KTM®

KTM700 RUS
ULTRASONIC FLOW METER

CUSTODY TRANSFER METERING OF NATURAL GAS, PETROLEUM ASSOCIATED GAS AND HYDROGEN

In the Register of Industrial products of Russian Federation in accordance with the Decree of the Russian Government #719 «On the recognition of the products of Russian Federation».

Software KTM Smart Stream of our own development is included in the register of Russian software (Note in the registry 11574 from 24.09.2021).

Accredited as the manufacturer of instrumentation & controls by the Federal Service for Technical and Export Control on the ability to use software and hardware on Key Information Infrastructures of fuel and power enterprises.

FLOW METER FOR CUSTODY TRANSFER METERING KTM700 RUS™

KTM700 RUS

PURPOSE:

Custody transfer metering of natural gas, associated petroleum gas and hydrogen.

ADVANTAGES:

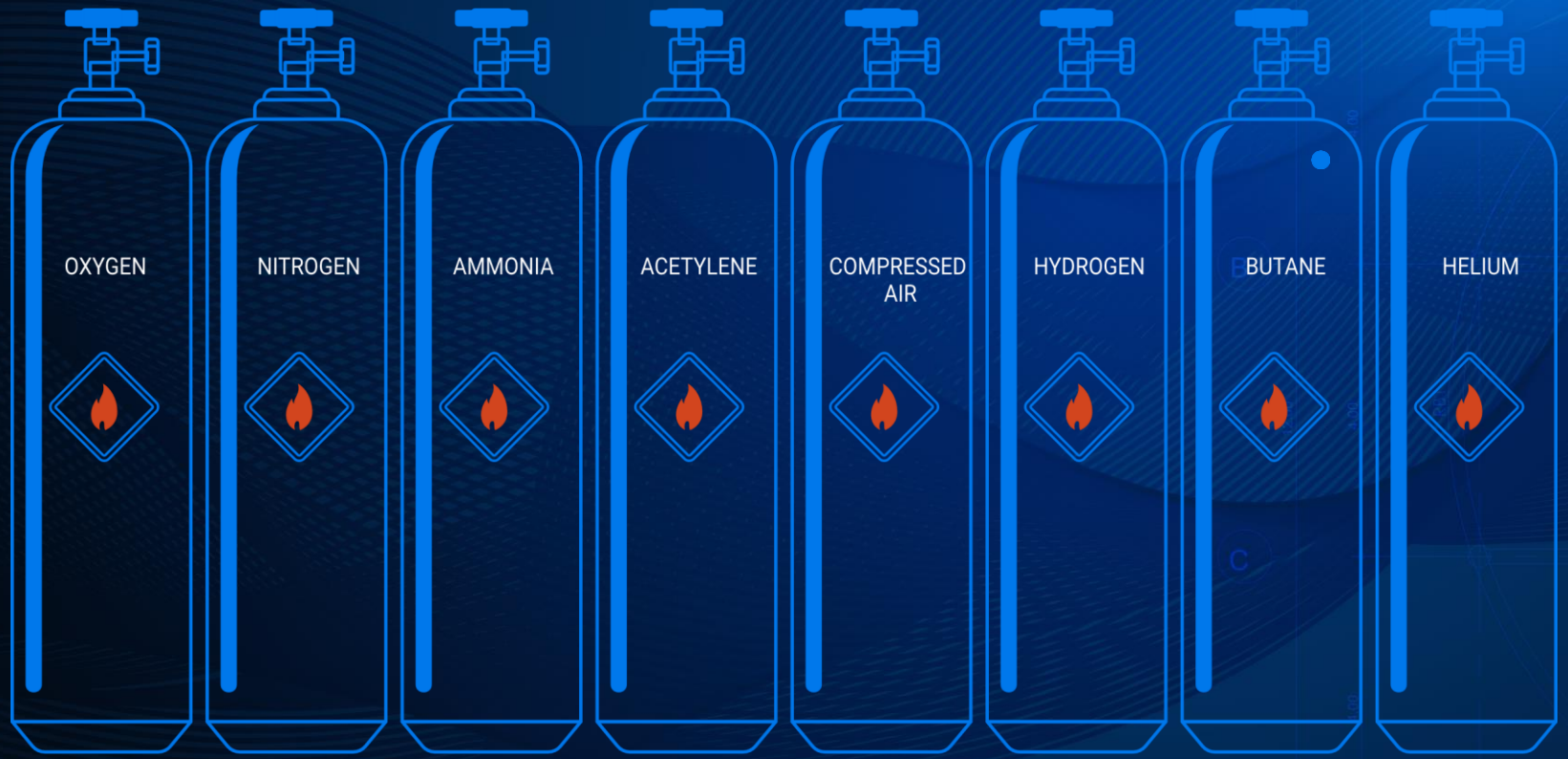
- Working pressure (HV) up to 45 MPa for solid-machined version;
- Metering of hydrogen H2 and clean gases;
- Metering of the dirty gases and wet gases, hydrates, and gases with solid content;
- Metering of corrosion-active gases (manufactured by using special stainless steels: Monel*, Hastelloy**, and others at customer's request);
- Compensation of geometric dimensions changes of the housing by temperature and pressure;
- Solid-machined version up to DN1400 size;
- Measurement accuracy down to 0.5%;
- Simulation proving method 0.5%;
- Calculation of mass flow without a density meter using the «Hydrocarbon» method;
- Splitted calculation for Customer and Consumer by two independent meters in one housing (Quadro version);
- Metrological characteristics control;
- Ability to replace sensors under working pressure;
- IBC - 4 years, service life - 20 years.

* is a trademark owned by Special Metals Corporation
** is a trademark owned by Haynes International

SOLID-MACHINED VERSION

- For pressure up to 45 MPa;
- Precise execution of the meter inner surface and positioning of sensors for most accurate measurements of the volume flow of gas;
- Possibility to manufacture up to DN1400 inclusive without welding.

CLEAN GAS MEASURING



Clean gases such as hydrogen and helium have a sound velocity of 1,100 to 1,500 m/s, which is 3 times faster than in natural gas. Such measurements require special sensor designs and high-speed signal processing and calculation.

HYDROGEN TRANSPORT TYPES

H2 - THE FUEL OF THE FUTURE

PIPELINE

Pressure up to 20 MPa
Temperature -40°C ... + 100°C

GROUND TRANSPORT

Pressure up to 100 MPa
Temperature -253°C ... + 100°C

SEA TRANSPORT

Pressure up to 100 MPa
Temperature -253°C ... + 100°C

RAIL TRANSPORT

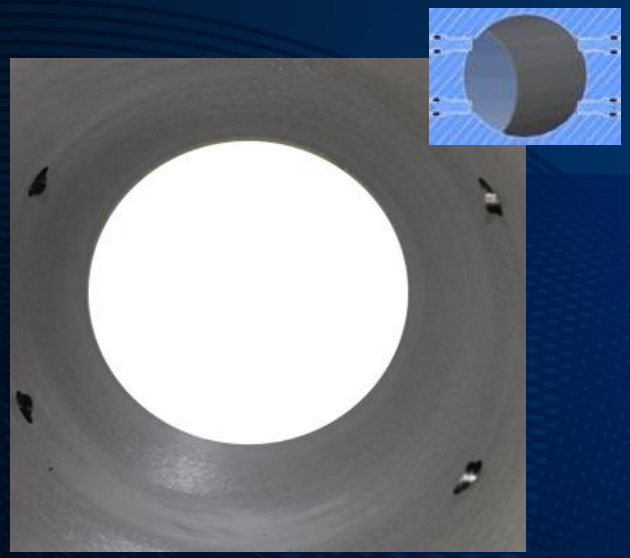
Pressure up to 100 MPa
Temperature -253°C ... + 100°C

CONSUMER

The most economically feasible method in the next five years is to blend hydrogen with natural gas for further transportation. The maximum hydrogen concentration in this case is not more than 20%.

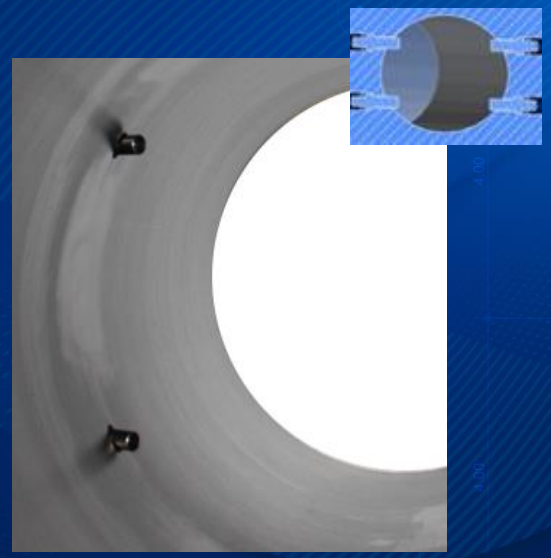
DIRTY AND WET GASES MEASURING

SENSOR TYPES



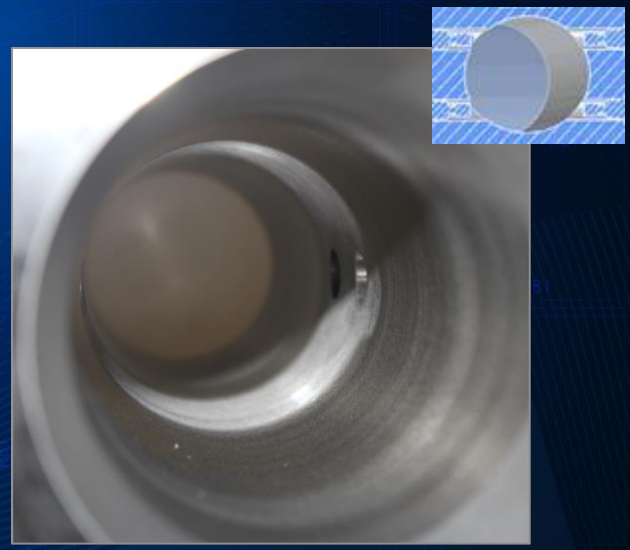
DRY GAS

High condensate or thick resin deposits presence on the inner surface of the sensors will cause a loss of signal.



FOR THE GAS WITH CONDENSATE

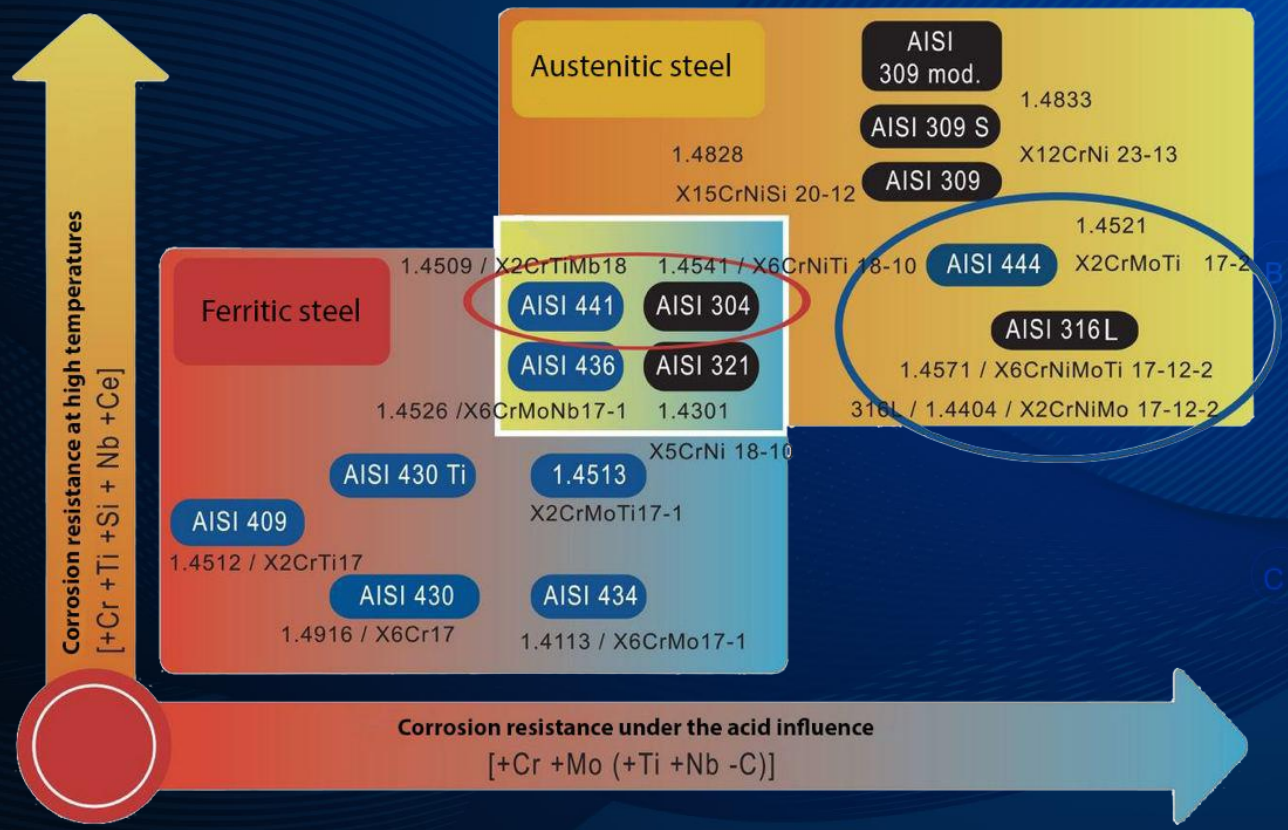
Special type of transceivers, extended from their places, for operation in gas with increased content of drip fluid.



FOR GAS WITH SOLID CONTENT

For the gas metering at the well, the problem for the sensors has been solved - a gas containing sand, solid contend, ice shards. Special type of flow meter body, transceivers are located in unique mounting pockets.

STAINLESS STEEL HOUSING

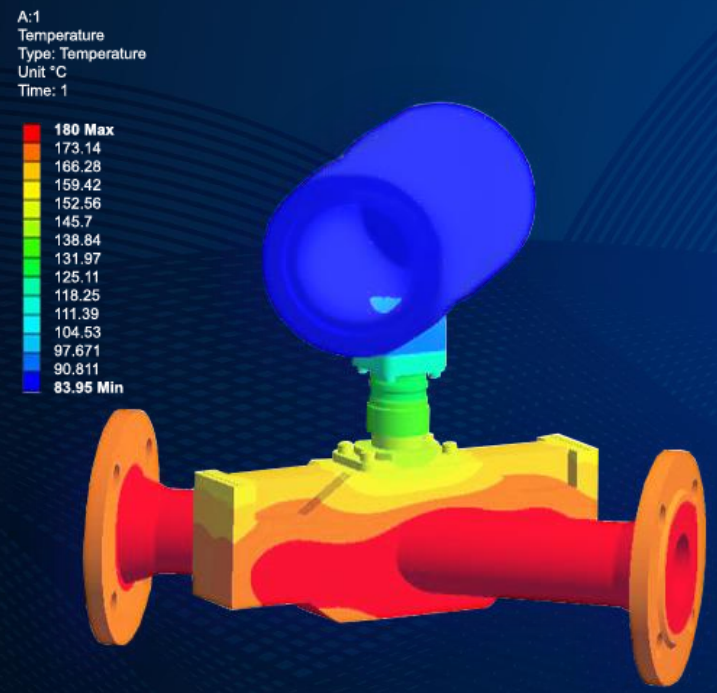


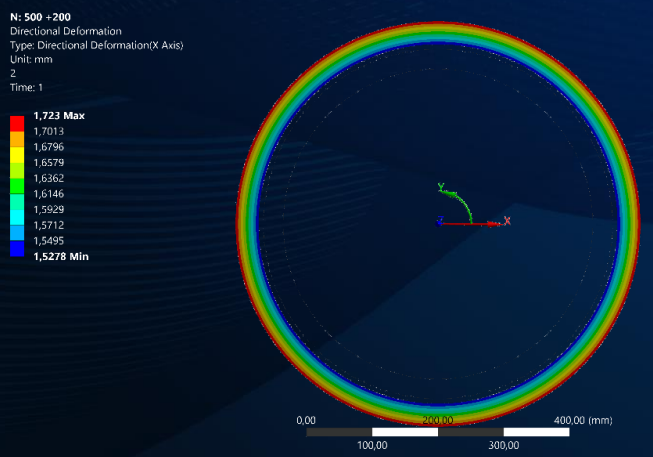
- Aggressive and cryogenic fluids require usage of stainless steel for safe operation throughout the life cycle;
- Can be made of special stainless steels: monel*, hastelloy** and others according to customer's requirement;
- Metering of gas with temperature down to -194°C;
- Metering of highly aggressive gases with temperature up to +280°C.

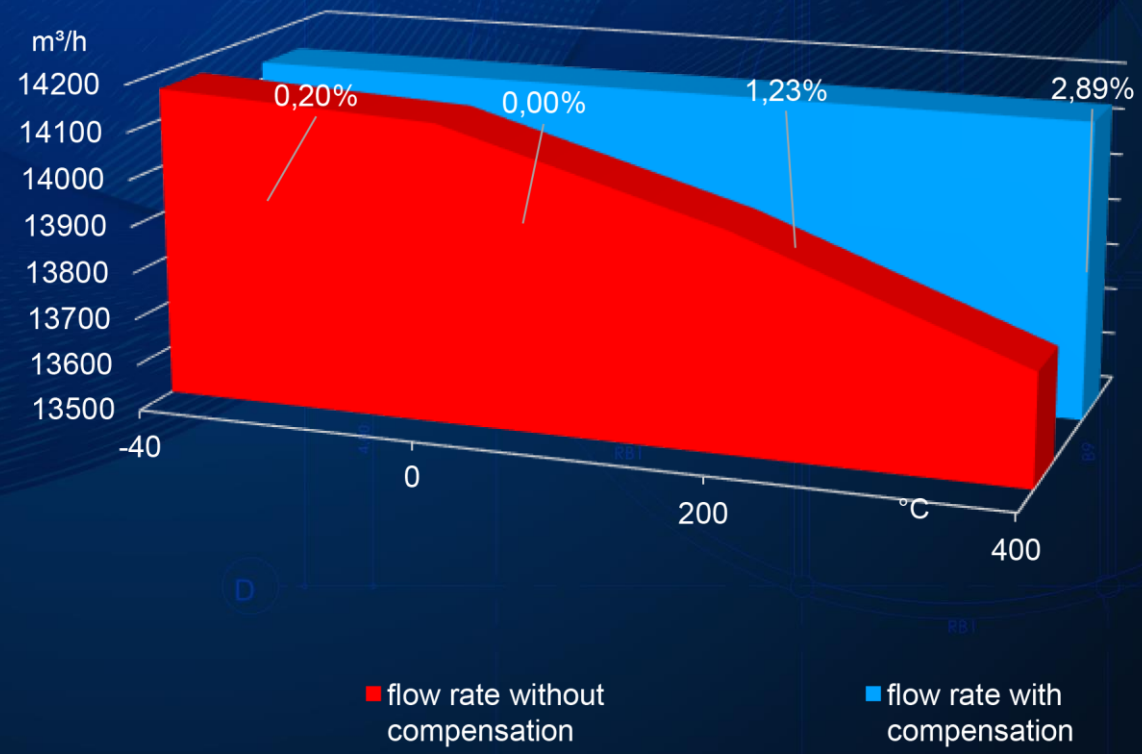
* is a trademark owned by Special Metals Corporation
** is a trademark owned by Haynes International

HOUSING GEOMETRY COMPENSATION CAUSED BY THE TEMPERATURE AND PRESSURE

When the temperature of the flow changes by 200 °C, there is a change of the meter housing geometric dimensions, what is resulting in a discrepancy between the actual and the calculated flow rate.
Without the compensation function, this change results in lower accuracy.
The compensation corrects measured data in the flow meter and ensures a stable accuracy of measurements.



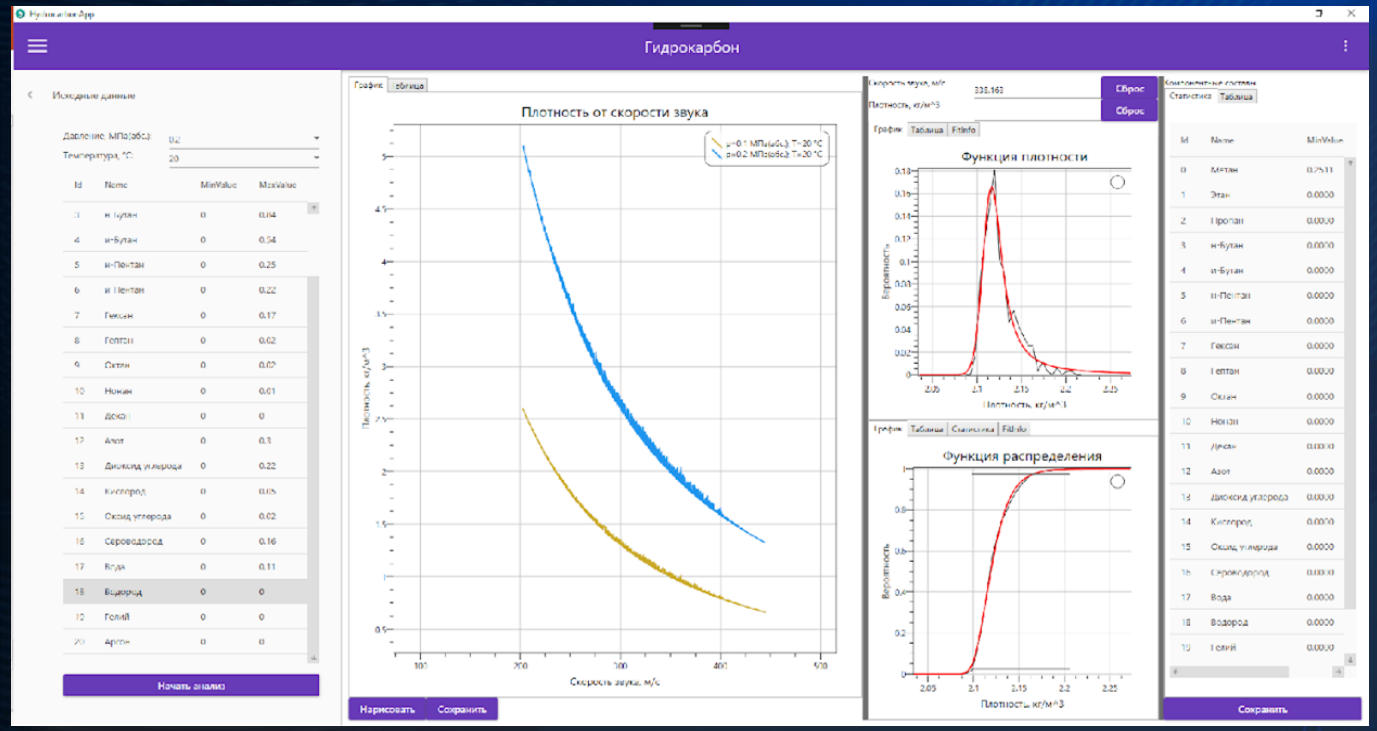




ACCURACY OF VOLUME FLOW METERING UNDER OPERATING CONDITIONS

- 4-beam and 8-beam versions for high precision measurements with a relative accuracy to 0.5% by simulation method proving with the condition of primary calibration at the metrology stand;
- High measurement accuracy and minimal periodical costs of proving after primary proving under STO standard of Gazprom (natural gas stand).

“HYDROCARBON” METHOD



CALCULATION OF THE MOLECULAR MASS OF THE GAS OF DIFFERENT COMPOSITIONS BASED ON CALCULATION OF THE SOUND VELOCITY IN THE FLUID BY THE FLOW METER, AND ALSO THE TEMPERATURE AND PRESSURE FROM THE CORRESPONDING SENSORS.

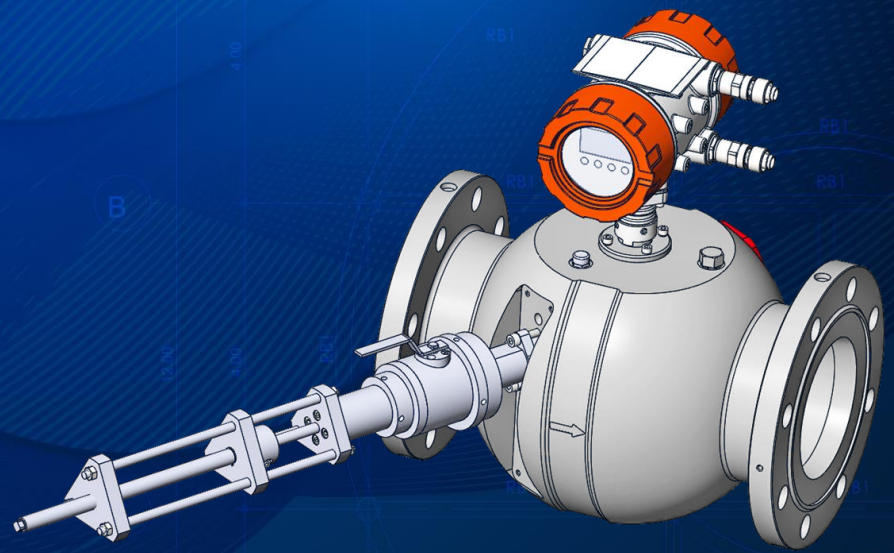
- Calculation of mass flow of gas without density meter;
- No gas composition is required;
- Reduction of the cost of the measuring unit;
- It is possible to compile a measuring methodology for a unit from Russian Research Institute of Metrology (VNIIR) or other organizations (from 6 months);
- 3% accuracy, if gas molar mass greater than 25 g/mol and pressure between 0.1 and 3.5 MPa;
- 5% accuracy, if gas molar mass greater than 25 g/mol and pressure between 3.5 and 4.0 MPa

QUADRO VERSION

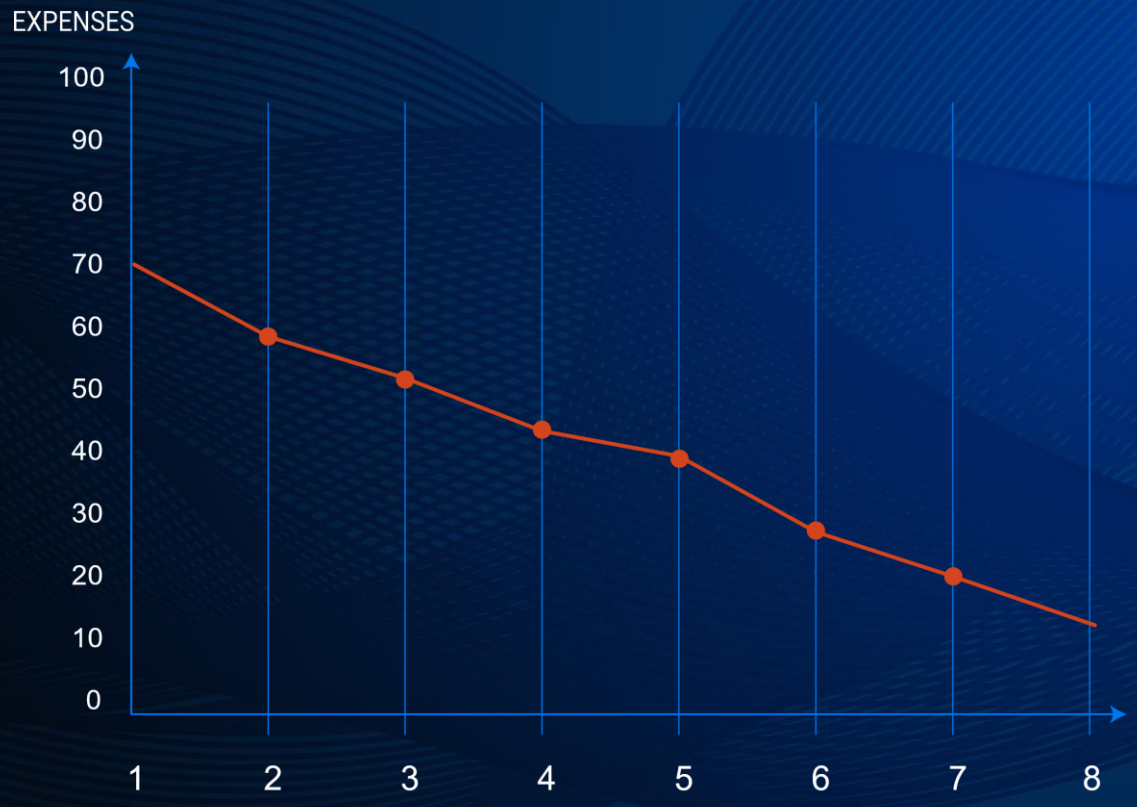
- Complete duplication due to two independent meters in one housing, for divided calculation for the Customer and the Consumer.
- Control of metrological characteristics due to the comparison of readings on two independent meters. Confirmation of this function in the proving method.
- Reduced installation costs for measuring lines. Due to the use of two meters at one housing, it is possible to reduce straight-line sections and reduce costs by buying one housing instead of two, which is especially important on large diameters.

SENSOR REPLACEMENT UNDER THE OPERATING PRESSURE

The specialized sensor extraction equipment allows you to remove the sensor for cleaning, diagnostics or replacement without interrupting the process, and save money instead of stopping the process and losing the gas released into the atmosphere.



LONG SERVICE LIFE



- Service life up to 15 years, according to customer requirements, for supplying to metering skids.
- Reduction of the owning over the service life of the equipment and reduction of depreciation payments.

THANK YOU FOR YOUR ATTENTION!

NPP KuibyshevTelekom-Metrologiya, LLC
Samara, Volzhsky CTS

www.ktkprom.com
info@ktkprom.com

Phone number: +7 (846) 202 00 65