

## Features



- DC-signals 0 to 10 V resp. 0 to 20 mA
- Temperature measurement with thermocouples and Pt100
- **or** measurement of AC-signals 0 to 250 V resp. 0 to 16A, independent of signal shape
- **or** for 2 Digital inputs to measure frequency and pulse (counter)
- Menu driven configuration capabilities
- 6-digit 7 segment LED, red
- Optional: Analogue output resp. serial interface RS232

## Display

<b>Display</b>	7-Segment display 13 mm LED red, 2 LED for status of limit relays
<b>Display range</b>	- 99999 to 999999 digit
<b>Decimal point</b>	Menu driven decimal point set resp. auto ranging
<b>Operating elements</b>	4 membrane keys
<b>Error indication</b>	Display overrange / underrange, A/D-converter and EEPROM error

## Measurement functions

<b>DC input signals</b>	Voltage, current, thermocouples, Pt100
<b>Measuring range</b>	<b>U</b> - 1 ... + 11 V <sub>DC</sub> , scaling range: - 99999 ... 999999 Accuracy: $\leq \pm 2 \text{ mV} \pm 0,2 \% \text{ of display, } R_{in} > 1 \text{ M}\Omega$
	<b>I</b> - 2 ... + 22 mA, Scaling range: - 99999 ... 999999 Accuracy: $\leq \pm 20 \mu\text{A} \pm 0,2 \% \text{ of display, } R_{in}: 5\Omega$
	<b>TC</b>
	IEC NiCr-Ni type K: - 270 ... 1300 °C
	IEC FeCu-Ni type J: - 210 ... 1200 °C
	IEC PtRh-Pt type S: - 50 ... 1700 °C
	DIN FeCu-Ni type L: - 120 ... 900 °C
	W/Rh5/26 Tungsten: 0 ... 2300 °C
	DIN PtRh-Pt type B: 400 ... 1820 °C
	Accuracy: $\leq \pm 1 \text{ K} \pm 0,2 \% \text{ of display}$ Temperature drift: $\leq \pm 0,05 \text{ K} / \text{K}$ (related to 25 °C), resolution: 0,1 K, $R_{in} > 40 \text{ k}\Omega$ , Internal ambient reference junction: menu driven from 0 ... 60 °C, automatically by internal NTC from 0 ... 50 °C $\pm 0,3 \text{ K}$

Preliminary Rev 07

<b>Pt100</b>	- 200 ... 800 °C, connection 2-, 3-, 4-wire																																																												
	Accuracy: $\leq \pm 0,3 \text{ K} \pm 0,2 \%$ of display Temperature drift: $\leq \pm 0,04 \text{ K/K}$ (related to 25 °C) up to 50 $\Omega$ acquiring conductor resistant by measuring function																																																												
<b>Temperature unit</b>	°C / °F (Celsius / Fahrenheit) switchable																																																												
<b>Method of measurement</b>	12-Bit A/D-converting, automatic range shifting																																																												
<b>Setting time</b>	Menu driven Ptn-controller function																																																												
<b>AC input signals</b>	Measuring range: <table border="0"> <tr> <td>Voltage</td> <td>U</td> <td>30</td> <td>....</td> <td>250</td> <td>VAC</td> </tr> <tr> <td>Current</td> <td>I</td> <td>0,03</td> <td>....</td> <td>16</td> <td>AAC</td> </tr> <tr> <td>Power factor</td> <td></td> <td>-1,000</td> <td>....</td> <td>1,000</td> <td></td> </tr> <tr> <td>Active power</td> <td>P</td> <td>-4000</td> <td>....</td> <td>4000</td> <td>W</td> </tr> <tr> <td>Inductive power</td> <td>S</td> <td>0</td> <td>....</td> <td>4000</td> <td>VA</td> </tr> <tr> <td>Reactive power</td> <td>Q</td> <td>-4000</td> <td>....</td> <td>4000</td> <td>var</td> </tr> <tr> <td>Active energy</td> <td>W</td> <td>-99999</td> <td>....</td> <td>999999</td> <td>kWh</td> </tr> <tr> <td>Inductive energy</td> <td>WS</td> <td>0</td> <td>....</td> <td>999999</td> <td>kVAh</td> </tr> <tr> <td>Reactive energy</td> <td>WQ</td> <td>-99999</td> <td>....</td> <td>999999</td> <td>kvarh</td> </tr> <tr> <td>Duration of test</td> <td>t</td> <td>0</td> <td>....</td> <td>999999</td> <td>h</td> </tr> </table>	Voltage	U	30	....	250	VAC	Current	I	0,03	....	16	AAC	Power factor		-1,000	....	1,000		Active power	P	-4000	....	4000	W	Inductive power	S	0	....	4000	VA	Reactive power	Q	-4000	....	4000	var	Active energy	W	-99999	....	999999	kWh	Inductive energy	WS	0	....	999999	kVAh	Reactive energy	WQ	-99999	....	999999	kvarh	Duration of test	t	0	....	999999	h
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<b>Method of measurement</b>	12-Bit A/D-converting, voltage directly at input L/N current measured by precision shunt at input L/L'																																																												
<b>Accuracy</b>	$\leq \pm 1 \%$ of display reading power factor $I > 0,300$ , resp. $I < -0,300$ , sinus, cycle time 1 sec. if voltage $> 30 \text{ V}$ , basic error at current $\leq \pm 20 \text{ mA}$ , at power $\leq \pm 5 \text{ W}$ (VA, var)																																																												
<b>No load recognition</b>	Current $< 0,03 \text{ A}$ display of current and power will be set to "zero"																																																												
<b>Digital input signals</b>	Voltage pulses of sensors with negative switching TTL-logic level: $0 \text{ V} \leq U_{Lo} \leq 1,5 \text{ V}$ , $3,5 \text{ V} \leq U_{Hi} \leq 24 \text{ V}$ Input frequency: frequency meter: Range1: 1 Hz ... 25 kHz Range2: 1 Hz ... 250 kHz pulse counter: max. 5 kHz Display range: -99999 ... 999999 Input resistor: 56 k $\Omega$ Modes: <b>frequency meter / pulse counter:</b> channel A, channel B, sum A+B, difference A-B, ratio A/B, percentage difference $(A-B)/A \cdot 100$ <b>cycle duration:</b> channel A, channel B hours of operation, simulation value																																																												
<b>Control signals</b>	2 independent signals (low active), free scaling channel A, channel B as gate- / reset- or hold signal																																																												
<b>Method of measurement</b>	Frequency meter: gate measurement, sampling rate adjustable Counter triggering at negative edge																																																												
<b>Accuracy</b>	Range1: $\leq \pm 0,05\%$ of Display $\pm 1\text{Digit}$ Range2: $\leq \pm 0,1\%$ of Display $\pm 20\text{Digit}$																																																												

Preliminary Rev 07

<b>Measuring rate</b>	<b>DC/CF:</b> 0,2, 0,5 or 1,0 second programmable <b>AC:</b> 0,5 or 1,0 second programmable
<b>Min.- / Max.- values</b>	Inquiry by menu or serial interface
<b>EEPROM-memory</b>	Setups remains an Min.-/Max.-values stored after switch off

## Output signals

<b>Limit contacts</b>	Two potential-free relay contacts (changer), load: 250 V <sub>AC</sub> max. 8 A, delay time depending on programmed measuring rate. Set point, hysteresis and circuit logic programmable freely. At line break and short cut both relays are in quiescent state.
<b>Analogue output (Option)</b>	Galvanic separated, proportional to one of the modes: voltage, current, active-, reactive-, inductive power / energy or power factor Output 0 ... 10 V, < 5 mA or 0 (4) ... 20 mA. Burden max. 500 Ω. Scaling range -99999 ... + 99999 of programmed operation mode
<b>Interface (Option)</b>	RS 232 bi-directional, galvanic separated via optical coupler, ASCII-characters with 1200, 2400, 4800 or 9600 baud, 1 Start bit, 8 data bit, 1 stop bit, no parity
<b>Sensorsupply</b>	±30mA, ±12V, GND

## Voltage supply

<b>Supply voltage</b>	100 ... 264 V <sub>AC</sub> , 47 ... 63 Hz, ca. 7VA 24 V <sub>DC</sub> , + 10 / -10 %, max. 350 mA, galvanic isolated, residual ripple: max. 100 mV <sub>SS</sub>
<b>Fuse</b>	DC-supply protection against pole reversal

## Dimensions

<b>Size</b>	ca. 96 x 48 x 135 [mm] (B x H x L) incl. terminal
<b>Panel cut out</b>	92 x 45 [mm]
<b>Mounting depth</b>	ca. 126 mm
<b>Material</b>	Glass-fibre reinforced Noryl, hardly inflammable
<b>Weight</b>	ca. 320 g
<b>Panel thickness</b>	max. 40 mm
<b>Attachment</b>	via 2 attachment elements

## Environment

<b>Ambient temperature</b>	0 ... 50 °C, no dew allowed
<b>Protection</b>	Front panel IP 65 (seal for front panel), panel IP 50, terminal block IP 20 (DIN 40050, IEC144)
<b>Protective class</b>	II (prot. isolation)

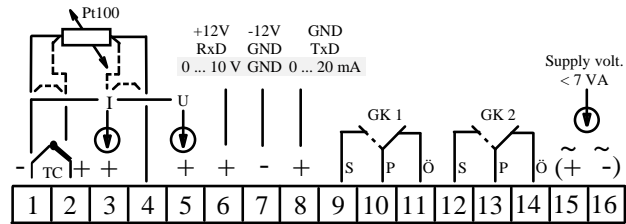
**Connection**

**Interconnecting techn.**

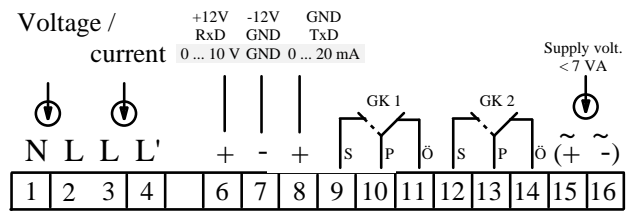
Terminal screws with wire protection for max. 1,5 mm<sup>2</sup>

**Connecting diagram**

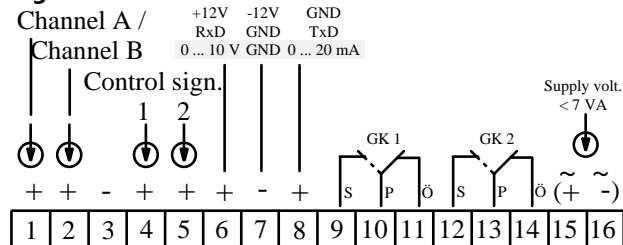
**DC input signals**



**AC input signals**



**Digital input signals**



Date: February 2012  
 Changes may occur without notice!