

Measuring System “autarkon®“ Calculation Unit ERW 521

PTB approval no.: IB.9.11.-74/94

Technical
Information
100 163 A2
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Processing of input signals supplied by any flow transducers like Woltman, impeller, vortex, ultrasonic, magnetic-inductive counters as well as direct mass counters (Coriolis) and thermal methods.

Calculation and recording of volume and mass flow, thermal output and energy (heating and cooling applications).
Display of temperatures, pressure, operating and measurement hours.

District heating supply, industry, power plants

Applicable for	liquids, gases, steam
Temperature range	-50 ... 500°C
Temperature difference Δt	≥ 0.25 °K
Inputs	4-20 mA for volume or mass flow 4-20 mA pabs./ prel. 0 – 100 bar frequency/ pulses
Temperature input	Pt100, Pt1000, four-wire (-50 ... 500° C)
Mains supply	230 V, 50 Hz, 24V AC/DC
Output	4 x analog output 0(4)... 20 mA pulse / frequency, M-BUS

- Can be combined with any current flow transducers
- Voltage-free outputs
- Electromagnetically compatible case
- Wall or panel mounting
- Automatic error analysis and storage
- Freely configurable output signals

2 tariff functions (optional additional counters, not approved)
Fault counters (option, not approved)

Application

Application field

Technical data

Properties

Technical information

Design

- 1- display key
- 2- LC display
- 3- cover with lock
- 4- connection box
- 5- glands for screened cables
- 6- operating keys

Description

The calculation unit determines the values for volume, mass, flow, energy and thermal output. In order to achieve a high accuracy of the calculated values, the pressure and temperature dependent factors (density) are continuously corrected. The sheet steel case of the calculation unit is designed for direct wall or panel mounting.

Basic unit

The device is equipped with an LC Display. Please see page 4 for an overview of the displayed data. There are inputs for the analog current signals (volume/mass flow, pabs./prel.) and temperature sensors Pt100 or Pt1000. The basic version is equipped with two voltage-free contacts for crawl-flow and fault indication. In addition, the device is equipped with an error management in case of erroneous signals.

Additional equipment

An output board offering up to 4 electrically isolated current outputs, 2 additional voltage-free contacts (e.g. for energy and mass) as well as 2 limit contacts is optionally available. A further option is the version with M-Bus or a serial RS232 interface. In addition, a pulse input board can be installed enabling the device to read any current pulse generator. As an option, the device can be equipped with fault or tariff counters (warning: no PTB approval).

Technical information

Technical data

Design	Case for wall or panel mounting	
Case material	Zinc coated sheet steel, powder coated (EMV safe)	
Protection class	IP54	
Power supply	230 V / 50 Hz / 24 V AC / DC (option)	
Power consumption	20 VA	
Ambient temperature (case)	4 °C – 50 °C	
Display	alpha-numeric LC display, 2 lines with 16 characters each	
Input language	German, English, French, Polish, Czech	
Data backup	triple storage of the counter values for volume and energy, in case of mains failure or disturbances, all programmed data and counter values are stored in non-volatile memory, storage time 10 years	
Temperature input	Platinum resistance-based thermometer Pt100 or Pt1000, four-wire, inputs for flow and return temperature, max. range –50 ... 500 °C	
Volume / mass flow input signal	1 x 4 - 20 mA, freely configurable	
Pressure input signal for pabs./prel.	4 – 20 mA, freely configurable, max. range 0 – 100 bar	
Output	voltage-free contact for crawl-flow quantity voltage-free contact for fault indication	max. load: DC voltage 48V / 1A, 5 Hz
Error calculation unit	< 0.1 %	
Weight	2 kg	

Optional assembly

Output board		Amount	
Output		Amount	
Current signal 0/4 – 20 mA, floating		4	can be freely assigned to any of the actual values: flow, thermal output, warm and cold temperature, temperature difference, absolute pressure, pressure differential
voltage-free contact (option: opto-coupler)	max. load: DC 48V / 1A, 5 Hz	2	for volume or mass and energy; range: 0.1 [pulses /unit] up to 1000 [pulses/unit] in decadic steps, pulse width 10 to 500 ms
voltage-free contact (option: opto-coupler)		2	<p>tariff functions: 2 additional counters for volume, mass and energy; controlled by external pulse signal</p> <p>or fault counters 2 additional counters for volume, mass and energy; acticated by internal fault indication, e.g. sensor failure, absolute pressure transducer defective</p> <p>Please note: there are only 2 additional counters available for tariff functions or fault counters</p>
M-Bus board			
Board: serial interface RS232			
power supply	24 V AC / 24V DC		

Technical information

Display items, units, range

Display menu	Unit	Display range	Notes
Energy 1	Wh, kWh, MWh, kJ, MJ, GJ	-	
Energy 2			via additional or fault counters
Volume, mass 1	l, kg, m ³	-	The volume of gases is denoted at the standard state or at any temperature-pressure state
Volume, mass 2			via additional or fault counters
Thermal output	W, kW, MW, GW, kJ/h, MJ/h, GJ/h, TJ/h	-	
Flow	m ³ /h, t/h	-	For gases: calculation in standard volume flow
Measured signal	mA, Hz	4-20 pulses/frequency	Input signal from volume transducer
Pressure	bar	0-100	Absolute or relative pressure display
Warm temp. sensor	°C	-50 ... +500	Display of sensor temperature (Pt100, Pt1000) at the warm or cold side of the flow medium
Cold temp. sensor	°C	-50 ... +500	
Temp. difference	°C	0 – 500	Shows the difference between the measured or input values of the warm and the cold sensor
Specific volume	m ³ /kg		Only applicable in service menu
Enthalpy difference	kWh/K		Only applicable in service menu
User menu			
Operating hours			Total number of operating hours
Measuring hours			Total number of hours during which the flow was above the crawl-flow quantity
Failure hours	h	0-99999.99	Number of hours during which the arithmetic unit was not connected to the power supply
Saturated steam hrs			Number of hours during which the saturated steam line was underflown
Fault hours			Number of hours during which an error / fault occurred
Error storage			Display of the last 16 error messages with notification of the operating hours count

Temperature sensors according to DIN IEC 751

Pt100 sensor with connection head, measuring range 0.1 °C – 500 °C, tolerance class 1/3 class B		
Pairing accuracy	Measuring range	Deviation
Pt100 sensor	20 °C – 120 °C	0.1 K
	120 °C – 300 °C	0.2 K
	300 °C – 500 °C	0.6 K
Pt1000 sensor with connection head, measuring range 0.1 °C – 400 °C, tolerance class 1/3 class B		
Pairing accuracy	Measuring range ΔT	Deviation
Pt1000 sensor	20 °C – 120 °C	0.1 K
	120 °C – 400 °C	0.7 K

Immersion pockets for Pt100 sensors

Welding-type immersion pocket type 100, L=200 mm, material 1.0305
Screw-type immersion pocket type 100, L=85 / 155 / 210 mm, G ½, material 1.4571

Immersion pockets for Pt1000 sensors

Welding- or screw-type immersion pocket type 200, L=200 mm, G½, material 1.4404
Welding-type immersion pocket type 200, L=200 mm, material 1.7335
Screw-type immersion pocket type 75, type 160, type 200, L=75 / 160 / 200 mm, G ½, material 1.4571

Other components

Sensor connection cable, 4-wire, screened
8 digit remote counter, controlled by voltage-free contacts
System test, commissioning and instruction by Metra service personnel, costs according to effort (see business conditions / customer service)

Technical information

Dimensions

[Bilder]

Rechenwerk = Calculation unit

Blendenrechner=Orifice plate calculator

Schalttafeleinbau= Panel mounting

Schalttafelausschnitt =Panel cut-out

Montagesatz Schalttafeleinbau =Mounting kit for panel mounting: 2 mounting clamps

Mindestabstand beim Einbau mehrerer Geräte =Minimum clearance if several devices are installed

Wandmontage =Wall mounting

Montagesatz Wandmontage = Mounting kit for wall mounting: 4 dowels Ø6, 4 wood screws

Bohrbild = Drilling jig

Temperature sensor, immersion pocket

Type	D mm	L mm	G ISO 228
Temperature sensor Pt100	6	245	-
Temperature sensor Pt1000	7.8	250	-
Welding-type immersion pocket type 100	8	200	-
Screw-type immersion pocket type 100	7.5	85 / 155 / 210	G ½
Welding-/screw-type immersion pocket type 200	14	200	-
Screw-type immersion pocket type 75 / type 160 / type 200	10	75 / 160 / 200	G ½

Einschweißtauchhülse = Welding-type immersion pocket

Einschraubtauchhülse =Screw-type immersion pocket

Einschraub-/Einschweißtauchhülse = Welding-/screw-type immersion pocket

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