

**Digital Panel Meter SPE 670 - 025**

Meas. Type: Precision power meter  
 Display / Rate: 4 Digits / 2.5 Meas./s  
 Display Type: LED 12.5mm, red  
 Input Voltage AC: 0 – 270V AC r.m.s.  
 Input Voltage DC: 0 – 270V DC  
 Input Current Sensor: 0 – 100mV with 100A Shunt  
 Input current Sensor: 0 – 200mV with 20A Shunt  
 Frequency Range: DC ... 65Hz  
 Dimension Display: W (Watt)  
 Protection Index: IP50, DIN 40050  
 Operating Temp.: -10°C...+50°C  
 Control Outputs: 2 Relays N/O or N/C  
 Limit Values: Programmable SP1 and SP2  
 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: According to Shunt used  
 Sensor Supply: 24V / 30mA DC

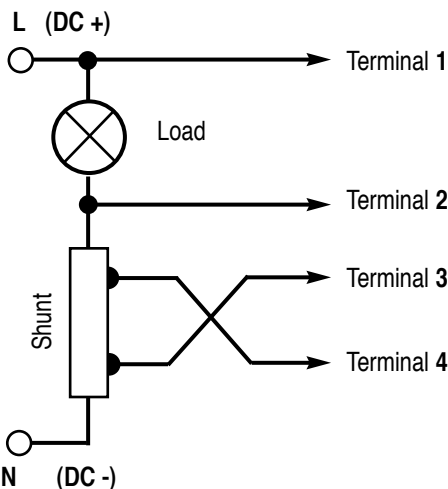
**Measuring Ranges:**

Power in Watt  
 Accuracy: ± 1% of meas.val. ±2 Digits

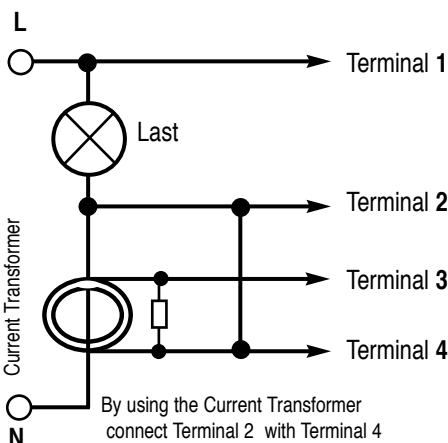
- I 0 – 9999 Watt with external Shunt 100A/100mV
- II 0 – 999.9 Watt with external Shunt 20A/200mV
- III 0 – 99.99 Watt with external Shunt 2A/200mV

Shunts are not part of the delivery

**Circuit diagram for AC / DC Measurements with Shunt**

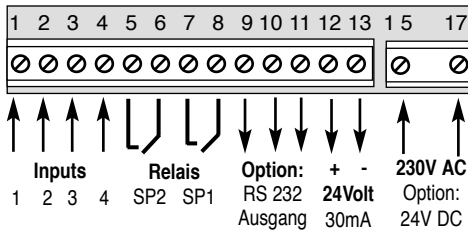


**Circuit diagram for AC Measurement and Current Transformer**



**Terminal Legend:**

SPE 670 rare view



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

**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 Converter 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)

**CE-Convention**

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

**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.

**Option: Analog Output Terminal 9, 11**

Models -025 / -070 / -075  
 Output: 0000 digits generate = 0V  
 9999 digits generate = +10V

Terminal 9 = +10 V Terminal 11 = GND  
 With this option the 24V voltage supply is not available

**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.

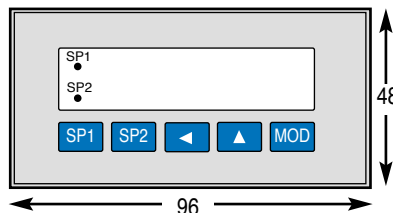
**Service**

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

**Operation Instruction:**



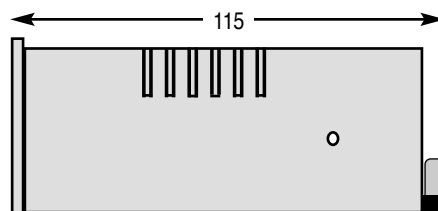
- MOD** enter or leave programming mode
- ▶** increment selected digit
- ◀** select next digit / position
- SP1** display threshold value of SP1 relay
- SP2** display threshold value of SP2 relay
- SP1 ON : SP1 relay contact is closed
- SP2 ON : SP2 relay contact is closed

**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.



Key Lock is not available with this model

**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:



Push MOD to enter programming mode



Select routine number with increase key



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

The device now works again in the measuring mode.

**Integrated Programming Routines**

Routines 1 – 4 are not available

**Routine 5:** Measuring or Time display

Setting 1 the Time of the SPE will be displayed in minutes and hours ( i.e. 12.35 )

- 000 = display measuring value
- 001 = display Time

Applies to all devices:

**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 i.e. 9.999 KW

**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 (Default = 1)

**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 (Default = 1)

**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 [ ^ ] 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:** Selection of measuring method

Setting: 000 = standard measuring (default)  
001 = special measuring range.  
Routines 1 – 4 can be accessed

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

Setting: 000 = no measurement output (default)  
001 = output activated, cycle time Minutes  
002 = output activated, cycle time Seconds

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

**Routine 26:** Measurement 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, 6 = 9600 Baud

## 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, 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

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

The amount of transmission cycles also effects the transmission of the measuring values if Jumper 4 is closed. If the parameter is set to 0 transmission is stopped. 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 character-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.