

# **UnimeterXQ Supplement**

**Additional Functions & Special Functions**

**This booklet should be read in conjunction with the Unimeter XQ manual. All the functions in this booklet are all available in the Unimeter XQL, and some are available in the Unimeter XQ.**



## **Unimeter XQL**

**The Unimeter XQL is a Logging version of the Unimeter. It logs up to the last 10,500 readings automatically, with logging intervals from 1 second to over 4 hours into a circular buffer. Logged data can be downloaded by UniTools into a comma separated text file, ready for importing into any spreadsheet.**

**The UnimeterXQL has an enhanced display which displays the control effort with an analog bargraph, (as well as digitally via hotkey if required).**

**The UnimeterXQL also has a 'Shift Left' key which was not available on previous versions.**

**Please visit our web site for more information:**

**[www.unimeter.com](http://www.unimeter.com)**

## Function Details:

Selection of the above function will configure the UNIMETER as an ambient temperature monitor and controller using a sensor of the type PT 100. Function 87 will display the measured temperature in degrees F, function 86 will display the measured temperature in degrees C. All special functions including full PID control may be selected. The temperature range is from -50 to +50 degrees C.

## Electrical Specification:

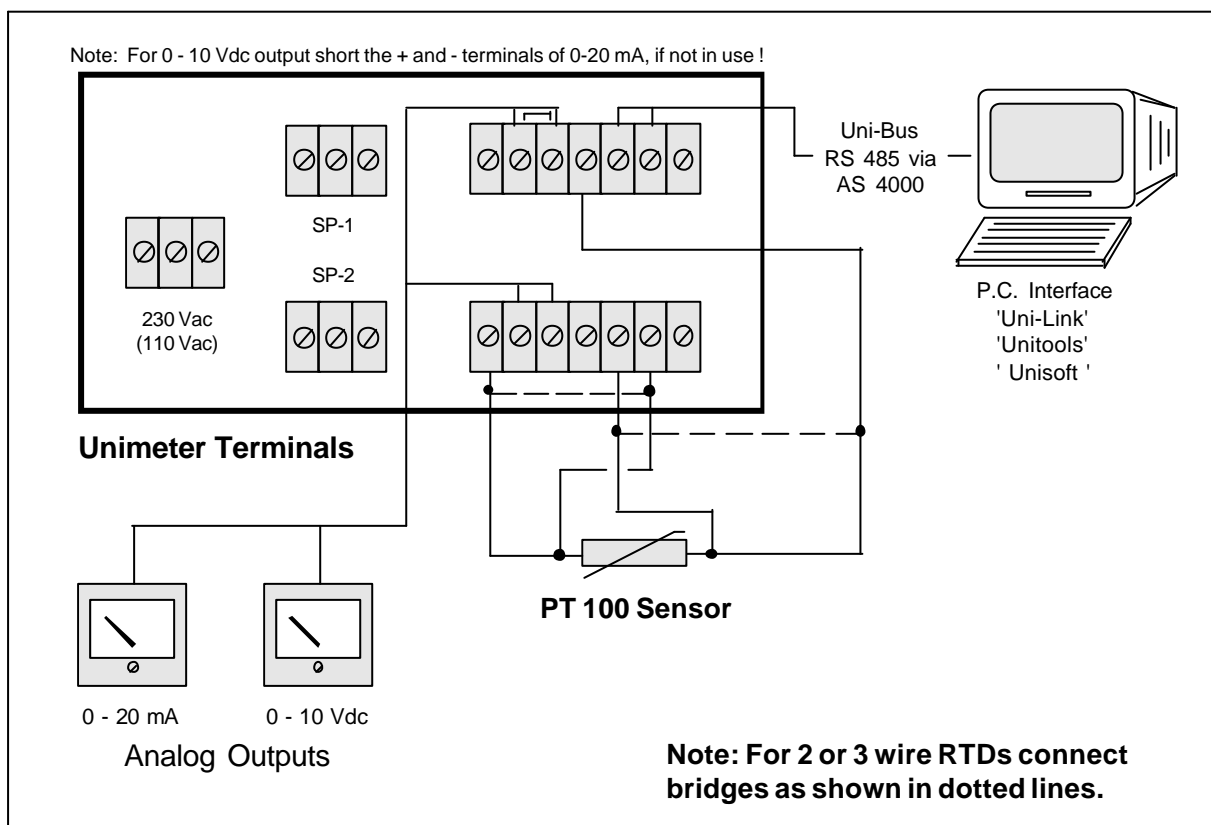
General electrical specification applies.

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



# Cascade Controller 4-20mA/0-5V F88/89

## Function Details:

Selection of the above function will configure the UNIMETER as a process monitor and cascade PID controller with an input range of 4 to 20 mAdc. Two input currents from 4 to 20 mAdc will be measured and conditioned to provide a display and control variable for input 'A' and a control setpoint for input 'B'. Both inputs will be spanned by values in special functions 2 and 3. The offset, programmed by special function 1, will only be applied to input 'A'. All standard PID features except the proportional band and controller setpoint are available.

## Electrical Specification:

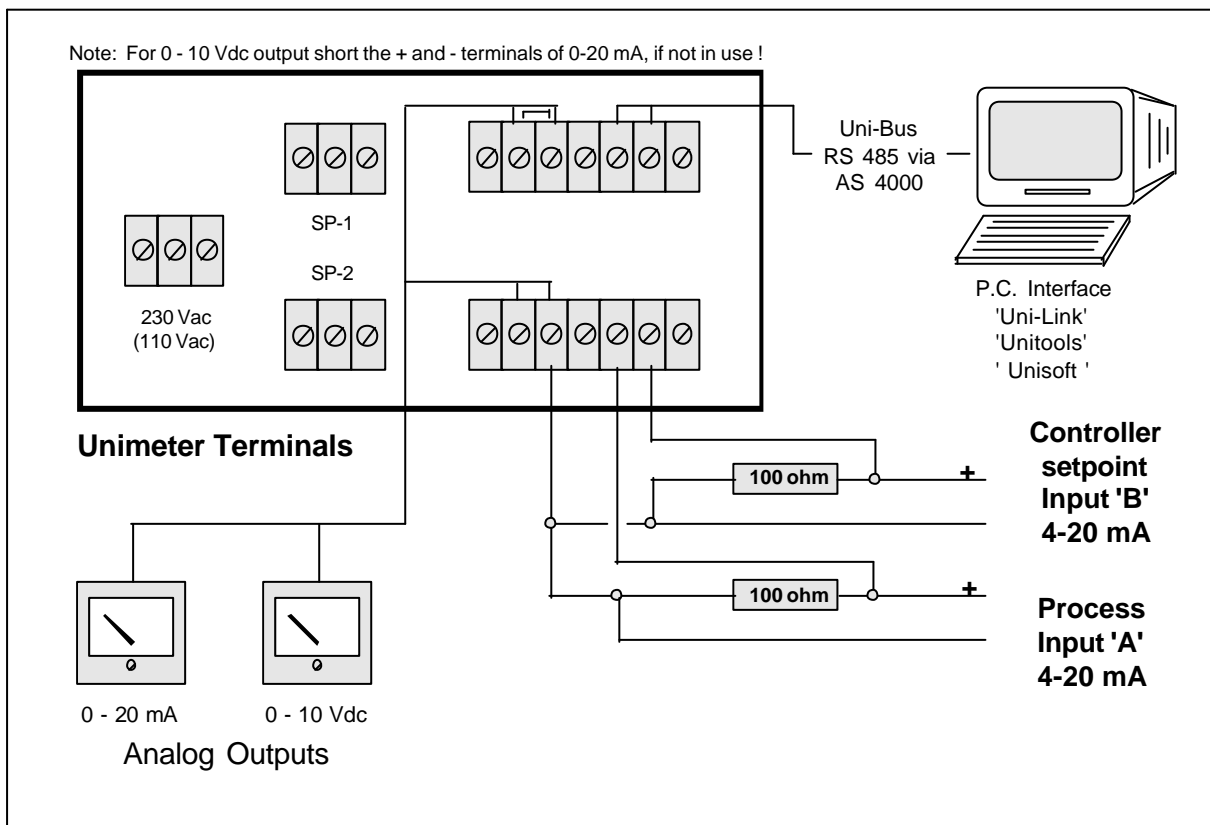
General electrical specification applies.

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



## Function Details:

Selection of the above function will configure the UNIMETER as a load cell monitor and controller for a 'Loss-in-Weight' system. One or more load cells are fitted to the dispensing vessel to measure the loss of weight ( flow) between periods of 1 to 250 seconds, as selected by special function 234. The sample and hold contacts may be closed to display the last flow measurement during the recharging of the dispensing vessel. Special function 28 must be selected to enable this feature. The display can be modified by special functions 1,2 and 3 as required. All standard Unimeter functions are available for communications and control.

## Electrical Specification:

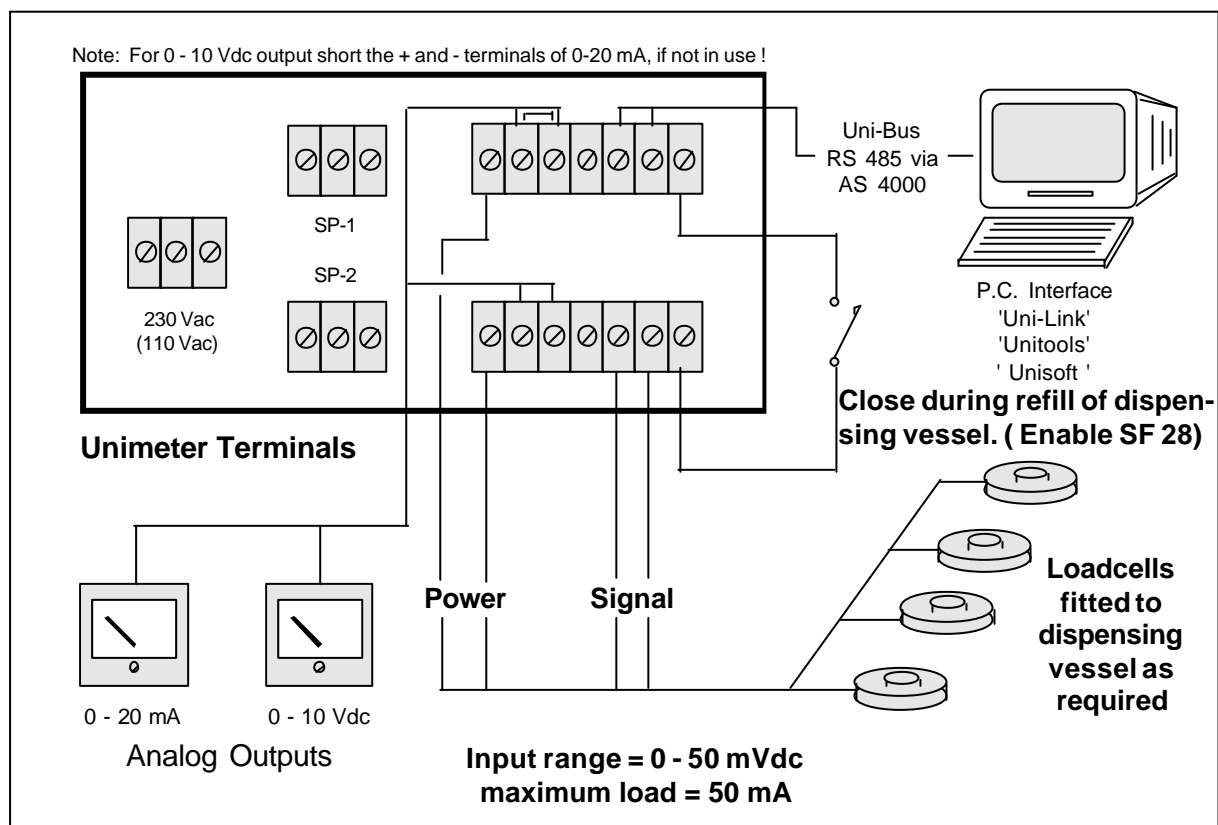
General electrical specification applies.

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



Selection of the above function will configure the UNIMETER as a quadrature up-down counter using two input sensors or a quadrature encoder. The display will indicate a result of the up and down count. The display may be modified to show any value from 0 to +/- 19 999. The analog outputs are available and can be selected by setting special function 229 = 0, however, this may reduce the maximum count rate from 4000 to 1700 ppm. Selecting SF 29 = 1 will cause the Unimeter to save the count value to be restored in case of power loss. This feature will also reduce the maximum count rate to 1700 ppm. Serial communications are also available but should be at the highest baud rate to minimise the maximum rate degradation. Proximity detectors, as shown, can be used as sensors.

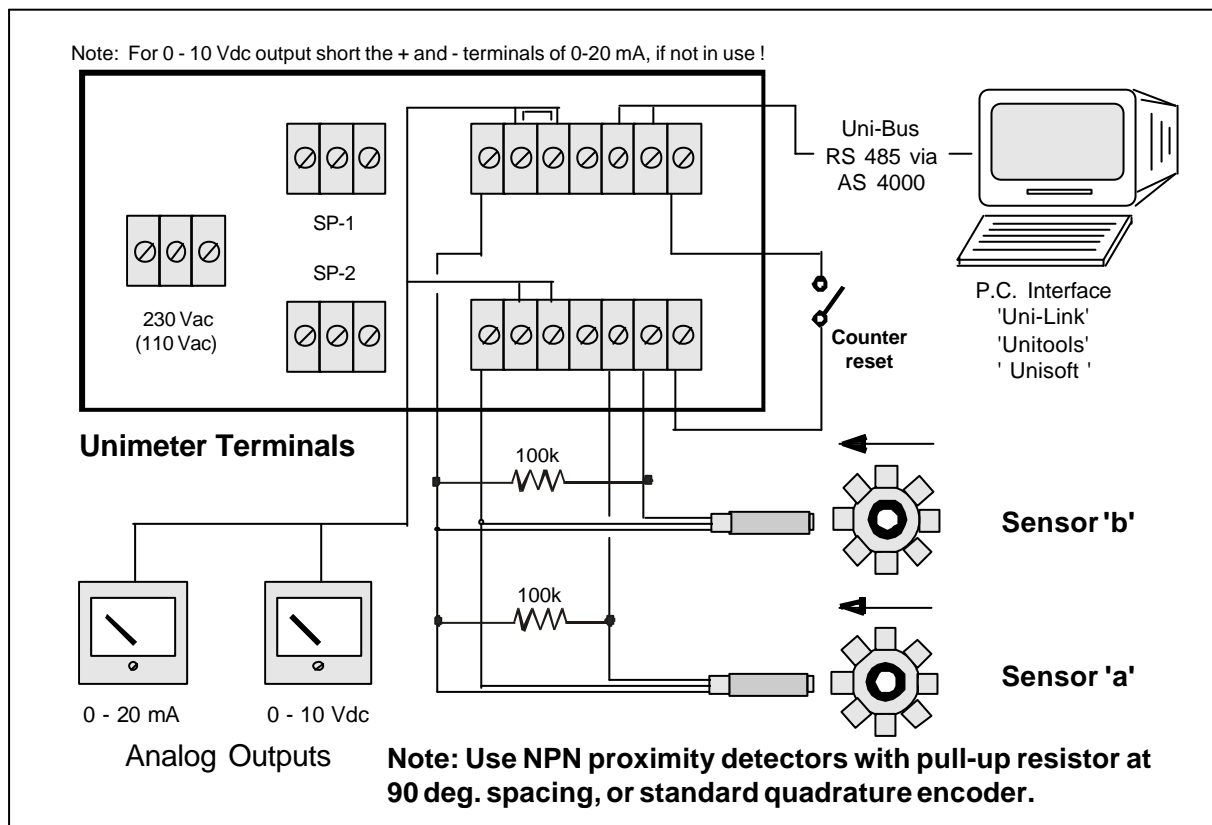
## Electrical Specification:

See details next page.

User Offset : ..... count store  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... +/- full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

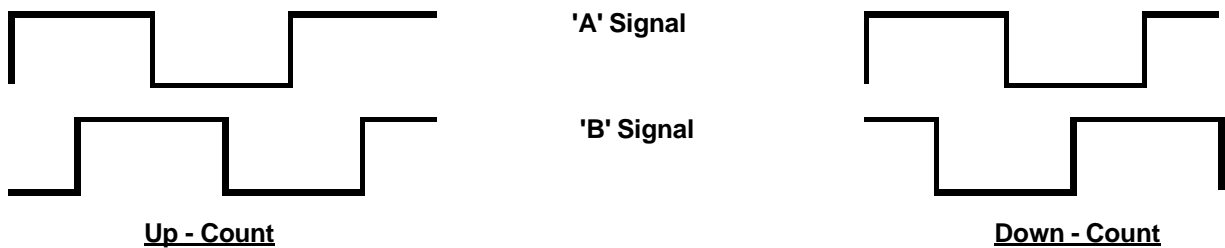
## Connection Diagram



# Quadrature Up-Down Counter continued

Supply : ..... 110 Vac / 230 Vac  
Optional Supply : ..... 10 - 30 Vdc  
Maximum Input Voltage : ..... +/- 10 Vdc  
Setpoints : ..... 2 setpoints, 3 Amp SPDT relays  
Analog Outputs : ..... 0 - 10 Vdc, 0 - 20 mAdc, user programmable  
Display Range : ..... +/- 0.00 - 19999  
Communications : ..... RS 485, 2400, 4800, 9600, 19200, 38400 Baud  
User Power Supply : ..... 5 Vdc, 10 Vdc, 15 Vdc, 24 Vdc 50 mA max.  
Input Rate Range ..... 4000 ppm

Input Signal for best results:

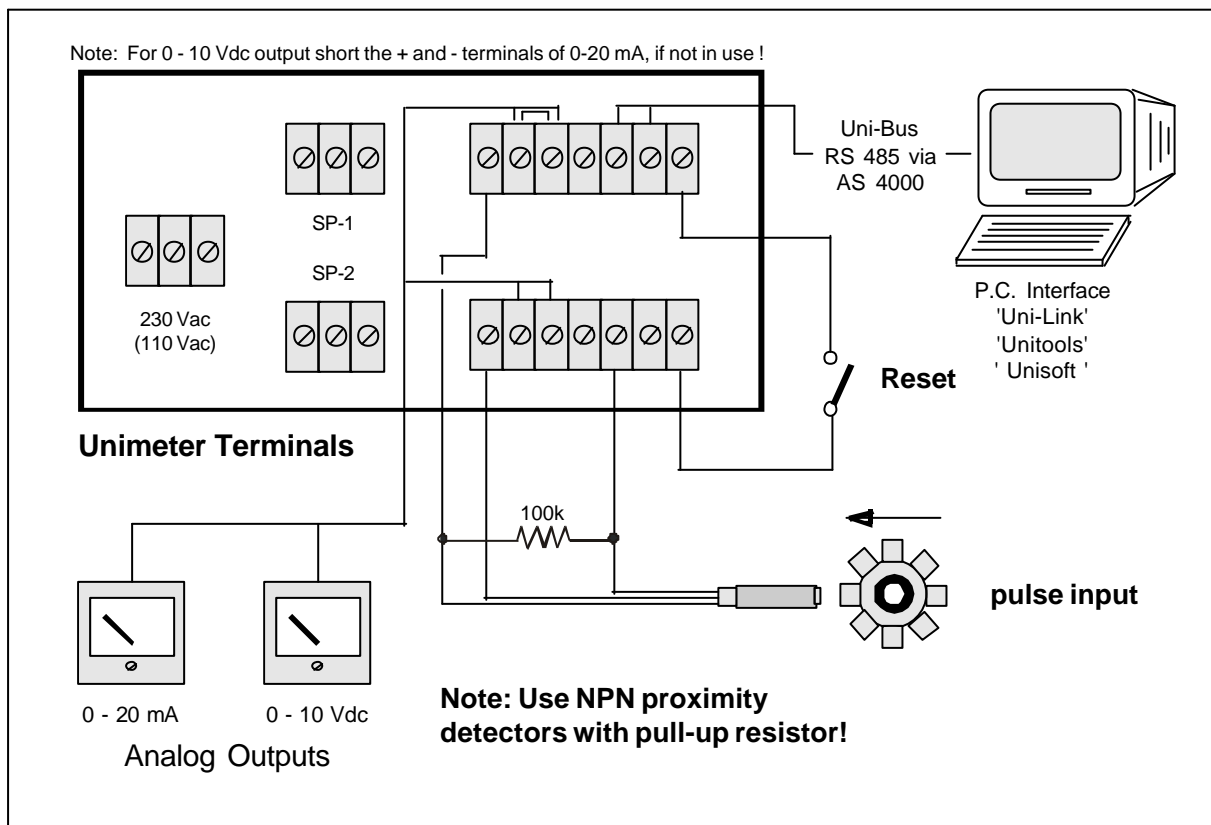


Selection of the above function will configure the UNIMETER as a batch controller with batch length and batch number control and indication. On reaching the batch length (special function 3 user set value), the batch length will reset and increment the batch number total. Setpoint 1 will act on batch length. Setpoint 2 will act on the batch number and can be used to reset the batch length and number via the sample and hold terminals. The analog output will represent the batch length value. The serial communication will represent the batch number value. The batch controller can be reset by Hot-Key anti-tare function, by entering zero via special function 1, or by shorting the sample and hold terminals of the Unimeter. The Unimeter will

General electrical specification applies.

User Offset : ..... batch number store  
 User Span Multiplier : ..... N.A.  
 User Span Divisor : ..... batch length reset  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 tp 38.4 kbaud  
 Analog Outputs : .... 0 - 10 vdc, 0 - 20 mAdc



## Function Details:

Selection of the above function will configure the UNIMETER as a dual function 'Rate and Total' monitor/controller with an input range of 0 to 50 mVdc. The display can be toggled between rate and total by pressing the 'Enter' key. The total can be reset by pressing the 'Shift Right' and 'Enter' keys simultaneously. All controlling functions including span, offset and serial comms work on the rate. The total can be spanned by special functions 218 (multiply) and 219 (divide).

## Electrical Specification:

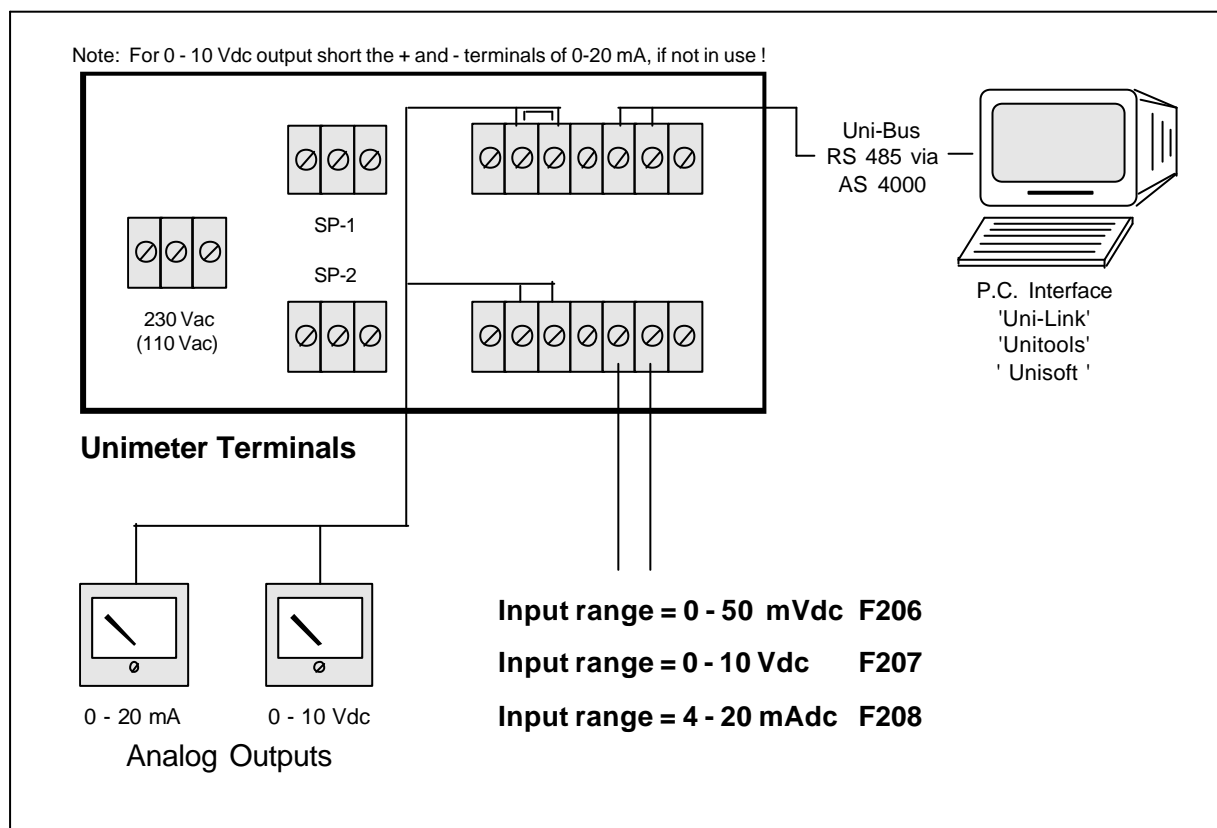
General electrical specification applies.

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



## Function Details:

Selection of the above function will configure the UNIMETER as a dual function 'Rate and Total' monitor/controller with a pulse input range of 1 Hz to 10 000 Hz. The display can be toggled between rate and total by pressing the 'Enter' key. The total can be reset by pressing the 'Shift Right' and 'Enter' keys simultaneously. All controlling functions including span, offset and serial comms work on the rate. The total can be spanned by special functions 218 (multiply) and 219 (divide).

## Electrical Specification:

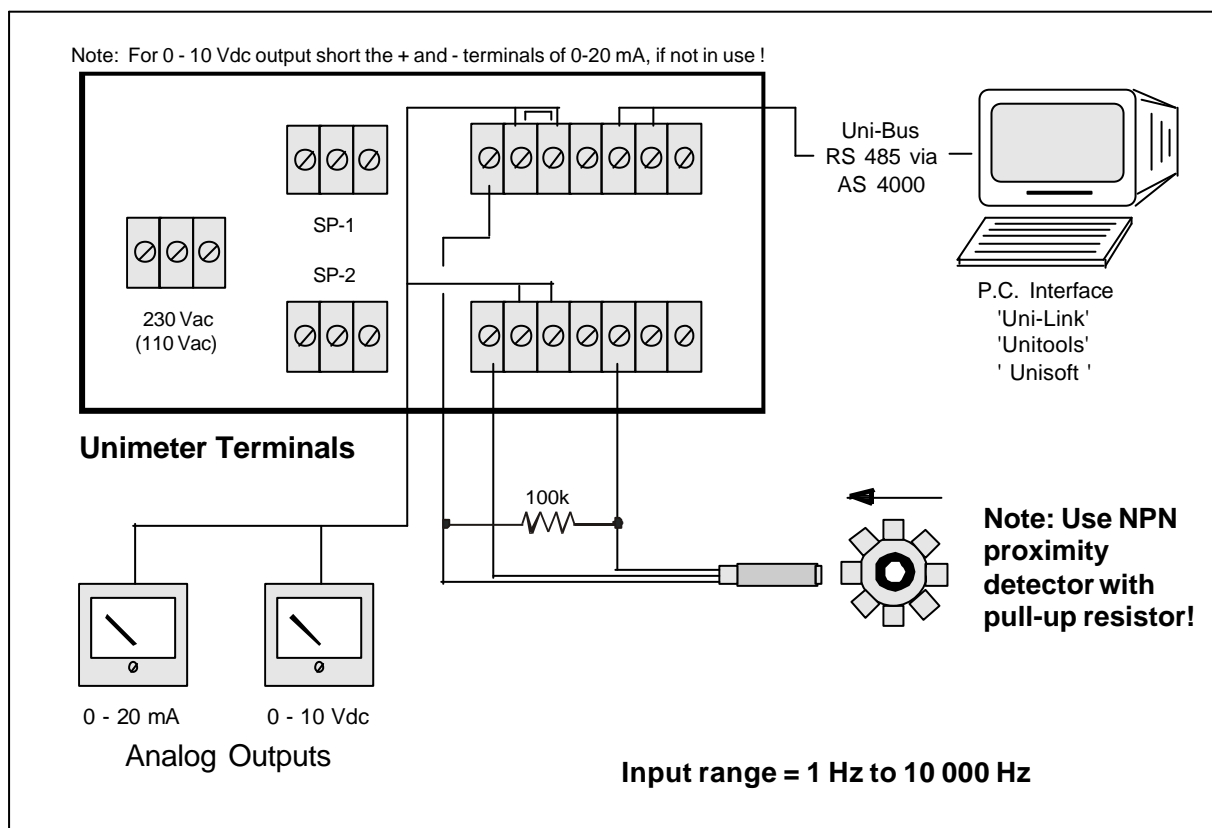
General electrical specification applies.

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



## Function Details:

Selection of the above function will configure the UNIMETER as a mains power monitor and controller. This function will measure and display 6 variables - volts ac, amps ac, power factor, watts, herz and watt/hours. The display can be selected for rotation of each of the 6 variables or locked on any one of the variables by pressing the 'Enter' key. The watt/hours can be reset by pressing the 'Shift Right' and 'Enter' keys simultaneously. The variables can be spanned and are available via the communications port. See next page for details and options.

## Electrical Specification:

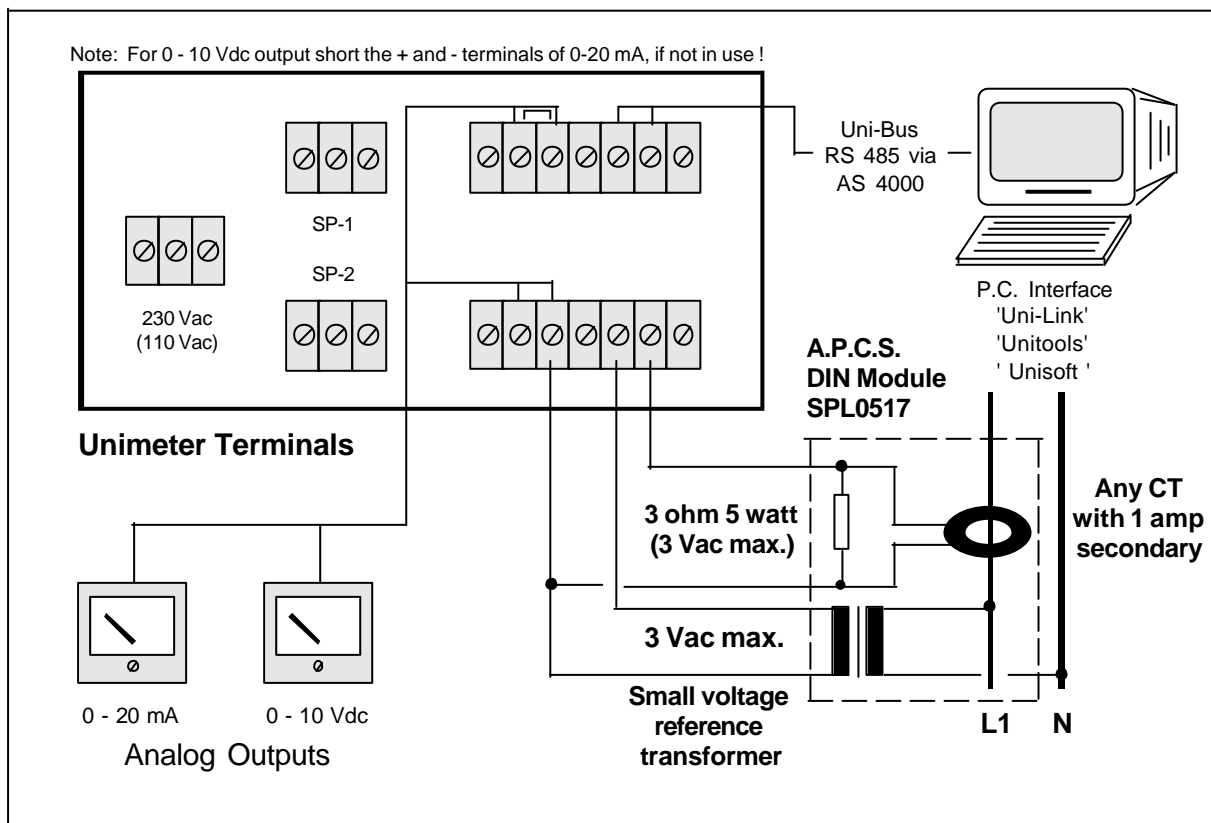
General electrical specification applies, except:  
 Accuracy: 2.5 % Full scale  
 Zero crossing distortion/spikes not allowed

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



# Mains Power Monitor continued

## Additional Details:

### Display:

Volts:	E---	followed by value
Amps:	A---	followed by value
Kwhr:	P hr	followed by value
Power Factor:	PF--	followed by value
Herz:	F---	followed by value
Kwatts:	P---	followed by value

The display will scroll through each variable. Pressing and Holding the ENTER key will stop the scrolling, and step the display through each variable. Press

### Communications:

Programmed ID ( SF 8 ) will communicate value of Kwatts, and if SF 215 = 1:

ID	= Kwatts
ID + 1	= Kwhrs,
ID + 2	= Amps,
ID + 3	= Volts,
ID + 4	= Power factor,
ID + 5	= Herz

Note: If SF 215 = 1, all 6 ID numbers used can not be made available for other instruments. If SF 215 = 0, only power variable is available.

### Variable Span:

The standard SF 1, 2 and 3 apply to the Kwatt variable. SF218 and 219 will span the Kwhr variable. SF 216 will span the Volts variable and SF 217 will span the Amps variable.

### Control:

All analog outputs, controllers and setpoints are available for the Kwatt variable.

## Function Details:

Selection of the above function will configure the UNIMETER as a dual function 'Rate and Total' monitor/controller with dual pulse inputs with a range of 1 Hz to 10 000 Hz. The display can be toggled between rate and total by pressing the 'Enter' key. The total can be reset by pressing the 'Shift Right' and 'Enter' keys simultaneously. Both rate and total are based on the result of the A - B input signals. All controlling functions including span, offset and serial comms work on the rate. Special Function 218 Multiplies the Total increment rate, and S.F. 219 divides it. This function is ideal for a Diesel engine, showing net fuel flow from the supply minus return signals. (Unimeter XQL only)

## Electrical Specification:

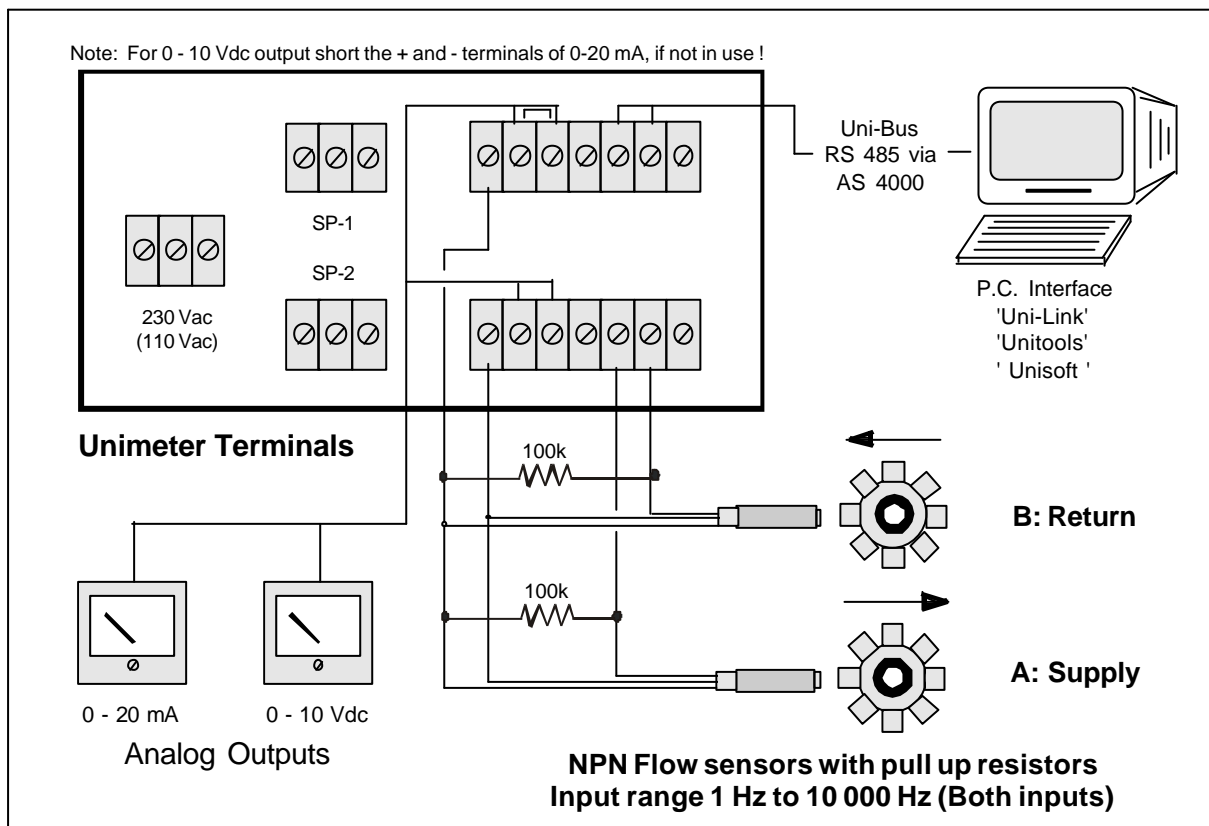
General electrical specification applies.

## Auxiliary Special Functions:

User Offset : ..... +/- full scale  
 User Span Multiplier : ..... +/- full scale  
 User Span Divisor : ..... full scale  
 Output Span Upper Limit : ..... +/- full scale  
 Output Span Lower Limit : ..... +/- full scale

Setpoint 1 Range : ..... +/- full scale  
 Setpoint 2 Range : ..... +/- full scale  
 User Power Supply : ..... 5, 10, 15, 24 Vdc  
 Serial Comms : ..... 2.4 to 38.4 kbaud  
 Analog Outputs : .... 0 - 10 Vdc, 0 - 20 mAdc

## Connection Diagram



# New Special Functions

## Band Filter Bandwidth

SF214

This special function will program the bandwidth of the band filter selected by special function 229. This is an integer only selection between 0 and 250. Every integer will widen the bandwidth by +/- 2.5. The default value = 0

### Example:

A value of 5 entered by special function 214 will cause the band filter to reset if the last Unimeter input value moves outside +/- 12.5 of the previously displayed value. The 2.5 step is absolute and applies at all display ranges.

## Multi Serial Communications

SF215

This special function will enable or disable the multi variable serial communications for up to 6 variables in functions numbers 206, 207, 208, 209 and 210. When this function is enabled, by programming a '1' in step 3 of the programming procedure, the Unimeter will automatically enable communications with up to 6 ID numbers. The allocated ID numbers will be ID + 1, ID + 2, ID + 3, ID + 4 and ID + 5. No other device on the RS 485 port can have these ID numbers. See main functions 206 through to 210 for further information.

## Span Multiplier / Divisor (F 210)

SF216

This special function will program the span multiplier or divisor for the voltage variable in function 210. The range is from 0.01 to 199.99 and the default value set at the factory is 1.00.

### Warning:

The range is limited from 0.01 to 199.99 and must have the decimal point in this position. Small input calibrations should be done via the input module.

## Span Multiplier / Divisor (F 210)

SF217

This special function will program the span multiplier or divisor for the ampere variable in function 210. The range is from 0.01 to 199.99 and the default value set at the factory is 1.00.

### Warning:

The range is limited from 0.01 to 199.99 and must have the decimal point in this position. Small input calibrations should be done via the input module.

## Span Multiplier (F206-210)

SF218

This special function will program the span multiplier for the dual rate functions total as required. The range is from 0.01 to 199.99. The default value set at the factory is 1.00. The span multiplier is relative to the values shown on the Unimeters display when displaying the total. This is the span multiplier for the dual functions 'total' for functions 206, 207, 208, 209 and 210).

**WARNING:** The range is limited from 0.01 to 199.99 and must have the decimal point in this position.

## Span Divisor(F206-210)

SF219

This special function will program the span divisor for the dual rate functions total as required. The range is from 0.01 to 199.99. The default value set at the factory is 14.06 ( Value required to calculate KWhrs in function 210). The span multiplier is relative to the values shown on the Unimeters display when displaying the total. This is the span divisor for the dual functions 'total' for functions 206, 207, 208, 209 and 210.

**WARNING:** The range is limited from 0.01 to 199.99 and must have the decimal point in this position.

## PLCType

SF220

This special function will select the PLC type for connection to receive the Unimeter value ( integer value , times 10 ) into its data memory . At step 3 of the above programming procedure enter:

- 0 = Texas 505 series PLC, V-memory 1024
- 1 = Fuji NB series, data memory location 0000
- 2 = NHP-ML14, D memory location 0000
- 3 = Siemens S7-200, location VW5 ( Free Port driver available )

## High Security Comms

SF221

This special function will select (1) or de-select (0) the high security communications option for the RS 485 communications port. When selected, by programming a '1' as outlined above, the serial communication will add an additional exclusive OR checksum byte in addition to the standard communication protocol. This additional byte applies to both transmission and reception during the transfer of data only. Effected by this protocol are sending and receiving the Unimeter value and setpoint values.

## Last Display Digit Equals Zero

SF222

This special function will select (1) or de-select (0) the function to cause the Unimeter display to show a zero ('0') in the last digit of the display. This feature may be used to avoid display flicker or to ensure display of relevant value resolution in some applications.

## Proportional Time Controller

SF223

This special function will select (1) or de-select (0) the proportional time controller to output a correction via the two setpoint relays. The correction will be proportional to the error between the present reading and the setpoint (controller setpoint, centre of SF 4 and SF 5). The gain of the controller is controlled by the span between SF 4 and SF 5 and the proportional value in SF 254. The process operates over a 20 second period with a resolution of 1%. Relay 2 will energise when variable is below the setpoint, relay 1 when above the setpoint. For a setpoint of say 50.00, we recommend a starting point of SF 4 = 0.00, SF 5 = 100, SF 254 = 100. All normal controllers features including Hot-Key setpoint shift are available.

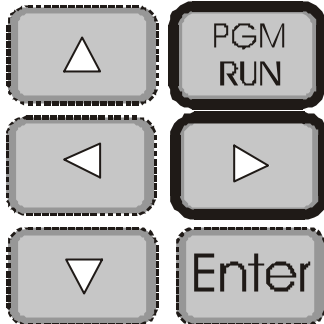
### Note:

This type of control is typically used to control humidity in a glass house by regulating the opening of a window. It can also be employed to modulate flaps or control levers to regulate and control the flow of solid or liquid materials in industry.

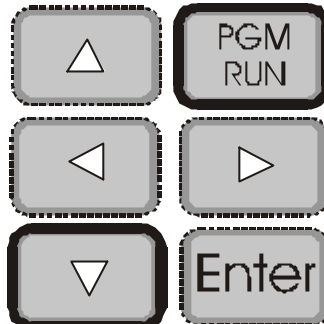
# XQL Hot - key ready reminder

For Unimeter XQ - ignore the 'shift Left' key, and the down key is in a different position.

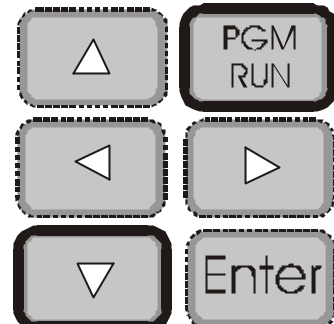
Tare



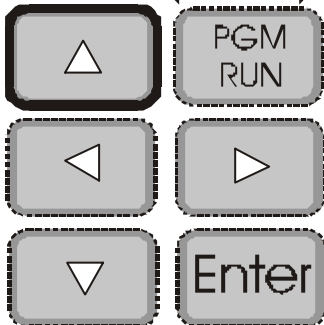
Anti - Tare



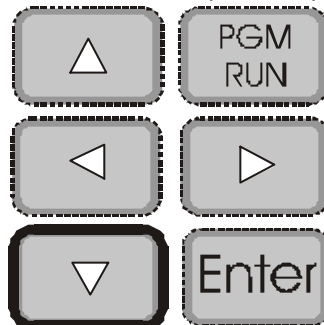
Counter reset



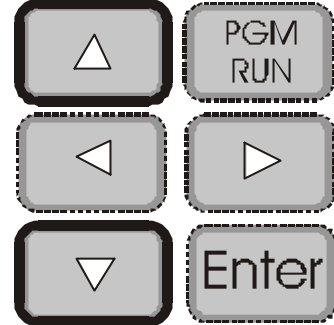
Peak (Max)



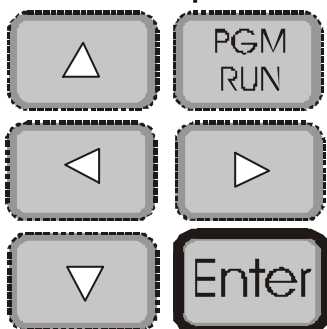
Valley (Min)



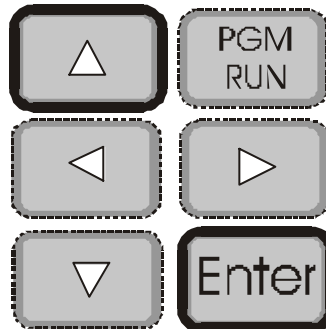
Reset P/V



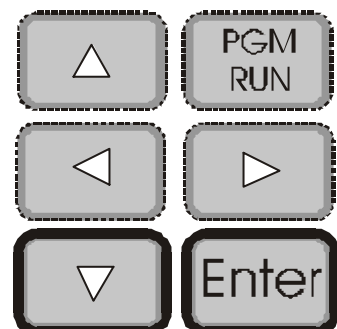
PID Setpoint



Increase SP

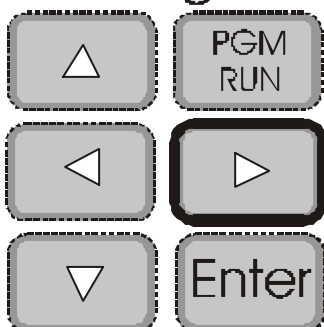


Decrease SP

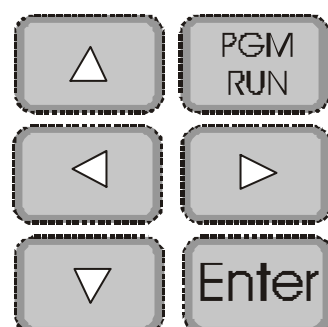
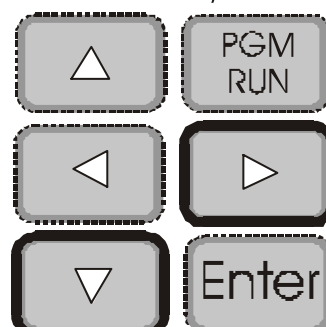


(set Special Function 231 to enable)

Analog OP



PID Auto/Man



(set Special Function 244 to enable)