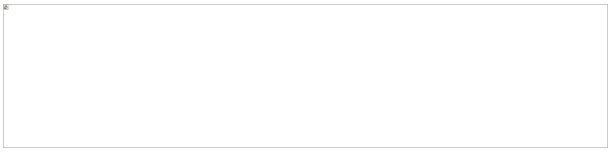
Instruction manual

PM 966 • RM 66

for versio P1.00 bis P1.39



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Error Messages

After powering on, the instrument performs a self-test. If any error is discovered, an error code is displayed. The error code number flashes alternately with the supplementary number. After ten seconds, a new self-test is performed. The error codes have the following meaning:

Err.0	EPROM defective or not readable
Err.1	EEPROM defective or the test sum is incorrect

Settings

All settings can be made using a small isolated screw driver to turn the digiswitch, then confirmed by pressing once. The switch is located behind the front panel. By pressing once, the menu is activated and can be altered by turning the screw driver. As soon as the desired function appears on the display, it can be activated by pressing once. When making a setting, the display will begin to blink and can be changed by turning the screw driver. Numeric settings such as range limit values can be reached dynamically by increasing the speed of the turn, thus broadening the steps. The value is then held as a setting by pressing again. This returns the display to the previous menu item. All settings are only saved in the EEPROM by activating the menu item SAVE . If the digiswitch is not turned within a ten second period, the menu is terminated and all unsaved settings return to their previous values, in some cases by a reset.

☝Atention: By opening the case respectively with the screw driver it is possible to touch con ducting parts whitch are on same voltage as the measure input.

Menu structure

The menu comprises several protection levels and operation modes that are activated via code numbers. Only those menu items are displayed that have been enabled via the particular operation mode.

The menu structure is depicted on the following page.

Setting limit contact values - SP 1 / SP2

Under these two menu headings, the values for the respective limit contacts (switching points) can be set. Each time the range-limit monitoring function is active, one pair of values becomes available, whereby the upper and lower values are automatically assigned (see ''Setting the Relay Function'' below).

☝Please note: that menu headings only become available after setting the relay function to limit monitoring (see menu Func. at rEL.1 / rEL.2).

Setting Hysteresis Values - HY. 1 / HY.2

In setting hysteresis of the respective limit contact or pair of limit contacts, only positive values are possible. For best range monitoring results, this value should not exceed the measuring range or half of the range limit.

Display Scale - SCAL

Setting the Scale Factor – FACt

This item is used to set a scale factor for the display value. (Value 0 will be interpreted as 1)

Setting the Scale divisor - d iu.

This item is used to set a scale divider for the display value. (Value 0 will be interpreted as 1)

Setting the scale (Time base) – SCL.

This item is userd to change the time base to impulses per second (/S), impulses per minute (/mn) or kilo-impulses per hour (/h).

Setting the decimal point – dP

This item is used to set the decimal point for the level currently active (see Func. CtrL. function). The solution respectively the measuring range is modified by attitude of the point !

Null value for the analog output – A.nuI

This item is used to set the display value for the analog output to display its minimum value.

Full Scale value for the analog output – A.FS

This item is used to set the display value for the analog output to display its maximum value.

Ending this menu sublevel – EndE

To leave any menu sublevel, select the menu item EndE . This returns you to the next highest menu level.

Setting Functions - Func.

Setting the input filter - FILt

To gain more stabile readings when input measurements are fluctuating, a mean value can be calculated for 1 to 127 measured values. The measuring rate or display rate of the instrument is not affected, only the setting time is changed. For negative values, the filter has a jump function that enables the display to instantly follow the measured value during radically changing measurements.

Setting the control input function - CtrL.

Control input can have the following functions assigned:

• Display hold – hold
to freeze the measured value during active control input (measuring, range-limit monitoring, and interface communication, except the BCD bus, continue as set).

• Maximum value storage – Hi
When the control input is activated (edge triggering), the statistic storage (min/max/mean) is erased. As long as it remains active, the maximum value will be displayed.

• Minimum value storage – Lo
When the control input is activated (edge triggering), the statistic storage (min/max/mean) is erased. As long as it remains active, the minimum value will be displayed.

• Mean value storage – AU
When the control input is activated (edge triggering), the statistic storage (min/max/mean) is erased. As long as it remains active, the mean value will be displayed.

• Decimal point switching – dP
When the control input is activated, the decimal point is switched to the second level, making it possible to change the decimal point position when switching over to a different measuring point.

• Tare function – tArA
When the control input is activated (edge triggering), the respectively current value at that time becomes null, ie, the currently measured value is calibrated to null. As long as the control line remains active, the tared value will be displayed.

• Switching the limit contacts – ALt
When the control input is activated, the limit contacts for limit monitoring are switched around, ie, if relay 1 has been configured to Hi1, it now reacts to Hi2 when the control input is active (see the menu item on relay setting).

The lower light field of the display shows the current state of the control line. By using the appropriate stick-on label, the currrently active function of the display can be identified (min/max/av/tara/Alt).

Setting the display's stepping function - StEP

The step progression of the display value can be set to 1, 2, 5, or 10, meaning that the last-place digits will be changed in steps of 1, 2, 5, or 10.

Acitvating the sign – Sign

This setting enables the instrument to display certain signs (+, -, or + -). If the plus sign is not enabled, for example, no sign will appear for positive values, but the minus sign still appears for negative values.

Setting the bit transfer rate - bAUd

The transfer rate of the serial port can be set to 300, 600, 1200, 2400, 4800, 9600, 19200, or 57600 bits per second (bAUd).

Setting the transfer protoco l - Prot

The parameters of the V.24 serial port can be set to 7 or 8 bits with 1 or 2 stop bits and even, odd, or no parity.

Setting the communication address - Adr .

This is used to set the serial port address by which the instrument can receive data. An address of 0 (zero) disables addressing with the V.24 interface, or in the case of the field bus port, enables only conference broadcast messages.

☝ Please note: Any changes in the settings for baud, protocol, or address will only become active after resetting the instrument and have no effect when using a BCD bus or no serial ports.

Setting the relay function - rEL.1 /rEL.2

The conditions for activating the relay can be set as follows:

- OFF
  the respective relay can be set to off, ie, always passive.
- on
  the respective relay can be set to on, ie, always active, whenever the instrument is on.
- **Exceeding the limit** - H i1/H i2
  Whenever the set value of the limit contact is reached and exceeded, the relay switches to its active state. It can be set to respond to either of the limit contacts 1 and 2 (see also the menu item for alternating these values). Deactivation of the relay occurs only after the measured value reaches the limit contact value minus the hysteresis value.
- **Exceeding the limit** - Lo 1/Lo2
  Whenever the set value of the limit contact is reached and exceeded, the relay switches to its active state. It can be set to respond to either or each of the limit contacts 1 and 2. Deactivation of the relay occurs only after the measured value reaches the limit contact value plus the hysteresis value.
- **Maintaining the range limit** - Go 1/Go2
  As long as the measured value remains within the range of set values, the relay is active. Hysteresis is also active in this state.
- **Exceeding the range limit** - HL 1/HL2
  As long as the measured value remains within the range of set values, the relay is passive. Whenever the set value of the limit contact is reached and exceeded, the relay switches to its active state. Hysteresis is also active in this state.

☝Please note that pairs of limit-contact values only become available under the function for monitoring the range limit.

End this menu sublevel - EndE

To leave any menu sublevel, select the menu item EndE . You will return to the next highest menu level.

System settings – SyS

Device type - G.tYP *)

This is used to select the device type respectively the integrated amplifier.

Selection of sensor typ and function - tYP.

It is possible to select the input trigger level between 2.5 V (.3) and 0 V (.0) and the function of input 2 between direction detection (F.) and ratio measuring (FrF).

Selection of timeout (underrange) - to

This is used to select the maximum measure time to detect underrange (± 0000)

Setting the interface options - OPt. *)

Software support for the interface is set under this menu item: no for none, C for BCD bus, F for RS-232, and H for the DIN measuring bus (RS-485).

☝ WARNING: Setting a different interface option than for the device installed can lead to failures and even damage the instrument or any devices attached to the instrument.

Adjusting the offset for the analog outpu t - A.OFF

The offset for the analog output can be adjusted directly. Therefore, this setting should be monitored with a measuring device while making the adjustment.

Adjusting the reference slope of the analog output - A.rEF

Full scale deflection of the analog output can be set similarly to the offset (A.OFF). The output offset remains unchanged and should therefore be adjusted first

End this menu sublevel - EndE

To leave this menu sublevel, select the menu item EndE . You will return to the next highest menu level.

Setting the mode of protection for the instrument settings - CodE

By inputing the code value for the respective protection mode (see the menu-structure figure), this mode can be changed. Any wrong values will cause C.Err to appear on the display and terminate the menu function. The preset factory value is service mode.

Saving the settings - SAVE

Any and all settings implemented under the menu function only become stored in the EEPROM after the SAVE option has been selected. Successful completion is signalled by a brief interruption in the display and subsequent exit from the menu function. Attention: Don't interrupt the power during saving, it can cause a data loss (Err. 1).

Procedure for making adjustments

1. E Remove the front panel frame and the red filter or plug cover over the digiswitch in order to gain access to the switch.

Atention: By opening the case respectively with the screw driver it is possible to touch conducting parts whitch are on same voltage as the measure input !

2. Connect the instrument to the proper power supply.

3. The desired function and sensor type is first adjusted as follows:

• Press down once on the switch using a small isolated screw driver in order to enter the menu function. Turn screw driver clockwise until SYS appears on the display. Press down again to activate the menu, TYP appears on the display.

• Now press down once again. The function pulse-rate measurement F or the quotient measurement FrF with respective triggering levels 0 volt or 3 volt can be modified by turning and chosen by pressing.

• Then select ENDE , in order to reach the main menu again and to store permanently the attitudes there with SAVE . The instrument now returns to the measuring mode and displays the current measured value after the first measurement. Please note: On low measuring frequencies the measure time can be up to 20 seconds!

4. Das Eichen der Anzeige auf die gewünschte Einheit erfolgt durch Einstellen von vier Parametern. Zunächst kann ein Faktor (Multiplikator) und ein Divisor (Teiler) angegeben werden womit der Meßwert verrechnet wird. Des weiteren ist die Zeitbasis auf Sekunden, Minuten oder Stunden einstellbar und durch Verändern der Dezimalpunktposition kann die Auflösung eingestellt werden. Das Einstellen geschieht wie folgt:

- How before by pressing the digiswitch go into the menu. Turn for so long clockwise, until SCAL appears in the display.
- Now further press again to activate the scaling menu, it appears FACt. in the display. Press down once again. This action calls up the current preset value for the factor of measurement input on the display. This value can be changed by turning the screw driver. Once you have reached the desired value, pressing down once on the screw driver sets that value and returns the display to the FACt. -menu.
- Now go by further turning to div. and adjust the divisor as before.
- Now select the desired time base among menu item SCL. and adjust the desired decimal point position under dP.
- Conclude the menu sublevel with endE and go directly to SAVE in the main menu level to store all the settings permanently.

Example:

A turbine supplies 98,25 pulses/liters.

The flow rate should be displayed in m3/h with 3 decimal places.

The following adjustments are necessary:

Divisor (div.) auf 9825	for calibrate the display to 1 Count per unit here scaled to 0,01 per liter.
Faktor (FACt.) to 100	the display is now calibrated to 1 per liter.
Zeitbasis (SCL.) to hour (rh)	scaled to kilo-liter per hour = m3/h (unit kilo-liter because at time base /h the value is displayed in value/1000)

Decimal point to 4th position from the back, consequently 3 decimal places.

Now the display of the PM966 is scaled in m3/h.