as condensed characters. If the string length is set to 0, no initialization string is sent. If the value is greater than 0, you are prompted to enter the hexadecimal values for the string. (See programming instructions PRN BUF TXT and SER BUF TXT for an explanation of how to enter the hex codes.) You must know the initialization string values that are required by the printer you are using. This string is sent out to all printer ports once before going into OPERATE mode.

SET AUTO-START enables the 26700 to go directly to OPERATE mode on power up. Also see section 8.0, OPTION JUMPER.

SET ERROR HANDLE determines whether the 26700 stops to report errors during OPERATE mode or ignores them. Ordinarily, **SET ERROR HANDLE** is set to STOP ON ERROR during program development and turned off for normal operation.

SET AUTO LBL CHG automatically updates wind speed and temperature units when units are changed in the INP WIND SPD or INP TEMP instructions. For example, if wind speed units are changed from M/S to MPH in the INP WIND SPD instruction, the unit will scan all headers, text, labels. Wherever the text "M/S" appears it will be changed to "MPH". This feature only works with labels from the following group: M/S, MPH, KTS, KPH, °C, °F.

SET LINE FREQ sets the integration period for voltage and current input module measurements. The choices are 60 and 50 Hz (default 60). Setting the integration period to one cycle of the line frequency reduces AC line noise on the measured signal to an insignificant value.

SET ACCESS LEVEL determines the level of viewing and editing privileges. NONE prevents any SETUP or program parameter except this one to be viewed or changed. PARTIAL allows any SETUP or program parameter to be viewed or changed but no program instructions may be inserted or deleted. FULL allows full viewing and editing privileges in all areas. If the KEYSWITCH LOCKOUT OPTION JUMPER is installed (see section 8.0), all privileges are removed.

2.3 TEST

The TEST section is for checking and calibrating the 26700 and its modules. Some of the tests may require a working knowledge of modern signal conditioning and data acquisition equipment.

The following information describes each TEST. Press EXIT to return from each selection.

TEST LCD tests each dot in the dot-matrix by turning them all on. The result is a row of blocks. The UP/DOWN keys selects each of the 2 display rows.

TEST RAM performs a comprehensive non-destructive test of all RAM addresses. The test takes about 1 second and the results are displayed when it is finished. If an error is detected, contact your supplier.

TEST ROM performs a checksum calculation on all ROM addresses. The leftmost value must match the rightmost value. If they do not, contact your supplier. This test takes several seconds to complete.

TEST PGM CHKSUM calculates a checksum for the internal user program. If a program does not change, its checksum does not change. Use this test to check the integrity of the user program over time.

TEST SERIAL I/O is used to test the serial link between the 26700 and another 26700 or a PC. In this test, serial data sent to the 26700 is echoed back to the source (ECHO must be set to YES in the SET COMM parameter). After a carriage return is received, the first 16 characters sent to the 26700 are displayed on the LCD screen. Baud rate and data format on the 26700 must be the same as the serial device it is connected to.

TEST PRINTER sends a constant stream of the character set to the printer until EXIT is pressed.

TEST V OUT tests the 26728 Voltage Output Module. Select a module number 0-3. If the module is not present, an error message will appear and the unit will beep until the EXIT key is pressed. If the module is present, the module number and millivolt (mV) output is displayed. Press EDIT to select a new mV value. The UP/DOWN keys change the value in ± 200 mV increments from -5000 to +4999 mV. Press ENTER to accept the mV value on the display and send it to all 4 voltage output channels.

Use TEST V OUT to exercise or calibrate external devices such as chart recorders or process control systems.

TEST V IN tests the 26727 Voltage Input Module. Select a module number 0-3. If the module is not present, an error message will appear and the unit will beep until the EXIT key is pressed. If the module is present, use the UP/DOWN keys to scroll through the input range menu (50, 500, and 5000 mV). Press ENTER to select the desired range. The display now shows the channel number and the raw value from the analog - to - digital convertor (ADC). The raw ADC values span ± 4095 . Use the UP/DOWN keys to change the channel number. Channels 0 - 3 represent the actual voltage input channels 0 - 3. Channels 4 - 7 represent the internal reference voltages.

TEST I OUT is identical to TEST V OUT except the output range is 0.00 to 24.00 mA with increments of 2.00 mA.

TEST I IN is identical to TEST V IN except the full scale input range is ± 50 mA.

TEST WIND IN tests the 26725 Wind Input Module. Select module 0-3. Select ADC (V input) or CTC (counter timer chip freq. input). The display will show the channel and raw value returned from the ADC or CTC, whichever was selected. Use the UP/DOWN keys to change channel number. When CTC input is selected, the displayed value represents the number of pulses counted during the SAMPLE INTERVAL period.

TEST TEMP IN tests the 26726 Temperature Input Module. Select a module 0-3. Select a sensor type, 100 or 1000 ohm RTD. The display will show the channel and raw ADC value. Use the UP/DOWN keys to change channel number. Channels 0 & 1 represent the two RTD inputs. Channels 2-4 represent internal references in the module.

TEST RELAYS tests the 26730 Alarm/Relay Module. Select a module 0-3. The display shows the module and channel. When a channel is selected, the relay switch closes.

USE CAUTION IF THE RELAY CONTROLS OTHER EQUIPMENT WHEN PERFORMING THIS TEST! DISCONNECT THE EQUIPMENT BEING CONTROLLED IF NECESSARY!

TEST BEEP turns on the piezo sound element as long as the ENTER key is pressed.

RESET initiates a FIRST-POWERUP sequence. All parameters are set to default values and all battery backed-up data storage and program memory are erased. The user program will be lost!

TEST OPT BLOCK examines the pattern of OPTION JUMPERS on the Power Supply Module.

3.0 PROGRAMMING

The 26700 operates by executing a series of user program instructions that make measurements, display data, manipulate data, record data, test for conditions, and produce output. The instructions may be combined in any way for a broad range of applications.

The user program environment has three storage areas: one area for storing the program instructions; another area for storing temporary values; and an area for recording data. The program area holds 99 instructions, the temporary storage area holds 100 values, and the data record area holds 24,000 values (see RECORDING DATA, section 4.0, for more details on this area).

The programming area is accessed via the SETUP menu under the ENT/EDIT PROGRAM selection. Once in the program area, instructions and associated parameters may be viewed, edited, inserted, or deleted. (Some access restrictions may be in effect depending on the SET ACCESS LEVEL parameter. See section 2.2. Unless otherwise requested, all units are shipped with full access privileges.)

When developing your own programs, it is helpful to have the STOP ON ERROR feature turned on so the unit stops and identifies the source of error while in OPERATE mode. Once the program has been developed, you may turn that feature off. For more details, see SET ERROR HANDLE parameter in SETUP section 2.2.

VIEWING THE PROGRAM: From the SETUP MENU use the UP/DOWN keys to select ENT/EDIT PROGRAM. Press ENTER to display the first program instruction.

Example:

```
i101INP WIND SPD      instruction number and name
p1 chan = 01          parameter 1
```

The UP and DOWN keys will scroll through the program one parameter at a time. The ENTER key will scroll through the program one instruction at a time. The number of parameters will vary depending on the instruction.

EDITING A PARAMETER: Press the EDIT key. Use the UP and DOWN keys to change the value at the cursor and press ENTER to accept it. Edit mode is always designated by a cursor under the item being edited.

INSERTING AN INSTRUCTION: While viewing the program, press the INS/DEL key. The screen will prompt for INS OR DEL?. Press ENTER to select INSert. The screen will now prompt for -instruction?-- and the first available instruction from the list will appear. Use the UP/DOWN keys to scroll through the list and press ENTER to select the desired instruction. The display will then prompt for each parameter value for that instruction. Use the UP, DOWN and ENTER keys to set each parameter.

Example:

```
i113 INP WIND DIR
p1 chan = 01
```

DELETING AN INSTRUCTION: While viewing the program, use the UP/DOWN keys to go to the instruction to be deleted. Press INS/DEL and the display will prompt INS OR DEL? Press DOWN to select DEL then press ENTER to DELETE the current instruction.

RETURN TO SETUP MENU: Press EXIT.

Most instructions interact with the temporary storage locations in some way. Values are either placed in those locations or retrieved from them or both. The locations are numbered 0 through 99. A location may be considered a source (SLOC) or destination (DLOC) depending on the how it is used. When storing, a location is a destination. When retrieving, it is a source.

Blank worksheets for program instructions, temporary storage locations, and screen layouts are included in Appendix C. Copy and use them to plan the program.

When developing a new program, set the ERROR HANDLE under SETUP to STOP ON ERR (see section 2.2). This enables extensive error trapping that will catch most programming errors and reveal the source. Section 6.0, ERROR MESSAGES, addresses each type of error. Disable STOP ON ERROR after the program has been developed.

If a program does not generate any error messages and still does not produce the intended result, carefully review the sequence of instructions. The unit does only what it is instructed to do. For example, suppose you want to make a wind speed measurement and display it on the screen. You use the Inp Wind Speed instruction and store the result in LOCation 10. Then you retrieve the value from LOC 20 and display it. The program will execute without error yet no wind speed value will appear on the screen. In this example, the value in LOC 10 must be displayed, not LOC 20. Although this example is simplistic, it illustrates a common programming mistake. With more measurements, locations, and more display and processing instructions, it is easy to overlook something.

3.1 PROGRAM INSTRUCTIONS

Instruction names are in bold letters and listed alphabetically. Each instruction name is followed by a detailed description of the instruction and how it is used. The instruction parameters, if any, are also listed and described. A sample program appears in Appendix B.

ALARM activates one of the relays (MODEL 26730 ALARM MODULE required) and may be set to sound the internal beeper when the condition specified in this instruction is met.

SLOC= Location of value which could activate alarm
COND: <, <=, >, >=, <>, =
Condition sets the relationship between the value in SLOC and SETPT which activates the alarm.
SETPT: Setpoint value for activating alarm
DELAY: Number of samples which must meet the condition before alarm is activated (1-99).
BEEP: Determines whether beeper sounds when alarm is activated (Yes/No).
RELAY: Relay number. 1st digit is module number (0-3), 2nd digit is relay switch number (0-3).

ALARM WD is similar to the ALARM instruction but is designated for Wind Direction signals specifically. SETPT & SPAN determine the condition which activates the alarm. SETPT is at the mid-point of the SPAN value. For example, with a SPAN of 20 and a SETPT of 180, the alarm will be activated when the wind direction value is between 170 and 190.

SLOC= Location of wind direction value which could activate alarm
SETPT: Setpoint value for activating alarm.
SPAN: Span of wind direction values which activate alarm with setpoint value at the mid-point.
DELAY: Number of samples which must meet the condition before alarm is activated (1-99)
BEEP: Determines whether beeper sounds when alarm is activated (Yes/No).
RELAY: Relay number. 1st digit is module number (0-3), 2nd digit is relay switch number (0-3).

AQ STATS performs a number of statistical calculations specifically for air quality monitoring using the exact methods recommended by the U.S. EPA. Details on these methods appear in the EPA document "On-Site Meteorological Program Guidance For Regulatory Modeling Applications."

SLOC = Start of consecutive locations where raw horizontal wind speed and direction input values are stored.
SLOC Horizontal wind speed
SLOC+1 Horizontal wind direction
DLOC = Start of consecutive locations where results are stored.
DLOC Mean wind speed
DLOC+1 Mean wind direction
DLOC+2 Standard deviation of wind direction
PER = 15-MIN or 60-MIN sampling period
TYPE = SCALAR, VECTOR, OR UNIT VECTOR

IMPORTANT NOTES ABOUT AQ STATS:

- 1) Locations DLOC+3 through DLOC+10 are used by the AQ STATS instruction for internal calculations. The values in these locations *MUST NOT* be changed by any other instructions in the user program.
- 2) This instruction requires a SAMPLE INTERVAL of 1 second

to comply with EPA recommendations. Intervals other than 1 second will cause AQ STATS to yield improper results.

- 3) Since the sampling period begins immediately, the user program must control the point in time at which this period (and its subsequent repetitions) begins. For example, with a sample period of 60-MIN and a start time of 1:07, AQ STATS will produce results at 2:07, 3:07, etc. If you want to start at a specific time, use the example shown in Appendix B for doing so.
- 4) When the 60-MIN sampling period is selected, the standard deviation of wind direction is based on the RMS value of the four preceding 15-minute values as recommended by the EPA. Also, the wind direction standard deviation is calculated using the Yamartino method as recommended.

AVERAGE calculates the average of a group of samples. When #SAMP is greater than 0, each execution of the instruction stores values from SLOC until #SAMP values have been collected then calculates the average and begins again.

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP = 0, each execution of the instruction stores values from SLOC until FLAG 0 is set (see FLAG instruction) then calculates the average and begins again. For wind direction average, use the AVERAGE WD instruction.

SLOC= Location of sample value
DLOC= Location where resulting average is stored
#SAMP= Number of samples to average (0-32767, note special case for 0).

AVERAGE WD is similar to the AVERAGE instruction except it calculates a unit vector average using 0-360° wind direction values. The mathematical method used is one of several recommended by the US EPA for use in Air Quality monitoring. When #SAMP is greater than 0, each execution of the instruction stores values from SLOC until #SAMP values have been collected then calculates the average and begins again.

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP=0, each execution of the instruction stores values from SLOC until FLAG 0 is set (see FLAG instruction) then calculates the average and begins again.

SLOC= Location of sample angle value (degrees)
DLOC= Location where resulting angle average is stored
#SAMP= Number of samples to average (0-32767, note special case for 0).

AVG MOV calculates a moving average of up to 99 samples. On each execution of the instruction, values from SLOC are stored and a new average is calculated using the last #SAMP values. Be aware that the number of Temporary Storage Locations used by this instruction equals #SAMP + 2. For wind direction moving average, use the AVG WD MOV instruction.

SLOC= Location of sample value
DLOC= Location where resulting average is stored
#SAMP= Number of samples to average (1-99 max).

To calculate the Temporary Storage Location needs:
DLOC + 1 = Start of buffer
DLOC + 1 + #SAMP = End of buffer

AVG MOV WD is similar to the AVG MOV instruction except it calculates a unit vector moving average using 0-360° angular values. The mathematical method used is one of several recommended by the US EPA for use in Air Quality monitoring. On each execution of the instruction, values from SLOC are stored and a new average is calculated using the last #SAMP values. Be aware that the number of Temporary Storage Locations used by this instruction equals #SAMP + 2.

SLOC= Location of sample angle value (degrees)
 DLOC= Location where resulting average is stored
 #SAMP= Number of samples to average (1-99).

To calculate the Temporary Storage Location needs:
 DLOC + 1 = Start of buffer
 DLOC + 1 + #SAMP = End of buffer

BEEP produces from 1 to 9 beep sounds. It can be used to signal an event.

NUM= Number of beeps to sound

CHNG TO SCR instructs the unit to change to screen number 0 to 9 based on the value in a temporary storage location. A message can be displayed as a result of some condition. For example, after an alarm has been triggered, the display could alternate between the normal screen and one that announces the condition or explains how to reset the alarm.

SLOC= Location holding value of screen number to display

DISPLAY FLAG shows the condition of all 8 flags in the form: 00000000. The flags are numbered 0 through 7 starting with the leftmost digit. 1 designates the flag is SET, 0 designates RESET. The flag display can be sent to any screen and placed in any position.

SCRN= Screen number on which to display, 0-9
 ROW= Screen row number, 0-1
 COL= Screen column number, 0-15

DISPLAY NESW takes the angular wind direction value in degrees from a temporary storage location and displays it in terms of compass point descriptions (N, NNE, NE, ENE, E, etc.). The description can be sent to any display screen and placed in any position. Allow 3 character spaces.

SLOC= Location of angular wind direction value to be displayed as a compass point
 SCRN= Screen number on which to display, 0-9
 ROW= Screen row number, 0-1
 COL= Screen column number, 0-15

DISPLAY TEXT displays 7 text characters on any screen at any position. Use this instruction to display a message based on some condition without having to change to another screen. For permanent labels or messages use SET SCREEN TEXT under SETUP, section 5.2.

SCRN= Screen number on which to display text, 0-9
 ROW= Screen row number, 0-1
 COL= Screen column number, 0-15
 TEXT= Text to be displayed, 7 characters

DISPLAY TIME displays time from the internal real time clock on any screen at any position. Several formats are available. Leap years are handled automatically.

SCRN= Screen number on which to display time, 0-9
 ROW= Screen row number, 0-1
 COL= Screen column number, 0-15

FRMT=	HOUR	00 (24 hour)	2 spaces
	MIN	00	2 spaces
	SEC	00	2 spaces
	HH:MM	00:00 (24 hour)	5 spaces
	H:M:S	00:00:00 (24 hour)	8 spaces
	MON	00	2 spaces
	DAY	00	2 spaces
	YEAR	00	2 spaces
	MM-DD	00-00	5 spaces
	M-D-Y	00-00-00	8 spaces
	DD-MM	00-00	5 spaces
	D-M-Y	00-00-00	8 spaces

DISPLAY VAL displays the value from a temporary storage location on any screen at any position. The width can be set from 1 to 9 digits, same for the decimal points. The width value determines the number of spaces to allocate on the screen.

SLOC= Location holding value to be displayed
 SCRN= Screen number on which to display, 0-9
 ROW= Screen row number, 0-1
 COL= Screen column number, 0-15
 WIDTH= Number of digits allowed in number
 DECPT= Number of digits after the decimal point

ELSE is used with IF statements as a branch when the associated IF tests false. Example:

```
IF LOC 10 = 100.0
BEEP 5
LOC 10 = 0
ELSE
LOC 10 = LOC 10 + 1.0
END IF
```

Only one ELSE statement can be used with an IF. ELSE statements other than the first will be ignored and an ELSE without a preceding IF statement will generate an error when STOP ON ERROR is set.

END IF marks the end of an IF block and must be used to conclude every IF statement. END IF without an IF will generate an error when STOP ON ERROR is set.

FLAG is used to SET or RESET a flag. Use flags to signify the occurrence of some event and trigger a response (see IF FLAG). There are 8 flags available.

FLAG#= Flag Number, 0-7
 FCOND= Condition of flag, SET or RESET

NOTE: FLAG 0, when SET, is used to force several instructions to complete their calculation when #SAMP = 0 has been specified in those instructions (see AVERAGE, AVERAGE WD, MAXIMUM, & MINIMUM). If those instructions are not being used, FLAG 0 is available for general use, however, be aware that FLAG 0 IS AUTOMATICALLY RESET AT THE END OF EACH ITERATION OF THE USER PROGRAM.

NOTE FOR ALL "IF" INSTRUCTIONS:

The depth to which "IF" statements may be nested is limited only by the available space in the user program area. Only one "ELSE" instruction may be used with each "IF" instruction.

IF ERR CODE tests whether a specific user program execution error has occurred (see section 6.0 for a list of error codes and their description). If the specified error has occurred, the instructions following IF ERR CODE will be executed. Otherwise, the instructions following the next ELSE or END IF statement will be executed. An END IF statement must follow the IF ERR CODE statement:

```
IF ERR CODE
instruction(s)...
ELSE (options)
instruction(s)
END IF
```

CODE= Value of error code to be tested
(see section 6.0 for list)

This instruction is useful for detecting errors of interest when STOP ON ERROR is set to OFF (see section 2.2 SET ERROR HANDLE).

IMPORTANT NOTE: Since each instruction generates an error code value (zero for success or non-zero for an error condition), IF ERR CODE must immediately follow the instruction being monitored for error. If it does not immediately follow, subsequent successful instruction executions will reset the internal error code value to zero before reaching the IF ERR CODE instruction.

IF FLAG tests whether a particular flag is SET or RESET. There are 8 flags. If the flag tested is in the same state as the FCOND parameter, the instructions following IF FLAG will be executed. Otherwise, the instructions following the next ELSE or END IF statement will be executed. An END IF statement must follow the IF FLAG statement:

```
IF FLAG
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

FLAG#= Flag Number, 0-7
FCOND= Condition of flag, SET or RESET

IF KEYSWITCH tests whether any of the 6 keys is pressed or not. If the designated key is pressed, the instructions following IF KEYSWITCH will be executed. If the designated key is NOT pressed, the instructions following the next ELSE or END IF statement will be executed. An END IF statement must follow IF KEYSWITCH:

```
IF KEYSWITCH = ENTER
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

Note that in OPERATE mode, the UP, DOWN, and EXIT keys may be used to change screens and exit the program.

KEY= UP
DOWN
EXIT
INS/DEL
ENTER
EDIT
NONE (no key pressed)

IF L1 ? L2 compares the values in temporary storage locations SLOC1 and SLOC2. If the comparison is true, the instructions following IF L1 ? L2 are executed. If the comparison is false, the conditions following the next ELSE or END IF statement will be executed. An END IF statement must follow IF L1 ? L2:

```
IF L1 > L2
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
SLOC1= Location first value to be compared
```

COND?: <, less than
<=, less than or equal to
>=, greater than or equal to
>, greater than
<>, not equal to
=, equal to

SLOC2= Location holding second value to compare

IF L ? VALUE compares the value in a temporary storage location to a fixed value. If the comparison is true, the instructions following IF L1 ? L2 are executed. If the comparison is false, the conditions following the next ELSE or END IF statement will be executed. An END IF statement must follow IF L ? VALUE:

```
IF L > 123.45
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

SLOC= Location of first value to be compared

COND?: <, less than
<=, less than or equal to
>=, greater than or equal to
>, greater than
<>, not equal to
=, equal to

VALUE= floating point value to be compared to

IF TIME INTR determines how often to execute the instructions which follow: For example, if the IF TIME INTR minutes parameter is set to 5 then the instructions which follow will be executed at 5 minutes after the hour, 10 minutes after the hour, 15 minutes after the hour, etc., throughout the hour. At all other times the instructions following the next ELSE or END IF statement is executed. An END IF statement must follow IF TIME INTR. Use a -1 value for a 24 hour interval that occurs every midnight. Example:

```
IF TIME INTR = 5
instruction(s)...
ELSE (optional)
instruction(s)... (optional)
END IF
```

MINS= Number of minutes in time interval
(see text above for note on special values)

NOTE REGARDING INSTRUCTIONS THAT USE INPUT AND OUTPUT MODULES:

Up to 4 modules of the same type may be used in the 26700 Translator. For example, 4 26725 Wind Modules. Each module must have a unique module number, 0-3 (see section 7.0). User program instructions that interact with a module have a 2 digit CHANNEL parameter. The first digit refers to the module number (0-3) and the second digit refers to the channel number on that module (varies). Using an instruction without the module present (or correctly numbered) and having the ERROR HANDLE set to STOP ON ERROR (see section 2.2) produces an error when the unit is in OPERATE mode. The error identifies the instruction which refers to the missing module.

INP CURRENT (mA) measures current from a MODEL 26732 CURRENT INPUT MODULE. The input range is ± 20 mA. See Appendix E for wiring details. Use the MULT and OFFS parameters to establish the proper scale for the engineering units being used.

CHAN= 1st digit is module number (0-3)
2nd digit is channel number (0-4)

MULT= Multiplier
 OFFS= Offset
 DLOC= Location where result is stored

INP FREQ measures the number of pulses from the Model 26725 WIND INPUT MODULE. The frequency source(s) must be correctly connected to the module for this instruction to produce meaningful measurements. See the wiring diagram in Appendix E for additional details.

The value returned from the counter on the module is the number of pulses counted during the SAMPLE INTERVAL (see section 2.2).

CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-2)
 MULT= Multiplier
 OFFS= Offset
 DLOC= Location where result is stored

INP PRECIP-T measures precipitation from a tipping bucket type sensor using the MODEL 26725 WIND INPUT MODULE as a pulse counter. Refer to section 12.0 for details. Up to 3 tipping bucket sensors may be connected to one module. (See Appendix E for wiring details).

The RESOLUTION parameter must be set to match the amount of precipitation represented by each tip. This value may vary from manufacturer to manufacturer. Common RESOLUTION values are 0.01 inches per tip and 0.1, 0.2, or 0.25mm per tip. Refer to your precipitation sensor specifications.

The UNIT parameter may be set to inches or millimeters (mm) and simply serves as a reminder in the instruction. It does not enter into the measurement in any way.

MULT is a numeric multiplier that may be used to fine tune the calibration. It is usually set to 1.00000.

This instruction produces several results which are consecutively placed in the temporary storage area beginning with the location designated by DLOC. The results are: CURRENT HOUR PRECIP, LAST HOUR PRECIP, CURRENT 24 HOUR PRECIP, LAST 24 HOUR PRECIP, HOURLY RATE, and RAW COUNT.

CURRENT HOUR PRECIP and CURRENT 24 HOUR PRECIP are updated on every sample. LAST HOUR PRECIP and RAW COUNT are updated every hour. LAST 24 HOUR PRECIP is updated every 24 hours. HOURLY RATE is updated every 5 minutes.

CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-2)
 RESO= Resolution (amount) of precipitation per tip
 UNIT= mm or inches (reminder only - see text)
 MULT= Multiplier
 DLOC= Location where results are stored:
 DLOC Current Hour Precip
 DLOC + 1 Last Hour Precip
 DLOC + 2 Current 24 Hour Precip
 DLOC + 3 Last 24 Hour Precip
 DLOC + 4 Hourly Rate
 DLOC + 5 Raw Count

INP PRECIP-S measures precipitation from a YOUNG self siphon type sensor using the MODEL 26727 VOLTAGE INPUT MODULE. Up to 4 sensors may be connected to one module. (See Appendix E for wiring details).

The UNIT parameter may be set to mm (millimeters) or inches.

This causes the precipitation measurement values to be scaled properly. If changing from one unit to the other, you must change any labels in the display, record, or printer output areas.

This instruction produces several results which are consecutively placed in the temporary storage area beginning with the location designated by DLOC. The results are: CURRENT HOUR PRECIP, LAST HOUR PRECIP, CURRENT 24 HOUR PRECIP, LAST 24 HOUR PRECIP, HOURLY RATE, and RAW PRECIP.

CURRENT HOUR PRECIP and CURRENT 24 HOUR PRECIP are updated on every sample. LAST HOUR PRECIP and RAW PRECIP are updated every hour. LAST 24 HOUR PRECIP is updated every 24 hours. HOURLY RATE is updated every 5 minutes.

CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-3)
 UNIT= mm or inches
 DLOC= Location where results are stored:
 DLOC Current Hour Precip
 DLOC + 1 Last Hour Precip
 DLOC + 2 Current 24 Hour Precip
 DLOC + 3 Last 24 Hour Precip
 DLOC + 4 Hourly Rate
 DLOC + 5 Raw Precip

INP SERIAL accepts 1 or more fields of numeric data via the serial communications port and places that data into designated temporary storage locations. If more than one field is received, the data is stored in consecutive temporary storage locations beginning with the one designated by the DLOC1 parameter. Once the data is in a temporary storage location it can be processed or displayed like any other data.

This instruction extracts numeric data only. The data may be signed or unsigned integers or floating point numbers. Each data field MUST be separated by a space or comma. Normally the incoming data string must end in CR or CR-LF. (For information on receiving data that may contain control codes, text, or begin with CR, see section 2.2 SET COMM | NUM ONLY INP. See INP NMEA for information on receiving NMEA data.)

When the incoming serial data is parsed, the number of data fields extracted must match the number expected or an internal error count is incremented. When that error count reaches the value set by MAX SER ERRS (the default is 10, see section 2.2 SETUP | SET COMM), an internal error flag is set. Each correctly received string resets the error count to zero. If the internal error flag becomes set, each DLOC designated in the INP SERIAL instruction is set to -99999. Also, if SET ERROR HANDLE (see section 2.2) is set to STOP ON ERROR, program execution stops.

Be sure the baud rate and other COMM settings in the 26700 match the settings of the device sending serial data. The INP SERIAL instruction is also useful for operating remote slave displays.

#FLDS= Number of fields of numeric data that will be received
 DLOC1= First location where incoming data will be stored

INP SER NMEA accepts one of three standard National Marine Electronics Association (NMEA) sentences via the RS-232 serial communications port and places the numeric data from the received sentence in designated storage locations. The sentence types are: MWV for wind speed and direction, XDR for transducer data such as temperature, humidity, barometric pressure, general purpose transducers, etc., and HDT for heading data.

This instruction is intended primarily to allow the 26700 translator to be used as slave indicator(s) in a system where the master 26700 must also provide NMEA format data to a third-party device. Since NMEA transmission sentences are easily constructed with 26700 serial output instructions, INP SER NMEA facilitates systems where both NMEA serial data transmission and slave indicators are required.

This instruction is NOT intended to be an all purpose NMEA input instruction; it looks only for the numeric values contained in the sentence and places those values in designated storage locations. The instruction cannot distinguish reference angle type (true or relative), wind speed units, transducer type or units, or other elements of the NMEA sentence. Any other NMEA sentences sent to the 26700 are ignored.

TYPE = MWV, XDR, or HDT sentence
 #FLDS = Number of significant data fields. Always 2 with MWV, one for HDT, and one for each transducer with XDR.
 DLOC = Location where results are stored:
 DLOC Wind Direction (MWV), Heading (HDT), or Transducer 1 (XDR)
 DLOC + 1 Wind Speed (MWV) or possible Transducer 2 (XDR)
 DLOC + 2 Possible Transducer 3 (XDR only)
 DLOC + 3 Possible Transducer 4 (XDR only) continued...If more XDR transducers...

Since the XDR sentence is limited only by its length, the user must know how many transducer fields to expect and place that value in the #FLDS parameter. If the incoming XDR sentence contains numerous transducer fields, be sure to account for all the storage locations that will subsequently be used.

IMPORTANT NOTE: The INP SER NMEA instruction requires a complete sentence prefix of either \$WIMWV, \$WIXDR, or \$HEHDT. Any other prefix, even if it contains MWV, XDR, or HDT will be ignored.

INP TEMP measures temperature using the MODEL 26726 TEMPERATURE INPUT MODULE and 1 or 2 RTD temperature sensors. See the wiring diagram in Appendix E for connection details.

The temperature input module can make accurate measurements within ± 0.03 °C. To achieve measurements with this accuracy may require calibrating the RTD being used. For greater accuracy, stability, and resolution 10 or more temperature measurement samples may be averaged.

Temperature units in degrees C or degrees F can be selected. This will automatically set the correct multiplier and offset values. If the AUTO LBL CHG parameter is set to YES, unit labels on the display, record headers, record labels, and program text instructions will be updated also. (For more information about the AUTO LBL CHG feature, see section 5.1.2 SETUP.) If the SPECIAL unit is selected, the multiplier and offset values must be set by the user.

To get a DELTA T (temperature difference) value, make two temperature measurements and store them in two temporary storage locations. Subtract one value from the other to get DELTA-T.

CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-1)
 TYPE= 1000 ohm RTD (3.75 alpha)
 100 ohm DIN RTD (0.385 alpha)
 UNIT= unit of measure (°C, °F, Special)

MULT= Multiplier (1.0 for °C, 1.8 for °F, or other for special calibrations)
 OFFS= Offset (0.0 for °C, 32.0 for °F, or other for special calibrations)
 DLOC= Location where result is stored

INP VOLTAGE measures voltage from a MODEL 26727 VOLTAGE INPUT MODULE. The module has 4 input channels which can be configured for single ended or differential measurements. See the wiring diagram in Appendix E for connection details.

The input range may be set to ± 5000 , ± 500 , and ± 50 mV with the RANGE parameter. Use the MULT and OFFS parameters to establish scale or units.

CHAN= 1st digit is module number (0-3)
 2nd digit: chan# (0-3) for single ended measurements chan # (0 or 2) for differential measurements
 TYPE= SE, single ended
 DIFF, differential
 RANGE= 5000mV
 500 mV
 50 mV
 MULT= Multiplier
 OFFS= Offset
 DLOC= Location where result is stored

INP WIND DIR measures wind direction using MODEL 26725 WIND INPUT MODULE and one or more wind direction sensors. See section 12.0 for jumper details and Appendix E for wiring details.

The wind input module can measure wind direction with 0.4 degrees accuracy. Use the MULT and OFFS parameters to establish scale and calibrate the sensor.

CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-2)
 MULT= Multiplier
 OFFS= Offset
 DLOC= Location where result is stored

INP WIND SPD measures wind speed using MODEL 26725 WIND INPUT MODULE and one or more wind speed sensors. See section 12.0 for jumper details and Appendix E for wiring details.

The TYPE parameter can be set for the correct YOUNG sensor model. For other sensors, use either FREQ for frequency output or VOLTS for DC voltage output sensors. When using FREQ, the value measured will be the number of pulses counted during the SAMPLE INTERVAL (see section 2.2). The SAMPLE INTERVAL must be considered when scaling the raw count value with the MULT parameter.

Wind speed units in M/S (meters per second), MPH (miles per hour), KTS (knots), and KPH (kilometers per hour) can be selected. This will automatically set the correct multiplier and offset values. If the AUTO LBL CHG parameter is set to YES, unit labels on the display, record headers, record labels, and program text instructions will be updated also. (For more information about the AUTO LBL CHG parameter, see SETUP section 2.2.) If the SPECIAL unit is selected, the multiplier and offset values must be entered. Use the MULT and OFFS parameters to establish scale or calibrate the sensor.

CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-2)
 TYPE= 03XXX Wind Sentry
 05103 Wind Monitor
 05305 Wind Monitor-AQ

	05701	Wind Monitor-RE
	12102	3-Cup Anemometer
	FREQ	AC or pulse output sensors
	VOLTS	DC voltage output sensors
UNIT=	M/S	meters/second
	MPH	miles/hr
	KPH	kilometers/hr
	KTS	knots
	Special	special calibration
MULT=	Multiplier	
OFFS=	Offset	
DLOC=	Location where result is stored	

L = ERR CODE sets the value of a storage location (L) to the present value of the error code. This instruction is useful for monitoring and/or recording error events during program operation when STOP ON ERROR is set to OFF (see section 2.2 SET ERROR HANDLE).

DLOC = Location where error code is to be stored (see section 6.0 for error code list)

IMPORTANT NOTE: Since each instruction generates an error code value (zero for success or non-zero for an error condition), L = ERR CODE must immediately follow the instruction being monitored for error. If it does not immediately follow, subsequent successful instruction executions will reset the internal error code value to zero before reaching the L = ERR CODE instruction.

L1 OPER L2 performs a numerical operation using the values in two locations and stores the result. For example, dividing the value in location 10 by the value in location 11 and storing the result in location 12.

SLOC1=	Location where first value is stored
OPER:	
	+ value in SLOC1 plus value in SLOC2
	- value in SLOC1 minus value in SLOC2
	* value in SLOC1 multiplied by value in SLOC2
	/ value in SLOC1 divided by value in SLOC2
	pow value in SLOC1 raised to the power of the value in SLOC2
	mod value in SLOC1 modulo value in SLOC2

SLOC2= Location where second value is stored
DLOC= Location where result is stored

L OPER VALUE performs a numerical operation using the value in a temporary storage location and fixed value and stores the result. For example, dividing the value in location 10 by 5.00 and storing the result in location 12.

SLOC=	Location where first value is stored
OPER:	
	+ value in SLOC plus a fixed value
	- value in SLOC minus a fixed value
	* value in SLOC multiplied by a fixed value
	/ value in SLOC divided by a fixed value
	pow value in SLOC raised to the fixed value
	mod value in SLOC modulo the fixed value

VAL= Fixed value
DLOC= Location where result is stored

L1 = F(L2) performs one of several selectable complex functions, usually on the value in location SLOC. The result is usually stored in location DLOC. Some functions require additional arguments which are stored in consecutive locations after SLOC. Only SLOC is specified.

SLOC=	Location where first or only function argument is stored.
OPER:	
	cos cosine of value in SLOC
	sin sine of value in SLOC
	acos arccosine of value in SLOC. Result is in degrees.
	asin arcsine of value in SLOC. Result is in degrees.
	atan2 Standard atan2 function calculates arctan of two values. Result is in degrees and proper quadrant. SLOC = first value SLOC+1 = second value
	dewpt Calculates dew point (°C) from RH% and temperature. SLOC = RH% SLOC+1 = temperature (°C)
	wetbulb Calculates wetbulb temperature (°C) from RH%, temperature, and pressure. SLOC = RH% SLOC+1 = temperature (°C) SLOC+2 = pressure (hPa or mB)
	wndchill Calculates wind chill temperature (°C) from ambient temperature and wind speed using standard NWS formula. SLOC = temperature (°C) SLOC+1 = wind speed (m/s)
	nmeachk Calculates standard NMEA checksum and appends to end of string in serial out buffer. String must begin with \$ and end with *. SLOC and DLOC are not used.

DLOC= Location where result is stored

L1 = L2 sets the value in one storage location (L2) equal to the value in another storage location (L1).

SLOC= Location of value L1
DLOC= Location of value L2 that will change

L = TIME sets the value in a storage location equal to the current time in the real time clock.

DLOC= Location where time will be stored. (see note below)

FRMT=	hour	hours only (00-23)
	min	minutes only (00-59)
	sec	seconds only (00-59)
	hh:mm	hours and minutes (24 hr format)
	h:m:s	hours, minutes, seconds (24 hr format)
	month	current month only (1-12)
	day	current day only (0-31)
	year	current year only
	mm-dd	current month-day
	m-d-y	current month-day-year
	dd-mm	current day-month
	d-m-y	current day-month-year

If a time format with 2 or more values is selected (hh:mm for example), DLOC will be the location where the first value is stored (hours, in this case). Additional values are stored in successive locations (DLOC + 1, DLOC+2, etc...).

L = VALUE places a fixed value into a memory location.

LOC= Location where value will be placed
VAL= Fixed value

MAXIMUM finds the highest value in a group of samples. When #SAMP is greater than 0, each execution of the instruction stores the greater of SLOC and DLOC1 in DLOC1 until #SAMP values have been taken, then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP=0, each execution of the instruction stores the greater of SLOC and DLOC1 in DLOC1 until FLAG 0 is set (see FLAG instruction), then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

SLOC= Location of sample value
 DLOC1= Location of current maximum
 DLOC2= Location of final maximum
 #SAMP= Number of samples to examine
 (0-32767, note special case for 0)

MINIMUM finds the lowest value in a group of samples. When #SAMP is greater than 0, each execution of the instruction stores the lesser of SLOC and DLOC1 in DLOC1 until #SAMP values have been taken, then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

In special applications it may be preferable to collect samples based on other events or times. For these applications #SAMP is set to 0.

When #SAMP=0, each execution of the instruction stores the lesser of SLOC and DLOC1 in DLOC1 until FLAG 0 is set (see FLAG instruction), then copies DLOC1 to DLOC2 and begins again. (DLOC1 is re-initialized).

SLOC= Location of sample value
 DLOC1= Location of current minimum
 DLOC2= Location of final minimum
 #SAMP= Number of samples to examine
 (0-32767, note special case for 0)

OUTPUT mA produces a specified output current using MODEL 26729 CURRENT OUTPUT MODULE. Up to 4 current output modules may be installed in the 26700. See the wiring diagram in Appendix E for additional details.

Use the MULT and OFFS parameters to scale the output. Maximum output per channel is 20 mA and only positive current values will be recognized.

SLOC= Location of value to convert to milliamp out put
 CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-3)
 MULT= Multiplier
 OFFS= Offset

OUTPUT mV produces a specified output voltage using MODEL 26728 VOLTAGE OUTPUT MODULE. Up to 4 voltage output modules may be installed in the 26700. See the wiring diagram in Appendix E for additional details.

Use the MULT and OFFS parameters to scale the output. Maximum output per channel is ± 5000 mV.

SLOC= Location number of value to convert to milli v o l t output
 CHAN= 1st digit is module number (0-3)
 2nd digit is channel number (0-3)
 MULT= Multiplier
 OFFS= Offset

PRN BUF NESW takes the angular wind direction value from a temporary storage location and puts it in the print buffer in terms of a compass point description (N, NNE, NE, ENE, E, etc...). The description can be placed in any column (buffer position) in the print buffer. Allow 3 character spaces.

SLOC= Location with angular value to print as compass point
 COL= Column number (position) in print buffer

PRN BUF OUT sends the contents of the print buffer to a MODEL 26731 PRINTER MODULE. Up to 4 printer modules may be installed in the 26700.

CHAN= module number (0-3)

PRN BUF TXT puts 7 text characters in a specified position in the print buffer. Use this instruction to create labels or special messages. Allow 7 character spaces.

Special ASCII characters may be insert by using the special form "¥hh" where "¥" is the last character in the character selection list and "hh" is the hexadecimal value of the ASCII character. For example, ¥01 represents the ASCII code for CNTL-A. Note that each special character occupies only one character in the print buffer, not 3 as it might appear.

COL= Column number (position) in print buffer
 TEXT= Text to be placed in print buffer

PRN BUF TIME puts the time from the internal real time clock in a specified position in the print buffer. Several time formats are available. Leap years are handled automatically.

COL= Column number (position) in print buffer
 FRMT= HOUR, 00 24 hour format, 2 spaces
 MIN, 00 format, 2 spaces
 SEC, 00 format, 2 spaces
 HH:MM, 00:00 24 hr format, 5 spaces
 H:M:S, 00:00:00 24 hr format, 8 spaces
 MON, 00 format, 2 spaces
 DAY, 00 format, 2 spaces
 YEAR, 00 format, 2 spaces
 MM-DD, 00-00 format, 5 spaces
 M-D-Y, 00-00-00 format, 8 spaces
 DD-MM, 00-00 format, 5 spaces
 D-M-Y, 00-00-00 format, 8 spaces

PRN BUF VAL puts a value from a temporary storage location in a specified position in the print buffer. The width can be set from 1 to 9 digits, also the decimal places. The width value determines the number of spaces to allow in the print buffer.

SLOC= Location holding value to put in print buffer
 COL= Column number (position) in print buffer
 WIDTH= Number of digits allowed in number
 DECPT= Number of digits after the decimal point

RECORD TIME puts the time from the internal real time clock in the next available data record field(s). Several time formats are available. Leap years are handled automatically. Note below the number of fields occupied for each format.

FRMT= HOUR, 24 hour format, 1 field
 MIN, 1 field
 SEC, 1 field
 HH:MM, Hour:Min 24 Hour format, 2 fields
 H:M:S, Hour:Min:Sec 24 hour format, 3 fields
 MON, Month, 1 fields
 DAY, Date, 1 fields
 YEAR, 1 fields

MM-DD, Month-Day, 2 fields
M-D-Y, Month-Day-Year, 3 fields
DD-MM, Day-Month, 2 fields
D-M-Y, Day-Month-Year, 3 fields

RECORD VAL puts a value from a temporary storage location in the next available record field.

SLOC= Location holding value to record

RELAY controls the relay switches on the MODEL 26730 ALARM MODULE. Up to 4 alarm modules may be installed in the 26700. See the wiring diagram in Appendix E for additional details.

CHAN= 1st digit is module number (0-3)
2nd digit is relay switch number (0-3)
S W= ON, relay switch contacts are closed
OFF, relay switch contacts are open

SER BUF CHKSUM calculates a checksum based on the contents of the serial output buffer and places it in a designated location. After using this instruction to calculate the checksum, use the SER BUF VAL instruction to put it in the serial buffer.

DLOC= Location where checksum will be placed

SER BUF NESW takes the angular wind direction value in degrees from a temporary storage location and puts it in the serial output buffer in terms of a compass point description (N, NNE, NE, ENE, E, etc...). The description can be placed in any column (buffer position) in the serial output buffer. Allow 3 character spaces.

SLOC= Location with angular value to print as compass point
COL= Column number (position) in serial output buffer

SER BUF OUT transmits the contents of the serial output buffer through the serial port on the 26700. See section 2.2, SET COMM, and the SER BUF TXT instruction for additional information.

SER BUF TXT puts 7 text characters in a specified position in the serial output buffer. Allow 7 character spaces to be occupied in the serial buffer.

Control codes may be inserted by entering a '¥' character followed by the hexadecimal value for the control code. For example, ¥01 represents the code for ASCII CTRL A. The '¥' character is the last one in the character list. Up to two control codes may be entered with each SER BUF TXT instruction. Note that each control code occupies only one character space in the serial buffer.

Use the special control code ¥FF to manually mark the end of the buffer. When this code is encountered, the buffer is truncated and the BUFFER END codes (CR, LF, or CRLF - see SET COMM, section 5.2) are sent.

COL= Column number (position) in serial output buffer
TEXT= Text to be placed in serial output buffer

SER BUF TIME puts the time from the internal real time clock in a specified position in the serial output buffer. Several time formats are available. Leap years are automatically handled. Note the number of spaces (character positions) each format occupies in the serial output buffer.

COL= Column number (position) in serial output buffer

FRMT= HOUR, 00 24 hour format, 2 spaces
MIN, 00 format, 2 spaces
SEC, 00 format, 2 spaces
HH:MM, 00:00 24 hr format, 5 spaces
H:M:S, 00:00:00 24 hr format, 8 spaces
MON, 00 format, 2 spaces
DAY, 00 format, 2 spaces
YEAR, 00 format, 2 spaces
MM-DD, 00-00 format, 5 spaces
M-D-Y, 00-00-00 format, 8 spaces
DD-MM, 00-00 format, 5 spaces
D-M-Y, 00-00-00 format, 8 spaces

SER BUF VAL puts a value from a temporary storage location in a specified position in the serial buffer. The width can be set from 1 to 9 digits, same for the decimal points. The width value determines the number of spaces to allow in the print buffer. Note that if the LEAD 0s parameter is set in SET COMM (see section 2.2), values which occupy less than the allotted width are padded on the left with 0s.

SLOC= Location of value to put in serial output buffer
COL= Column number (position) in serial output buffer
WIDTH= Number of digits allowed in number
DECPT= Number of digits after the decimal point

STD DEV calculates the standard deviation of up to 32767 samples. Account for the relationship between the number of samples in this instruction and the SAMPLE INTERVAL under SETUP. For example, calculating the standard deviation of 600 samples with a 1 second sample interval produces a 10 minute (600 seconds), standard deviation. For wind direction standard deviation, use the STD DEV WD instruction.

SLOC= Location of values for standard deviation calculation
DLOC= Location where result will be placed
#SAMP= Number of samples to use in calculation (32767 max)

STD DEV WD is similar to the STD DEV instruction except that it calculates a standard deviation using 0 to 360° angular wind direction values using the Yamartino method. This method is approved by the US EPA for use in Air Quality monitoring applications.

SLOC= Location of angles for standard deviation calculation
DLOC= Location where result will be placed
#SAMP= Number of samples to use in calculation (32767 max)

SUBR BEGIN marks the beginning of a subroutine. The subroutine number is assigned in the SUBR# parameter. The subroutine is called from elsewhere in the program by a SUBR CALL instruction. The subroutine block must end with a SUBR END statement. For example,

```
instruction(s)...
SUBR CALL 01
instruction(s)...

SUBR BEGIN 01
instruction(s)...
SUBR END
```

When all instructions in the subroutine block have been executed, program execution resumes with the instruction following the one which called the subroutine. As many subroutines may be used as will fit in the program area and they may be nested to any depth. A SUBR BEGIN without a SUBR END will cause an error

if the ERROR HANDLE is set to STOP ON ERR and the unit is in OPERATE mode.

SUBR#= Number of this subroutine block

SUBR CALL calls a numbered subroutine. The subroutine number being called is designated by the SUBR# parameter. After a called subroutine is finished, program execution resumes with the instruction following the SUBR CALL. Calling a SUBR that is incorrectly numbered or does not exist will cause an error if the ERROR HANDLE is set to STOP ON ERR and the unit is in OPERATE mode.

SUBR#= Number of subroutine block being called

SUBR END ends a subroutine block. A SUBR BEGIN without a SUBR END will cause an error if the ERROR HANDLE is set to STOP ON ERR and the unit is in OPERATE mode.

UVW CORRECT applies the Horst correction algorithm to raw UVW values. The 3 raw UVW values must be contiguous starting with the location designated by the SLOC parameter. The results, 3 corrected UVW values, are placed contiguously beginning with the location designated by the DLOC parameter. Corrections for 4 different propeller types are available as designated by the PROP parameter.

SLOC= Location number of first of 3 contiguous raw UVW values
 SLOC = raw U
 SLOC + 1 = raw V
 SLOC + 2 = raw W

DLOC= Location of first of 3 contiguous corrected UVW values
 DLOC = corrected U
 DLOC + 1 = corrected V
 DLOC + 2 = corrected W

PROP= 8254, Young CFT propeller
 8254EX, Young CFT propeller w/ shaft ext
 8274, Young EPS propeller
 8274EX, Young EPS propeller w/ shaft ext

UVW VECTOR converts orthogonal UVW values to wind velocity, azimuth, and elevation vector values. The 3 UVW values must be contiguous starting with the location designated by the SLOC parameter. The wind velocity, azimuth, and elevation values are placed contiguously beginning with the location designated by the DLOC parameter. Wind velocity will be calculated in the same units as the UVW values. Azimuth and elevation will be in degrees.

SLOC= Location of first of 3 contiguous UVW values
 SLOC = U
 SLOC + 1 = V
 SLOC + 2 = W

DLOC= Location of first of 3 contiguous output values
 DLOC = wind velocity
 DLOC + 1 = azimuth
 DLOC + 2 = elevation

WD 540 converts 0-360° wind direction values to a 0-540° range for output to pen-type chart recorders. The 0-540° range helps prevent chart "painting" when wind direction oscillates about the 0/360° transition.

SLOC= Location of 0-360° wind direction value
 DLOC= Location of 0-540° wind direction value

4.0 RECORDING DATA

The 26700 can record up to 24,000 data points in its internal memory. Values are recorded in groups called RECORDS with each value occupying a FIELD within the record. The number of RECORDS can be limited in the SET RECORDS parameter (see section 5.2). Values are recorded so the most recent values occupy the end of the record list.

As an example, suppose you want to record 7 values every 10 minutes (6 times per hour) and have records from only the last 24 hours available. The values you want to record are hours, minutes, seconds, average wind speed, maximum wind speed, average wind direction, and temperature.

The SETUP parameters (see section 2.2) would be set as follows:

SAMPLE INTERVAL: 01 1 sample per second
 FIELDS/REC: 7 fields per record
 RECORDS: 1446 times/hour x 24 hrs

The PROGRAM instructions would be entered as follows:

INP WIND SPEED
 CHAN=00 WIND, channel 00 input
 TYPE= 05XXX For Young Model 05103 Wind Monitor meters per second
 UNIT= M/S Store measurement in location 00
 DLOC= 00

INP WIND DIR
 CHAN= 01 WIND, channel 01 input
 MULT=1.0000
 OFFS= 0.0000
 DLOC= 01 Store measurement in location 01

INP TEMP
 CHAN= 00 TEMP, channel 00 input
 TYPE= 1000 1000 ohm RTD temperature sensor degrees Celsius
 UNIT = C
 OFFS= 0.0000
 DLOC= 02 Store measurement in location 02

AVERAGE
 SLOC= 00 Average the values in loc 00 (wind speed)
 DLOC= 10 Store the result in location 10
 #SAMP=00600 10 min x 60 sec/min x 1 sample/sec

MAXIMUM
 SLOC= 00 Take the maximum value in loc 00 (wind speed)
 DLOC= 11 Store the result in location 11
 #SAMP=00600 10 minutes worth

AVERAGE WD
 SLOC=01 Average the values in loc 01 (wind direction)
 DLOC= 12 Store the result in location 12
 #SAMP=00600 10 minutes worth

IF TIME INTR
 MINS= 10 Execute following instructions every 10 minutes

RECORD TIME
 FRMT= HMS Record hours, minutes, and seconds

RECORD VAL
 SLOC= 10 Record average wind speed from location 10

RECORD VAL SLOC= 11	Record maximum wind speed from location 11	TYPE= 05103 UNIT= M/S DLOC=00	For Young 05103 Wind Monitor Units are meters/second Store measurement in location 00
RECORD VAL SLOC= 12	Record average wind direction from location 12	DISPLAY VAL SLOC= 00	Take wind speed measurement from source location 00
RECORD VAL SLOC= 02	Record temperature from location 02	SCRN=0 ROW=0 COL= 00 WIDTH =8 DECPT=1	Display on Screen 0 Top row on screen Leftmost column of screen Occupy 8 spaces Display to one decimal place
END IF	End the IF block		
PGM END	Program end		

With this arrangement, whenever you EXAMINE RECORDS in the TEST area or retrieve them via serial communications, the hours, minutes, seconds, average wind speed, maximum wind speed, average wind direction, and temperature will always be grouped together and only the last 24 hours of data will be available.

This same scheme can be adapted to numerous applications involving many different measured and calculated values over different time frames.

SER BUF VAL SLOC=00	Take wind speed measurement from source location 00
COL= 000 WIDTH= 8 DECPT= 1 SER BUF OUT	Place at beginning of serial out buffer Occupy 8 spaces Display to one decimal place Transmit the serial buffer
PGM END	End of program in Local unit

5.0 SERIAL COMMUNICATIONS

The 26700 base unit includes a standard 9-pin RS-232 port for serial communications. Using appropriate cables, the port can be connected to a computer, modem, remote display, another 26700, or other instrument using serial communications. Recorded data, program instructions, setup information, and measurement data may be accessed through this serial connection. Refer to Appendix E for serial wiring details.

Although the 26700 works with almost any general purpose PC communication program, it is supplied with RMYCOMM - a program designed specifically for it. Both Windows 95/98 and DOS versions are supplied. Refer to the README.TXT files on the supplied disk for instructions regarding installation and use.

The Remote unit program:

INP SERIAL #FLDS=01	Input 1 field (wind speed from master) Place it in location 00
DLOC1=00	
DISPLAY VAL SLOC= 00	Take wind speed measurement from source location 00
SCRN= 0 ROW=0 COL= 00 WIDTH=8 DECPT=1	Display on screen 0 Top row on screen Leftmost column of screen Occupy 8 spaces Display to one decimal place
PGM END	End of program in Remote unit

IMPORTANT NOTES:

When the 26700 is set to NUM ONLY INP (see section 2.2 SET COMM), the unit will NOT respond to most serial communication control commands.

If you use the 26700 with your own serial communications software (other than RMYCOMM), refer to the DOS version README.TXT file for information on commands and their functions. Also, your communications software MUST provide a 0.1 second delay at the end of each line sent to the 26700. This is especially important when sending a user program.

6.0 ERROR MESSAGES

When an error occurs during OPERATE mode, the 26700 generates a code identifying the specific type of error. If STOP ON ERROR is set to ON (see section 2.2 SET ERROR HANDLE) and an error occurs, the 26700 will stop operation and display the type of error and the instruction number where it occurred. If STOP ON ERROR is set to OFF and an error occurs, the 26700 continues to operate without stopping. See the IF ERR CODE and L = ERR CODE instructions for information on detecting errors when STOP ON ERROR is OFF. The following list summarizes each error type and its error code value:

The 26700 has program instructions allowing it to send and receive measurement values in real-time while in OPERATE mode. These are INP SER and the SER BUF group.

Here is an example of a system using two 26700 Translators. The first 26700 (Local) makes wind speed measurements, displays them, and sends them to the other 26700 (Remote). The Remote unit functions only as a remote display.

The Local unit program:

INP WIND SPD CHAN= 00	Measure wind speed on module 0, channel 0
--------------------------	--

1 ADC ERROR indicates that the analog-to-digital converter (ADC) chip on the module in question has taken too long to make a conversion or produced an error code of its own. The Temperature Module can cause this error if it is operated without a sensor connected.

If the ADC error source is anything other than a temperature measurement instruction to an unconnected temperature input channel, contact your supplier.

2 MODULE MISSING indicates that the instruction number shown in the error message refers to a module which is not present. Make sure that the module is actually installed. If it is, check the two digit CHAN parameter in the instruction. It should

agree with the module to which the instruction refers. Make sure two or more of the same module type with the same module number are not installed.

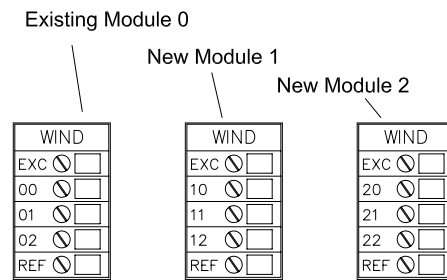
- 3 **DIVIDE BY ZERO** indicates that an instruction is attempting to divide by zero. Check values or parameters that would cause this to occur in the instruction showing the error.
- 4 **ELSE WITHOUT IF** indicates an ELSE statement without a matching IF statement is being used. Check the program listing to find where the missing IF needs to be entered or delete the offending ELSE.
- 5 **END IF WITHOUT IF** indicates an END IF statement without a matching IF is being used. Check the program listing to find where the missing IF needs to be added or delete the offending END IF.
- 6 **INVALID DATA** indicates that a value is unacceptable. For example, if both values for the ATAN2 instruction are 0.0, this error will be generated. Check the values or parameters for the instruction showing the error.
- 7 **INVALID PARAMETER** indicates some parameter is unacceptable in the instruction showing the error. For example, displaying a value in row 5 on the screen will cause this error since only rows 0 and 1 are valid.
- 8 **TIMEOUT ERROR** indicates that the time required for the program to execute all of its instructions exceeds the sample interval time. Either increase the sample interval or eliminate instructions.
- 9 **SUBROUTINE WITHOUT END** indicates that a subroutine has no matching SUBR END statement. Insert the needed SUBR END statement or delete the offending SUBR statement.
- 10 **CALL WITHOUT SUBROUTINE** indicates a call was made to a nonexistent subroutine. Make sure the number of the subroutine matches the number of the subroutine being called.
- 11 **END WITHOUT SUBROUTINE** indicates a SUBR END statement has no matching SUBR statement. Insert the needed SUBR statement or delete the offending SUBR END statement.
- 12 **DATA OVERRUN** indicates the data being loaded in either the serial or printer output buffers exceeds their capacity. Either increase the buffer size in SETUP or make sure the data stays within the buffer size limit.
- 13 **SERIAL INPUT ERROR** indicates that an incorrect number of fields has been received by the INP SERIAL instruction. The number of fields transmitted must agree with the number expected as set by the #FLDS parameter in the INP SERIAL instruction.
- 14 **IF WITHOUT END IF** indicates an IF statement is being used without a matching END IF statement. Check the program listing to find where the missing END IF needs to be entered or delete the offending IF.
- 15 **PRINTER ERROR** indicates the following possible conditions: printer off-line, out of paper, cable disconnected, printer is off or has no power.
- 16 **DATA OFF-SCALE** indicates that values sent to the OUTPUT mV or OUTPUT mA instructions exceed the allowable output range.

7.0 INSTALLING PLUG-IN MODULES

Additional modules are easily installed in the 26700. Modules are available from your YOUNG representative. To install a new module, follow these steps (make sure power is off):

1. Check the module number against modules of the same type already installed. The first digit of the new module (0, 1, 2 or 3) should be different. (See following diagram)
2. Remove 4 screws securing back panel. Remove back panel; sensor wires can remain attached.
3. Carefully plug new circuit module into next available slot in translator mother board. Be sure connector is fully inserted.
4. Remove filler door covering back panel opening.
5. Replace back panel and screws.
6. Connect sensor wires to new module.

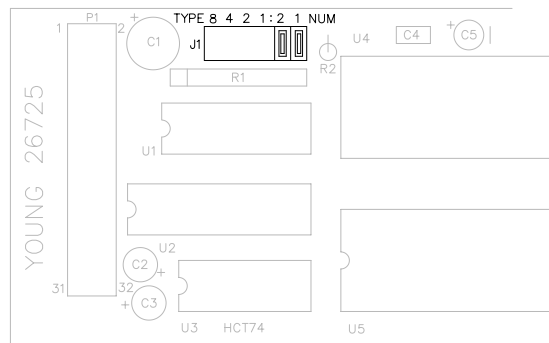
Additional program instructions may be required when modules are added. Be sure to use the correct two-digit channel number when setting instruction parameters.



Example showing installation of 2 additional WIND Modules. Note the input labels.

Modules ordered with your original system are configured and properly labeled. When ordering moduled individually, be sure to indicate whether they are replacements or are being added to an existing 26700. With that information, we can properly configure the module and apply the correct label before it is shipped.

If your organization keeps a stock of modules and frequently arranges them in multi-module configurations, plan to stock appropriate labels. Also jumpers identifying the module must be correctly set. See the drawing below.



8.0 OPTION JUMPERS

There are 6 staking pin type jumpers on the Model 26724 POWER SUPPLY module that establish several default conditions when power is applied. Their functions are outlined below.

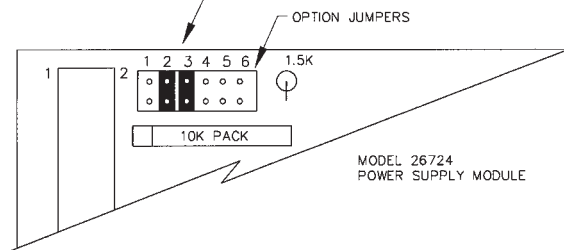
JUMPER FUNCTIONS

- | | |
|-------|---|
| 1 | First power-up override. Factory only. Do not use. |
| | Baud rate |
| 2 & 3 | 2 & 3 - 9600 baud |
| | 2 - 4800 baud |
| | 3 - 2400 baud |
| | none - 1200 baud |
| 4 | Force first power-up reset. Factory only. Do not use. |
| 5 | Force auto-start to OPERATE mode on power-up. |
| 6 | Force auto-start to OPERATE mode on power-up & lock out key switches. |

Configuring the jumpers should be performed only by a qualified technician.

To access the OPTION JUMPERS, disconnect the power source, remove the 4 screws holding the top cover and remove it. The Power Supply module is the one that connects to the power source (wall adapter or otherwise). The OPTION JUMPERS are along the top edge of the circuit board toward the front of the unit and appear as shown in the illustration below. Configure the shorting blocks to the desired pattern then replace the top cover and screws. Re-connect the power source.

JUMPER	1	2 & 3 =	BAUD	4	5	6
BYPASS	0	0	1200	FORCE	FORCED	LOCK
FIRST	0	1	2400	FIRST	AUTO	OUT
POWERUP	1	0	4800	POWERUP	START	KEY
RESET	1	1	9600	RESET		SWITCHES



9.0 WARRANTY

This product is warranted to be free of defects in materials and construction for a period of 12 months from date of initial purchase. Liability is limited to repair or replacement of defective item. A copy of the warranty policy may be obtained from R. M. Young Company.

10.0 CE COMPLIANCE

This product, has been tested and shown to comply with European CE requirements for the EMC Directive (see Declaration of Conformity below). Please note that shielded cable and Model 26760 RF Suppression Kit (or equivalent) must be used.

Declaration of Conformity

Application of Council Directives:
89/336/EEC

Standards to which Conformity is Declared:
EN 50081-1
EN 55022 (CISPR 22 class A)
EN 50082-1 (IEC 801-2, 3, 4)

Manufacturer's Name and Address:
R. M. Young Company
Traverse City, MI, 49686, USA

Importer's Name and Address:
See Shipper or Invoice

Type of Equipment:
Meteorological Instruments

Model Number / Year of Manufacture:
26700/1996

I, the undersigned, hereby declare that the equipment specified conforms to the above Directives and Standards.

Date / Place:
Traverse City, Michigan, USA February 19, 1996

David Poinsett

David Poinsett
R & D Manager, R. M. Young Company

11.0 REPLACING THE BACKUP BATTERY

When the 26700 is not powered, the realtime clock, recorded data, user program, and setup parameters are maintained by a lithium battery on the backside of the microprocessor module. Each time the unit is powered up, the battery condition is checked and displayed momentarily on the screen. The battery is also checked periodically during operation and the 26700 will beep once per minute if the battery needs replacing.

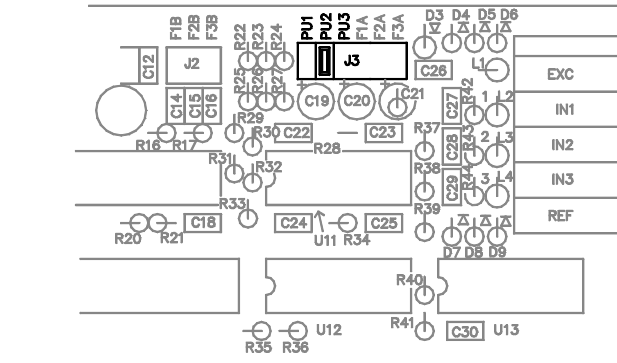
When indicated, the battery should be replaced by a qualified technician. To replace the battery:

1. Disconnect all power.
2. Remove the 26700 back panel.
3. Remove the Microprocessor Module. (It has the DB-9 connector on it.)
4. Carefully remove the lithium battery from its holder.
5. Place the new battery (type DL-2450) in the holder.
6. Carefully replace the microprocessor module in the case. Be sure the board connector is fully inserted and properly seated.
7. Replace the 26700 back panel.
8. Reconnect power.

The 26700 realtime clock will need to be reset (see section 2.2 SET TIME/DATE) and the user program and setup parameters reentered (see sections 2.2 SETUP, 3.0 PROGRAMMING, or 5.0 SERIAL COMMUNICATIONS). Any data recorded prior to replacing the battery should be considered invalid.

12.0 WIND MODULE JUMPERS

The 26725 WIND module is normally connected to just one wind sensor such as the YOUNG Wind Monitor. When connected this way, channel x0 is configured as the wind speed input and channel x1 is configured for wind direction input. ("x" is the WIND module number.) Even though each input, x0 and x1, may be connected to a wind speed or direction signal, a special jumper must be set for inputs used with wind direction. These jumpers, part of J3 and labeled PU1, PU2 and PU3 in the drawing below, provide a special "pull-up" signal when the wind direction sensor is in its deadband.



nei x2. Insert a jumper for each channel that is used as wind direction input. Omit the jumper for each channel used as a wind speed input. Failure to set the pull-up jumper may result in unpredictable behavior for either wind speed or direction measurements. Of course, for proper operation, the appropriate program instruction must also be used.

The 26725 WIND module may also be connected to the tipping bucket rain gauge such as the YOUNG Model 52202. The IMP-PRECIP-T instruction expect this type of connection. Pull-up jumpers on the WIND module can provide the excitation voltage for the tipping switch so normally a jumper is set for each channel used with this type of rain gauge.

APPENDIX A

SPECIFICATIONS - 26700 SERIES PROGRAMMABLE TRANSLATOR

Dimensions 3.1 in (79 mm)H x 8.5 in (216 mm)W x 8.8 in (224 mm)D
Weight: Base Unit 2.8 lb (1.26 kg), Each Module 0.22 lb (0.10 kg)
Construction: Aluminum case, thermoplastic front and back panels.
Operating Temp/Humidity: 0° C to 50° C, 0 to 95% RH (non-condensing).
Storage Temperature: -30° C to 80° C
Display: 2 rows x 16 columns alpha-numeric LCD with back-lighting
Power Requirements: 7 - 30 VDC, 9W
24VDC wall adapter supplied, UL & CSA or VDE listed
Serial Interface: RS-232, 9-pin, 300 to 9600 baud, 9600 baud default
Record Memory: 24,000 data points with battery back-up. Values are stored as single precision floating point numbers, Value range : -3.4E-38 to 3.4E38, Approx 6-digit precision (Base 10).

Modules: 5 available slots for modules. Modules may be used in any combination. Up to 4 of any module type may be used in the same enclosure. The specifications listed below are for the modules only and do not represent the accuracy of the sensors to which they are connected.

26725 Wind Speed/Direction Input:
3 input channels per module. Each channel may be configured for wind speed or wind direction. Wind speed channel may be configured for voltage or frequency input through software instructions.
Frequency Input (low level sine or square wave, 4KHz max), internal counter has 16-bit capacity
(0 to 65,535) Voltage Input Range 0 to 5VDC for wind speed or direction, 10-bit resolution and accuracy (1/1023). 5.00VDC excitation for wind direction sensors

26726 Temperature Input:
2 channels per module. Software configurable for 100 ohm DIN or 1000 ohm RTD sensors. Scaling and offset also software configurable (°F and °C std). 60 Hz rejection, 5 ppm/°C tempco. ±0.01°C resolution, ±0.03°C uncalibrated accuracy.

26727 Voltage Input:
Software configurable as 4 single ended, 2 single ended and 1 differential, or 2 differential inputs per module. Input range, multiplier, and offset also software configurable. ±12-bit resolution (±1/4095), 0.1% uncalibrated accuracy, 15 ppm/°C tempco.
Input Ranges: ±50mV, ±500mV, ±5000mV

26728 Voltage Output:
4 channels per module. Output range -5000mV to +5000mV. 14-bit resolution (0.6mV). 0.1% uncalibrated accuracy, 15 ppm/°C tempco.

26729 Current Output:
4 channels per module. Output range 0 to 24mA. 14-bit resolution (0.001mA). 0.1% uncalibrated accuracy, 15 ppm/°C tempco. Maximum load resistance is 300 ohms for each output.

26730 Alarm/Relay Module:
4 relays per module. Contacts rating : 5A resistive, 2A inductive @ 24 VAC, 30 VDC

26731 Parallel Printer Module:
Output for standard parallel printer. Cable included

26732 Current Input:
Same as 26727 Voltage Input module except all 4 input channels configured for single ended current input.
Input Range 0 to 22mA.

APPENDIX B

PROGRAM EXAMPLES

The following sample program measures Wind Speed, Wind Direction, Temperature and Relative Humidity. It contains useful programming examples. The actual program in your unit may be different.

Comments are added here for clarity.

Instruction Number	Name/Parameters	Comment
1	IF TIME INTR mins=60	If time is at the top of the hour
2	FLAG flag#=7 fcond=set	Set flag number 7.
3	END IF	
4	INP WIND SPD chan=00 type=05103 unit=MPH mult=0.21922 offs=0.00000 dloc=00	Input a wind speed signal from Wind Input module 0, channel 0. Sensor is a Young Model 05103. Measurement units are miles per hour. Multiplier for MPH units. Offset is zero. Store measurement in location 00.
5	AVERAGE sloc=00 dloc=01 #samp=00060	Calculate the average of the value in location 00 and store the result in location 01. Use 60 samples to calculate average.
6	DISPLAY VAL sloc=00 scrn=0 row=0 col=03 width=5 decpt=0	Display the instantaneous wind speed from location 00 on screen 0, row 0, column 3, using 5 spaces with no decimal point.
7	DISPLAY VAL sloc=01 scrn=0 row=0 col=08 width=4 decpt=0	Display the average wind speed from location 01 on screen 0, row 0, column 8, using 4 spaces with no decimal point.
8	IF FLAG flag#=7 fcond=set	If flag 7 is set (top of the hour has occurred)
9	AVERAGE sloc=00 dloc=02 #samp=03600	Calculate the average wind speed from location 00 and store the result in location 02. Use 3600 samples to calculate the average.
10	MAXIMUM sloc=00 dloc1=03 dloc2=04 #samp=03600	Calculate the maximum wind speed from location 00. Store the current maximum in location 03. Store the last maximum value in location 04. Use 3600 samples to calculate the maximum.
11	DISPLAY VAL sloc=03 scrn=0 row=0	Display the current maximum from location 03 on screen 0, row 1,

	col=12 width=4 decpt=0	column 12, using 4 spaces with no decimal point.
12	END IF	
13	INP WIND DIR chan=01 mult=1.00000 offs=0.00000 dloc=10	Measure wind direction from Wind Input module 0, channel 1. Use a multiplier of 1, an offset of 0, and send the result location 10.
14	AVERAGE WD sloc=10 dloc=11 #samp=00060	Calculate the average wind direction from location 10. Put the result in location 11. Use 60 samples to calculate it.
15	STD DEV WD sloc=10 dloc=12 #samp=00060	Calculate the standard deviation of wind direction from location 10 and store the result in location 12. Use 60 samples for the calculation.
16	DISPLAY VAL sloc=10 scrn=1 row=0 col=04 width=4 decpt=0	Display the wind direction from location 10 on screen 1, row 0, column 4, using 4 spaces with no decimal point.
17	DISPLAY VAL sloc=11 scrn=1 row=0 col=08 width=4 decpt=0	Display the average wind direction from location 11 on screen 1, row 0, column 8, using 4 spaces with no decimal point.
18	DISPLAY VAL sloc=12 scrn=1 row=0 col=12 width=4 decpt=0	Display the std deviation of wind direction from location 12 on screen 1, row 0, column 12, using 4 spaces with no decimal point.
19	IF FLAG flag#=7 fcond=set	If flag 7 is set (top of the hour has occurred)
20	AVERAGE WD sloc=10 dloc=13 #samp=03600	Calculate the average wind direction from location 10. Put the result in location 13. Use 3600 samples to calculate the average.
21	STD DEV WD sloc=10 dloc=14 #samp=03600	Calculate the std deviation of wind direction from location 10. Put the result in location 14. Use 3600 samples to calculate the std deviation.
22	END IF	
23	INP VOLTAGE chan=00 type=diff range=5000mV mult=0.18000 offs=-58.000 dloc=20	Input the temperature voltage signal from voltage input module 0, channel 0. Measurement is differential. Input Range is ± 5000 mV. Multiplier is 0.18 (for Fahrenheit). Offset is -58 (for Fahrenheit). Put temperature measurement in location 20.

24	<pre> DISPLAY VAL sloc=20 scrn=2 row=0 col=03 width=5 decpt=1 </pre>	<p>Display temperature from location 20 on screen 2, row 0, column 3, using 5 spaces with 1 decimal place.</p>
25	<pre> IF FLAG flag#=7 fcond=set </pre>	<p>If flag 7 is set (top of the hour has occurred)</p>
26	<pre> AVERAGE sloc=20 dloc=21 #samp=03600 </pre>	<p>Calculate the average temperature from the values in location 20. Store the result in location 21 . Use 3600 samples to calculate the average.</p>
27	<pre> MINIMUM sloc=20 dloc1=22 dloc2=23 #samp=03600 </pre>	<p>Calculate the minimum temperature from location 20. Store the current minimum in location 22. Store the last minimum in location 23 Use 3600 samples the calculate the minimum temperature.</p>
28	<pre> MAXIMUM sloc=20 dloc1=24 dloc2=25 #samp=03600 </pre>	<p>Calculate the maximum temperature from location 20. Store the current maximum in location 24. Store the last maximum in location 25. Use 3600 samples to calculate the maximum temperature.</p>
29	<pre> DISPLAY VAL sloc=22 scrn=2 row=0 col=08 width=4 decpt=0 </pre>	<p>Display the current minimum temperature from location 22 on screen 2, row 0, column 8, using 4 spaces with no decimal point.</p>
30	<pre> DISPLAY VAL sloc=24 scrn=2 row=0 col=12 width=4 decpt=0 </pre>	<p>Display the current maximum temperature from location 24 on screen 2, row 0, column 12, using 4 spaces with no decimal point.</p>
31	<pre> END IF </pre>	
32	<pre> INP VOLTAGE chan=02 type=diff range=5000mV mult=0.10000 offs=0.00000 dloc=40 </pre>	<p>Input the RH voltage signal from Voltage Input module 0, channel 1. Measurement is differential. Input range is ± 5000 mV. Multiplier is 0.1 for 0 to 100% RH. Offset is 0. Store result in location 40.</p>
33	<pre> DISPLAY VAL sloc=40 scrn=3 row=0 col=04 width=4 decpt=0 </pre>	<p>Display the RH value from location 40 on screen 3, row 0, column 4, using 4 spaces with no decimal point.</p>
34	<pre> IF FLAG flag#=7 fcond=set </pre>	<p>If flag 7 is set (top of the hour has occurred)</p>
35	<pre> AVERAGE sloc=40 dloc=41 #samp=03600 </pre>	<p>Calculate the average RH from location 40. Store the result in location 41 . Use 3600 samples to calculate the average RH.</p>

36	<pre> MINIMUM sloc=40 dloc1=42 dloc2=43 #samp=03600 </pre>	<p>Calculate the minimum RH from location 40. Store the current minimum in location 42. Store the last minimum in location 43 Use 3600 samples to calculate the minimum RH.</p>
37	<pre> MAXIMUM sloc=40 dloc1=44 dloc2=45 #samp=03600 </pre>	<p>Calculate the maximum RH from location 40. Store the current maximum in location 44. Store the last maximum in location 45. Use 3600 samples to calculate the maximum RH.</p>
38	<pre> DISPLAY VAL sloc=42 scrn=3 row=0 col=08 width=4 decpt=0 </pre>	<p>Display the current minimum RH from location 42 on screen 3, row 0, column 8, using 4 spaces with no decimal point.</p>
39	<pre> DISPLAY VAL sloc=44 scrn=3 row=0 col=12 width=4 decpt=0 </pre>	<p>Display the current maximum RH from location 44 on screen 3, row 0, column 12, using 4 spaces with no decimal point.</p>
40	<pre> END IF </pre>	
41	<pre> IF TIME INTR mins=60 </pre>	<p>If the time is at the top of the hour</p>
42	<pre> RECORD TIME frmt=mm-dd </pre>	<p>Record the month and day.</p>
43	<pre> RECORD TIME frmt=hh:mm </pre>	<p>Record the hours and minutes.</p>
44	<pre> RECORD VALUE sloc=02 </pre>	<p>Record the average wind speed from location 02.</p>
45	<pre> RECORD VALUE sloc=04 </pre>	<p>Record the maximum wind speed from location 04.</p>
46	<pre> RECORD VALUE sloc=13 </pre>	<p>Record the average wind direction from location 13.</p>
47	<pre> RECORD VALUE sloc=14 </pre>	<p>Record the std deviation of wind direction from location 14.</p>
48	<pre> RECORD VALUE sloc=21 </pre>	<p>Record the average temperature from location 21.</p>
49	<pre> RECORD VALUE sloc=23 </pre>	<p>Record the minimum temperature from location 23.</p>
50	<pre> RECORD VALUE sloc=25 </pre>	<p>Record the maximum temperature from location 25.</p>
51	<pre> RECORD VALUE sloc=41 </pre>	<p>Record the average RH from location 41.</p>
52	<pre> RECORD VALUE sloc=43 </pre>	<p>Record the minimum RH from location 43.</p>
53	<pre> RECORD VALUE sloc=45 </pre>	<p>Record the maximum RH from location 45.</p>
54	<pre> END IF </pre>	

Typical program as it appears when uploaded using the CTRL-U command:

CODE								DESCRIPTION
8233								Program header code
17	60							If time interval
12	7	1						Flag set
11								End if
24	00	1	1	0.21922	0.00000	00		Input wind speed
1	00	01	00060					Calculate avg wind speed
9	00	0	0	03	5	0		Display wind speed
9	01	0	0	08	4	0		Display avg wind speed
13	7	1						If flag set
1	00	02	03600					Calculate average wind speed
31	00	03	04	03600				Calculate max wind speed
9	03	0	0	12	4	0		Display max wind speed
11								End if
23	01	1.00000	0.00000	10				Input wind direction
2	10	11	00060					Calculate avg wind direction
50	10	12	00060					Calculate std dev of wind direction
9	10	1	0	04	4	0		Display wind direction
9	11	1	0	08	4	0		Display avg wind direction
9	12	1	0	12	4	0		Display std dev of wind direction
13	7	1						If flag set
2	10	13	03600					Calculate avg wind direction
50	10	14	03600					Calculate std dev of wind direction
11								End if
22	00	1	0	0.18000	-58.000	20		Input voltage as temperature
9	20	2	0	03	5	1		Display temperature
13	7	1						If flag set
1	20	21	03600					Calculate avg temperature
32	20	22	23	03600				Calculate min temperature
31	20	24	25	03600				Calculate max temperature
9	22	2	0	08	4	0		Display current min temperature
9	24	2	0	12	4	0		Display current max temperature
11								End if
22	02	1	0	0.10000	0.00000	40		Input voltage as RH
9	40	3	0	04	4	0		Display RH
13	7	1						If flag set
1	40	41	03600					Calculate avg RH
32	40	42	43	03600				Calculate min RH
31	40	44	45	03600				Calculate max RH
9	42	3	0	08	4	0		Display current min RH
9	44	3	0	12	4	0		Display current max RH
11								End if
17	60							If time interval (60 minutes)
40	8							Record time (month and day)
40	3							Record time (hour and minute)
41	02							Record avg wind speed
41	04							Record max wind speed
41	13							Record avg wind direction
41	14							Record std dev of wind direction
41	21							Record avg temperature
41	23							Record min temperature
41	25							Record max temperature
41	41							Record avg RH
41	43							Record min RH
41	45							Record max RH
11								End if
0								End of program

Continued on next page...

CODES	DESCRIPTION	CODES	DESCRIPTION
00144	144 Records	9	Field 17
14	14 Fields	1	
R M YOUNG	Record Header 1	FLDLABEL1	
26700 SERIES	Record Header 2	FLDLABEL2	
5	Field 1 Width	9	Field 18
0	Field 1 Decimal	1	
DATE	Field 1 Label 1	FLDLABEL1	
MON	Field 2 Label 2	FLDLABEL2	
5	Field 2	9	Field 19
0		1	
DATE		FLDLABEL1	
DAY		FLDLABEL2	
5	Field 3	9	Field 20
0		1	
TIME		FLDLABEL1	
HR		FLDLABEL2	
5	Field 4	9	Field 21
0		1	
TIME		FLDLABEL1	
MIN		FLDLABEL2	
7	Field 5	9	Field 22
1		1	
WS:AVG		FLDLABEL1	
MPH		FLDLABEL2	
7	Field 6	9	Field 23
0		1	
WS:MAX		FLDLABEL1	
MPH		FLDLABEL2	
7	Field 7	9	Field 24
0		1	
WD:AVG		FLDLABEL1	
DEG		FLDLABEL2	
7	Field 8	9	Field 25
0		1	
WD:SDV		FLDLABEL1	
DEG		FLDLABEL2	
7	Field 9	MPH	Screen 0,
1		WIND ins avg max	
T:AVG		1	
DEG F		DIR	Screen 1
7	Field 10	WIND deg avg sdv	
1		_F	Screen 2
T:MIN		TEMP ins min max	
DEG F		RH%	Screen 3
7	Field 11	HUM ins min max	
1		UNUSED	Screen 4
T:MAX		SCREEN 4	
DEG F		UNUSED	Screen 5
7	Field 12	SCREEN 5	
0		UNUSED	Screen 6
RH:AVG		SCREEN 6	
%		UNUSED	Screen 7
7	Field 13	SCREEN 7	
0		UNUSED	Screen 8
RH:MIN		SCREEN 8	
%		UNUSED	Screen 9
7	Field 14	SCREEN 9	
0		CODES	DESCRIPTION
RH:MAX			
%			
9	Field 15	1	Serial Buffer End
1			Code
FLDLABEL1		0	Leading Zero Flag
FLDLABEL2			
9	Field 16		
1			
FLDLABEL1			
FLDLABEL2			

APPENDIX C

PROGRAM WORKSHEETS

Copy the blank worksheets and fill in the copies as needed.

26700 Display Worksheet

Screen Number

Row

	Column															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0																
1																

Screen Number

Row

	Column															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0																
1																

Screen Number

Row

	Column															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0																
1																

Screen Number

Row

	Column															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0																
1																

Screen Number

Row

	Column															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0																
1																

26700 Temporary Storage Location Worksheet

Loc	Contents	Loc	Contents	Loc	Contents	Loc	Contents
00		25		50		75	
01		26		51		76	
02		27		52		77	
03		28		53		78	
04		29		54		79	
05		30		55		80	
06		31		56		81	
07		32		57		82	
08		33		58		83	
09		34		59		84	
10		35		60		85	
11		36		61		86	
12		37		62		87	
13		38		63		88	
14		39		64		89	
15		40		65		90	
16		41		66		91	
17		42		67		92	
18		43		68		93	
19		44		69		94	
20		45		70		95	
21		46		71		96	
22		47		72			
23		48		73			
24		49		74			

APPENDIX D

MENU STRUCTURE & PROGRAM INSTRUCTIONS

OPERATE

SETUP

SET TIME/DATE
SET SAMPLE INTERVAL
ENTER/EDIT PROGRAM
ERASE PROGRAM
SET RECORDER
 SET HEADER 1
 SET HEADER 2
 FIELDS PER RECORD
 RECORDS
 SET FIELDS
 FIELD NUMBER
 WIDTH
 DECPT
 LABEL
 CLEAR RECORDS
SET SCROLL
 SCROLL (Y/N)
 INTERVAL
 END SCREEN
 SET SCREEN TEXT
 SCREEN NUMBER
SET COMM
 BAUD RATE
 DATA BITS
 PARITY
 BUFFER LENGTH
 BUFFER END
 ECHO (Y/N)
 LEAD 0s (Y/N)
 INIT STR LEN
 INIT STR
 NUM ONLY INP
 MAX SER ERRS
SET PRINTER
 LINE LENGTH
 PAGE LENGTH
 INIT STR LEN
 INIT STR
SET AUTO-START
SET ERROR HANDLE
SET AUTO LABEL CHANGE
SET ACCESS LEVEL
 FULL
 PARTIAL
 NONE

TEST

TEST LCD
TEST RAM
TEST ROM
TEST PROGRAM CHECKSUM
TEST SERIAL I/O
TEST PRINTER
TEST VOUTPUT
TEST V INPUT
TEST I OUTPUT
TEST I INPUT
TEST WIND INPUT
TEST TEMP INPUT
TEST RELAYS
TEST BEEP

RESET
TEST OPTION BLOCK

Codes for program instructions as they appear when retrieved with the CNTL-U command.

CODE PROGRAM INSTRUCTION

57 ALARM
58 ALARM WD
63 AQ STATS
 1 AVERAGE
 2 AVERAGE WD
66 AVG MOV
67 AVG WD MOVE
 3 BEEP
 4 CHANGE TO SCREEN
 5 DISPLAY FLAGS
 6 DISPLAY NESW
 7 DISPLAY TEXT
 8 DISPLAY TIME
 9 DISPLAY VALUE
10 ELSE
11 END IF
12 FLAG
61 IF ERR CODE
13 IF FLAG
14 IF KEYSWITCH
15 IF L1 ? L2 (<,<=,>,>=,<>=)
16 IF L ? VALUE (<,<=,>,>=,<>=)
17 IF TIME INTERVAL
18 INPUT CURRENT (mA)
19 INPUT FREQUENCY
59 INP PRECIP-T
60 INP PRECIP-S
20 INPUT SERIAL
64 INP SER NMEA
21 INPUT TEMP
22 INPUT VOLTAGE
23 INPUT WIND DIRECTION
24 INPUT WIND SPEED
25 L1 OPER L2 (+,-,*,/, power, mod)
26 L OPER VALUE (+,-,*,/, power, mod)
62 L=SCREEN
27 L1 = F (L2) (cos, sin, acos, asin, atan, dewpt, wet bulb, wind chill)
28 L1 = L2
65 L=SCREEN
29 L = TIME
30 L = VALUE
31 MAXIMUM
32 MINIMUM
33 OUTPUT mA
34 OUTPUT mV
35 PRINT BUFFER NESW
36 PRINT BUFFER OUT
37 PRINT BUFFER TEXT
38 PRINT BUFFER TIME
39 PRINT BUFFER VALUE
40 RECORD TIME
41 RECORD VALUE
42 RELAY
43 SERIAL BUFFER CHECKSUM
44 SERIAL BUFFER NESW
45 SERIAL BUFFER OUT
46 SERIAL BUFFER TEXT
47 SERIAL BUFFER TIME
48 SERIAL BUFFER VALUE
49 STANDARD DEVIATION
50 STANDARD DEVIATION - WD
51 SUBROUTINE BEGIN
52 SUBROUTINE CALL
53 SUBROUTINE END
54 UVW CORRECTIONS
55 UVW VECTOR
56 WIND DIRECTION - 540

APPENDIX E

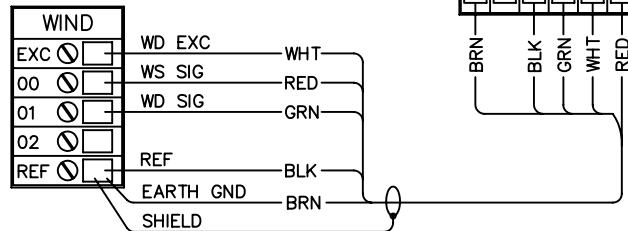
WIRING DIAGRAMS

The 26700 Series Translator works with all YOUNG sensors and sensor combinations. Many other sensor types can be connected directly to the unit. A separate wiring list printout is sent with each 26700 showing the exact terminal connections for the unit ordered. Use the printout along with the following examples when connecting both YOUNG sensors and those from other manufacturers. Color code shown depicts wiring using YOUNG supplied cables. Refer to sensor instruction manual for specifics regarding sensors.

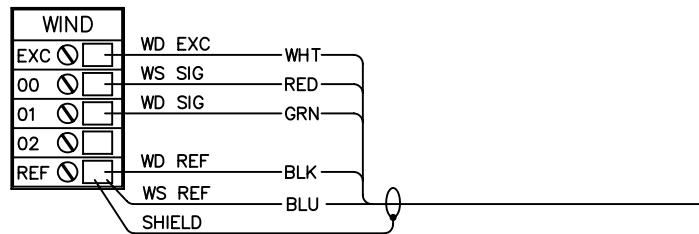
Note: Earth ground connection to ground terminal (\perp) on back of 26700 Translator required.

TYPICAL SENSOR WIRING CONNECTIONS

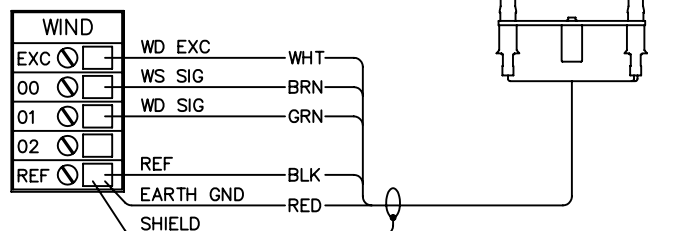
WIND MONITOR
05103, 05305, 05701



WIND MONITOR
05106

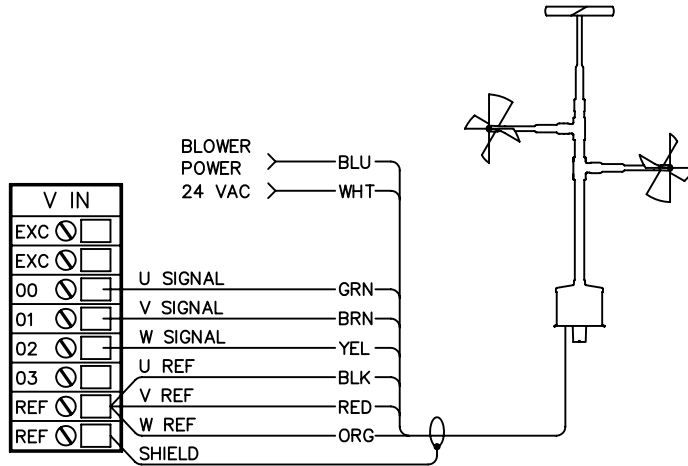


MICROVANE & 3-CUP
ANEMOMETER
12002, 12005,



TYPICAL SENSOR WIRING CONNECTIONS

UVW ANEMOMETER
27005/27005T

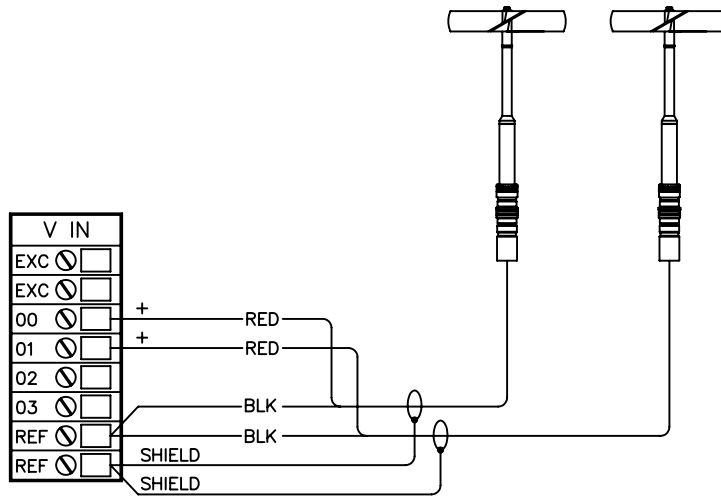


PROPELLER
ANEMOMETERS
27106

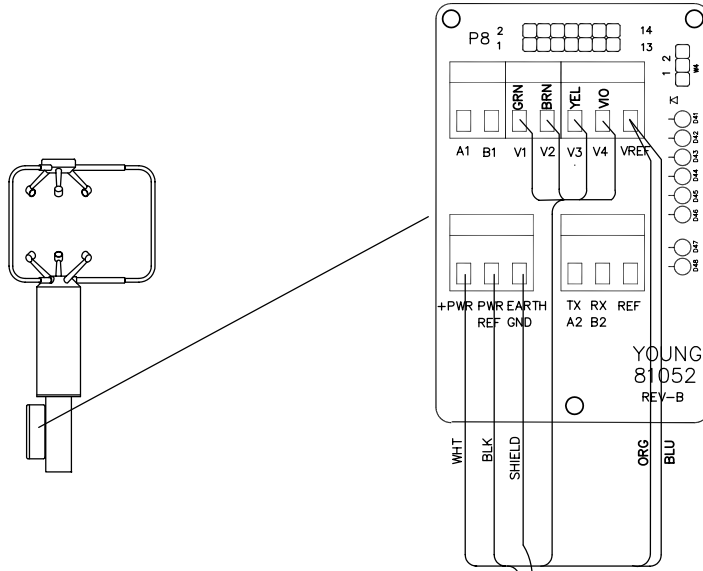
OR

CUP ANEMOMETERS
12102

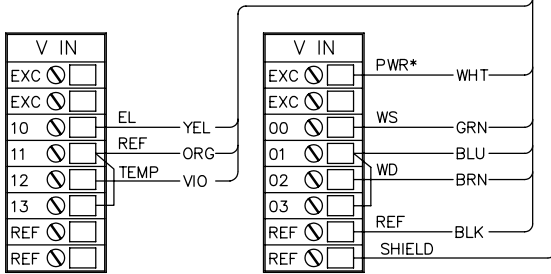
(UP TO 4 MAY
BE CONNECTED)



TYPICAL SENSOR WIRING CONNECTIONS

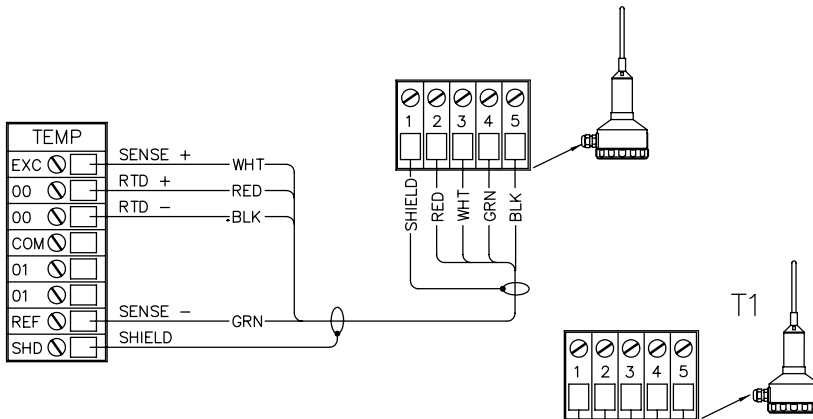


ULTRASONIC ANEMOMETER 81000
(USING VOLTAGE OUTPUTS)



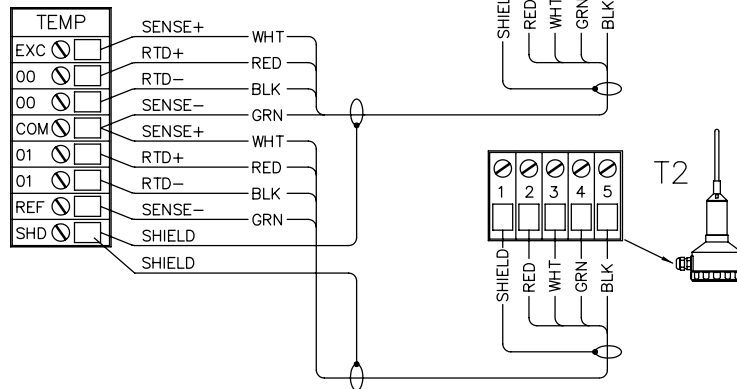
*NOTE:
TOTAL POWER REQUIRED BY ALL SENSORS PLUS 26700 MUST NOT EXCEED POWER RATING OF A.C. ADAPTER 18822/18822H OR SEPARATE POWER SOURCE REQUIRED.

PLATINUM RTD TEMPERATURE PROBE 41342



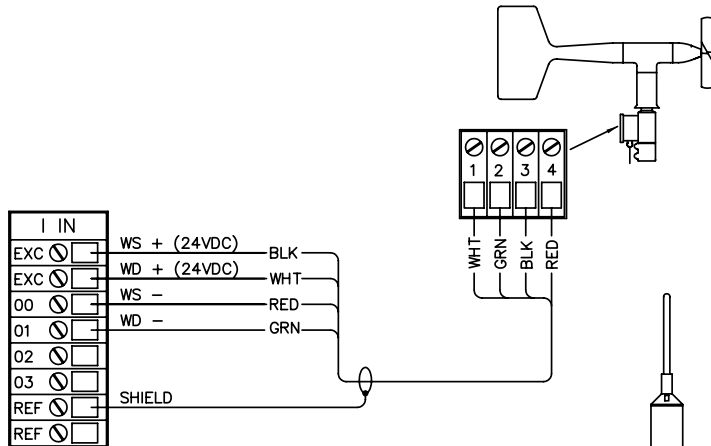
TWO PLATINUM RTD TEMPERATURE PROBES 41342

FOR DELTA T APPLICATIONS 43408 ASPIRATED SHIELD IS RECOMMENDED

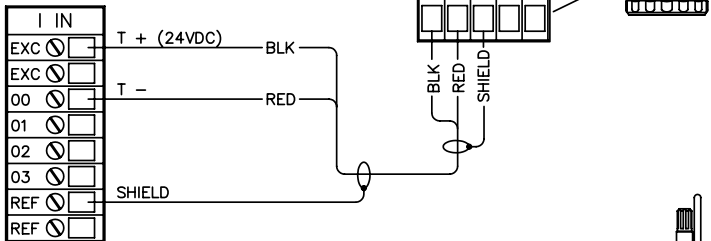


TYPICAL SENSOR WIRING CONNECTIONS

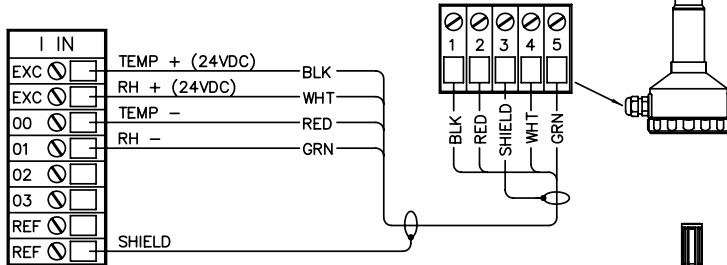
WIND SENSOR
WITH 4-20mA OUTPUTS



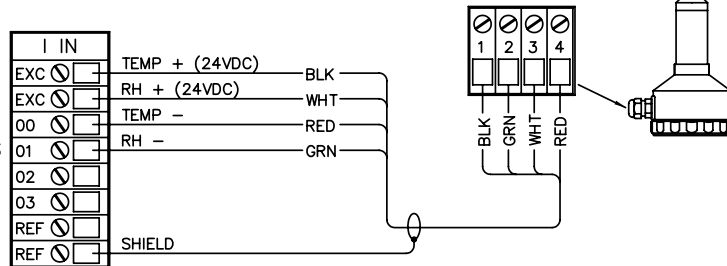
TEMPERATURE PROBE
WITH 4-20mA OUTPUT
41342LC



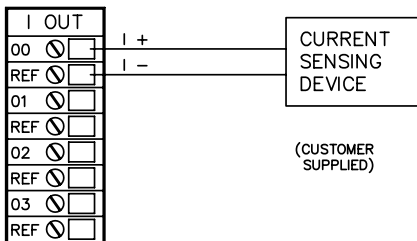
RELATIVE HUMIDITY/
TEMPERATURE PROBE
WITH 4-20mA OUTPUTS
41372LC



RELATIVE HUMIDITY/
TEMPERATURE PROBE
WITH 4-20mA OUTPUTS
41382LC

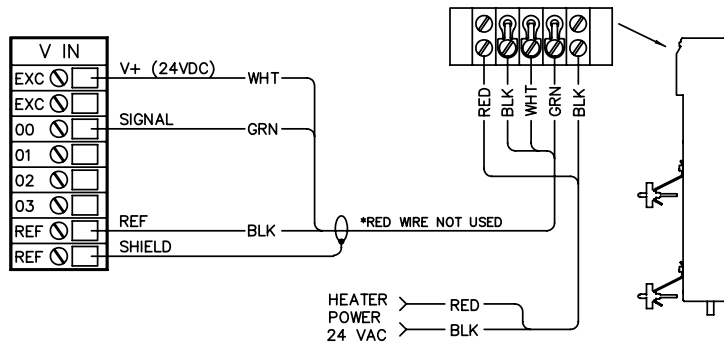


CURRENT OUTPUT
(GENERAL)

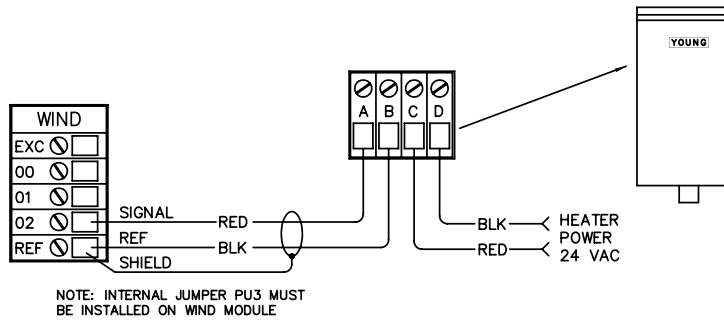


TYPICAL SENSOR WIRING CONNECTIONS

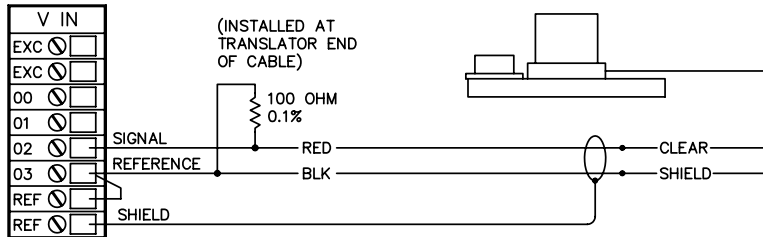
PRECIPITATION GAUGE
50202, 50203



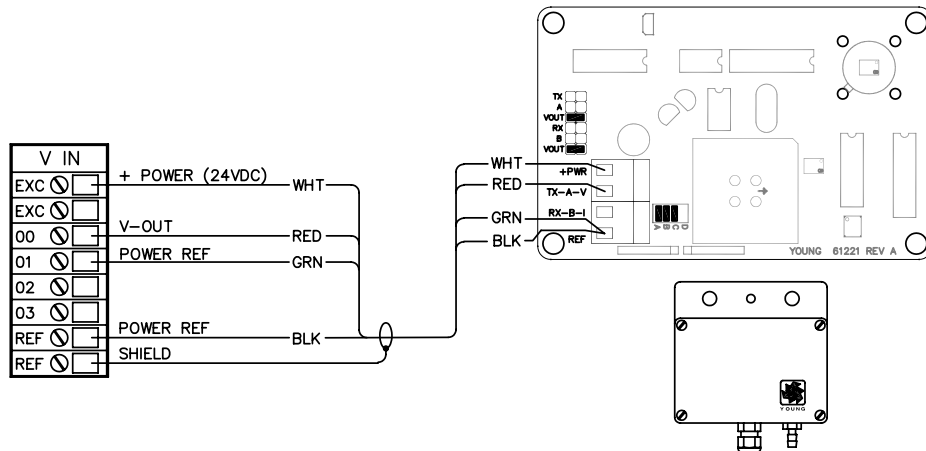
TIPPING BUCKET
RAIN GAUGE
52202/52203



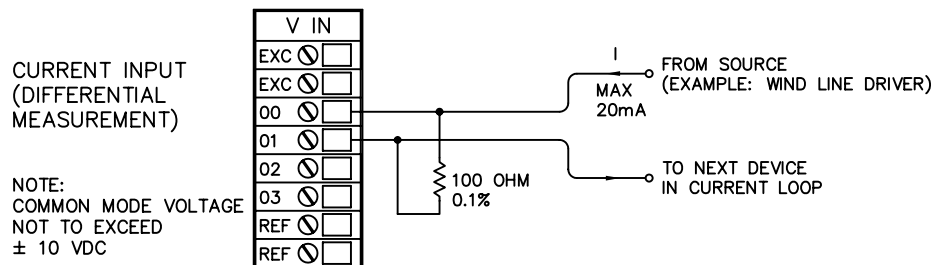
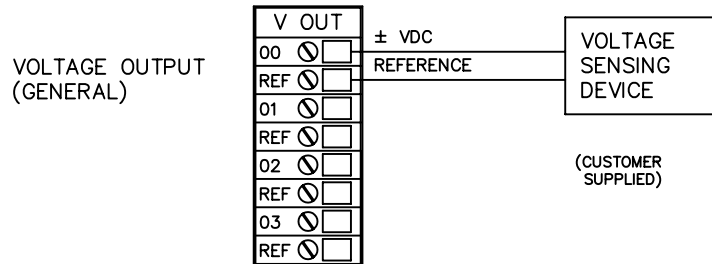
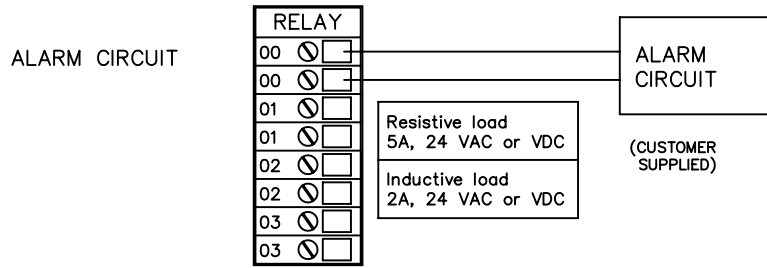
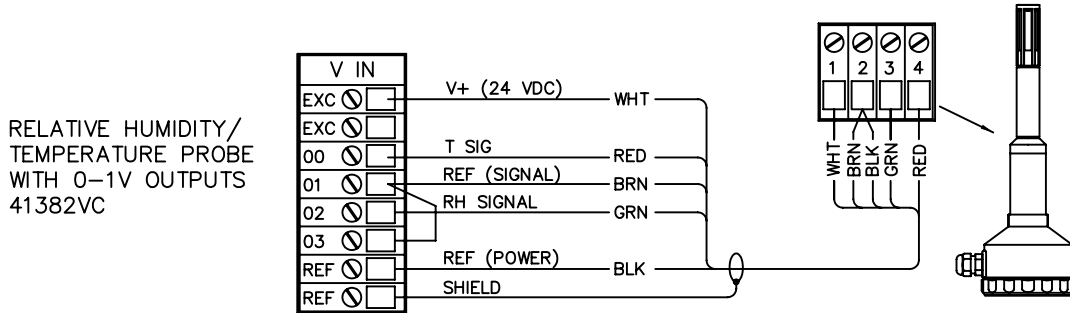
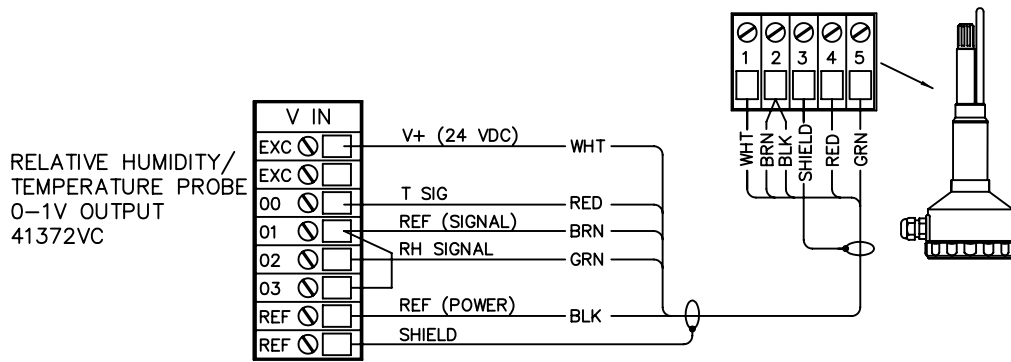
PYRANOMETER
70090



BAROMETRIC PRESSURE
SENSOR
61202V



TYPICAL SENSOR WIRING CONNECTIONS



SERIAL CABLE WIRING (RS-232)

MODEL 26753		MODEL 26753 (USING ALTERNATE DB-25)		MODEL 26754	
PC SERIAL PORT	26700 SERIAL PORT	PC SERIAL PORT	26700 SERIAL PORT	MODEM	26700 SERIAL PORT
DB9 FEMALE	DB9 FEMALE	DB25 FEMALE	DB9 FEMALE	DB25 MALE	DB9 FEMALE
RX 2	2 RX	TX 2	2 RX	8	1 CD
TX 3	3 TX	RX 3	3 TX	3	2 RX
DTR 4		RTS 4		2	3 TX
GND 5	5 GND	CTS 5		20	4 DTR
DSR 6		GND 7	5 GND	7	5 GND
RTS 7	7 RTS	DSR 6		6	6 DSR
CTS 8	8 CTS	DTR 20		4	7 RTS
			7 RTS	5	8 CTS
			8 CTS		

8 BIT DATA, 1 START, 1 STOP, NO PARITY. 9600 BAUD DEFAULT

TYPICAL LOCAL - REMOTE 26700 TRANSLATOR WIRING

