

**Digital Panel Meter SPE 670 – 050**

Meas. Type: PT100, PT1000 Temperature  
 Dimension Display: °C (Standard)  
 Display/ Rate: 3\_Digits / 2.5 Meas./s  
 Display Type: LED 12.5mm, red  
 Polarity: Auto., "-" sign  
 Decimal Point: according to range  
 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

**Measuring Ranges:**

PT 100 Temperature  
 2 - wire, 3 - wire, 4 - wire Measuring Method

Accuracy: ± 0.1%, ±1 Digit of meas.val.

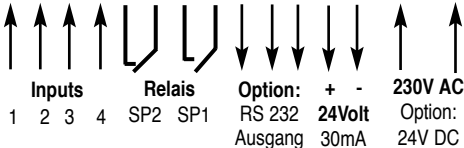
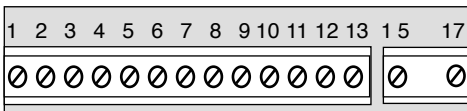
B1 - 100.0 °C ... + 199.9 °C  
 B2 - 100 °C ... + 650 °C

PT 1000 Temperature  
 2 - wire, 3 - wire, 4 - wire Measuring Method

Accuracy: ± 0.1%, ±1 Digit of meas.val.

B1 - 100.0 °C ... + 199.9 °C  
 B2 - 100 °C ... + 650 °C

**1. Terminal Legend:**



**2 – wire Measuring Method** Connection of PT100 / PT1000: Connect Terminal 1 with 2 and Terminal 3 with 4

**3 – wire Measuring Method** Connection of PT100 / PT1000: Connect Terminal 1 with 2 and Sense Line with Terminal 3

**4 – wire Measuring Method** Connection of PT100 / PT1000: Sense Lines Terminal 2 and 3 Current Path Terminal 1 and 4

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: RS232 with Real Time Clock**

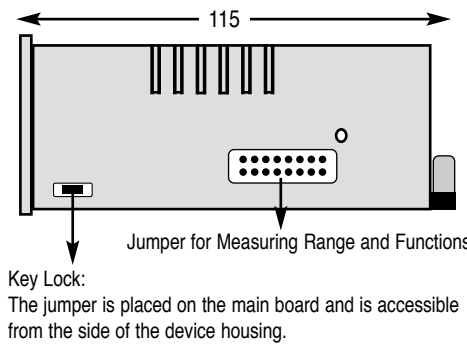
The RS232 module with Real Time Clock provides a printer output via the serial interface. Data, Time and Measuring values with dimension are available. The isolated RS232 interface is bi-directional and comes with a driver software. Models 670/... can be controlled external via this interface. (See description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

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

Models -010 / -020 / -030 / -050 / -060  
 Output: -1999 digits generate = 0V  
 Terminal 9 = + V ±000 digits generate = +5V  
 Terminal 11 = GND 1999 digits generate = +10V

With this option the 24V voltage supply is not available

**2. Setting Ranges and Functions**

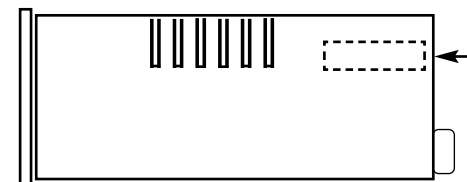


Measuring Ranges are freely settable through jumpers at the right side of the device housing.

	Jumper	
Meas. Range B2: - 100 °C ... + 650 °C	A	
Meas. Range B1: - 100.0 °C ... + 199.9 °C	B	
Measurements using PT100 Sensor	C	
Measurements using PT1000 Sensor	D	
2 – wire Measuring Method	G	
4 – wire Measuring Method	E + F	
3 – wire Measuring Method	E	

**For Selection of Function and Ranges** see Routine 23  
 000= Range B1 for PT100  
 001= Bereich B2 for PT100  
 002= Bereich B1 for PT1000  
 003= Bereich B2 for PT1000  
 Default "000"

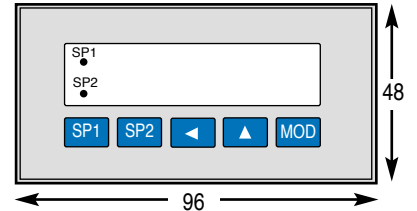
Compensation Procedure of line resistance using the 2 – wire Measuring Method The procedure applies to the 2 – wire Measuring Method only, using PT 100. The Trim-Potentiometer is accessible from the back side of the device housing: Put sensor into ice water (0.0°C). Calibrate with trimmer for a 00.0 °C display reading.



**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.

**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** SP1 ON : SP1 relay contact is closed
- SP2** 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.

**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 **MOD**
- Enter inserted value
- The device now works again in the measuring mode.

## Integrated Programming Routines

**Routine 1 – 4:** Special Measuring Range only Locked with Temperature Meter models. Decimal point is preset according to the ranges used

**Routine 5:** Setting the Options  
DAC (Analog Output) or  
RS232 / Real Time Clock board mounted  
000 = DAC or no extension board  
001 = RS232 / RTC board

**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 inter-rupted. 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 for at least 3 seconds keys SP 1 and SP 2 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:** Function selection and Ranges

Setting: 000 = Range B1 for PT 100  
001 = Range B2 for PT 100  
002 = Range B1 for PT 1000  
003 = Range B2 for PT 1000  
Default = 000

**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,  
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 valued in minutes which is the time difference between two transmissions. Note that transmission must be activated in general through Routine 25

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 effects the transmission of measuring values if Jumper 4 is closed. With setting 0 there will be no transmission. 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,  $\ddot{U}$  = 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 inter face 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)

## 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

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