

DESCRIPTION AND SPECIFICATION

GASFLOW MEASUREMENT

EMITTER SENSOR SYSTEMS

Sensor System Dynamic GUNYFLOW V10

Sensor System Dynamic GUNYFLOW V10 ATEX

Safety Barrier SB V10 ATEX

Central Unit GUNY-CPU V10

CALIBRATION UNIT GUNYFLEX

Calibration and reference measurement of sensors and tubes

OIL CONDITION MONITORING

GUNYOIL V1 Oil Condition Monitoring Sensor



COMPETENCE AND INNOVATION



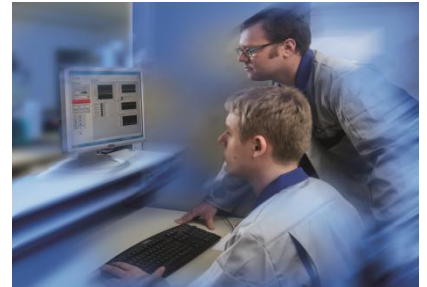
To secure our core competences, research, development, engineering and as well manufacturing are done by our engineers. Our aim and daily challenge is to offer our clients innovative products with a high quality standard, professional service and personal engagement.

AUSTRIAN QUALITY AND SERVICE



At our locations in St. Valentin (Lower Austria) and Weng (Upper Austria) all sensor systems are produced and calibrated according to international standards and are finally checked regarding their perfect condition. Our products and processes are subject to a continuing and strict quality control.

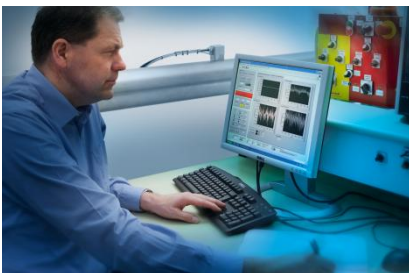
HIGHEST FLEXIBILITY



Due to high performance production and close cooperation with our logistic partners we are able to meet our customers' requirements in a quick and flexible manner. Various equipment allows expanded fields of application as they can even be easily linked into an existing process control system.

PROCESS OPTIMIZATION | ENERGY SAVING | UNIVERSALLY APPLICABLE | CROSS STANDARDIZATION

ENGINEERING SERVICES



Services offered are customer counselling, engineering, prototyping, simulation, (initial) calibrations, assembly as well as technical inspection and performance tests. We rely on focussed procedures and qualified employees who enable us to improve our services every day and keep them at the highest stage. This allows us to even take care of specific development requests.

MANUFACTURE / CERTIFICATES



Our products and processes subject to standardized procedures and quality controls to ensure a constant level of high quality. We are certified in accordance with ISO 9001:2008 and the Council Directive 94/9/EC, Annex IV. The production of devices applicable in explosive areas is in compliance with the quality assurance in Annex IV of the Council Directive 94/9/EC .

PARTNERSHIPS

















Practical advice and the highest level of support before/after delivery of any sensor lead to a successful partnership. Further benefits are science-based cooperations with technical colleges, national/international universities and research companies such as LCM Linz Center of Mechatronics or our design partnership with MICROCHIP (since 09/2009) and the MC-membership (since 02/2011).





CHARACTERISTICS AND ADVANTAGES OF GUNYTRONIC EMITTER SENSOR SYSTEMS

-  Modular device concept:
due to different operating conditions several modules are available
-  Measurement data in real-time, no delays
-  Central unit processes and controls up to 10 sensors simultaneously
-  Customized data output
- e.g. RS485 – Protocol: Modbus RTU-Mode, USB, analog, Ethernet-IP, various Bus-Systems etc.
-  Robust with high durability, insensitive to shock and vibration
-  Various EMV-standards
-  Simple installation and constant reliability with low maintenance effort
-  Easy handling, comfortable communications
-  Protected from unwanted influences (e.g. electromagnetic influence and external ionization)
-  Synchron measurement of gas velocity, gas flow, mass flow (by external pressure and temperature compensation) and gas direction; additionally a temperature sensor is implemented
-  Very short touching stretch due to the patented Ion Emitter-technology
-  Integrated self calibration
-  No pressure loss / no influence of the measured stream due to the flush-mounted sensor system
-  Ex-protection certified flow measurement



YOUR BENEFITS

*Reliable, accurate, easy and trouble free
in handling and installation –
comfortable start up, low maintenance effort.*

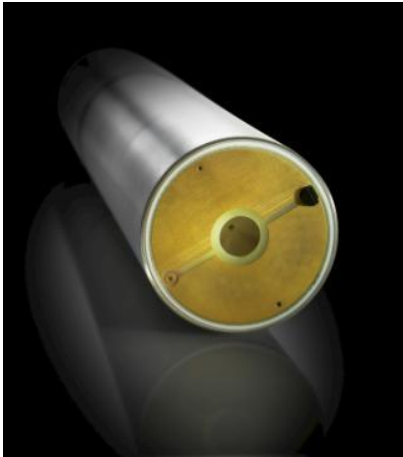
WE WILL BE GLAD TO ADVISE YOU





VOLUME FLOW SENSOR SYSTEMS

Emission and process control – direct and delay free ion emitter technology with highest accuracy
Application as well possible in explosive areas (up to zone 0)



Sensor head

The *Dynamic GUNYFLOW V10* sensor system, developed by **GUNYTRONIC®**, offers a wide range of solutions for different measuring tasks.

The sensor is used for volume flow detection within processes, emission control and as well to determinate the amount of induction gas in test stands. Flexible due to a building block system the *Dynamic GUNYFLOW V10* satisfies many customer requirements.

MEASUREMENT TECHNIQUE

The *Dynamic GUNYFLOW V10* measures gas velocity, volume flow and gas direction without influencing the aerodynamics of the medium. The sensor - insensitive to shock and vibration - can be used in channels, tubes or on rigid or flexible foils.

All these four measurements - velocity, direction, volume flow and the temperature - can be processed by one sensor.

The flush-mounted sensor guarantees measurement without any pressure drop and therefore no influence of the measured stream; furthermore it allows high flexibility regarding the mounting place.



Sensor connection

The connection of the sensor system with the central unit is realized via a single multi-conductor low voltage cable. This cable is optimized to eliminate interfering signals in the process or more precisely to protect the signal from unwanted electromagnetic influences and external ionization.



Sensor electronic

EMISSION CONTROL

Continuous, direct and contactless - the *Dynamic GUNYFLOW V10* measuring system detects accurately and reliably volume flow and gas velocity in (air) supply/(air) exhaust ducts or tunnels.

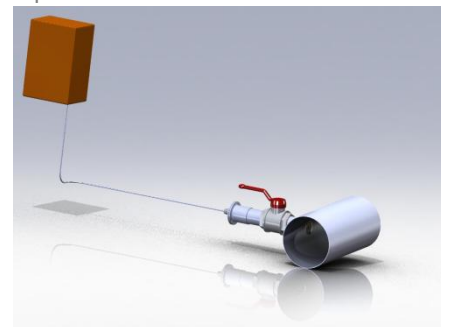


Central Unit **GUNY-CPU**

PROCESS MEASUREMENT

Reliability, accuracy and a response time less than 1 ms - all combined in the patented *Dynamic GUNYFLOW V10* system - lead to a significant advantage in the efficiency of control cycles.

Because of the fast measurement the current state of the process is reflected; even under difficult conditions, such as increased chemical or dust exposure.



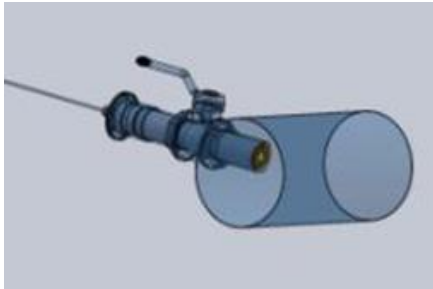
System structure

Especially for these requirements **GUNYTRONIC®** developed the *Dynamic GUNYFLOW V10* measurement system. The ideal coordinated constructional design of the devices, detectors integrated in a measuring transducer as well as the hidden cable guiding in low voltage technology lead to a very robust measurement



system that performs most accurately even under rough operating conditions.

The **GUNYTRONIC**[®] emitter sensor system can easily be installed on existing tubes or retrofitted in already existing systems; no installation of separate components is needed.



Installation situation

FUNCTIONAL PRINCIPLE

The *Dynamic GUNYFLOW V10* emitter-sensor set up is flush-mounted on the wall of a channel or tube. Therefore the sensor itself is perfectly matched to the curved wall. The sensor, which is not exposed to the direct stream and is therefore protected, ionizes the passing gas molecules.

In case of the **GUNYTRONIC**[®] emitter-sensor system, ionized gas molecules are seen as in the stream inserted particles which exist in high quantity.

The sensor system, flush-mounted, with an integrated collector on the wall of a channel or pipe detects an ion current. This measuring signal is directly dependent of the electric field strength and the particle transportation within the medium. The generated space charge (drift zone) penetrates the gas stream relatively far at which the integrated signal of the collector is used to determine the gas flow.

The *Dynamic GUNYFLOW V10* measures the single signals of the collector streams and calculates the **velocity of the flow** and the **volume flow** under operating conditions. Simultaneously, the **direction of the flow** will be detected without any delay, and the *Dynamic GUNYFLOW V10* analyses the values of these three parameters. Due to the fact that also pulsations which can occur in the stream will be detected, the system determines the “real” velocity of the flow.



Stacking arrangement

MEASURING TECHNOLOGY

GUNYTRONIC[®] uses the approved In-Situ technology for the ion emitter-system. To analyze the measurements, the in-house developed central unit **GUNY-CPU** is used.

A single central unit can provide and control the measuring data from up to 10 sensors simultaneously at which the data output is customized. Therefore we offer analog and state-of-the-art corresponding digital interfaces and bus-systems.

EX-PROTECTION

The **Safety Barrier SB V10-ATEX** guarantees intrinsic safe digital/analog data- and voltage transfer which is needed to operate and proceed data of the *Dynamic GUNYFLOW V10 ATEX*.

The Safety Barrier links three intrinsically safe with three not-intrinsically safe electric circuits. This involves a 12 V DC power supply, a bi-directional digital data transfer and an analog interface (4-20 mA).

Installation of the Safety Barrier takes place in non explosive areas.

We do provide a power transfer of 6 Watt in zone 0 - this makes the **Safety Barrier SB V10-ATEX** one of the most efficient barriers available!



Safety Barrier



CALIBRATION UNIT GUNYFLEX

Allows reference measurement and calibration of the Dynamic GUNYFLOW V10 series – a highly precise and flexible unit!



GUNYFLEX Calibration Unit

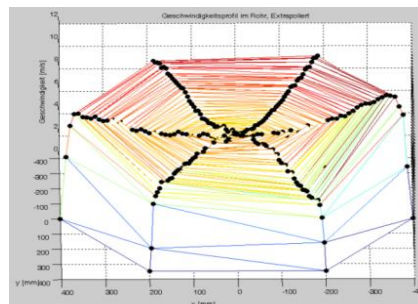
GUNYTRONIC® developed the Calibration Unit **GUNYFLEX** to calibrate the *Dynamic GUNYFLOW V10* sensor series as it allows accurate system measurements directly at the mounting place. Now this highly precise, all-purpose unit is as well available in our product range.

DESCRIPTION OF THE SYSTEM

If a sensor system from our *Dynamic GUNYFLOW V10* range is already in use, calibration/reference measurements can be done by using the (optional) featured 1/2" welded socket to insert the Pitot-sensor (contraction choke anemometer). Otherwise a notch of minimum \varnothing 8 mm will as well allow the measurement execution – depending on the material thickness of the measuring tube and the diameter.

Using a method, developed by **GUNYTRONIC®**, the sensor will be moved - in operative and reverse direction – through the whole flow cross-section (automatically controlled by motor or hand operated). Recorded data is used to analyze volume flow, mass flow and temperature profile.

Collected data will be used for the flow calibration of the *Dynamic GUNYFLOW V10* sensors or to calibrate other measurement systems. Measurement reports will be saved and transferred to the control unit. Via USB-connection the detected data of volume flow/mass flow and temperature profile can as well be transferred to a personal computer (each gauge separately) and can be saved and printed as a journal.



System Measurement of flow velocity within the pipe

EXECUTION OF MEASUREMENT

To calculate the mean velocity, two measurements can take place: *circular and square diameters*.



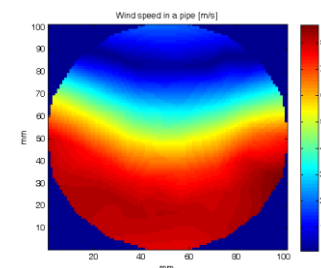
Pitot-sensor with Calibration Unit

Circular diameters:

Multiple measurement points within the circumference especially if the diameter is quite large. E.g.: diameter of one meter: 3 measuring points, each displaced by 120°; this will show up a more accurate, flow profile and improves the measuring result.

Square diameters:

The mean velocity will be calculated by a profile measurement along the center lines. The amount of measuring points recommended as well belongs to the diameter of the channel.



Simulation flow velocity within the pipe

BRIEF DESCRIPTION

- ★ Measuring within contraction choke (diameters of 50 mm – 1.000 m, >1.000 mm on request)
- ★ Hand-operated or automatic operation (option)
- ★ All-purpose system, self-sufficient (internal power supply via battery)
- ★ Control unit with internal data logging
- ★ Automatic detection of relevant measuring data (v_{MIN} , v_{MAX} , T_{MIN} and T_{MAX})
- ★ Automatic calculation of average value by control unit (V_{\varnothing} , Q_{\varnothing} , \dot{m}_{\varnothing} and T_{\varnothing})
- ★ USB Interface
- ★ Analysis by specifically developed software as 2D- and 3D-diagrams



Technical Data

- ☆ Measurement range 0 - 40 m/s
- ☆ Temperature 0 - 100°C
(applicable in theory > 600°C, practicable use needs to be inspected)
- ☆ Battery supply 3x1,5V AA
- ☆ USB Interface
- ☆ Measuring of selected points, measurement hand-operated or via spindle drive with shaft joint
- ☆ Data logging from several gauges (can be named through central unit)
- ☆ Automated compensation of temperature
- ☆ Entry of correction factor and density of medium possible

Position Encoder: optical way sensor attached to the Prandtl's Pitot tube

Prandtl's Pitot tube – gauge length: 350 mm incl. Thermal element | 1.000 mm incl. Thermal element up to 3.000 mm length available (customized)

Technical Data Prandtl's Pitot tube-: elliptic cone point | Co-efficient: 1,0015
Accuracy: < 1 %, at +/- 10° aligned with the flow streaming
Quality: stainless steel 4/4

Software: Analysis | Profile generation
Reports (PDF) showing velocity, volume flow, mass flow and temperature profile



CHARACTERISTICS AND ADVANTAGES OF THE GUNYFLEX CALIBRATION UNIT

- ☆ Plenty of measuring points are used to determine the flow – the flow profile can be pictured as exactly as possible!
- ☆ Temperature measurement is integrated and taken care of whilst analysis and evaluation. This is how highly accurate measurement results in regards to the density of the medium and the mass flow can be determined.
- ☆ If hand-operated, optic and acoustic signals on the indicator will help to comply with the basic technical conditions (rotation/feed rate); as an option the automated model of the **GUNYFLEX** Calibration Unit offers exact guidance.
- ☆ A number of measurements (e.g. three points within 120°) can be taken along the cross-section, to receive an even more accurate 3-D-illustration of the volume flow/mass flow.
- ☆ Internal diameters along the measuring points can be entered manually or will be detected automatically by the unit. The internal diameter will be considered for highly precise detection of volume flow/mass flow.



OIL CONDITION MONITORING SENSOR

Developed to improve and monitor the maintenance and drain intervals of oils in industrial applications

- self-sufficient with measurement of 6 units!



Front View Electronic Housing

GUNYOIL V1 is in use, wherever oil condition measurement for cost reduction is requested. The sensor is able to modify pre-term drain intervals and as well to suspend testing of the current oil condition in specific laboratories.

By cutting the intervals of oil changes and the reduction of oil-disposals an important environmental contribution will as well be achieved!

GUNYOIL V1 measures simultaneously: temperature, operating time, transparency, conductivity, specific humidity as well as permittivity of oils.

Out of these measuring data **GUNYOIL V1** detects oil specific alterations such as deterioration, pollution, humidity, carbon black/fuel portion, tribopolymers and oxidation.

The **self-sufficient energy supply** whilst two years is to be emphasized!

GUNYOIL as a Measuring Instrument

In-house developed measuring device for oil condition monitoring via 6 parameters!

Detection of temperature, operating time, transparency, conductivity, specific humidity as well as permittivity allows more efficient operation of industrial applications.

A single measuring instrument is able to transfer data of each of the above mentioned parameters.







Internal data storage and all-time available data supply of measurements taken do allow easy evaluation.

The **GUNYOIL V1** sensor can even be installed in exposed areas without external power supply; embedding into existing process control systems is also easily possible!



GUNYOIL V1 Sensor

CHARACTERISTICS AND ADVANTAGES OF THE OIL CONDITION MONITORING SENSOR

-  **SELF-SUFFICIENT ENERGY SUPPLY**
- whilst minimum 2 years; this allows sensor application even in exposed areas (external power supply is implemented as well)
-  Synchron measurement of 6 units (t, T, τ , σ , ϵ_r and rH)
-  „Real“ operating time is measured
cost reduction due to optimization of drain intervals, oil-disposal and suspension of current oil condition tests
-  Embedding in existing process control systems easily possible!
-  Simple communication and operation
-  Easy installation and a high level of reliability with low maintenance effort