

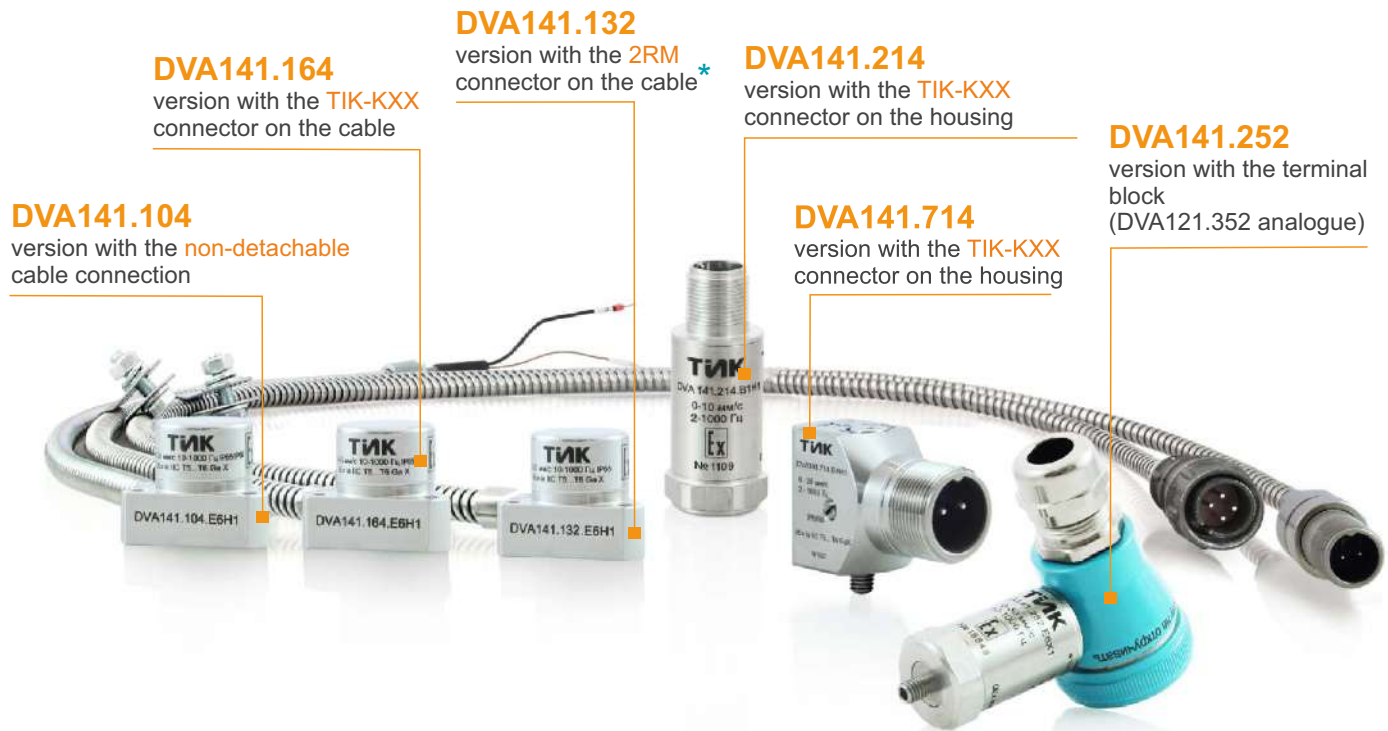
Made in Russia



# “Vibration key” system based on DVA141.XXX sensor and TIK-PLC 112 controller



## DVA141.XXX vibration velocity sensors with current output



\* Only for SPTA

The appearance of the products may differ a little from those presented in the brochure

### Features

They are designed to measure the root-mean-square (RMS) value of vibration velocity in emergency shutdown (ESD) systems.

They consist of a sealed housing that comprises an integral acceleration sensor and a conversion board.

Depending on the version, the sensor is installed on the unit using the standard threaded stud M6 / M8 / M10 / M12, fastening with 3 screws or 1 screw.

A threaded stud with a different thread, including inch thread, can be supplied on special order.

For the .214 version, it is possible to use cable assemblies with the MIL connector of imported transducers.

### Metrological parameters

| Conversion coefficient, mA*s/mm                                   |        |      |      |        |       |      |      |        |       |      |       |
|---|--------|------|------|--------|-------|------|------|--------|-------|------|-------|
| 1.6   | 1.259  | 0.8  | 0.64 | 0.63   | 0.533 | 0.4  | 0.32 | 0.315  | 0.267 | 0.2  | 0.16  |
| Measurement ranges for the RMS value of vibration velocity, mm/s: |        |      |      |        |       |      |      |        |       |      |       |
| 0-10  | 0-12.7 | 0-20 | 0-25 | 0-25.4 | 0-30  | 0-40 | 0-50 | 0-50.8 | 0-60  | 0-80 | 0-100 |

Operating frequency range, Hz . . . . . 2-1000;  
 3-1000;  
 5-1000;  
 10-1000

### Interface

Type of output signal . . . . . 4-20 mA current loop  
 Supply voltage of the sensor, V . . . . . 10-24  
 Connection polarity . . . . . random  
 Connection via the TIK-PLC controller\*\* or the TIK-BIS safety barrier

\*\* The controller operates as ESD, sensor power source, and a safety barrier

### Explosion protection

Marking . . . . . 0Ex ia IIC T5...T6 Ga X / PO Ex ia I Ma X

### Climatic version

Operating temperature range, °C  
 ▶ H climatic version . . . . . -40...+80  
 ▶ X climatic version . . . . . -60...+80

### Reliability parameters

MTBF, hours, not less than . . . . . 40 000  
 Design service life, hours, not less than . . . . . 80 000  
 Warranty service life, months . . . . . 24  
 Service life, years . . . . . 10  
 Verification interval, years . . . . . 2



## Constructive versions

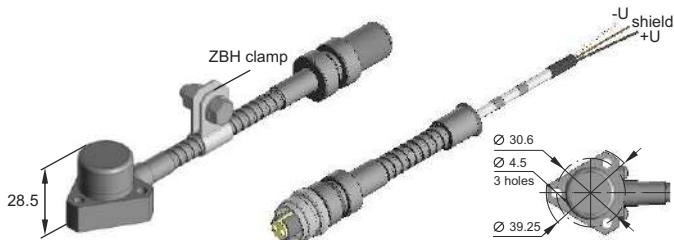
### DVA141.104



### DVA141.132



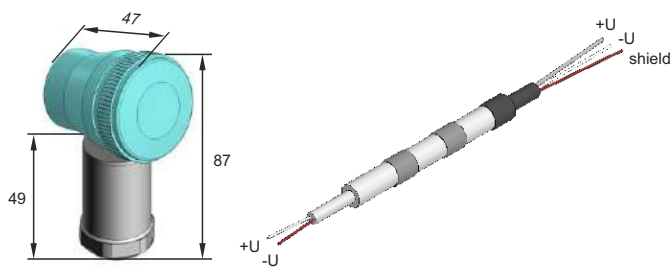
### DVA141.164



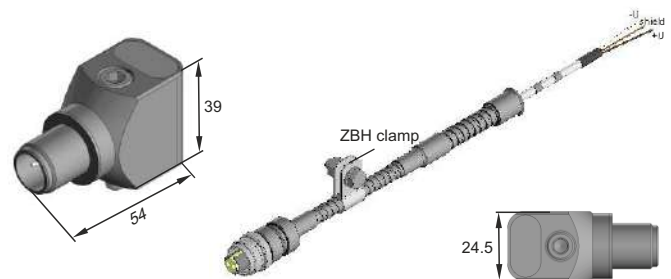
### DVA141.214



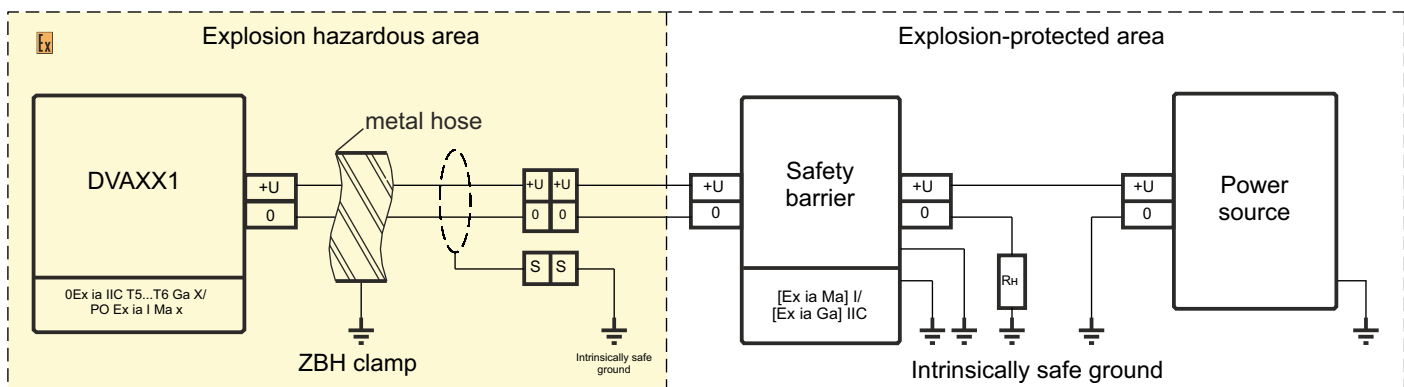
### DVA141.252



### DVA141.714



## Wiring diagram



## TIK-PLC 112 type 02 controller (TIK-PLC.112.11)

Designed for recording the signals coming from the external sensors with 4-20 mA output, their processing, and transmission of the information obtained to external telemetry and control system



### Description

TIK-PLC 112 type 02 controller performs the functions of EPS, power supply for sensors and safety barrier.

The principle of operation is based on the conversion of the input signal of the 4-20 mA “current loop” into digital form, its software averaging, comparison of the obtained value with the programmed settings, transmission of the averaged current value via the digital RS-485 communication interface, analog output 4-20 mA, and the generation of control signals to the EPS.

### Features

- two digital RS-485 interfaces;
- OLED display for displaying controller parameters and settings;
- 3-color controller status LED;
- 5-position joystick for menu navigation;
- simplified installation of power supply and RS-485 interface through a bus connector (*not included*);
- built-in intrinsic safety barrier in the controller;
- quick-release, spring-loaded terminals for easy and reliable installation.

### Specifications

#### Interface

|                                     |   |
|-------------------------------------|---|
| Input signal type                   | 4-20 mA “current loop”;<br>discrete input |
| Output signal type                  | 4-20 mA “current loop”;<br>relay output   |
| Interface                           | 2*RS-485                                  |
| Protocol                            | Modbus RTU                                |
| Supply voltage, V                   | +24±2                                     |
| Power consumption, W, not more than | 2   |

#### Explosion protection

|         |                            |
|---------|----------------------------|
| Kind    | intrinsically safe circuit |
| Marking | [Ex ib Gb] IIC             |

#### Design features

|                           |               |
|---------------------------|---------------|
| Overall dimensions, mm    | 99x113.6x22.6 |
| Weight, kg, not more than | 0.2           |
| Protection class          | IP20          |
| Mounting                  | on DIN-rail   |

#### Performance

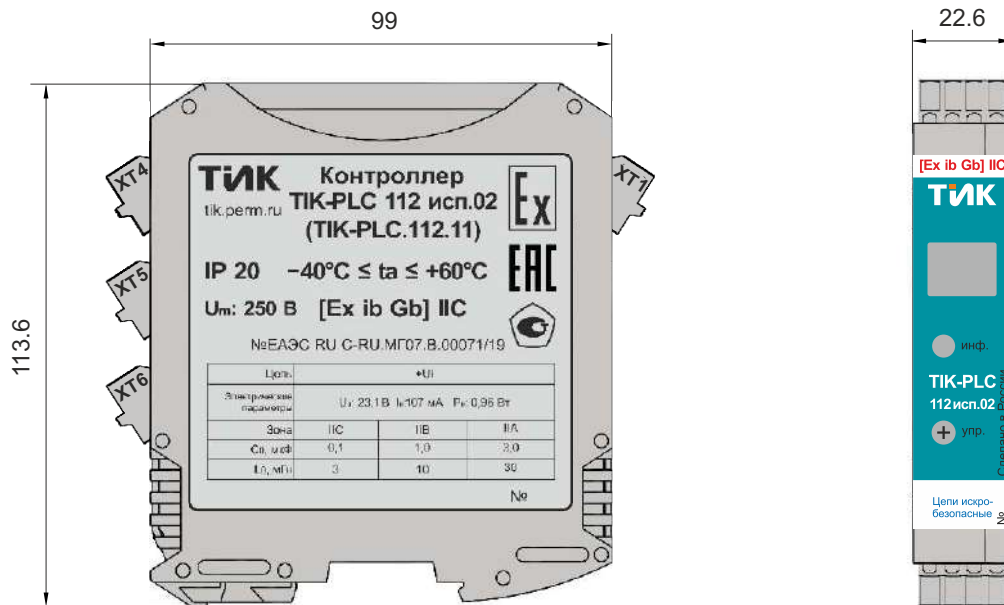
|                                 |           |
|---------------------------------|-----------|
| Operating temperature range, °C | -40...+60 |
|---------------------------------|-----------|

#### Reliability and manufacturer’s warranties

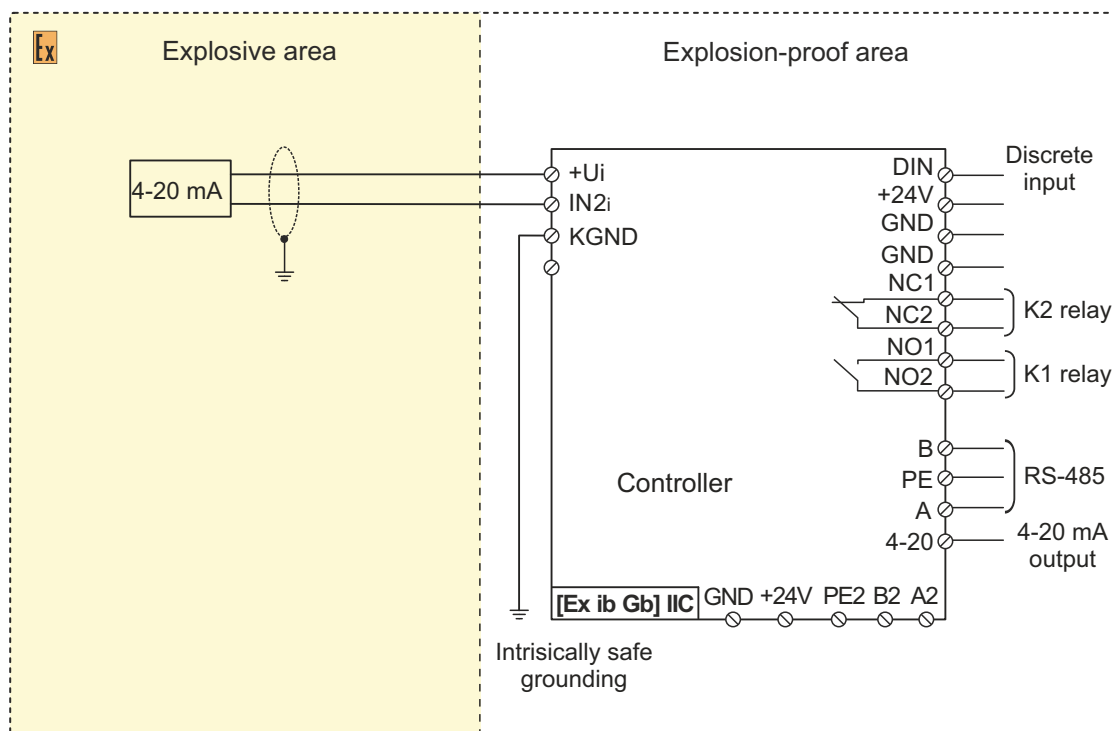
|                            |        |
|----------------------------|--------|
| MTBF, hours, not less than | 20 000 |
| Service life, years        | 10     |
| Warranty period, months    | 18     |



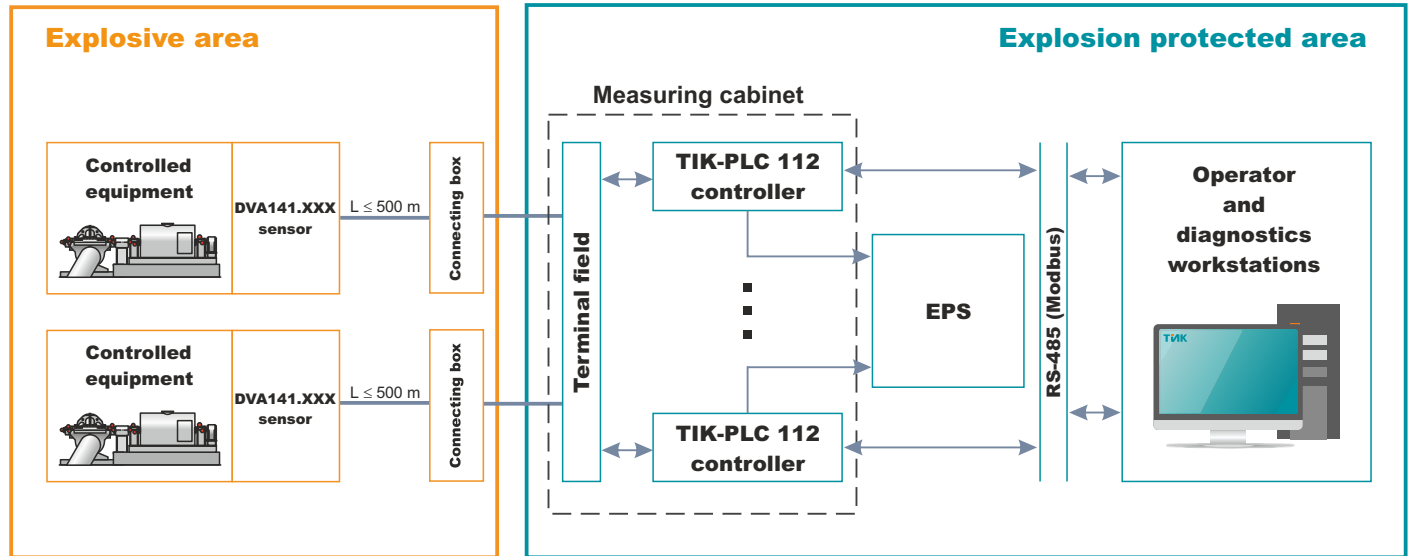
## General view, dimensions and mounting dimensions



## Wiring diagrams



## Block diagram of the “vibration key” system





## Approval documents

Certificate of Type Approval of Measuring Instruments No.69044-17  
for the DVA vibration transducers

Valid till 10/25/2027



Certificate of Conformity RU C-RU.AA71.B.00397 Series RU No. 0162217  
for the DVA vibration transducers

Valid till 07/26/2023



Certificate of Conformity No. POCC.RU.HX37.H09404  
for the DVA vibration transducers

Valid till 03/24/2024



Certificate of conformity with TP TC 012/2011 "About safety of equipment for operation in explosive environments" for TIK-PLC equipment, EAEC registration number RU C-RU.MГ07.B.00071/19,  
Series RU №0127612  
Test Report №20И-19 of 08/02/19

Valid till 08/05/2024



Type Approval Certificate No. 62594-15 for TIK-PLC equipment

Valid till 10/22/2025





TIK Research & Production Enterprise,  
Limited Liability Company  
14A, Marii Zagummennykh St., Perm, 614067, Russia  
Tel.+7 (342) 214-75-75  
E-mail: [tik@perm.ru](mailto:tik@perm.ru)  
Web-site: <https://tik.perm.ru/en>