

Metran-515 Portable Pressure Calibrator



- **Specifications: similar to Metran-501-PKD-R**
- **Measurement Ranges:**
 - Pressure 0...1.6 kPa to 0...60 MPa;
 - Vacuum 0...-0.025 to 0...-0.1 MPa
- **Measurement and generation ranges of electrical signals: dc voltage: 0-1 V; dc: 0-20 mA**
- **Pressure measurement accuracy $\pm 0.05\%$ subrange URL**
- **Supply of transmitters under test with voltage of 24 V from Metran-516 Power Supply**
- **Pressure measurement units: Pa, kPa, MPa, kgf/m², kgf/cm², mmHg, cmHg, mmH₂O, mbar, bar**
- **RS232 output interface and software**
- **Calibrator power supply:**
 - Built-in Ni-Cd battery;
 - Metran-516 Grid Power Supply
- **Dust and water tightness as per IP54**
- **Release: III quarter of 2006.**

Metran-515 Portable Pressure Calibrator is used as a reference standard for verification of gage and vacuum pressure transmitters, gage-vacuum transmitters, pressure indicators, vacuum meters, secondary devices with unified inputs and outputs.

The device provides calibration of pressure instruments under service operation.

Basic functional capabilities:

- pressure generation and measurement;
- measurement and reproduction of electrical signals;
- reproducible pressure entering from more precise standard samples;
- pressure relay verification;
- automatic calculation of accuracy of devices under test;
- calibration result archiving: 1 to 14 transmitters in non-volatile memory;
- recalibration may be performed at Customer's site.

DESIGN AND OPERATING PRINCIPLE

Design and operating principle of Metran-515 Calibrator are the same as design and operating principle of Metran-501-PKD-R Calibrator (refer to the relevant section of the Catalog).

SPECIFICATIONS

PRESSURE RANGES

Table 1

Pressure Module Code	Measurement Ranges of Pressure Modules, MPa	Pressure Measurement Subranges, MPa				Maximum Pressure, MPa
Gage Pressure Modules						
K2.5	0-0.0025	0-0.0016		0-0.0025		0.0035
K2.5D						0.005
K6	0-0.006	0-0.004		0-0.006		0.0085
K6D						0.012
K25	0-0.025	0-0.01		0-0.016	0-0.025	0.035
K25D						0.05
M0.16	0-0.16	0-0.04	0-0.06	0-0.1	0-0.16	0.22
M0.16D						0.32
M1	0-1.,0	0-0.25	0-0.4	0-0.6	0-1.0	1.4
M1D						2
M2.5	0-2.5	0-1.6		0-2.5		3.5
M10	0-10	0-4.0		0-6.0	0-10.0	14
M25	0-25	0-16.0		0-25.0		35
M60	0-60	0-40		0-60		70
Gage-Vacuum Modules)						
V25	-0.025...0	-				-0.035
V63	-0.063...0	-				-0.09
V100	-0.1...0	-				-0.1

Notes:

1. One electronic module can work with any quantity of pressure modules.
2. To provide minimum verification/calibration error of pressure transmitters, measurement range of each plug-in reference module is divided into 2-4 subranges, and calibrator error is rated from upper range limit of a subrange.
3. Letter D at the end of a code means a module with and isolating diaphragm.

MEASUREMENT AND GENERATION RANGES OF ELECTRICAL SIGNALS

Table 2

Parameter	Range
In Measurement Mode	
Direct current	0-20 mA*
DC voltage	0-1 V
In Generation Mode	
Direct current	0-20 mA
DC voltage	0-1 V

* Metran-501-PKD-R Calibrator enables measurement of 0-5, 5-0, 4-20, 20-4 mA pressure transmitter outputs.

Transmitters under test are supplied by DC voltage of 24 V. Maximum load current is 50 mA.

Input resistance of electronic module:

- 10 MOhm min. - at voltage measurement in the range of 0-1.0 V;
- 75 Ohm max. - at current measurement.

Power consumption of electronic module from grid power supply, max.

- 0.4 W - in measurement mode;
- 0.6 W - in generation mode.

Weight of electronic module

0.45 kg max.

Average life time - 8 years minimum

Number of digits for parameter indication:

- 5 decimal places - pressure/vacuum display;
- 6 decimal places - current/voltage display

CALIBRATOR ACCURACY

Table 3

Parameter	Range	Accuracy, minimum
In Measurement Mode		
Gage Pressure	0-0.16...0-60 MPa	±0.05%URL
	0-25 kPa	±0.06%URL
	0-2.5; 0-6 kPa	±0.1%URL
Vacuum	-25-0 kPa...-100-0 kPa	±0.06%URL
Current	0-20 mA	±(0.02%rdg+0.001 mA)
Voltage	0-1 V	±(0.02%rdg+0.0002 V)
In Generation Mode		
Current	0-20 mA	±(0.04%rdg+0.001 mA)
Voltage	0-1 V	±(0.04%rdg+0.0002 V)

URL - upper range limit of pressure module subrange;

Rdg (of reading) - the current value of measured/generated/reproduced quantity.

VERIFICATION

Interval is once a year.

Verification may be carried out at the manufacturer or in Rostekhregulirovaniye territorial offices.

OPERATION CONDITIONS

Ambient temperature 0 to 50°C.

Relative humidity 30 to 80%.

Atmospheric pressure 84 to 106.7 kPa.

WARRANTY

Warranty is 12 months from the date of commissioning, but no more than 18 months from the date of shipment from the manufacturer.

DELIVERY SET

The calibrator delivery set includes:

- Electronic Module	1 unit
- Pressure Module	by request
- Pressure Source	by request
- Battery	1 unit
- Electrical Cable for connection of device under test	1 unit
- Metran-516 Grid Power Supply	1 unit*
- Carrying Case	1 unit
- Product Data Sheet 1560.000PS	1 copy
- Operation Manual 1560.000RE	1 copy
- Verification Certificate	1 copy
- Verification Procedure	1 copy
- Options	by request

* Metran-516 Power Supply provides voltage supply of 24 V for the calibrator and transmitters under test (refer to the Section "Accessories").

SERVICE

Metran IG performs the following types of work:

1. Preventive maintenance:

- Leak test, functional test;
- Fault repair;
- Determination of metrological characteristics.

2. Short-term medium maintenance or complex repair.

3. Re-adjustment:

- Delivery of additional pressure modules and pressure sources for previously acquired calibrators;
- Change of pressure measurement accuracy from ±0.05% to ±0.04%.

4. Calibration (if accuracy less than specified).

5. Verification (carried out at metrological lab of the manufacturer together with Chelyabinsk Center for Standardization and Metrology).

OPTIONS

1. Hardware-and-software PC interface includes software (compact disk) and RS232 cable to connect to PC (see at the end of this Section).

2. Metran-650, 375 HART Communicator or Metran-682 HART Modem and H-Master Software (refer to Section "Equipment to Display Transmitter Output Signals with HART Protocol" in the Catalog).

3. Reducing sleeves for connection of transmitters under test with different threads to an air hose of (hydraulic hose) of pressure source (refer to Accessories Section).

Use of optional "Metran-650 HART Communicator" or "Metran-682 HART Modem" and "H-Master Software".

The option is implemented to verify Metran-100 Pressure Transmitters and equivalent transmitters with HART output, which are produced by other manufacturers.

As an input signal of HART Protocol is a digital measuring signal, it is possible to verify pressure transmitters also by HART signal. For this purpose upon Customer's request, Metran-515 Pressure Calibrator is available with Metran-682 HART Modem, H-Master Software, which both provides conversion of HART signal from the transmitter to RS232 interface and interpretation of transmitter readings on PC monitor, as well as the Calibrator is available with HART Communicator.

ORDERING INFORMATION (WITHOUT PV-411-HP PUMP)

Metran-515 - K25D/M1D/M25 - P-0.25/H-2.5M/P-25 - RS232 - Metran-682 - TU 4212-006-36897690-2003					
1	2	3	4	5	6
Reducing Socket No.5					

1. Calibrator Type.
2. Codes of required pressure modules (selectable from Table1).
3. Codes of required pressure sources, except for PV-411-HP (Table 4).
4. Code of optional "Hardware-and-software PC interface (indicate only if required).
5. Code of optional "Metran-682 HART Modem and H-Master Software" or code of Metran-650, or 375 when ordering optional HART Communicator (indicate only if required).

6. Specifications.
- * It is possible to order pressure modules and sources separately.
- Note: Optional "Reducing Sockets" should be indicated when ordering in a separate line (refer to Section "Accessories" in the Catalog; indicate only if required).

ORDERING INFORMATION (WITH PV-411-HP PUMP)

Metran-515 - K25D/M1D/M25 - P-0.25 - ShRV - RS232 - Metran-682 - TU 4212-006-36897690-2003						
1	2	3	4	5	6	7
PV-411-HP Multifunctional Pump						

1. Calibrator Type.
2. Codes of required pressure modules (selectable from Table1).
3. Codes of required pressure sources, except for PV-411-HP (Table 4).
4. Code of reducing sockets for PV-411-HP Pump (refer to Section "Pressure Sources").
5. Code of optional "Hardware-and-software PC interface (indicate only if required).
6. Code of optional "Metran-682 HART Modem and H-Master Software" or code of Metran-650, or 375 when ordering optional HART Communicator (indicate only if required).

7. Specifications.
- * It is possible to order pressure modules and sources separately.
- Note: Indicate in separate lines when ordering (indicate only if required):
- PV-411-HP Multifunctional Pump (refer to Section "Pressure Sources");
 - Optional Reducing Sockets (refer to Section "Accessories" in the Catalog).

**ORDERING INFORMATION
Module for Metran-515 Calibrator on Separate Order**

Pressure Module - K2.5 - (for Metran-515 №100)		
1	2	3

1. Name.
2. Pressure Module Code (Table 1).
3. Type and Serial Number of Metran-515 Calibrator to be operated with.

Important! It is possible to order Metran-515 Electronic Module as a self-contained product (w/o modules and pressure sources) to be used as a digital milliamperemeter/voltmeter and a precision current/voltage generator for verification and adjustment of various secondary instruments and transmitters.

Table 4

Model Code	Pressure Source	Pressure Setting Range
P-0.25M	Pneumatic Hand Pump	minus 90 to 250 kPa
P-0.25	Pneumatic Hand Pump	minus 63 to 250 kPa
N-2.5M	Pneumatic Hand Pump	0 to 2.5 MPa
P-25	Hydraulic Hand Press	0 to 25 MPa
P-60	Hydraulic Hand Press	0 to 60 MPa
PV-411-HP	Multifunctional Pump: - Pneumatic Version - Pneumohydraulic Version	minus 95 kPa to 6 MPa minus 95 kPa to 70 MPa

Note: Data on Pressure Sources, additional reducing sockets and pneumatic hoses can be found in relevant sections of this Catalog.

Pressure Sources Recommendations:

- P-0.25M Pump for Modules V25; V63; V100; K6; K6D; K25; K25D; M0.16; M0.16D;
- P-0.25 Pump for Modules V25; V63; K2.5; K2.5D; K6; K6D; K25; K25D; M0.16; M0.16D;
- N-2.5M Pump for Modules M0.16; M0.16D; M1; M1D; M2.5;
- P-25 Hydraulic Press for Modules M2.5; M10; M25;
- P-60 Hydraulic Press for Modules M10; M25; M60;

- PV-411-HP Pump for all Gage Pressure/Vacuum Modules (except K25, K25D).

Important for Customers! Transmitters under test and reference modules of calibrators with measurement range up to 25 kPa are sensitive to overload pressure, and their readings after applying pressure $P_{in} > P_{add}$ (refer to Table 1) may not restore. When using pressure sources not recommended for these modules, such as N-2.5M Hand Pump, one sharp press to pump levers may exceed the maximum permissible value. P-0.25 Pump (P-0.25M Pump) eliminates this risk.