

# EngyCal RS33

## Steam calculator

Steam calculator for recording steam mass and energy flow for saturated or superheated steam



More information and current pricing:

[www.de.endress.com/RS33](http://www.de.endress.com/RS33)

### Benefits:

- Compensation of differential pressure flow measurement
- Calculation according to international water steam tables
- Electronic matching of the temperature sensor (sensor-transmitter matching) with the arithmetic unit enables highly accurate temperature measurement
- Detailed data logging of current and counter values and of error messages, off-limit conditions and changes to operating parameters
- Standard models are suitable for connecting and supplying all common flow transmitters, temperature sensors and pressure sensors
- Remote readout via Ethernet and fieldbuses
- Deficit counter for transparency in case of error or alarm

### Specs at a glance

- **Input** 1x Puls/Analog for flow 2x RTD/Analog for temperature and pressure Loop power supply 24V DC (+/-16%)
- **Output** 1x 4...20mA 2x digital (Open Collector)
- **Display** 160 x 80 Dot-Matrix LCD with white backlit colour change in case of alarm event active display area 70 x 34 mm
- **Calculations** IAPWS-IF97

**Field of application:** The steam calculator EngyCal RS33 is used to record steam mass and energy flow of saturated and superheated steam. The calculation is based on the measured process variables volume flow, temperature and/or pressure. The EngyCal RS33 uses the standard IAPWS IF97 to calculate the mass and energy flow of steam. The density

and enthalpy of the steam are calculated from the input variables pressure and temperature.

## Features and specifications

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Energy & Application Manager	<b>Measuring principle</b>
	Energy manager
	<b>Measuring principle</b>
	Energy manager
	<b>Function</b>
	Monitoring and billing of energy in saturated and superheated steam applications (steam heat flow, heat difference. Typical applications can be found in food & beverage industry, chemical industry, pharmaceutical industry, power plants, building automation and skid builders.
	<b>Calculations</b>
	IAPWS-IF97
	<b>Number of applications</b>
	Not defined
<b>Data storage</b>	
yes	
<b>Calculation standards</b>	
IAPWS-97	
<b>Communication</b>	
web server USB Ethernet Modbus RTU/TCP Slave M-Bus	
<b>Power supply</b>	
Not defined	

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## Energy & Application Manager

### Loop power supply

Low voltage power supply:  
100 bis 230 V AC (-15% / +10%)  
Small voltage power supply:  
24 V DC (-50% / +75%)  
24 V AC ( $\pm 50\%$ )

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### Protection class

IP65

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### Input

1x Puls/Analog for flow  
2x RTD/Analog for temperature and pressure  
Loop power supply 24V DC (+/-16%)

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### Output

1x 4...20mA  
2x digital (Open Collector)

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### Dimensions (WxHxD)

144 x 144 x 103.1 mm (5.67" x 5.67" x 4.06")

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### Operation

3 button on site or via FieldCare  
read out of historical / logged data via Field Data Manager Software  
(SQL database and visualization interface)  
selectable language

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### Display

160 x 80 Dot-Matrix LCD with white backlit  
colour change in case of alarm event  
active display area 70 x 34 mm

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**Energy & Application Manager Software functions**

Calculated Values:

Energy, volume, density, enthalpy, DP-Flow

Counters:

volume, mass, energy, counter in case of failure

Optional:

tariff 1, tariff 2 or seperated heating energy, cooling energy, bilance energy

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**Certificates**

CE

CSA GP

MID 004

OIML R75

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**Thermal Energy Measurement Measuring principle**

Energy manager

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**Function**

Monitoring and billing of energy in saturated and superheated steam applications (steam heat flow, heat difference; typical applications can be found in food & beverage industry, chemical industry, pharmaceutical industry, power plants, building automation and skid builders

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**Certification**

CE, UL listed, CSA GP

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**Input**

1x Puls/Analog for flow,

2x RTD/Analog for temperature and pressure,

Loop power supply 24V DC (+/-16%)

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**Output**

1x 4...20mA,

2x digital (Open Collector)

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**Thermal Energy Measurement** **Relay output**2x

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**Auxiliary power supply**

Low voltage power supply: 100 bis 230 V AC (-15% / +10%); Small voltage power supply: 24 V DC (-50% / +75%), 24 V AC ( $\pm 50\%$ )

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**Dimensions (wxhxd)**

144 x 144 x 103.1 mm  
(5.67" x 5.67" x 4.06")

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**Software**

Calculated Values:

Energy, volume, density, enthalpy, DP-Flow;

Counters: volume, mass, energy, counter in case of failure

Optional: tariff 1, tariff 2 or seperated heating energy, cooling energy, balance energy

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**Operation**

3 button on site or via FieldCare; read out of historical / logged data via Field Data Manager Software (SQL database and visualization interface), selectable language

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**Display**

160 x 80 Dot-Matrix LCD with white backlit, colour change in case of alarm event, active display area 70 x 34 mm

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**Others**

electronic temperature sensor matching via CvD coefficients, logbook measured values, custody transfer logbook, event logbook, limit monitoring

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**Calculations**IAPWS-IF97

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More information [www.de.endress.com/RS33](http://www.de.endress.com/RS33)