

EMIS-VIHR  
ЭВ-205.000.100.  
000.00 PS

# VORTEX FLOW METER EMIS-VIHR 200 Modification EV-205

Data sheet

№ \_\_\_\_\_

Technical  
parameters

Adjustment  
parameters

Supply set

Initial and  
periodical  
inspection

Manufacturer  
warranty



[www.emis-kip.ru](http://www.emis-kip.ru)

**EMIS**  
Russia,  
Chelyabinsk



## Legal information

Manufacturer has the right to update the product and documents without prior notice. For any information about EMIS equipment please contact your local dealer or EMIS head office.

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### ATTENTION !

Before starting work, you should carefully study this document. Before installing, using or servicing the device, make sure that you have fully read and understood the contents of the manual. This condition is mandatory to ensure safe operation and normal functioning of the equipment.

For consultations, contact the regional representative of JSC EMIS or the company's technical support service:

tel./fax: +7 (351) 729-99-12

e-mail: [support@emis-kjp.ru](mailto:support@emis-kjp.ru)

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## 1 PRODUCT BASIC INFORMATION

### 1.1 Purpose of the product

The EMIS-VIHR 205 submersible vortex flow meter (hereinafter referred to as the flow meter) is designed to measure the volume and volumetric flow rate of gases, liquids, steam at operating pressure and operating temperature in pipelines with an internal diameter from 300 to 2000 mm in various industries and in commercial metering systems, as part of gas and steam meters

### 1.2 Designation

EMIS-VIHR 205

TU 4213-017-14145564-2009

### 1.3 Serial number

### 1.4 Date of manufacture

### 1.5 Manufacturing company

JSC «EMIS»  
Komsomolsky prospect, 29, building 7,  
Chelyabinsk city, 454112, Russia  
Tel./fax (351) 729-99-12  
[www.emis-kip.ru](http://www.emis-kip.ru)

## 2 MAIN TECHNICAL INFORMATION

Characteristic	Value
Explosion protection	
Accuracy class	
Flow range	
Measured medium	
Installation of electronic unit	
Max. pressure of measured medium	
Temperature of the medium	
Ambient temperature	
In-build indicator	
IP	
Voltage	
Explosion protection	24 V DC

The flowmeters do not contain any precious metals.

The other technical specifications are given in the appendix.

### ATTENTION!

The pressure of the measured medium shall not exceed the permissible values for the flowmeter and mounting kit (Set of mounting accessories).

### ATTENTION!

General industrial flowmeters are prohibited from being used in explosive conditions. In this case, explosion-proof flowmeters should be used. The specifics of using explosion-proof flowmeters are given in the operating manual.

### ATTENTION!

The choice of materials for the flow part of the flowmeter is based on the requirements of a specific technological process. The consumer is responsible for the choice of material for the flow part of the flowmeter.

### ATTENTION!

The H<sub>2</sub>S flowmeters are designed to work with hydrogen sulfide in the environment at a normal rate of no more than 10 mg/m<sup>3</sup>, in an emergency situation - up to 100 mg/m<sup>3</sup> for no more than 1 hour. Dissolved hydrogen sulfide content in the liquid is up to 6% by volume.

### 3 TESTS

#### 3.1 Tests for strength and tightness

Vortex flowmeter EMIS-VIHR 205 was tested for strength and tightness according to TU 4213-017-14145564-2009.

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Test method according to TU 4213-017-14145564-2009.

Measuring equipment and auxiliary equipment:

- hydraulic non-standard stand test.

The flow part of the flowmeter is exposed to a liquid at a pressure exceeding the maximum allowable working pressure by 1.5 times (but not more than 35 MPa) for ten minutes. No liquid leaks on the flowmeter body, no pressure drop on the control manometer.

Test results:

Flowmeter meets tightness requirements of TU 4213-017-14145564-2009.

Calculation result:

Flowmeter meets strength requirements of TU 4213-017-14145564-2009, GOST 14249-89.

Vortex flowmeter EMIS-VIHR 205 was tested for electrical insulation resistance according to 4213-017-14145564-2009.

#### 3.2 Insulation resistance test

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Test method according to TU 4213-017-14145564-2009.

The insulation resistance was measured:

- between the interlocked contacts «U+» and «U-» of the power supply of the flowmeter on the terminal block and the grounding terminal of the flowmeter;

- between the interlocked contacts «F+» and «F-» or «P+» and «P-» of the frequency pulse output on the terminal block and the flowmeter grounding terminal.

Rated voltage when testing the insulation resistance was 500 V. The insulation resistance of the flowmeter was at least 10 MOhm.

Test results:

Flowmeter meets the electrical resistance of the insulation requirements TU 4213-017-14145564-2009.

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signature

---

full name

---

date

**Stamp here**

## 4 INFORMATION ABOUT ACCEPTANCE AND VERIFICATION

### 4.1 Acceptance

Vortex flowmeter EMIS-VIHR 205 meets the specifications of TU 4213-017-14145564-2009 and is approved for use.

Serial number

Quality Control

\_\_\_\_\_  
signature

\_\_\_\_\_  
full name

Department  
signature

\_\_\_\_\_  
date

**Stamp here**

### 4.2 Verification

The parameters for verification of the meter are specified in the appendix.  
Interval between periodic verifications is 4 years

**Primary verification** (after manufacture)

\_\_\_\_\_  
date

\_\_\_\_\_  
signature and full name of the verifier

\_\_\_\_\_  
verification sign

**Verification** (initial / periodic)

\_\_\_\_\_  
date

\_\_\_\_\_  
signature and full name of the verifier

\_\_\_\_\_  
verification sign

**Verification** (initial / periodic)

\_\_\_\_\_  
date

\_\_\_\_\_  
signature and full name of the verifier

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verification sign

**Verification** (initial / periodic)

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signature and full name of the verifier

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signature and full name of the verifier

verification sign

**Verification** (initial / periodic)

\_\_\_\_\_

date

signature and full name of the verifier

verification sign

**Verification** (initial / periodic)

\_\_\_\_\_

date

signature and full name of the verifier

verification sign

**5 PRESERVATION**

**5.1 Preservation data**

Date	Job title	Validity period, years	Position, surname and signature

## 6 SUPPLY SCOPE AND PACKAGE

### 6.1 Supply scope

 Supply scope of transducer

Designation	Explanation
EMIS-VIHR 205	Vortex flowmeter EMIS-VIHR 205 in the design according to the order
EMIS-VIHR EV-205.000.000.000.00 PS	Passport for the flowmeter "EMIS-VIHR 205"

Additional equipment according to the packing list.

### 6.2 Packaging

Vortex flowmeter EMIS-VIHR 205 packed according to the customer's order and the requirements of the technical documentation.

## 7 DISPOSAL

Flowmeters do not contain harmful substances and components that pose a danger to human health and the environment during and after the end of their service life and during disposal. The flowmeter is disposed of in accordance with the operating manual.

## 8 INSTALLATION AND REPLACEMENT OF MODULES

### 8.1 Replacement info

During operation, modules were replaced (installed)

Name	Version	Serial №

organization

full name

position

date

signature

Name	Version	Serial №

organization

full name

position

date

signature

## 9 SERVICE LIFE. MANUFACTURER WARRANTY

### 9.1 Service life

Service life of EMIS-VIHR 205 is not less than 15 years, provided the operation conditions are observed. Rated service life is 15 years.

### 9.2 Manufacturer warranty

Warranty period:

- Standard warranty - Warranty period is 12 months from the commissioning of the transducer, but not more than 18 months from the date of shipment.
- Extended warranty - \_\_\_\_\_ months from the commissioning of the transducer, but not more than \_\_\_\_\_ months from the date of shipment.
- Special warranty -

Warranty period for replaced parts after maintenance at manufacturer is 6 month.

### 9.3 Commissioning mark

	company
name	position
date	signature

**ATTENTION!**

The manufacturer has the right to refuse warranty repairs in the event of failure of the device if the requirements described in Section 5 of the Operating Manual are violated.

**ATTENTION!**

The service life of the EMIS-VIKHR 205 flow converter when measuring chemically aggressive environments is not standardized by the manufacturer.

**ATTENTION!**

Repair of EMIS-VIKHR 205 flow converters is carried out only at the manufacturer's plant or in authorized service centers. Repair of converters is allowed only with the use of spare parts kits manufactured by EMIS JSC. The manufacturer does not bear warranty obligations in case of repair of converters using spare parts kits from a third-party manufacturer.

## 10 CERTIFICATES

1. Certificate of approval of the type of measuring instruments №86309-22. Issued by: Federal Agency for Technical Regulation and Metrology. Valid until: July 29, 2032.

2. Certificate of Conformity TR CU 012/2011 No. EAЭC RU C-RU.AЖ58.B.05206/24. Issued by: Certification Authority of "PROMMASH TEST Engineering" Limited Liability Company. Valid from 09.04.2024 until 23.04.2028.

3. Declaration of conformity TR CU 020/2011 No. EAЭC N RU Д-RU.PA10.B.48609/24. Valid from 14.11.2024 until 08.12.2027.

## 11 SETTING UP THE FLOWMETER ACCORDING TO THE CONDITIONS OF USE

To set up an immersioned flowmeter to the actual value of the inside diameter of the pipeline, it is necessary to recalculate the pulse price value for the frequency-pulse output of the flowmeter and the maximum flow value, which corresponds to the upper limit of the current output signal of the flowmeter. This calculation can also be performed using the program «EMIS-Integrator», entering the values of the internal diameter of the pipeline and coefficients on the tab «Monitor».

### **Impulse Price correction**

The actual value of the flowmeter pulse price is calculated by the formula

$$m_a = m * S, \quad (1)$$

where  $m$  - is the value of the sensor pulse price, indicated in the passport or in the Operation Manual on the flowmeter (for DN 40 mm), l;

$S$  – The coefficient of correction according to formula (3).

$$m_a = \text{_____} \text{ l}$$

### **Correction of the upper limit of the current output signal**

The actual flow value corresponding to the upper limit of the current output signal of the flowmeter is calculated by the formula

$$Q_{\max.f} = Q_{\max} * S, \quad (2)$$

where  $Q_{\max}$  – is the value of the sensor flow corresponding to 20mA of the current output signal, m<sup>3</sup>/h.; m<sup>3</sup>/h;

$S$  – coefficient of correction according to formula (3).

$$Q_{\max.f} = \text{_____} \text{ m}^3/\text{h}$$

### **Calculation of the correction factor**

The coefficient of correction  $S$  for the actual value of the inside diameter of the pipeline is calculated by the formula

$$S = (D_a / d)^2 * K_v * K_t * K_3 \quad (3)$$

where  $D_a$  – is the actual value of the inside diameter of the pipeline, mm;

$d$  – value of the internal diameter of the flow sensor at the installation location of the bluff body,  $d=40$  mm;

$K_v$  – coefficient depending on the immersion depth of the flow sensor.  $K_v=1$  for installing the sensor at the point of average velocity (0.242R). The  $K_v$  coefficient for installing the sensor on the pipeline axis is calculated using the method described in the OM for the flowmeter. In general, the  $K_v$  value for installing the sensor on the pipeline axis can be taken as 0.84;

$K_t$  – the transition factor that takes into account the change The  $K$ -factor of the flow sensor when the sensor is immersed in the installation is relative to the  $K$ -factor obtained by calibrating the flow sensor on the bench. The coefficient of  $K_p$  is selected from table 11.1 (values are determined empirically);

Table 11.1

Measuring point	Transition rate Kt
Center	1,65
Mid-speed point	1,42

Ks – Shading factor taking into account the influence of the dive bar. Determined according to table 11.2.

Table 11.2

Dn, mm	300	350	400	450	500	600	700	800	900
Ks	0,930	0,932	0,936	0,938	0,940	0,944	0,948	0,952	0,956
Dn, mm	1000	1100	1200	1300	1400	1500	1600	1800	2000
Ks	0,960	0,963	0,967	0,970	0,973	0,976	0,978	0,981	0,985

The actual value of the internal diameter of the pipeline is calculated using the formula

$$D_a = L_c / 3,1416 - 2*s, \quad (4)$$

где Lc – is the length of the pipe circle, averaged over four measurements;

s – is the thickness of the pipe wall, averaged over four measurements.

While determining the inside diameter of a pipeline, it is recommended to use the measurement means specified in table 11.3 or similar.

Table 11.3

Item №	Name	Required technical characteristics
1	Metal roller P10N2K, GOST 7502-98	Measuring limit 10 m, division price 0.5 mm
2	Ultrasonic UT-93P thickness gauge, GOST 25863-83	Measurement range 3...30 mm, relative error 3

$$D_a = \underline{\hspace{2cm}} \text{ mm}$$

$$K_v = \underline{\hspace{2cm}}$$

$$K_t = \underline{\hspace{2cm}}$$

$$K_s = \underline{\hspace{2cm}}$$

$$S = \underline{\hspace{2cm}}$$

Signature of the responsible person

\_\_\_\_\_

signature

\_\_\_\_\_

full name

\_\_\_\_\_

date

Place of seal









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