flowcom

made by systec

systec

Messen & Regeln

Controls

flowcom
made by systec

The smart flow-rate-compensation and heat-transfer computers

We spent a lot of time searching for a flow-rate compensation computer that would meet the stringent demands of today's applications, and finally came up with flowcom. Developed and manufactured from our own personnel in our own facilities. flowcom makes no compromises and is both exactly what you are looking for and exactly what we wanted. flowcom from systec Controls is manufactured in Germany and meets the same strict quality standards we demand from all other systec Controls products.

By the way, how your flowcom is to be equipped is entirely up to you. The basic version may be readily adapted to suit your budget and technical requirements.

What flowcom does

flowcom compensates for flowmeter errors due to pressure or temperature variations and computes mass or NTP-volume flow rates for gases or steam, and can even do so for a pair of monitoring stations. It also computes heat-transfer rates, thermal-energy contents, and thermal balances between supply and return lines for saturated steam, superheated steam, water, heat-transfer media, or refrigerants.

Why flowcom computes more accurately

Determining the mass densities and enthalpies of gases, vapors, and heat-transfer media under operating conditions where pressures and temperatures vary based on models is problematical. All equations based on such models are subject to errors and yield satisfactory results only over limited ranges of operating conditions. Such equations frequently become totally useless, particularly at high pressures and low temperatures and in the vicinities of phase transitions or critical points.

We recognized this problem and have incorporated its solution into flowcom. flowcom integrates a number of permanently stored tables covering the phases of commonly employed heat-transfer media over the technically relevant pressure and temperature ranges, to which you may readily add your tables. In the event that no tabular data is available for a given medium, flowcom can, of course, revert to using the appropriate model equations.

Range splitting or averaging over as m as 4 dp-transmitters

flowcom comes equ with an RS-232 serial interface.

Flexibly applicable, c to its total of as ma 10 inputs and 8 outp

Of course, its electronics are precalibrated.

Large capacity data buffer.

flow

flowcom's features

flowcom is available in two versions: a gas-compensation computer and an heat-transfer computer. Both versions have identical complements of hardware, and, of course, both feature impressive performance.

- Two complete pressure- and temperature-compensated flow-rate monitoring channels in a single computer, which allows redundant, bi-directional, or split-range measurements. Averaging over as many as four dp-transmitters is optionally available.
- Summation of the measured values of processing parameters for billing purposes.
- Suitable for use with all commonly employed types of flow-meters, such as deltaflow integrating-pitot tubes, orifices, nozzles, venturis, vortex flowmeters, turbines, coriolis-force flow-meters, mag-meters, etc.
- 24 VDC power supply for all connected two-wire transmitters may be supplied by the computer, if desired.
- Programmable from plaintext menus displayed on a large, menu-driven display using its integral front-panel keypad or via its RS-232 serial interface using our self-explanatory flowcom communications software.
- The units to be employed, CGS-units, SI-units, or FPS-units, are freely selectable. Its compact display is capable of accommodating two flow circuits onscreen simultaneously.
- Inputs: 2 sets of flow rate inputs (2 ea. 4 - 20 mA, plus 2 ea. pulse inputs), 2 ea. pressure inputs (4 - 20 mA), plus 2 sets of temperature inputs (2 ea. 3-conductor PT100-inputs, plus 2 ea. 4 - 20 mA inputs). All interfaced transmitters/sensors are monitored by the computer. An alarm will be transmitted in the event of a malfunction (signal levels falling outside the ranges specified by NAMUR-recommendations).
  Outputs: 4 ea. 4 - 20 mA outputs, each of which is freely allocable, plus freely adjustable error currents, in compliance with NAMUR; 2 ea. pulse-counter outputs; 2 ea. alarm-triggering relays; RS-232 serial interface.
- Precalibrated electronics: errors introduced by analog circuit components are offset by factory precalibrations.
- The analog and digital sections of the computer are mutually electrically isolated.
- Facilities for storing 2,600 records, each consisting of a pressure, a temperature, an NTP-volume flow rate, a mass flow rate or heat-transfer rate, and an user-defined sampling interval.
- Comprehensive alarm protocols for fail-safe recording of past alarm conditions, including monitoring of transmitters and supply-voltage outages. The times at which malfunctions occurred and the times required for their elimination are also recorded.
- Integral password protection.

flowcom for gases

flowcom for gases compensates for flowmeter errors due to pressure or temperature variations and computes NTP-volume flow rates.

- Incorporates permanently stored compressibility tables for air, nitrogen, carbon dioxide, methane, oxygen, and hydrogen.
- Facilities for entering user-defined compressibility tables consisting of 14 x 18 entries each.
- Facilities for computing mass densities based on an improved ideal-gas equation.
- flowcom employs the GERG 88-equation in handling computations for natural gas. This equation was developed for billing purposes, and is accepted by all major European natural-gas utilities, such as Ruhr-Gas (Germany), British Gas (Great Britain), Distrigaz (Belgium), Gas de France (France), N.V. Nederlandse Gasunie (The Netherlands), S.N.A.M. S.p.A. (Italy), and the PTB (Germany). GERG88 is much more accurate than the AGA-NX-19-mod. formerly employed for L-gas and the AGA-NX-19-mod. BR. CORR. 3H formerly employed for H-gas.

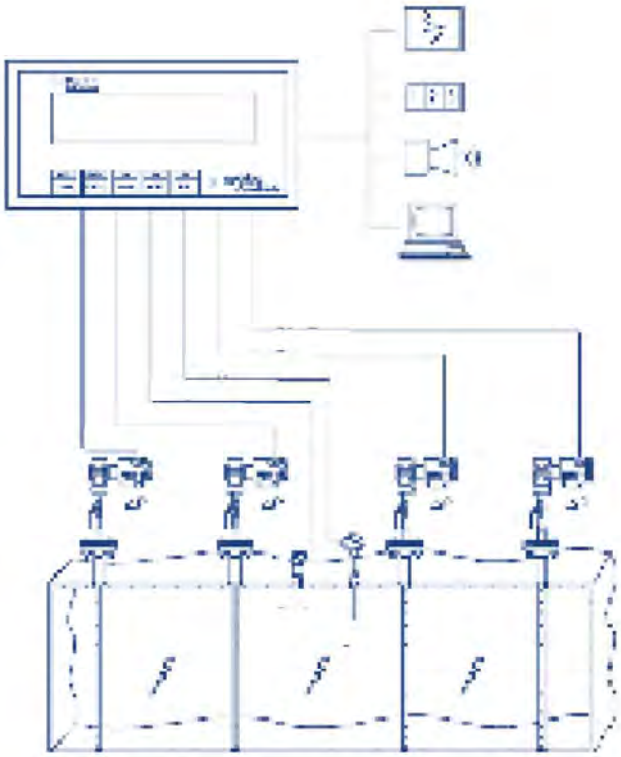
flowcom for energy

In addition to flow-rate compensations, flowcom for energy also computes power- and energy-transport for commonly employed gaseous or liquid heat-transfer media and refrigerants. A further feature of flowcom for energy is its ability to compute power and energy balances between Circuit 1 and Circuit 2, which allows computing energy balances for supply lines to, and return lines from consumers.

The major features of flowcom for energy:

- Permanently stored enthalpies and mass densities for water, saturated steam, and superheated steam.
- Facilities for storing user-defined enthalpy and density tables for other media, such as gaseous or liquid ammonia.
- Computations may be based on an improved ideal-gas equation, if desired.
- Facilities for readily performing computations for media, such as thermo-oils, with constant specific heat capacities.

A typical averaging application



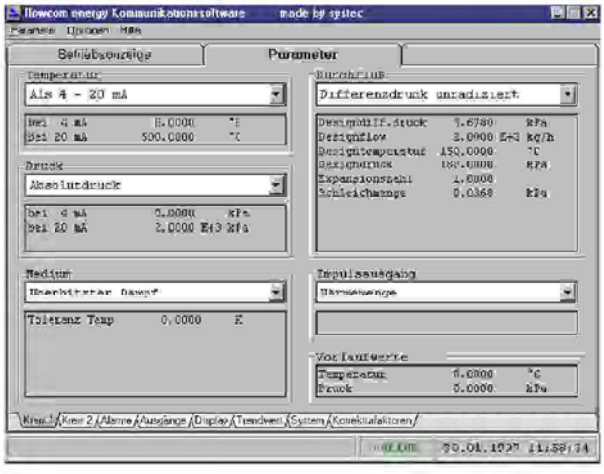
flowcom also handles difficult flow profiles.

The inlet sections of flow systems are often very short, particularly in the case of pipes or rectangular flow channels with large cross-sectional areas. systec Controls has developed a high-performance total solution that solves this problem. flowcom forms averages over up to four deltaflow integrating-pitot tubes, which allows compensating for even severe flow asymmetries.

flowcom communications software

flowcom communications software provides simple, clear means for parameter entry and readout of all recorded data.

It allows reading out current operating conditions, as well as recording past alarm conditions, the last eight totalizer readings, and much more. It also allows preparing and transferring user-defined compressibilty and enthalpy tables. flowcom communications software runs under Windows 3.11 and later versions, including Windows 95, and requires 1 MB free hard-disk space.



Technical Data

flowcom basic unit

Inputs:

3 ea. 4 - 20 mA inputs, 1 ea. 3-wire PT100-input

Outputs:

1 ea. 4 - 20 mA output, 1 ea. pulse-counter output

Interface:

RS-232 serial interface

Upgrade Package 1:

as for the flowcom basic unit, but with the following additions:

3 ea. 4 - 20 mA inputs, 1 ea. 3-wire PT100-input

3 ea. 4 - 20 mA outputs

Upgrade Package 2:

as for the flowcom basic unit, but with the following additions:

RAM for storing trend data

2 ea. relays for arbitrary purposes (min./max., malfunction alarms, redundancy alarms)

2 ea. pulse inputs for flow rates

1 ea. pulse-counter output

Illuminated display

Supply voltages for inputs and outputs:

The supply voltages for all inputs and outputs may be provided either by flowcom or by external power supplies. Configuration is simply accomplished by means of jumpers.

Electrical supply:

220 - 240 VAC or 90 - 120 VAC, 50 - 60 Hz, or 24 VDC

Housing:

DIN 43700 panel-mounting housing measuring 144 mm wide x 72 mm high x 250 mm deep. Overall depth is approximately 300 mm, including rear-panel cable connectors. Panel cut out required: 139 mm x 67 mm.

Protection class (front panel):

IP 52 (dust- and water-resistant); optionally available: IP 65 (dust-sealed and waterproof).

Operating conditions:

Ambient temperature: 00C - 500C, with adequate air circulation

Relative humidity: 5 % - 90 %, noncondensing

Connectors:

Inputs/outputs: screw terminals with removable nuts, max. conductor gauge: 1.5 mm

Supply voltages: screw terminals with removable nuts, max. conductor gauge: 2.5 mm

Resolutions:

Analog inputs and outputs: 12 bits (< 0.025 %)

PT100-inputs: 12 bits (< 0.25°C)

Pulse inputs: < 5 V = 0, > 10 V = 1, max. 10 kHz

Precisions:

A/D-conversion, D/A-conversion: < 0.1 %

Linearity: better than 0.05 %

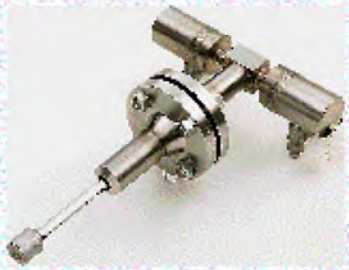
Computing accuracy: better than 0.05 %

Information we need from you:

Major items of information to be specified in your order:

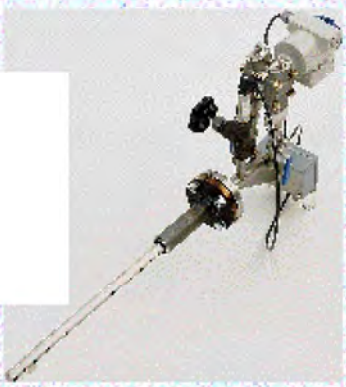
Supply voltage	230 VAC 110 VAC 24 VDC
Version	Gas Energy
Language	German English
Options	Upgrade Package 1 and/or 2 flowcom communications software Averaging Parameter entry by systec Controls Field housing

Flow-measurement equipment "made by systec"



deltaflow DF25HD made by systec

deltaflow Model DF25HD high-pressure-steam probes per (German) Technical Regulations for Pressure Vessels (TRD) issued by the Association of (German) Technical Inspection Associations (VdTÜV) for use at pressures up to PN 400 bar and temperatures up to 650°C. deltaflow provides ultrahigh-precision measurements, thanks to our totally new type of probe profile. Accuracy is much better than 1 %.



LSP1 made by systec

LSP1 is an air-flushing system for automatically scavenging dp-primary elements and stepping lines. The design and the function of the LSP1 is adapted to meet the particular prerequirements of power stations. Approaches, signals, and reports active or passive. Signal retention during the flushing process. Available alternatively for 2 pressure or 1 dp measurement transmitters. Fulfilling IP65. All come with a 2-year guarantee as standard.

The headquarter of systec Controls is situated in Puchheim near Munich. Here we develop and manufacture our products in keeping with the latest technological developments. Innovation and product quality alone are not enough however, we have also had our systems examined by independent institutes, and all have passed with flying colors. We are also there for you after installation. You can reach our hotline **24 hours a day, 7 days a week.**

systec Controls –
specialist in flow-measurement technology

Presented by:

systec
Messen & Regeln
Controls

Mess- und
Regeltechnik GmbH
Lindberghstrasse 4
D-82178 Puchheim
Germany
Tel.: +49 - 89 - 809 06-0
Fax: +49 - 89 - 809 06-200

The systec Controls hotline:
+49 - 89 - 809 06-108

WERBEATELIER PUR² 089 - 890 27 800