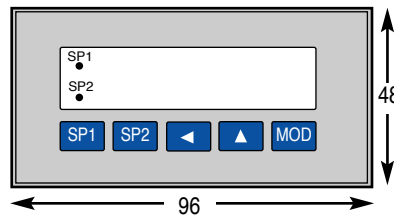


Digital Panel Meter SPE 670 – 085

Meas. Type: Event Counter  
 Input: Square Pulse 5 - 24V  
 Coupling: DC / AC or Opto coupler  
 Dimension display: Stck. (Standard)  
 Display/ Rate: 4 Digits / 1 Meas./s  
 Display Type: LED 12.5mm, red  
 Decimal Point: Programmable  
 Protection Index: IP50, DIN 40050  
 Operating Temp.: -10°C...+50°C  
 Control Outputs: 2 Relays N/O or N/C  
 Limit Values: Programmable  
 Relay Contact: 230V / 5A  
 Connector Type: Lift clamp  
 Front Panel: DIN 48 x 96  
 Mounting Depth: D = 115mm  
 Panel Cut-out: H x W = 44.5x90.5mm  
 Supply: 230V 50-60Hz 4.5VA  
 Meas. Ranges: Set by jumper  
 Front keys: Lockable by jumper  
 Sensor Supply: 24V / 30mA DC

**Operation Instruction:**



- MOD** enter or leave programming mode
- ▲** increment selected digit
- ◀** select next digit / position
- SP1** display threshold value of SP1 relay
- SP2** display threshold value of SP2 relay
- SP1** ON : SP1 relay contact is closed
- SP2** ON : SP2 relay contact is closed

**Option: 12V / 24V DC Supply**

In derivation of the standard model the device can be ordered for following auxiliary supply voltages: 12V DC or 24V DC (Conn. 15 "-", 17 "+"). For these models the 24V / 30mA sensor supply voltage is not available. Using this option measurements for up to 200V DC / AC can be performed only since the DC-DC converter isolates 500V. Special DC-DC Converters are available on request for higher measurements.

**Option: RS232 with Real Time Clock**

The RS232 module with Real Time Clock provides a printer output via the serial interface. Data, Time and Measuring values with dimension are available. The isolated RS232 interface is bi-directional and comes with a driver software. Models 670/... can be controlled external via this interface. (See description on back page)

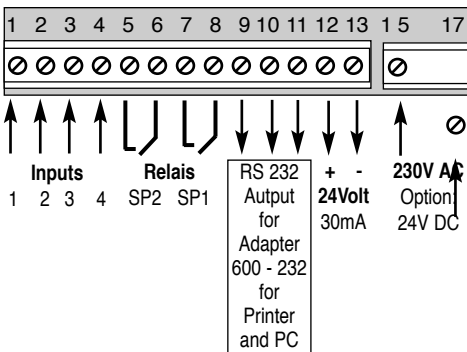
**Measuring Range**

Flow ( momentary flow and total quantity )  
 Accuracy: ±1 Digit of measuring value

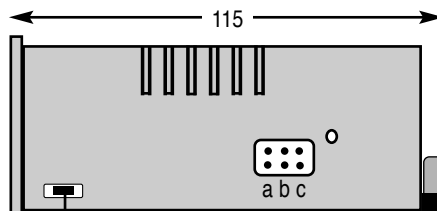
I 0000 – 9999 pcs.

**Terminal Legend:**

SPE 670 rare view



- Input 1: In-HI for Opto Coupler / Isolator
- Input 2: GND for Pulse 5–24V AC/DC coupling
- Input 3: GND for Opto Coupler / Isolator
- Input 4: In-HI for Pulse 5–24V AC/DC coupling
- Relay SP1: Potential free switch
- Relay SP2: Potential free switch
- Opt.RS232: Galvanic separated RS232 output GND(11), RXD(10), TXD(9)
- Output: 24V, 30mA galvanic separated voltage supply for external sensors
- 230V AC: AC Power input (15,17) or Optional 12V / 24V DC supply input



Coupling:  
 Select coupling type according to input signal.  
 a: AC - coupling  
 b: DC - coupling  
 c: Opto Coupler / Isolator

**Key Lock:**

The jumper is placed on the main board and is accessible from the side of the device housing. By removing the jumper the keys are locked.

**Error indications:**

If the measuring signal exceeds or falls short of the allowed measuring range the LED display shows:  
 "oooo" = Measuring range exceeded  
 "uuuu" = Measuring range fallen short

**Reset to default device setting:**

Turn off power. Push simultaneously the leftmost three keys. Hold and turn on power. Release keys after 3 seconds.

**Safety Precautions**

Employing these instruments, regulations for working with high voltage equipment, as well as any Professional Trade Association regulation for working with electrical appliances and installations have to be observed.

**CE-Guidelines**

Meets the EMV Guideline (89/336/EWG) and the German EMV ruling by applying the Basic Standard EN 50080/ EN 50081. Meets the Low Voltage Guideline (73/23/EWG) by applying Product Standard EN 61010.

**Guarantee Regulations:**

Regulations by law apply for guarantee within 12 month. All equipment is factory tested and calibrated. Excluded from the guarantee are normal wear and tear, defects due to misuse, negligence, chemical exposure, mechanical stress as well as equipment, which has been modified, re-labeled or otherwise altered or if attempts to repair have been made. All guarantee claims are subject to our scrutiny and approval.

**Service**

We are glad that you decided on an instrument from our product range. If there are what so ever any defects, please send the instrument (postage paid) to your distributor.

For technical information contact us via E Mail Info@schwille.de  
 Technical changes reserved.  
 Edition: 02.May 2003

**Programming:**

The programmable Panel Meter 670-XXX with its integrated measuring routines can be controlled by a variety of parameters for the measuring cycle. New values can be entered as on a pocket calculator via keyboard, easy and comfortable.

- This is how to select a measuring routine: **MOD**
- Push MOD to enter programming mode **▲**
- Select routine number with increase key **MOD**
- Push MOD again to confirm selection
- To change value on selected routine: **▲**
- Enter desired value with increase key
- Select next position with shift key, **◀**
- decimal point of selected digit is blinking **▲**
- Select value with increase key
- Enter inserted value **MOD**
- The device now works again in the measuring mode.

## Integrated Programming Routines

### Routine 1: Memory initialization

Erasing memory content  
Entering a preset value

With models SPE 670 – 080 / - 085 if power is turned off the memory location is erased which stores the last measured value. After power on the preset value is restored or will be overwritten by a new preset value. In this routine a preset value can be entered from which measurements continue. The setting in Routine 2 decides if new measuring values will be added to or subtracted from the preset value.

Setting: 0 = erase memory location  
1 - 9999 = Preset value

**Routine 2:** Setting the count direction. Measuring values will be added to or subtracted from the preset value.

Setting: 0 = Add to preset value  
1 = Subtract from preset value

**Routine 5:** Setting display options. With Parameter 1 the time of the SPE will be displayed in hours and minutes. ( i.e. 12.35 )

0 = display of measuring value  
1 = display of SPE time

**Routine 6:** Setting the Decimal Point. Setting the position of the comma on the LED display

- 000 = No decimal point (default)  
- 001 = 999.9  
- 002 = 99.99  
- 003 = 9.999

**Routine 7:** Setting the Switch Point SP 1 With this routine the desired threshold (display) value for SP 1 can be set.

**Routine 8:** Activating Switch Point SP 1 The switch point function can be turned on or off. 000 = Inactive, 001 = Active

**Routine 9:** Setting the Switch Point SP 2 With this routine the desired threshold (display) value for SP 2 can be set.

**Routine 10:** Activating Switch Point SP 2 The switch point function can be turned on or off. 000 = Inactive, 001 = Active

### Routine 11: Switch Point Hysteresis SP 1

### Routine 12: Switch Point Hysteresis SP 2

The hysteresis is set as an amount of digits (max. 1999). Default value 000

### Routine 13: Test Function Relay SP 1

### Routine 14: Test Function Relay SP 2

EIN is displayed if the relay is energized and if the relay is programmed as Closer (N/O). Otherwise AUS is displayed if programmed as Opener (N/C).

### Routine 15: Setting of relay function SP 2

### Routine 16: Setting of relay function SP 2

Each relay can operate as Closer (N/O) or Opener (N/C) when the Switch Point is reached. If the last digit is set to 1 = Opener (N/C) the current circuit is interrupted. If the last digit is set to 000 = Closer (N/O) the current circuit is closed. Default = 000.

### Routine 17: ON- / OFF- delay of SP 1

### Routine 18: ON- / OFF- delay of SP 2

When reaching the threshold value the relay function is time-delayed. The time-delay is proportional to the number of measuring cycles (max. 1999 cycles). Number of measuring cycles = Time-delay Default: 000

**Routine 19:** Viewing Maximum measuring value retention

**Routine 20:** Viewing Minimum measuring value retention  
The maximum and minimum measuring values since the last reset are continuously recorded and stored. These values can be reset while the min. or max. value is displayed by pushing and holding keys [  $\wedge$  ] and key [ < ] simultaneously.

**Routine 21:** Rounding the last digit

The last digit can be rounded to 0, 2 or 5.

Setting: 000 = last digit will be set to 0  
001 = last digit will be displayed (default)  
002 = 2 / 4 / 6 / 8  
003 = 0 / 5 / 0

**Routine 22:** Setting the number of measurements to generate an average value The average measuring value will be displayed.

Setting: 000 = no average value generation (default).  
002 – 1999 number of measuring cycles used to generate an average value

**Routine 23:** Setting the Measuring Function

Setting: 000 = momentary flow  
001 = total flow quantity.

**Routine 25:** Activation und Time setting for RS232

Interface and for the Analog Measurement output

Setting: 000 = Analog output DAC active (default)  
cycle time in Seconds  
001 = RS232 output active  
cycle time in Seconds  
002 = Analog output DAC active (default)  
cycle time in Minutes  
003 = RS232 output active  
cycle time in Minutes

**Routine 26:** Measuring value division by 10

Setting: 000 = no division (default)  
001 = measuring value divided by 10

**Routine 27:** Setting the Baud Rate of the RS232 interface

Setting: 0 = 150, 1 = 300, 2 = 600,  
3 = 1200, 4 = 2400  
5 = 4800 Baud

Data format: 4800 Bd, no Parity, 1 Stop bit and 8 Data bits

## Setting the Real Time Clock (RTC)

**Routine 28:** Minutes

This value sets the actual time in minutes  
Setting range: 0 – 59 minutes

**Routine 29:** Hours

This value sets the actual time in hours  
Setting range: 0 – 23 hours

**Routine 30:** Day of date

This value sets the actual day of the date  
Setting range: 1 – 31

**Routine 31:** Day of week

This value sets the actual day of the week  
Setting: 0 = Sunday, 1 = Monday, 2 = Tuesday,  
3 = Wednesday, 4 = Tuesday, 5 = Friday,  
6 = Saturday

**Routine 32:** Month of date

This value sets the actual month of the date

Setting range: 1 – 12  
1 = January, 2 = February ... 12 = December

**Routine 33:** Year of date

This value is least significant part of the year number of the actual year of date. The most significant part is set to 20.

Setting range: 0 – 99  
0 = 2000,  
99 = 2099

**Routine 34:** Setting the Transmission cycle for serial interface

Date and time are added to the measuring value at the time interval of the programmed transmission cycle and transmitted via the serial interface. The time distance of transmissions is entered in minutes Note that transmission must be activated first either through Routine 25 or through Jumper 4 (see description further down).

Setting range: 0 – 255

0 = Timer Stop ( no transmission)  
1 = transmission occurs every minute  
2 = every 2 minutes  
255 = every 255 minutes ( 4h 15min )

## Dimensioning measurements

The dimension of a physical unit consists mainly of two parts, the size and the type of the unit.

Dimensions are not displayed on the SPE 670 series but appear on the printout. The dimension size and type can be entered in ASCII-code as a decimal value. For the extended type-set code page 437 (IBM) applies.

**Routine 35:** Size of dimension

Sets the size of the physical unit for the displayed measuring value: m = Milli,  $\mu$  = Micro, p = Pico ...  
° = Grad. Examples: ° = 248,  $\mu$  = 230, m = 109,  
n = 110, p = 112, k = 107, M = 77, G = 71.

**Routine 36:** Type of dimension

Sets the type of the physical unit for the displayed measuring value: V = Volt, A = Ampere ... C = Celsius  
Examples: A = 65, C = 67, V = 86,  $\bar{U}$  = 234 (Ohm).

**Routine 37:** Customizing signs for measurements

Covering a wider variety of naming measuring values a third sign can be entered. Through this feature names like "Bar" are possible. In this example enter B = 66 in Routine 35, a = 65 in Routine 36 and r = 114 in Routine 37. For character translation see ASCII-code table or IBM code page 437.

**Jumper 4** Single or event triggering

If Jumper 4 is set measuring values are transmitted at programmed time intervals via the serial interface, even if the interface is deactivated through Routine 25. The transmission cycle is set through Routine 34 respectively can be stopped. Jumper 4 is accessible on the main board left hand side of the display unit. (seen from the front view)