Siemens SITRANS FU E950

Thermal Energy Calculator

Siemens SITRANS FU E950 combines a flowmeter pulse signal with hot- and cold-line temperatures to calculate thermal energy. The modular calculator supports configured heating, cooling or combined heating/cooling applications with water.

VOLUME INPUT

Flowmeter pulses, matched to IN0

TEMPERATURE PAIR

Hot and cold Pt100 / Pt500 setup

ENERGY ACCOUNT

Volume, delta temperature and thermal coefficient

MEASUREMENT

Combines flow pulses with hot- and cold-line temperatures

DISPLAY

Provides an 8-digit LCD and six menu loops

RECORDS

Stores history, logged values and recorded faults

CONFIGURATION

Accepts order-dependent supply and expansion modules

Important Notice: The family name does not identify fitted options. Confirm the complete order code, sensor setup, pulse scale, supply module and approval label before wiring or commissioning.

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Measured temperature range	-20 to +190 C
Approved heating range	0-180 C; requires corresponding approved configuration
Approved cooling range	0-105 C; requires corresponding approved configuration
Heating differential range	3-177 K; starts at 0.1 K
Cooling differential range	3-102 K
Temperature measurement cut-off	0.125 K
Temperature display resolution	0.1 K for hot, cold and difference values
Temperature conversion	16-bit digital resolution
Sensor configurations	Pt100 or Pt500; 2-wire or 4-wire, order dependent
Sensor wire detection	Automatic 2-wire / 4-wire detection
Temperature sensor cable limit	Up to 10 m under the stated EN 1434 / MID conditions

ENERGY MODEL

Energy = Volume x (THot - TCold) x Kfactor. Retain the sensor identities and the medium coefficient.

SMALL DIFFERENTIALS

The typical relative error expression includes 3 K divided by the temperature difference. Its contribution grows as the difference becomes smaller.

SENSOR SETUP

Pt100 / Pt500 and 2-wire / 4-wire are configuration choices. The specified sensor cable limit is up to 10 m under the stated approval conditions.

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Standard flow input	IN0: terminal 10 (+ pulse), terminal 11 (ground)
Flow pulse scale options	1-1000 L/pulse or 1-100 gal/pulse; exact scale is order dependent
Flow input pulse timing	ON >=3 ms; OFF >=2 ms
Flow input internal voltage	3.6 V DC
Flow input cable limit	10 m; shielded cable recommended
Installation position	Hot or cold line as selected by order code

HEATING

A: cold return; B: hot forward.

COOLING

C: cold forward; D: hot return.

COMBINED

E: forward; F: return, relative to heating.

IN0 MATCH

The calculator and flowmeter must use the same volume per pulse.

PULSE-SCALE EXAMPLE

For a 5 ms pulse length the catalog uses L/pulse > Qmax (m3/h) / 360. At 300 m3/h the result is >0.83 L/pulse, so the listed 1 L/pulse option fits that example.

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Main display loop	Energy, volume, flow rate and temperature
Heating/cooling tariff loop	Loop 5 additionally active for combined configuration
History memory	24 periods: months, weeks or days
Data logger	440 records; default interval 24 hours
Selectable logging intervals	5, 6, 10, 12, 15, 20, 30 or 60 min; 24 h
Event memory capacity	Up to 127 entries
Data retention	Non-volatile EEPROM
Accounting-date memories	Two independently programmable dates
Optical readout interface	ZVEI / IrDA with M-Bus protocol; 300 or 2400 baud

Optional function modules	2 pulse inputs; 2 pulse outputs; combined 2 inputs / 1 output
Optional communication modules	M-Bus, RS232 or RS485 using M-Bus protocol
Optional current module	2 passive 4-20 mA outputs; occupies both ports
Current module external supply	10-30 V DC
Current module maximum load	800 ohm
Current alarm values	3.5 mA or 22.6 mA programmable; default 3.5 mA

CURRENT OUTPUT USES BOTH PORTS

The dual passive 4-20 mA module connects through port 1 but occupies both expansion positions. Other optional modules cannot share its occupied space.

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Why must the flowmeter pulse value match FUE950 IN0?

Every incoming pulse represents the configured volume. A mismatch between the flowmeter output and IN0 scales the recorded volume incorrectly and therefore affects calculated energy. Compare both settings, rather than only checking that pulses arrive.

Does the family name tell me whether the flowmeter belongs in the hot or cold pipe?

No. The application and installation-position fields of the order code select the pipe. Heating codes A/B and cooling codes C/D use different arrangements; combined heating/cooling uses E/F. Retain the position shown on the device label and display.

Can a two-wire temperature pair be replaced without checking the sensor setup?

Wire count alone is not enough. The calculator accepts configured Pt100 or Pt500 sensors and detects 2-wire or 4-wire connections automatically. The sensor type, paired hot/cold identities and approval conditions must still match the installed setup.

Why can no second expansion module be fitted beside the 4-20 mA module?

The dual passive-current module is connected through port 1 but occupies both expansion ports. Its channels normally represent power and flow, and require an external 10-30 V DC supply. It is not a spare-port configuration.

What continues working when a mains-powered calculator switches to its backup battery?

Displayed values, date and time remain updated and communication remains available. Measurement stops, including flow measurement. Backup operation must not be described as uninterrupted energy metering.

Why does combined heating/cooling show an additional display loop?

The combined configuration activates tariff loop 5 in addition to the preconfigured main data loop. The display menus follow the ordered application and selected settings, so symbols or loops are not proof that all optional modules are fitted.

How does changing the logging interval affect retained history?

The logger holds 440 records. The catalog examples give 36.6 hours at 5-minute intervals, 110 hours at 15 minutes, 18.3 days at one hour and 440 days at the default 24-hour interval. The separate 24-period history memory is a different function.

Can FUE950 be paired indiscriminately with any SITRANS flowmeter?

No. The 2022 integration list identifies FUS380/FUE380, MAG 5000/6000 and FST020 arrangements. It explicitly excludes the FX and FC product groups and supports only some clamp-on products. Pulse scale and the approved application must also match.

READINGS, ALARMS AND LIVE MEASUREMENT

The display alarm symbol and recorded temperature, battery, supply or communication events describe a fault state. EEPROM retains values and parameters. Check present flow and both temperatures separately from the retained cumulative energy value when returning the installation to service.

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01 / Match the flowmeter output pulse value to the calculator IN0 setting.

02 / Retain the configured hot- or cold-line position of the flowmeter.

03 / Identify hot and cold sensor pairs before connecting temperature terminals.

04 / Use the selected Pt100 or Pt500 setup with its 2-wire or 4-wire connection.

05 / Verify the fitted power module; battery, 230 V AC and 24 V AC are alternatives.

06 / Keep the flow-input cable within 10 m and preserve its shielding arrangement.

07 / Allow both ports for the current-output module; do not add another module beside it.

08 / Confirm live measurement after power restoration; mains backup does not continue measuring.

MANUFACTURER SOURCE

SITRANS FUE950 energy calculator - Siemens FI 01 catalog

FI 01 2021, update September 2022; catalog pages 3/311-3/319

RETURN TO MEASUREMENT

After restoring power, verify live flow and both temperature readings before accepting the energy account. A retained cumulative value alone does not prove measurement is running.

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