PIEZOSENSOR

we constantly working
to improve the quality of our products
and their technical characteristics

ACCELERATION, VELOCITY, DISPLACEMENT, AND ROTATION FREQUENCY CONVERTERS

for stationary control systems

2021

CONTENT

INTRODUCTION

    Converters of vibration acceleration, vibration velocity, displacement, vibration displacement and rotation frequency into an electrical signal:
- absolute vibration acceleration and vibration velocity;
- relative displacement and vibration displacement;
- shaft rotation frequency;
- generator or turbine parts relative displacement ;
- safety catch movement.

    Converters and their components can be used both independently and as part of vibration monitoring and vibration diagnostic systems of the power plants state.

    VPI and VPE accelerometers are protected by patent No. 81540.

    Converters are manufactured according to TU U 32.1-14247566-001: 2005. They are registered in the State Register of Measuring Instruments under the number U1955-15.

acceleration, velocity, displacement and frequency converters

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ACCELERATION CONVERTERS

VPI-061

VPI-061-Q0,5; VPI-061-Q1; VPI-061-Q2; VPI-061-Q5; VPI-061-Q10;
VPI-061-Q25; VPI-061-Q50; VPI-061-Q100
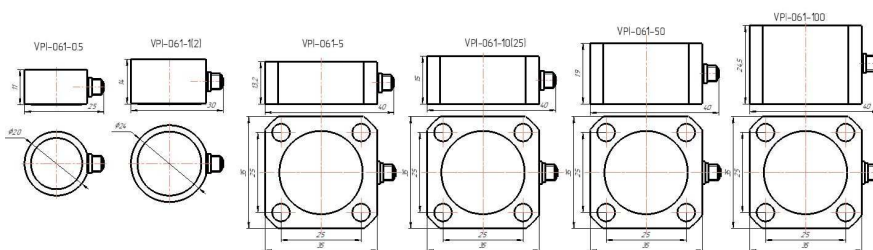
Making to order

VPI converters are designed to convert a vibration acceleration into a proportional electrical charge.

Together with secondary devices, they can be used as part of vibration monitoring and vibration diagnostic systems of the power plants state, elements of rotating power equipment, oil pumping and gas compression stations, and other industrial facilities.

The housing of the VPE vibration sensor is made of stainless steel. The sensing element is a piezoelectric bimorph made by the means of diffusion welding. Electrical characteristics of the sensing element are thermally stabilized.

Parameters	061-Q0.5	061-Q1	061-Q2	061-Q5	061-Q10	061-Q25	061-Q50	061-Q100
Sensitivity, pC/(m/s²), (± 10%)	0,5	1	2	5	10	25	50	100
Operating range, m/s²	8000	5000		5000	1000		100	
Shock limit, m/s²	10000	10000		10000	3000		-	
Amplitude nonlinearity, %	±2							
Frequency range, Hz ±10% ±3 dB	1-14000	1-8000 0.5-10000	1-7000 0.5-10000	1-5000	1-3000	1-2000	1-1000	1-1000
Installation resonance frequency, kHz	40	22	20	18	9	6	4.5	3
Transverse resonance frequency, kHz	40	22	20	18	9	6	4.5	3
Transverse Sensitivity, %	±5							
Insulation resistance in normal conditions, not less than, Ohm	$1 * 10^8$							
Temperature range, °C	-40 ÷ 120							
Temperature coefficient, %/ °C	0.1							
Weight without cable, gm	20	35	35	120	120	150	250	280
Dimensions, mm	11x20x25	14x24x30	14x24x30	13x35x40	15x35x40	15x35x40	19x35x40	25x35x40
Case Material	stainless steel							
Sensing element	piezoelectric							
Connector	10-32 UNF							
Mounting	4 holes 5.5mm							

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ACCELERATION CONVERTERS

VPI-103

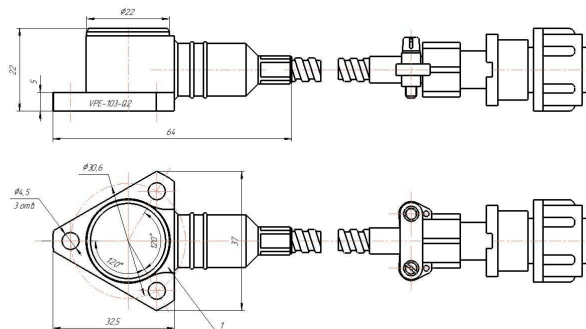VPI-103-Q1; VPI-103-Q2

UA.TR.001

VPI converters are designed to convert a vibration acceleration into a proportional electrical charge.

Together with secondary devices, they can be used as part of vibration monitoring and vibration diagnostic systems of the power plants state, elements of rotating power equipment, oil pumping and gas compression stations, and other industrial facilities.

The housing of the VPE vibration sensor is made of stainless steel. The sensing element is a piezoelectric bimorph made by the means of diffusion welding. Electrical characteristics of the sensing element are thermally stabilized.

Parameters	VPI-103-Q1	VPI-103-Q2
Sensitivity, pC/(m/s²), (± 5%)	1	2
Operating range, m/s²	4000	3000
Shock limit, m/s²	10000	10000
Amplitude nonlinearity, %	± 2	
Frequency range, Hz ±10% ±3 dB	1-6000 0.5-10000	1-5000 0.5-10000
Installation resonance frequency, kHz	22	20
Transverse resonance frequency, kHz	22	20
Transverse Sensitivity, %	± 5	
Insulation resistance in normal conditions, not less than, Ohm	$1 * 10^8$	
Temperature range, °C	-40 ÷ 250	
Temperature coefficient , %/ °C	0.05	
Weight without cable, gm	60	
Dimensions, mm	22x37x64	
Case Material	stainless steel	
Sensing element	piezoelectric	
Mounting	3 holes Ø 4.5	
Cable length , m	0.3 ÷ 5	

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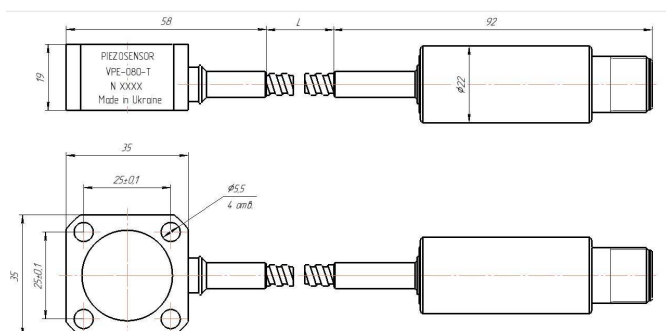ACCELERATION CONVERTERS

VPE-080

UA.TR.001

VPE converters are designed to convert a vibration acceleration into a proportional electrical signal.

Together with secondary devices, they can be used as part of vibration monitoring and vibration diagnostic systems of the power plants state, elements of rotating power equipment, oil pumping and gas compression stations, and other industrial facilities.

The housing of the VPE vibration sensor is made of stainless steel. The sensing element is a piezoelectric bimorph made by the means of diffusion welding. Electrical characteristics of the sensing element are thermally stabilized.

Parameters	VPE -080-T (N)
Sensitivity, mkA/(м/с^2) (mB/(м/с^2)) , (± 5%)	10
Operating range, m/s²	150 (300)
Amplitude nonlinearity, %	± 2
Amplitude-frequency characteristic from 10 to 1000 Hz, %	± 5
Installation resonance frequency, kHz	20
Transverse resonance frequency, kHz	20
Transverse Sensitivity, %	± 5
Temperature range, °C	-40 ÷ 250
Temperature coefficient , %/ °C	0.05
Vibration converter consumption current, mA	3 ÷ 4
Dimensions, mm: - vibration converter - remote electronic unit	55x35x20 Ø22x65
Weight without cable, gm	150
Case Material	stainless steel
Sensing element	piezoelectric
Mounting	4 holes Ø 5.5

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ACCELERATION CONVERTERS

VPE

VPE-078; VPE-079; VPE-089; VPE-086

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     VPE converters are designed to convert the vibration acceleration of machine units and mechanisms into a proportional electrical signal.

     The housing of the VPE vibration sensor is made of stainless steel. The sensing element is a piezoelectric bimorph made by the means of diffusion welding. Electrical characteristics of the sensing element are thermally stabilized.
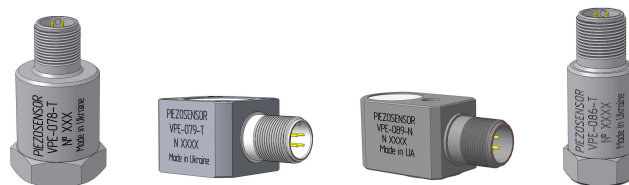
Parameters	VPE-078-I (N)	VPE-079-I (N)	VPE-089-I (N)	VPE-086-I (N)
Sensitivity, mkA/(м/с^2) (mB/(м/с^2)), (± 5%)	10(1; 100)	10(1; 100)	10(1)	10(1)
Operating range, m/s²	150 (300)			
Amplitude nonlinearity, %	± 2			
Amplitude-frequency characteristic from 10 to 1000 Hz, %	± 5			
Installation resonance frequency, kHz	20	20	20	40
Transverse resonance frequency, kHz	20	20	20	40
Transverse Sensitivity, %	± 5			
Temperature range, °C	**-40 ÷ 120**			
Temperature coefficient, %/ °C	0.05			
Vibration converter consumption current, mA	3 ÷ 4			
Dimensions, mm	56x30x34	30x35x53	25x25x58	48.5x22x25
Weight without cable, gm	100	150	150	80
Case Material	stainless steel			
Sensing element	piezoelectric			
Mounting	hole M6	4 holes Ø 5.5	hole Ø 6.2	hole M6

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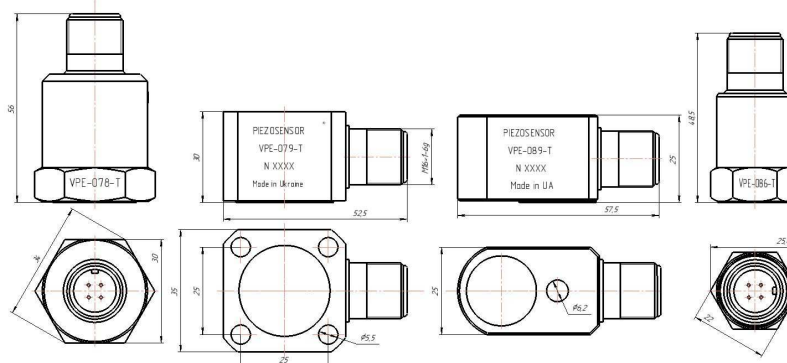
CONTROL ACCELERATION CONVERTERS

VPI

VPI-218-K; VPI-217-K; VPE-157-K

The reference converters VPI are designed to convert a vibration acceleration into a proportional electric charge.
Together with secondary devices, they can be used as part of vibration converter monitoring systems.
The housing of the VPE vibration sensor is made of stainless steel. The sensing element is a piezoelectric bimorph made by the means of diffusion welding. Electrical characteristics of the sensing element are thermally stabilized.

Parameters	VPI-218-K	VPI-217-K	VPE-157-K
Sensitivity, pC/(m/s²) (± 2%)	0.5	1/1/1	-
Sensitivity, µA/(m/s²) (± 2%)	-	-	10
Operating range, m/s²	8000	4000	150
Shock limit, m/s²	10000	10000	-
Amplitude nonlinearity, %		±1	
Operating frequency range, Hz			
±10%	1-14000	1-6000	1-3000
±3 dB	-	0.5-10000	-
Installation resonance frequency, kHz	40	22	9
Transverse resonance frequency, kHz	40	22	9
Transverse Sensitivity, %		± 3	
Insulation resistance in normal conditions, not less than, Ohm		$1 * 10^8$	-
Weight without cable, gm	50	100	120
Dimensions, mm	30x20x25	21x40x48	28x44x50
Case Material	titanium	stainless steel	titanium
Sensing element		piezoelectric	
Connector	OCCP-50	PC-4	
Mounting	M5	hole Ø 5.5	M5

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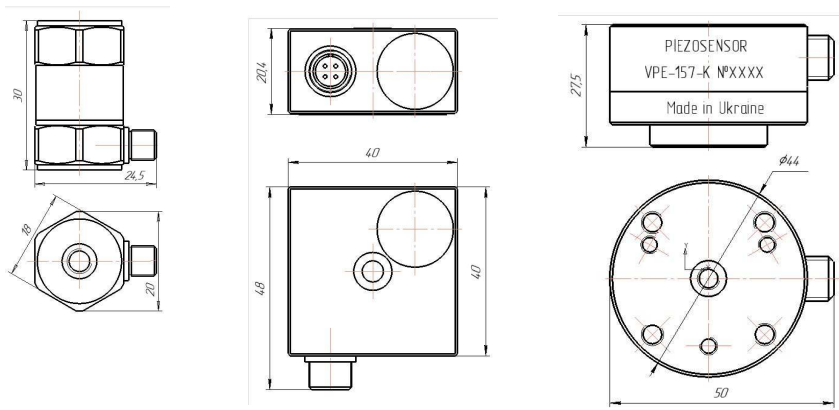
VIBRATION VELOCITY CONVERTERS

VPE/FSA

078,079,086,089,080/ 088

The vibration velocity converters VPE/FSA convert the vibration velocity of machines into a proportional electrical signal. Together with secondary devices, they can be used as part of vibration monitoring and vibration diagnostic systems of the power plants state, elements of rotating power equipment, oil pumping and gas compression stations, and other industrial facilities.

VPE-078   VPE-079   VPE-089   VPE-086   VPE-080

ACCELERATION CONVERTERS type
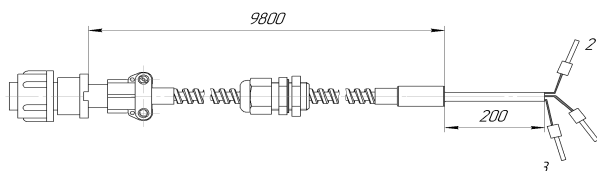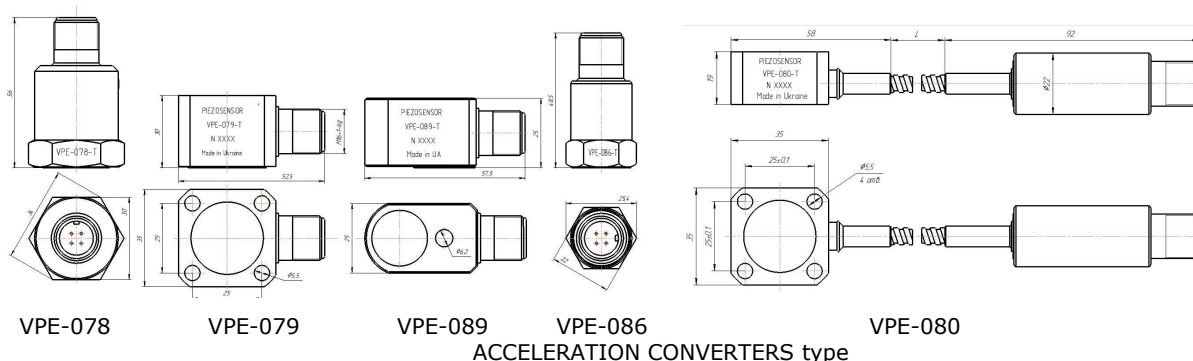
Cable diagram 079-088-125-10.
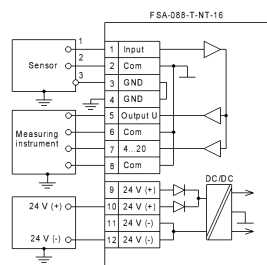
Dimensions and wiring diagram of the FSA driver - with analog outputs.
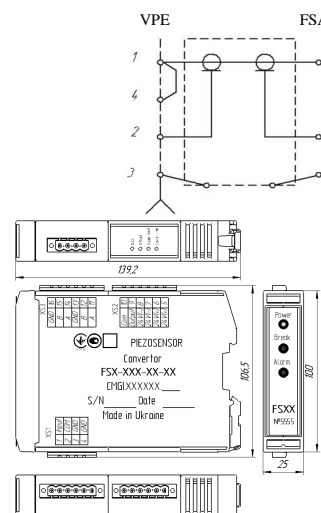
Main characteristics of the vibration converters VPE-078-T, VPE-079-T, VPE-086-T, VPE-089-T, VPE-080-T

Parameters	Specifications
Sensitivity, µA/(m/s²) (± 4 %)	10
Vibration acceleration conversion range, m/s²	0.1 - 150
Amplitude characteristic nonlinearity, %	± 2
Frequency range, Hz for VPE-079, VPE-078, VPE-080 for VPE-089	10 to 1000 10 to 5000
Passband flatness, %,	±5
Transverse Sensitivity, %	±5
Temperature range, °C for the VPE-079, VPE-078 for the VPE-080	0 to 120 0 to 250
Temperature coefficient , %/ °C	± 0.05
Insulation resistance, Ohm	10^{8}
Supply voltage, V	7.5 ±0.5
Consumption current of the vibration converter, mA	3 to 4
Dimensions, mm,	26x35x53
Weight without cable, gm	200
The protection degree of the vibration converter housing from the penetration of water, dust and foreign particles by the GOST 14254	IP 67

Main characteristics of the signal conditioner FSA-088-T-NT-16

acceleration, velocity, displacement and frequency converters   PIEZOSENSOR

Nominal conversion factors: - alternating voltage proportional to the vibration velocity, mV/(µA /s) (± 3%; (± 1% *)) - direct current proportional to the RMS of vibration velocity, mA /µA/s) (± 3%; (± 1% *))	4.25 0.1
Input signals range, (RMS) µA	0 to 1000
Output signals range: - alternating voltage proportional to the instantaneous value of vibration velocity, mV - direct current proportional to the RMS value of vibration velocity, mA	0 to 1000 4 to 20
Amplitude nonlinearity: - alternating voltage proportional to the instantaneous value of vibration velocity, % - direct current proportional to the RMS value of vibration velocity, %	± 2 ± 5
Passband flatness: - alternating voltage proportional to the instantaneous value of vibration velocity, % - direct current proportional to the RMS value of vibration velocity, %	± 5 ± 5
Temperature coefficient , %/ °C	0.1
Intrinsic noise level, mV	5
Supply voltage, V	24 ± 6
Dimensions, mm	150 x118 x 45
Weight, gm	250
The protection degree of the signal conditioner housing from the penetration of water, dust and foreign particles by the GOST 14254.	IP 20

* - for a batch of products.

Main characteristics of the VPE-/FSA-088-T-NT-16 **velocity** converters

Parameters	Specifications
Vibration velocity measurement range, mm/s	0.5 - 16
Frequency range, Hz	10 .. 1000
Base frequencies, Hz	40 (45), 80
Output signals range: - alternating voltage proportional to the instantaneous value of vibration velocity relative to the setpoint 1.5 V, mV - direct current proportional to the RMS value of vibration velocity, mA	1000 4 to 20
Nominal conversion gain at 80 Hz: - for the instantaneous value of vibration velocity, mV/(mm/s), - for the RMS value of vibration velocity, mA/(mm/s)	42.5 1.0
Deviation of the conversion gain from the nominal value - for the instantaneous value of vibration velocity, % - for the RMS value of vibration velocity, %	± 2; ± 2;
Passband flatness, %:	± 5
Limits of fundamental reduced measurement error at the base frequency, %	± 5
Temperature range: - for the vibration converter VPE, °C - for the signal conditioner FSA, °C - for the connection cable 079-088-125-10, °C	+ 0 to +120 + 0 to +70 + 0 to +125
Supply voltage, V	20 to 30

acceleration, velocity, displacement and frequency converters

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VIBRATION VELOCITY CONVERTERS

VPE-085; VPE-083.

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VPE converters are designed to convert a vibration velocity into a proportional electrical signal.
Together with secondary devices, they can be used as part of vibration monitoring and vibration diagnostic systems of the power plants state, elements of rotating power equipment, oil pumping and gas compression stations, and other industrial facilities.

The housing of the VPE vibration sensor is made of stainless steel. A sensitive element is fixed in the housing. The sensing element is a piezoelectric bimorph made by the means of diffusion welding. Electrical characteristics of the sensing element are thermally stabilized.
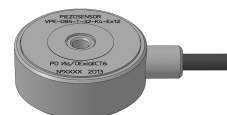
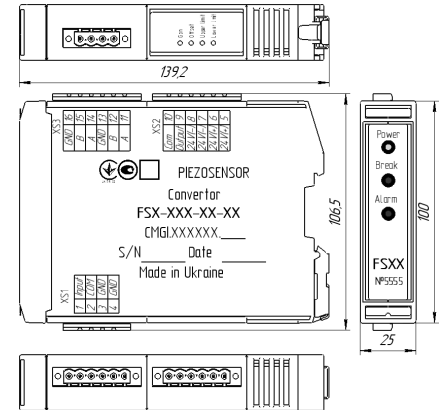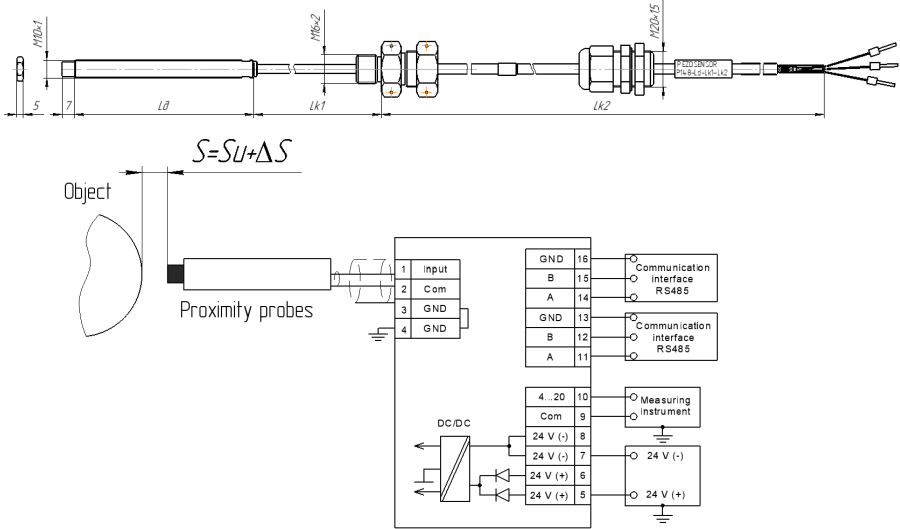| Parameters	085	083
Vibration velocity conversion range, mm/s	32 (16, 64)	
Sensitivity, mA/(mm /s) (± 10 %(5 *))	0.5 (1.0; 0.25)	
Amplitude characteristic nonlinearity,%	± 5	
Frequency range, Hz	10-1000	
Passband flatness - in the frequency range from 20 to 630 Hz - in the frequency range from 10 to 1000 Hz	± 10 +10 to - 20	
Transverse Sensitivity, %	5	
Temperature range, °C	-30 ÷ +80	
Temperature coefficient, %/ °C	0.1	
Supply voltage, V	24 ± 6	
Consumption current of the vibration converter, mA	4 ÷ 20	
Settling time, 4-20 mA, no more than s	30	
Line resistance at 24 V supply voltage, no more than Ohm	500	
The protection degree of the vibration converter housing from the penetration of water, dust and foreign particles by the GOST 14254	IP 67	
Explosion protection degree	RO IA/0ExiaIICT6	
Dimensions, mm	21x48x58	30x35x52.5
Case Material	12X18H10T	
Weight without cable, gm	250	120
Mounting	hole Ø 6.2	4 holes Ø 5.5

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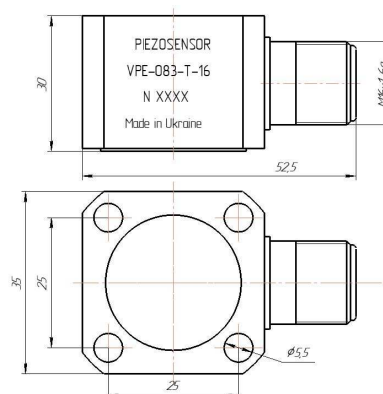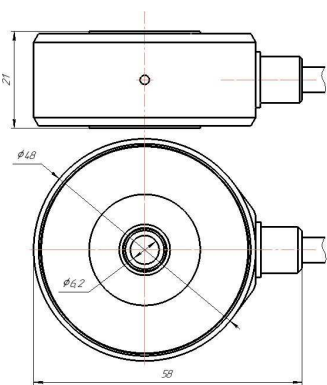
DISPLACEMENT AND VIBRATION CONVERTERS

P/FSP

UA.TR.001

P/FSP converters (Proximeters) are designed to convert a vibration displacement into a proportional electrical signal.

$$S = Su + \Delta S$$

Object

Proximity probes

1	input	
2	Com	
3	GND	
4	GND	

GND	16		Communication Interface RS485
B	15		
A	14		
GND	13		Communication interface RS485
B	12		
A	11		
4...20	10		Measuring instrument
Com	9		
24 V (-)	8		24 V (-)
24 V (-)	7		
24 V (+)	6		24 V (+)
24 V (+)	5		

DC/DC

PIEZOSENSOR
Convertor
FSX–XXX–XX–XX
CMGI.XXXXXX.___
S/N _____ Date ____
Made in Ukraine

Power
Break
Alarm

FSXX
№5555

Proximeter P. Connection diagram. Converter FSP.

(Output 1 "displacement")

Parameters	P148/FSPA149 P148/FSPA164	P150 / FSPA165	P150 / FSPA166	P151 / FSPA173
Output signal range, mA (V)	from 4 to 20			
Proximity sensor installation thread	M10 × 1	M16 × 1	M16 × 1	M20 × 1
Nominal sensitivity K, mA/mm for the output 4-20 mA (V/mm for the output 4-20 V)	8	4	3.2	3.2
Installation gap (Su), mm	1.4	3.0	3.5	3.5
Displacement measurement range, mm	0.4 to 2.4	1 to 5	1 to 6	1 to 6
Extended displacement measurement range, mm * (K, mA/mm)	1.0 to 6.0 (K = 3.2)	1.0 to 9.0 (K = 2)	1.0 to 11.0 (K = 1.6)	1.0 to 11.0 (K = 1.6)
Proximity sensor length without cable, mm	30; 40; 50; 80; 100; 160; 175	30; 40; 50; 80; 85		50; 80; 100
Base frequency, Hz	80 ± 1 (45 ± 1)			
Load resistance, Ohm	100 to 500 (up to 1000)			
Operating temperature range, °C: - proximeter - converter	0 to 180 (- 40 to 180) 0 to 70			
Supply voltage, V	24 ± 6			
Consumption current, mA	150			
Signal cable length, m	250			
FSP dimensions, mm	150 × 118 × 45			
Total cable length, m	1.0 to 14 with a multiplicity of 0.5			
Cable length from proximeter to cable gland, m	0.5 to 5 with a multiplicity of 0.5			
Weight of a 100 mm long proximeter with 8 m cable in the metal hose, kg	2.2			
Converter weight, kg	0.3			
Limits of permissible relative deviation of the actual value of the displacement sensitivity from the nominal, %	± 2.5			
Limits of the basic reduced error of displacement conversion, %:	± 2.5			
Limits of the additional permissible error of displacement conversion due to the temperature change (Defined as the output change due to ambient temperature change from normal to the border values of the operating temperature range), % - proximeter - converter	± 4 ± 2			

(Output 2 "Vibration displacement ")

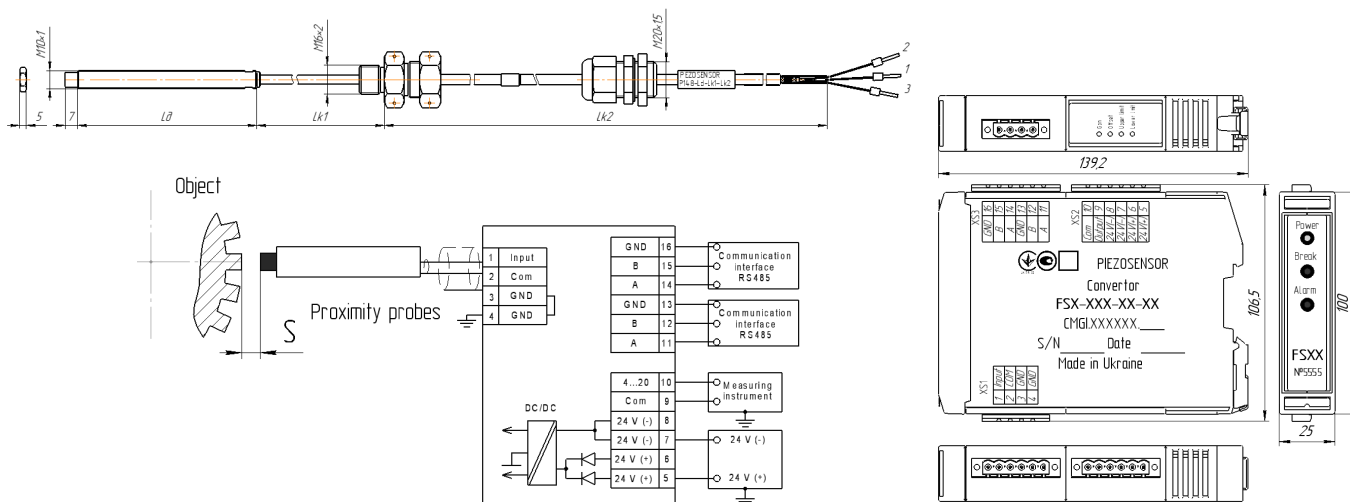| Parameters	P148/FSPA149
Conversion range of relative vibration displacement (p-p), µm:	
- AC output (AC voltage)	25 to 500
- DC output	25 to 500
Operating frequency range, Hz:	
- AC output (AC voltage)	5 to 500
- DC output	5 to 500
Output signal, mA (V):	
- AC output (AC voltage)	0.2 to 4
- DC output	4 to 20
Output current in the absence of vibration displacement, mA	
- DC output	4.0 ± 0.1
Nominal value of vibration displacement sensitivity, mA/mm (V/mm):	
- on the output of alternating current (p-p) (alternating voltage)	8
- DC output (p-p)	3.2
Amplitude non-linearity in the base frequency, with displacement up to 0.5 (Smax + So), mm, %	± 5
Basic reduced conversion error at the base frequency, %	± 6
Passband flatness, %	
- AC output	± 5;
- DC output	+5; -20

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VELOCITY CONVERTERS

P/FST

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Converters P/FST (Tachometers) are designed to convert displacement into a current signal and rotation frequency of shafts containing gears made of ferromagnetic materials into a current pulse signal.

Eddy-current converter P, converter FST, functional diagram

| Parameters	P148/FSTA167	P150/FSTA167	P185/FSTA167
Proximity sensor installation thread	M10 × 1	M16 × 1	M20 × 1
output "displacement "			
Displacement measurement range, mm	0.4 to 2.4	1 to 6	0.4 to 2.4
Nominal sensitivity proportional to static displacement, mA/mm	8	3.2	8
Output signal range, mA		from 4 to 20	
Limits of permissible relative deviation of the actual value of the displacement sensitivity from the nominal, %		± 2.5	
Limits of the basic reduced error of displacement conversion, %		± 2.5	
FST dimensions, mm		150 x 118 x 45	
Proximity sensor length without cable, mm		50, 80, 100	
Total cable length, m		1.0 to 14 with a multiplicity of 0.5	
Cable length from proximeter to cable gland, m		0.5 to 5 with a multiplicity of 0.5	
Weight of a 100 mm long proximeter with 8 m cable in the metal hose, kg		1.8	
Converter weight, kg		0.3	
output «impulse» («pulse»)			
Control surface		gear, groove, key	
Number of gear teeth, pcs		1 to 120	
Installation gap, mm	1.3 ± 0.3	3.5 ± 0.2	1.4 ± 0.2
Output signal, mA: - "0" - "1"		3.5 to 5.5 19 to 21	
Pulse frequency measurement range, Hz		1 to 4000	
Information refresh time on a digital output, s		1	
Synchronization line function		Phase mark former	
Load resistance, Ohm		100 to 500	
Operating temperature range, °C: - proximeter - converter		0 to 180 (-40 to 180) 0 to 70	
Supply voltage, V		24 ± 6	
Consumption current, mA		150	
Signal cable length, m		250	
Basic reduced error of rotation frequency measurement %, - pulse/s (Hz),		± 0.1	

± 2.0

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DISPLACEMENT CONVERTERS

K/FSM

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Converters K/FSM are designed to convert the displacement of the "ridge" type reference surface into a normalized electrical signal 4-20 mA.
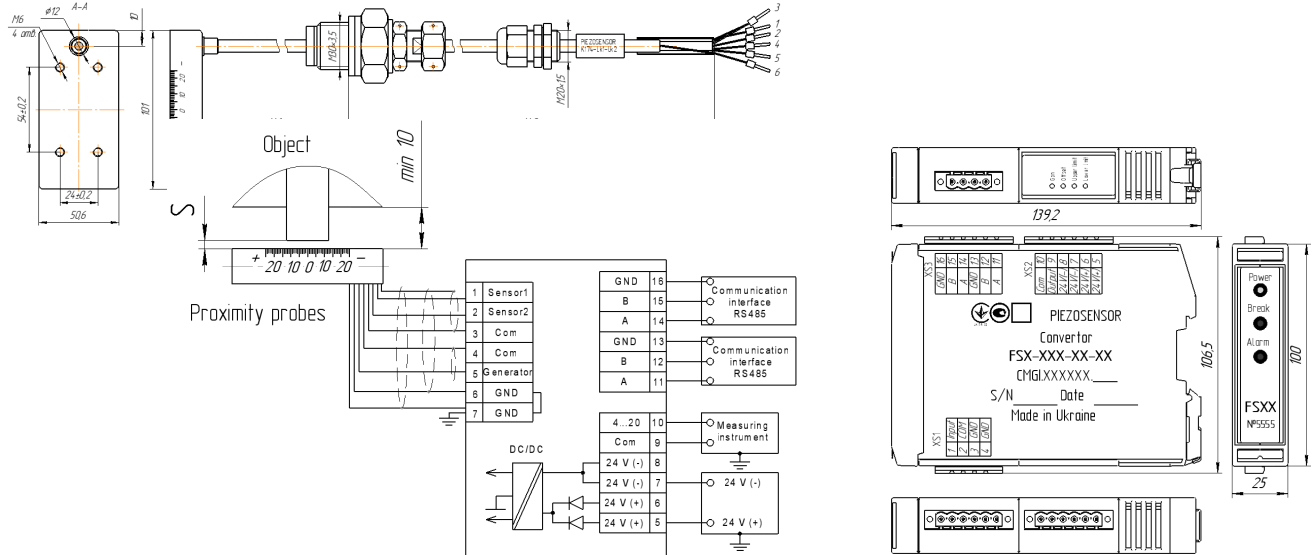
Displacement converter K, signal conditioner FSM, functional diagram

Parameters	Value					
Installation gap, mm	1.5 ± 0.2					
Width of the "ridge", mm	10	20	25	30	35	40
*Displacement measurement range, S, mm	0-50	0-50	0-45	0-40	0-35	0-12
Output signal range, mA	from 4 to 20					
The nominal value of the conversion factor proportional to the static displacement K, mA/mm	16/S					
Cable length, m	3, 5, 7, 9, 12, 14					
Operating temperature range, °C: - sensor - signal conditioner	 0 to 180 (- 40 to 180) 0 to 70					
Supply voltage, V	24 ± 6					
Consumption current, mA	200					
Dimensions, mm: - sensor - signal conditioner FSM	 101 × 51 × 21 150 x 118 x 45					
Weight, kg: - sensor - signal conditioner	 2 0.3					
Limits of permissible relative deviation of the actual value of the displacement conversion factor from the nominal, %	± 4					
Limits of the basic reduced error of displacement conversion, %	± 5					
Limits of the additional permissible error of displacement conversion due to the temperature change (Defined as the output change due to ambient temperature change from normal to the border values of the operating temperature range), %: - sensor - signal conditioner	 ± 4 ± 2.0					

* The range of the displacement S can be changed at the customer's request
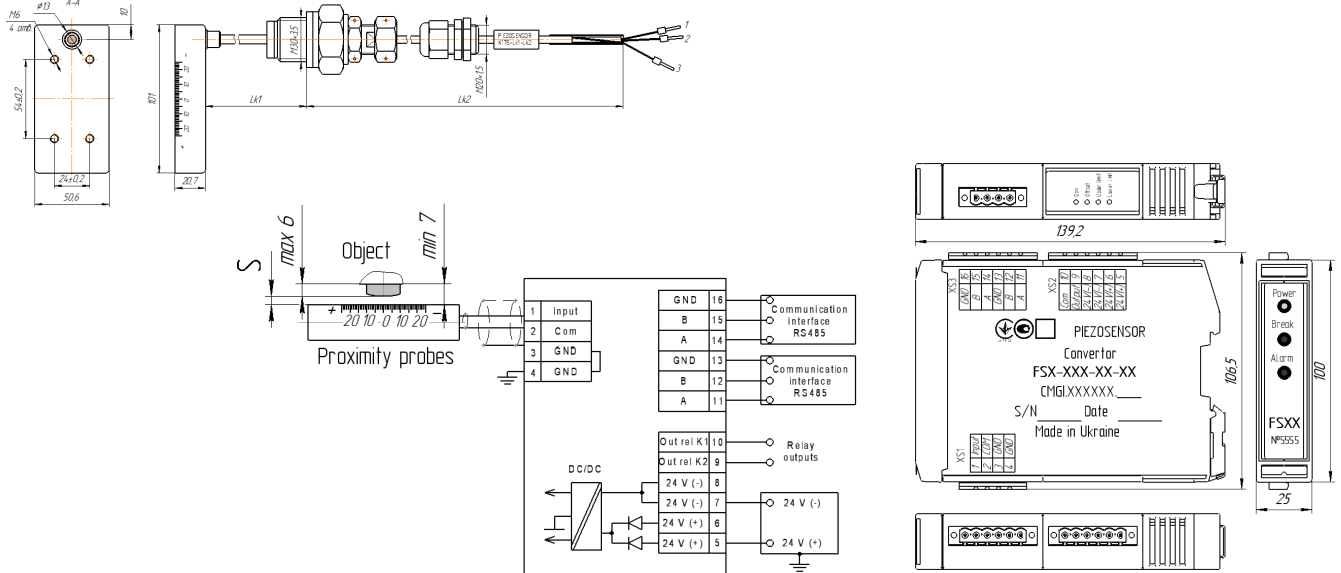
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DISPLACEMENT CONVERTER OF SAFETY STRIKER

K/FSB

UA.TR.001

K/FSB is designed to convert a displacement of the safety circuit breaker into a current signal. Together with secondary devices, K/FSB allows measuring displacement (striker reach).

K/FSB consists of an eddy-current converter K with a connecting cable and an FSB signal conditioner.

Eddy-current converter K, signal conditioner FSB, functional diagram.

| Parameters	Value
Sensing distance to the measuring surface, mm	3.0 ± 0.5
Measuring displacement, mm	6
Striker diameter, mm	20 (26)
Permissible displacement of the striker relative to the initial position, mm	± 15
Output signal, mA	4 to 20
Relay switching delay time, s	0.5
Load resistance, Ohm	100 to 500
Output relay contact parameters: - switching DC voltage, V - switching voltage of alternating current, V - switching power, W	34 115 0.35
Operating temperature range, °C: - sensor - signal conditioner	0 to 180 (- 40 to 180) 0 to 70
Supply voltage, V	24 ± 6
Consumption current, mA	150
Signal cable length, m	250
FSB dimensions, mm	150 x 118 x 45
Sensor dimensions, mm	101 × 51 × 21
Total cable length, m	1.0 to 15 with a multiplicity of 0.5
Cable length from the sensor to the cable gland, m	from 0.5 to 5 with a multiplicity of 0.5
Sensor weight with 14 m long cable in a metal hose, kg	2.8
Signal conditioner weight, kg	0.3

LINEAR DISPLACEMENT METER

ILP-160

Linear displacement meter ILP-160 is intended for the calibration of displacement converters together with signal conditioners.
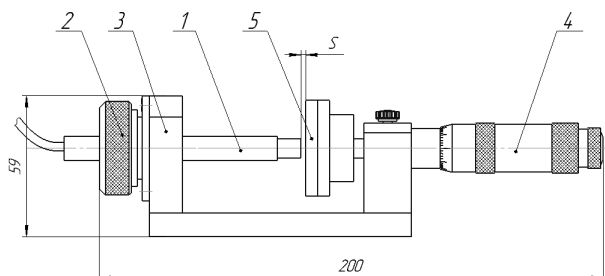
Exterior view of the ILP-160 stand. 1 - verified eddy-current displacement converter; 2 - collet clamp; 3 - rack; 4 - reading device, micrometer type MK 25-50 mm; 5 - standard of metal grade 20X13.
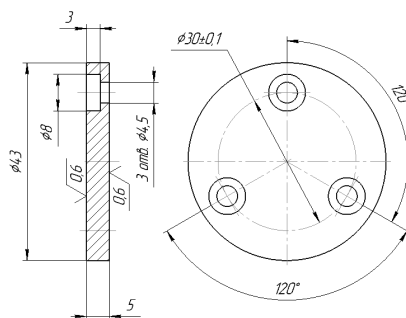
Standard of metal grade 20X13

|	
Displacement measurement range, mm	0 to 25
Basic error of displacement measurement, mm	± 0.01
Dimensions, mm	200 × 44 × 59
Weight, kg	0.5

Exterior of the ILP-160 stand

PIEZOSENSOR

TWO-AXIS LINEAR DISPLACEMENT METER

IPD-177

Two-axis linear displacement meter IPD-177 is intended for the displacement converters of different types calibration, together with signal conditioners.

The sensor under the test is installed on the IPD-177 following the figure.
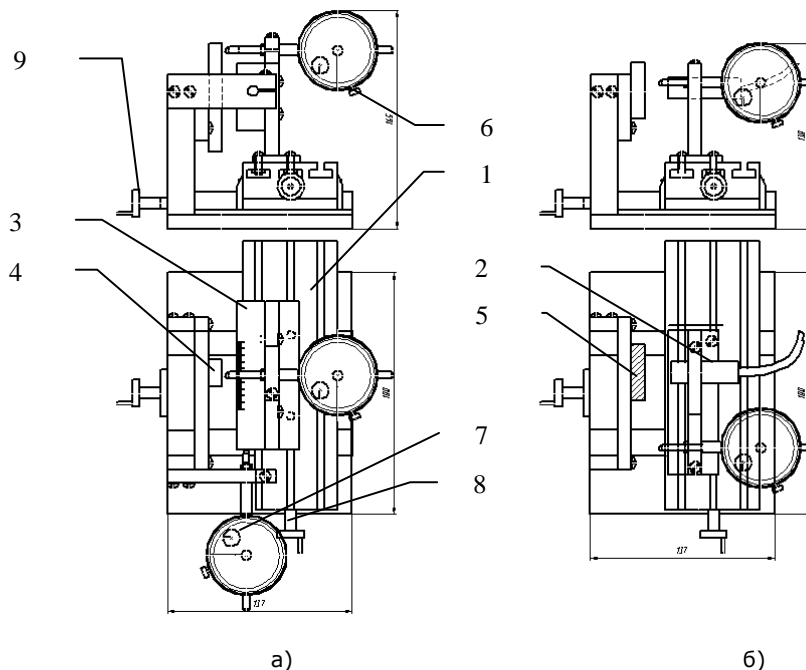
Installation diagram. a) Proximeter K at stand IPD-177; b) Proximeter P at stand IPD-177. 1 - two coordinate table; 2 - Proximeter P; 3 - Proximeter K; 4 - "belt" type metal model; 5 - model of the metal for calibration of the Proximeter P; 6 - dial indicator "ИЧ-10"; 7 - dial indicator "ИЧ-50"; 8 – displacement adjustment mechanism X-axis; 9 – displacement adjustment mechanism Y-axis.

The displacement of the sensor relative to the "belt" is created by the means of the carriage displacement. The displacement value is counted when the flywheel rotates on the calliper lead screw and on the scale of the "ИЧ-50" dial indicator.

The gap between the collar and the sensor is being set rotating the lateral offset screw. On the scale of the dial indicator "ИЧ-10", the setting of the gap is monitored.

Longitudinal displacement measurement range, mm	0 to 120
Lateral displacement measurement range, mm	0 to 25
Basic error of the offset setting, mm	± 0.02
Dimensions, mm	325 × 230 × 125
Weight, kg	5.0

acceleration, velocity, displacement and frequency converters
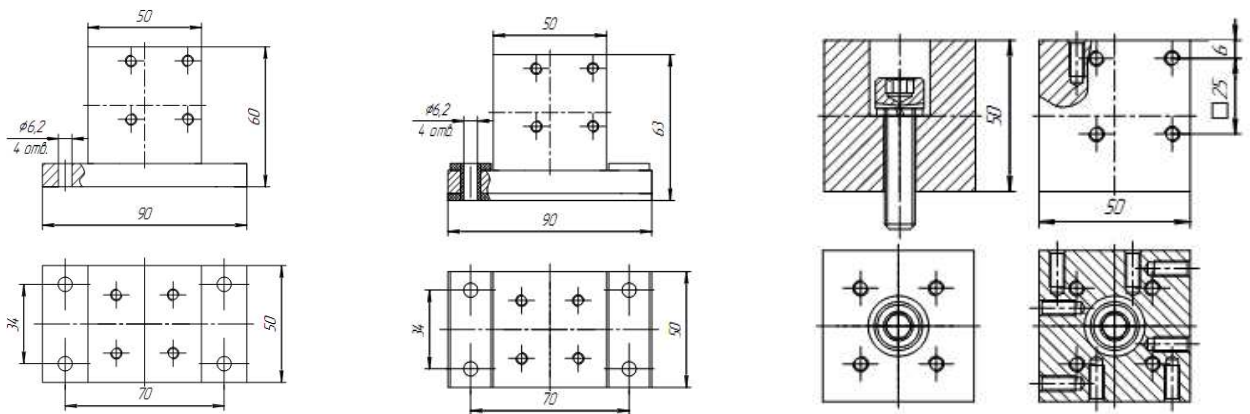
PIEZOSENSOR

CALIBRATOR

KV-184

The KV-184 is a fully self-contained, battery-powered device designed for the calibration of piezoelectric vibration converters with or without built-in electronic circuits, as well as proximeters. Calibration can be performed by vibration acceleration, vibration velocity and vibration displacement.
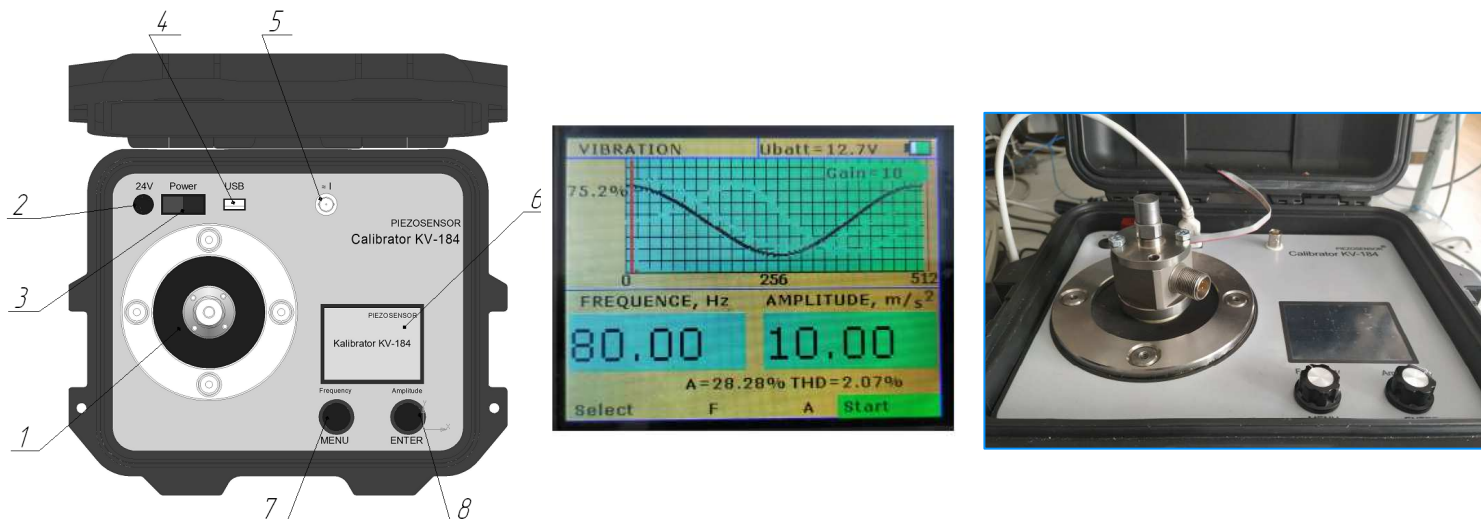
Calibrator KV-184. 1 - electromagnetic shaker; 2 - power connector (24 V); 3 - power switch; 4 - data transfer connector (USB); 5 - connector for the tested vibration converter (VPE-079) (optional); 6 - display; 7 - encoder used for setting the frequency (Frequency) and selection (Select) of the operating window, 8 – encoder used for the amplitude (Amplitude) setting and Start-Stop action.

Parameters	Value
Frequencies during vibration reproduction, Hz	10; 20; 45; 80; 159.15; 315; 500; 630; 1000
Base frequencies, Hz	45, 80
Operating range (with load up to 0.2 kg):	
- peak to peak value of vibration displacement (at a frequency of 45 Hz), microns	1000
- RMS vibration velocity (at a frequency of 80 Hz), mm/s	25
- RMS vibration acceleration (at a frequency of 45 Hz), m/s²	35
Frequency resolution, Hz	1
Vibration acceleration resolution, m/s²	0.1
Limits of permissible relative frequency error Hz, %	± 0.5
Limits of permissible relative error of vibration acceleration (RMS), (when reproducing vibration A = 10 m/s² at base frequencies 45, 80, 159.15 Hz), %	± 2
Limits of permissible relative error in the operating range of vibration acceleration (RMS)	± 2
Limits of permissible relative error in the operating frequency range (- from 20 to 1000 Hz), vibration acceleration (RMS),%	±2
Relative coefficient of the shaker transverse vibrations, %	
- at the base frequency	5
- at other frequencies	15
Nonlinear distortion coefficient of the shaker, %	
- at the base frequencies (45; 80; 159,15)	5
- at other frequencies within the measuring range	10
Power consumption, VA - in the idle mode - maximum	5 40
Supply voltage, V (AC)	198 to 242
Supply voltage frequency, Hz	50 ±0.5
Dimensions, mm	300x250x200
Weight, kg	9
Continuous operation time, hour	0.5

acceleration, velocity, displacement and frequency converters
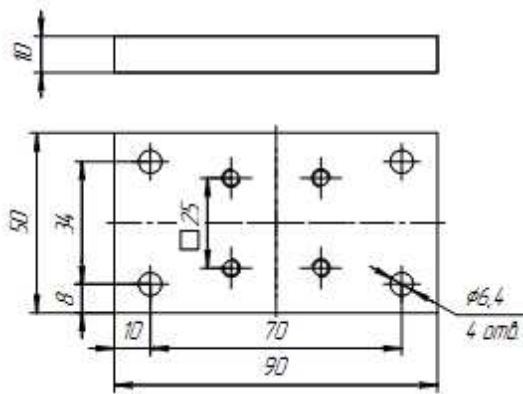
⬦ PIEZOSENSOR
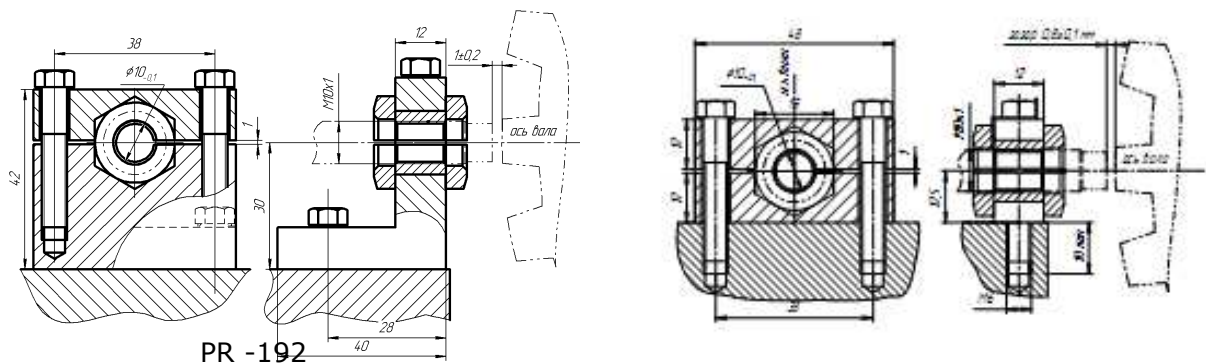
MOUNTING accelerometers

PR-152   PR -152-I   PR-190

PR-191. Plank

MOUNTING proximeters and tachometers.

PR -192