Area of Accreditation

Federal State Unitary Enterprise
D.I. Mendeleyev Institute for Metrology

Name of a legal body or name of an individual entrepreneur

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Calibration of measuring instruments

И М

Calibration decal code

№	Measurements, type (group) of measuring instruments	Metrological requirements: Measurement range	Metrological requirements: Uncertainty (error, class, order)	Notes
1	2	3	4	5
19, Moskovsky pr., St. Petersburg 190005				
MEASUREMENTS OF GEOMETRIC QUANTITIES				
1	Spectral lamps	(0,4 – 0,7) µm (0,2 – 50) µm	$U^o_{0,95} = (2,5 \cdot 10^{-9} – 2,1 \cdot 10^{-8})$ $U^o_{0,95} = (0,6 \cdot 10^{-5} – 0,3 \cdot 10^{-3})$	
2	Laser wavelength meters	λ = (0,4 – 11) µm	$U^o_{0,95} = (10^{-10} – 5 \cdot 10^{-9})$	
3	Monochromators	(0,4 – 1) µm	$U^o_{0,95} = (5 \cdot 10^{-6} – 5 \cdot 10^{-4})$	
4	Frequency stabilized lasers	λ = (0,4 – 11) µm	$U_{0,95}$ = 0,02 fm	
5	Continuous tunable and gas lasers	λ = (0,4 – 11) µm	$U^o_{0,95} = (1,5 \cdot 10^{-8} – 0,4 \cdot 10^{-4})$	
6	Laser displacement indicators	$(10^{-9} – 10^{-2})$ m	$U_{0,95}$ = 0,2 nm	
7	Line scale calibration systems	(0,001 – 1000) mm	$U_{0,95}$ = (0,02 – 0,10) µm	
8	Line measures of length (line scales)	(0,001 – 2000) mm	$U_{0,95}$ = (0,02 – 0,30) µm	
9	Stage micrometers	(0 – 1) mm	$U_{0,95}$ = 0,02 µm	
10	Measuring tapes	(0,001 – 30) m (0,001 – 100) m	$U_{0,95}$ = (1 – 450) µm	
11	Measuring tapes	(0,001 – 100) m	$U_{0,95}$ = (15 – 450) µm	

1	2	3	4	5
12	Step height standards Type A1 according to ISO 5436-1	(1 – 3000) nm	$U_{0,95}$ = (1,6 – 21,1) µm	
13	Measuring viewing telescopes	(0,5 – 30) m	$U_{0,95}$ = (3 - 48) µm	
14	Geodetic rods	no more than 4 m	$U_{0,95}$ = 0,36 µm	
15	Gauge blocks calibration systems	(0,1 – 1000) mm	$U_{0,95}$ = (0,01 – 0,06) µm	
16	Gauge blocks	(100 – 1000) mm	$U_{0,95}$ = (0,03 – 0,20) µm	
17	Gauge blocks	(0,1 – 100) mm	$U_{0,95}$ = 0,03 µm	
18	Measuring tapes calibration systems	(0,001 – 30) m (0,001 – 50) m	$U_{0,95}$ = (0,5 – 25) µm	
19	Measuring rulers	(0 – 3000) mm	$U_{0,95}$ = (0,03 – 0,23) mm	
20	Digital measuring rulers	(0 – 3000) mm	$U_{0,95}$ = (0,006 – 0,15) mm	
21	Level gauges calibration systems	(0 – 50) m	$U_{0,95}$ = (0,05 – 12) mm	
22	Laser, ultrasonic, wave radar, electronic, microwave, radar, capacitive, guided wave radar, and float level sensors (meters, transmitters)	(0 – 30) m	$U_{0,95}$ = (0,1 – 2) mm	
23	Measurement heads and indicators (lever-arm, digital, multiturn, clock, twisted-spring micrometers, optical gauges, micators, minicators)	(0 – 150) mm	$U_{0,95}$ = (0,01 – 3) µm	
24	Calibration testers for measuring heads, indicators, and inside gauges	(0 – 100) mm	$U_{0,95}$ = (0,01 – 2,5) µm	
25	Extensometer calibrators	(0 – 100) mm	$U_{0,95}$ = (0,1 – 20) µm	
26	Indicator thickness gauges and pipe wall thickness gauges	(0 – 200) mm	$U_{0,95}$ = (1 – 70) µm	
27	Geometric relationship measuring instruments	± 40 mm	$U_{0,95}$ = (0,005 – 1) mm in the range from 0 to +40 mm, $U_{0,95}$= (1 – 0,005) mm in the range from -40 to 0 mm	
28	Micrometers	(0 – 3000) mm	$U_{0,95}$ = (0,5 – 20) µm	
29	Beam-type measuring tools	(0 – 4000) mm	$U_{0,95}$ = (0,003 – 0,15) mm	
30	Micrometer and indicator depth-gauges	(0 – 300) mm	$U_{0,95}$ = (1 – 8) µm	
31	Staples	(0 – 2000) mm	$U_{0,95}$ = (0,3 – 12) µm	
32	Deflectometers	(0 – 300) mm	$U_{0,95}$ = (0,01 – 0,15) mm	
33	Horizontal and vertical length gages (altitude gauges)	(0 – 5000) mm	$U_{0,95}$ = (0,01 – 15) µm	
34	Three-dimensional coordinate measuring machines	X - 15000 mm Y - 5000 mm Z - 5000 mm	$U_{0,95}$ = (1,35 – 40) µm $U_{0,95}$ = (1,35 – 15) µm $U_{0,95}$ = (1,35 – 15) µm	
35	Probes	(0,02 – 2) mm	$U_{0,95}$ = 0,7 µm	
36	Radius gages	R (1 – 70) mm	$U_{0,95}$ = 10 µm	
37	Testing sieves	(0,02 – 125) mm	$U_{0,95}$ = 1 µm	
38	Ocular screw micrometers	15x (0 – 8) mm	 $U_{0,95}$ = 5 µm	
39	Screw thread gauges	(0,4 – 6,0) mm 28 – 4 threads per 1″	$U_{0,95}$ = 5 µm	
40	Checking squares	(60 – 1600) mm	$U_{0,95}$ = (1 – 36) µm	

1	2	3	4	5
41	Measuring cutters	(0,3 – 0,9) mm	$U_{0,95}$ = (0,3 – 3) µm	
42	Measuring magnifiers	10x (0 – 30) mm	$U_{0,95}$ = 1 µm	
43	Special and multipurpose gauges	(0 – 220) mm (0 – 160)°	$U_{0,95}$ = 10 µm $U_{0,95}$ = 1'	
44	Rail (track-measuring) slide gauges, gauges, setups, and instruments	(0 – 3000) mm (0 – 360)°	$U_{0,95}$= (0,0005 – 0,5) mm $U_{0,95}$ = 1'	
45	Gauges (traffic, water, etc.)	(0 – 8000) mm (0 – 360)°	$U_{0,95}$= (0,0005 – 0,5) mm $U_{0,95}$= 1'	
46	Linear-displacement transducers, extensometers	(0 – 7000) mm	$U_{0,95}$= (0,02 – 6) µm	
47	Two-coordinate measuring instruments, including projecting instruments	(0 – 1000) mm (0 – 360)º	$U_{0,95}$= (0,1 – 20) µm $U_{0,95}$ = 10"	
48	Horizontal comparators	(0 – 200) mm	$U_{0,95}$ = (0,1 – 0,5) µm	
49	Optical measuring microscopes	(1 – 5000) µm	$U^{o}_{0,95}$ = 3 %	
50	Multipurpose measuring microscopes	(0 – 300) mm	$U_{0,95}$ = (0,3 – 3) µm	
51	Reading microscopes	(0 – 12) mm	$U_{0,95}$ = 3 µm	
52	Screening registration systems	(2 – 10) mm	$U_{0,95}$ = 0,05 mm	
53	Straight Edges	(50 – 500) mm	$U_{0,95}$ = (0,2 – 1) µm	
54	Proof bars	(150 – 500) mm	$U_{0,95}$ = (0,1 – 0,5) µm	
55	Measuring and Control Plates	from 160×160 to 2500×1600 mm	$U_{0,95}$ = (0,7 – 2,7) µm	
56	Sine bars	(100 – 500) mm	$U_{0,95}$ = 2"	
57	Flat glass plates for interference measurements	Ø (30 – 200) mm	$U_{0,95}$= (0,07 – 0,10) µm	
58	Interferometers for measuring flatness deviation parameters	Ø (0 – 200) mm	$U^{o}_{0,95}$ = (1 – 2) %	
59	Systems and complexes for nuclear and gas industry	(0,0001 – 100) m (0 – 360)º	$U_{0,95}$ = (0,03 – 100) mm $U_{0,95}$ = 20"	
60	Coordinate measuring systems (including trackers and scanners)	(0 – 3500) m (0 – 360)º	$U_{0,95}$ = (0,0005 – 1,5) mm $U_{0,95}$ = 0,2"	
61	Optical and Digital levels	(0,1 – 5000) m	$U_{0,95}$ = 0,1 mm	
62	Laser levels, including Line & Point Lasers	(0 – 700) m	$U_{0,95}$ = 0,05 mm	
63	Telescopic Measuring Rods	(0 – 8000) mm	$U_{0,95}$ = (0,05 – 0,5) mm	
64	Gauging rods	(0 – 8000) mm	$U_{0,95}$ = (0,1 – 1,5) mm	
65	Measuring range poles	(0 – 12) m	$U_{0,95}$ = (1 – 3) mm	
66	Curvimeters and track-measuring instruments	(0,01 – 9999,99) m	$U_{0,95}$ = (0,005 + 0,002L) m, where L is a value numerically equal to length in meters	
67	Material length indicators	(0,1 – 99999,9) m	$U_{0,95}$ = (0,05 + 0,004L) m, where L is a value numerically equal to length in meters	

1	2	3	4	5
68	Tacheometers	(0 – 10000) m (0 – 360)º	$U_{0,95}$ = (0,2 + 1·10^{-6}L) mm, $U_{0,95}$= (0,2 – 5)", where L is a value numerically equal to length in millimeters	
69	Laser measurement systems	(0 – 100) m (0 – 360)º	$U_{0,95}$ = (0,05 – 5) µm $U_{0,95}$ = 0,05"	
70	Distance meters	(0 – 3500) m (0 – 360)°	$U_{0,95}$ = (0,001 – 1,5) mm $U_{0,95}$ = 0,01º	
71	Geodesic basis	(24 – 3500) m	$U_{0,95}$ = 0,5·10^{-6}L mm, where L is length, mm	
72	Interferometric examinators	(0 – 6)'	$U_{0,95}$ = 0,01"	
73	Angle-measuring devices	(0 – 360)º	$U_{0,95}$ = 0,015"	
74	Polygons, autocollimators	(0 – 360)º	$U_{0,95}$ = 0,05"	
75	Polygons	(0 – 360)º	$U_{0,95}$ = 0,05"	
76	Angle blocks	(0 – 360)º	$U_{0,95}$ = 0,05"	
77	Autocollimators	(0 - 600)'	$U_{0,95}$ = (0,01 - 0,02)"	
78	Angle-measuring instruments	(0 – 360)º	$U_{0,95}$ = 0,06"	
79	Rotary encoders	(0 – 360)º	$U_{0,95}$ = 0,1"	
80	Angle-measuring systems	(0 – 360)º	$U_{0,95}$ = 0,2"	
81	Deflecting setups and devices	(0 – 360)º	$U_{0,95}$ = 0,06"	
82	Angle dividing measuring instruments	(0 – 360)º	$U_{0,95}$ = 0,1"	
83	Optical dividing heads	(0 – 360)º	$U_{0,95}$ = 0,5"	
84	Theodolites	(0 – 360)º	$U_{0,95}$ = 0,05"	
85	Goniometers, goniometers - spectrometers	(0 – 360)º	$U_{0,95}$ = 0,05"	
86	Examinators	(0 – 360)'	$U_{0,95}$ = 0,08"	
87	Optical quadrants	(0 – 360)º	$U_{0,95}$ = 2,5"	
88	Levels: - with a micrometer feed of the ampoule; - frame and block levels.	± 30" ± 30 mm/m 250 mm	$U_{0,95}$ = 0,2" $U_{0,95}$ = (0,01 – 0,3) mm/m $U_{0,95}$ = 0,002 mm/m	
89	Electronic levels	± 90º	$U_{0,95}$ = (0,05 – 30)" in the range from 0º to 90º, $U_{0,95}$ = (30 – 0,05)" in the range from -90º to 0 º	
90	Protractors	(0 – 360)º	$U_{0,95}$ = 1'	
91	Total steering-wheel play meters	(0 – 55)°	$U_{0,95}$ = 0,2°	
92	Car Wheel Aligners	± 60°	$U_{0,95}$ = 0,5'	
93	Internal diameter (ring) gauges	(0,5 – 500) mm	$U_{0,95}$ = (0,05 – 0,3) µm	
94	Cylindrical measures of external dimensions – plain gauges	(0,5 – 500) mm	$U_{0,95}$ = (0,05– 0,3) µm	
95	Wires and rollers	Ø (0,1 – 60) mm	$U_{0,95}$ = (0,1 – 1) µm	
96	Bore gauges	(0,3 – 4000) mm	$U_{0,95}$ = (0,6 – 20) µm	
97	Grindometers	(0 – 1000) µm	$U_{0,95}$ = (0,1 – 5) µm	
98	Screw thread gauge: - metric, - pipe cylindrical, - pipe taper, - tool-joint	 (1 – 350) mm (1/8 – 20)" (1/8 – 20)" 3 65 – 3 203	 $U_{0,95}$ = (1 – 3) µm $U_{0,95}$ = (1 – 5) µm $U_{0,95}$ = (1 – 5) µm $U_{0,95}$ = (1 – 3) µm	

1	2	3	4	5
99	Instruments measuring inner diameters	(1 – 300) mm	$U_{0,95}$ = (0,1 – 0,5) µm	
100	Systems measuring plain and screw thread gauges and items of complicated configuration	(0 – 200) mm	$U_{0,95}$ = (0,1 – 15) µm	
101	Instruments measuring thread parameters	(0 – 350) mm	$U_{0,95}$ = (0,5 – 30) µm	
102	Coated thickness standards	(0 – 20) mm	$U_{0,95}$ = (0,1 – 50) µm	
103	Thickness gauge calibration blocks	(0,01 – 500) mm	$U_{0,95}$ = (0,05 – 1) µm	
104	Ultrasonic, eddy-current, magnetic thickness gauges	(0 – 500) mm (4500 – 6400) m/s	$U_{0,95}$ = (0,0003 – 5) mm $U^o_{0,95}$ = 0,1 %	
105	Roughness standards	R_a (0,01 – 150) µm R_z R_{max} (0,01 – 250) µm	$U^o_{0,95}$ = (6 – 1) %	
106	Roughness comparison specimens	R_a (0,01 – 150) µm R_z R_{max} (0,01 – 320) µm	$U^o_{0,95}$ = (20 – 3) %	
107	Roughness measuring instruments	R_a (0,001 – 400) µm R_z R_{max} (0,001 – 3000) µm	$U^o_{0,95}$ = (10 – 1) %	
108	Instruments measuring roughness of paper and cardboard	(0,6 – 3) µm	$U_{0,95}$ = 0,2 µm	
109	Image quality indicators	(0,1 – 5) mm	$U_{0,95}$ = (5 – 100) µm	
110	Flaw detection measures (materials)	от 0,1 mm R_a (0,01 – 150) µm R_z R_{max} (0,01 – 320) µm (0 – 360)°	$U_{0,95}$ = 1 µm $U^o_{0,95}$ = (6 – 1) % $U_{0,95}$ = 2"	
111	Materials for non-destructive testing	(0,0007 – 100) mm R_a (0,01 – 150) µm R_z R_{max} (0,01 – 320) µm	$U^o_{0,95}$ = (0,3 – 5) % $U^o_{0,95}$ = (6 – 1) %	
112	Short length materials (test-objects, photomasks, materials for calibration of microscopes, etc.)	(0,7 – 1000) µm	$U^o_{0,95}$ = (5 – 0,5) %	
113	Ultrasonic, eddy-current, magnetic flaw detectors	Minimum flaw size: 0,1 mm Flaw depth: (10 – 100) % of the wall thickness	$U^o_{0,95}$ = 1 % $U^o_{0,95}$ = (0,05 – 7) %	
114	Radiographic and X-ray television complexes	(0,01 – 1000) mm	$U_{0,95}$ = (0,1 – 0,7) µm	
115	Inclination angle sensors	(0 – 360) °	$U_{0,95}$ = 0,01°	
116	Systems, complexes, setups, instruments and units for angle measurements	(0 – 360)°	$U_{0,95}$ = (0,01 – 0,04)"	
117	Systems, complexes, setups, instruments and units for length measurements	(0 – 100) m	$U_{0,95}$ = ($0,2\cdot10^{-9}$ – $5\cdot10^{-6}$) m	
MECHANICAL QUANTITIES MEASUREMENTS				
118	Secondary copy standard of the unit of mass	1 kg	$U_{0,95}$ =$2,4\cdot10^{-2}$ mg	
119	Secondary (working) measuring standards of the unit of mass	($1\cdot10^{-6}$ – 20) kg	$U_{0,95}$ = (0,6 mkg - 3,0 mg)	
120	Measures of mass (weights, loads, working measuring standards in accordance with	($1\cdot10^{-6}$ – 20) kg	$U_{0,95}$ = (0,6 mg - 3,0 mg)	

1	2	3	4	5
	State verification schedule for mass measuring instruments)			
121	Measures of mass (weights, loads, working measuring standards in accordance with State verification schedule for mass measuring instruments)	200 kg; 500 kg; 1 t	$U_{0,95}$ = (0,3 g - 1,6 g)	
122	Non-automatic scales and other scales	$(1\cdot10^{-6} – 60)$ kg $(2\cdot10^{-5} – 2000)$ kg 0,002 kg – 200 t 0,2 kg – 200 t	$U_{0,95} = (1\cdot10^{-9}$-$4,6\cdot10^{-6})$ kg $U_{0,95} = (1,3\cdot10^{-8}$-$1,6\cdot10^{-3})$ kg $U^{o}_{0,95}$ = 0,03 % $U^{o}_{0,95}$ = 0,03 %	Calibration over 2000 kg is carried out only for crane balance
123	Mass comparators	$(1\cdot10^{-6} – 5000)$ kg	$U_{0,95} = (2,5\cdot10^{-4}$- $50\cdot10^{3})$ mg	
124	1 liter grain-grading balances of 1st and 2nd order in accordance with GOST 16464	(720 – 820) g	$U_{0,95}$ = 0,8 g	
125	Thermogravimetric moisture indicators	(0 – 100) %	$U_{0,95}$ = (0,012-1,16) mg	
126	Reference dynamometers	$(10 – 10^{6})$ N $(10^{6} – 2\cdot10^{6})$ N $(2\cdot10^{6}– 5\cdot10^{6})$N	$U^{o}_{0,95}$ = 0,01 % $U^{o}_{0,95}$ = 0,05 % $U^{o}_{0,95}$ = 0,05 %	
127	Working dynamometers	$(10 – 10^{6})$ N $(10^{6} – 2\cdot10^{6})$ N $(2\cdot10^{6} – 5\cdot10^{6}$ N	$U^{o}_{0,95}$ = 0,01 % $U^{o}_{0,95}$ = 0,05 % $U^{o}_{0,95}$ = 0,05 %	
128	Force measuring load cells	$(10 – 10^{6})$ N $(10^{6} – 2\cdot10^{6})$ N $(2\cdot10^{6} – 5\cdot10^{6})$ N	$U^{o}_{0,95}$ = 0,01 % $U^{o}_{0,95}$ = 0,05 % $U^{o}_{0,95}$ = 0,05 %	
129	Weight measuring load cells	$(1 – 5\cdot10^{5})$ kg	$U^{o}_{0,95}$ = 0,01 %	
130	Force standards machines	$(10 – 9\cdot10^{6})$ N	$U^{o}_{0,95}$ =(0,01 – 0,05) %	
131	Testing machines	$(10 – 10^{6})$ N $(10^{6} – 5\cdot10^{6})$ N (0 – 3) m (0,001 – 2500) mm/m	$U^{o}_{0,95}$ = 0,03 % $U_{0,95}$ = (1 – 5) µm $U^{o}_{0,95}$ = (0,2–0,05) %	
132	Hardness testing instruments microhardness testers: - Brinell hardness testing machine - Vickers hardness testing machine - Rockwell hardness testing machine - Shore hardness testing machine	(8 – 450) HB (8 – 2000) HV (20 – 67) HRC (20 – 100) HSD	$U^{o}_{0,95}$ = 2 % $U^{o}_{0,95}$ = 1 % $U_{0,95}$ = 0,5 HRC $U_{0,95}$ = 1,5 HSD	
133	Pendulum hardness testing instruments	(0,1 – 2,50) c.u.	$U_{0,95}$ = (0,005 – 0,10) c.u.	
134	Instruments measuring strength of concrete	(10 – 100) % of scale	$U^{o}_{0,95}$ = 1 %	

1	2	3	4	5
135	Impact strength meters	(0 – 1000) mm	$U_{0,95}$ = 0,1 mm	
MEASUREMENTS OF FLOW PARAMETERS, FLOW RATE, LEVEL, AND VOLUME				
136	Sampling devices, dust sampling devices, gas flow meters and regulators	(0,002 – 50) dm^3/min (50 – 250) dm^3/min (250 – 400) dm^3/min (0,1 – 60000) dm^3	$U^o_{0,95}$ = 0,1 % $U^o_{0,95}$ = 0,1 % $U^o_{0,95}$ = 0,1 % $U^o_{0,95}$ = 0,1 %	
137	Dosing devices, pipettes, syringes, microliter syringes, glass capacity measures, plastic capacity measures	from 10^{-4} ml to 10 l	$U^o_{0,95}$ = (6 - 0,01) %	
PRESSURE AND VACUUM MEASUREMENTS				
138	Copy standard of the unit of pressure	(0,02 – 100) MPa	$U_{0,95}$ = $2,16 \cdot 10^{-5}$ MPa	
139	Secondary (working) measuring standards; deadweight gauges; pressure calibrators	(minus 0,1 – 11) MPa	$U_{0,95}$ = ($1,77 \cdot 10^{-5}$ – $1,88 \cdot 10^{-5}$)	
140	Secondary (working) measuring standards; deadweight gauges; pressure calibrators	(minus 0,1 – 100) MPa	$U_{0,95}$ = $2,16 \cdot 10^{-5}$	
141	Secondary (working) measuring standards; piston gauges; pressure calibrators	(minus 0,1 – 100) MPa	$U_{0,95}$ = $5 \cdot 10^{-5}$ MPa	
142	Piston gauges, vacuum gauges, combined pressure gages	(minus 0,1 – 250) MPa	$U_{0,95}$ = ($7 \cdot 10^{-5}$ - 12,5) MPa	
143	Pressure calibrators; digital manometers; measurement transducers	(minus 0,1 – 250) MPa	$U_{0,95}$ = ($7 \cdot 10^{-5}$ - 12,5) MPa	
144	Indicating pressure gauges, vacuum gauges, combined pressure gages; differential pressure gauges	(minus 0,1 – 250) MPa	$U_{0,95}$ = (0,75 – 20) MPa	
145	Units for testing, verification and calibration of instruments for pressure measurements	(minus 0,1 – 250) MPa	$U_{0,95}$ = ($1 \cdot 10^{-4}$ – 12,5) MPa	
146	Vapor pressure analyzers	(8 – 115) kPa	$U_{0,95}$ = (1 – 3) kPa	
147	Vapor pressure reference materials	(8 – 115) kPa	$U_{0,95}$ = (0,5 – 2) kPa	
148	Secondary (working) measuring standards of the unit of pressure in the field of differential pressure	(10^2 – $4 \cdot 10^3$) Pa	$U_{0,95}$ = (0,1 – 1,1) Pa	
149	Micromanometers, measurement transducers, pressure generators	(1 – $4 \cdot 10^4$) Pa	$U_{0,95}$ = (0,2 – 2,2) Pa	
150	Indicating micromanometers, head gauges, draft gauges, draft and head gauges; differential	(1 – $4 \cdot 10^4$) Pa	$U_{0,95}$ = (0,4 – 5) Pa	

1	2	3	4	5
	pressure gauges; measurement transducers; pressure generators			
151	Secondary (working) measuring standards of the unit of pressure in the field of low absolute pressure	$(10^{-3} – 10^{3})$ Pa	$U_{0,95} = 1,6·10^{-2}$ Pa	
152	Reference vacuum gages, reference vacuum meters, reference measurement transducers	$(10^{-7} – 10^{3})$ Pa $(6,6·10^{-8} – 10^{3})$ Pa	$U^{o}_{0,95} = (4,1·10^{-2} – 1,2·10^{-2})$ $U^{o}_{0,95} = (17,3·10^{-2} – 2,9·10^{-2})$	
153	Vacuum gages, vacuum meters, measurement transducers	$(6,6·10^{-8} – 10^{3})$ Pa	$U^{o}_{0,95} = (57,8·10^{-2} – 2,9·10^{-2})$	
154	Flow measures (helium leaks), flowmeters, leak detectors	$(10^{-13} – 1)$ м^{3} Pa/s	$U^{o}_{0,95} = (35·10^{-2} – 1,73·10^{-2})$	
155	Secondary measuring standards of the unit of pressure in the field of absolute pressure	$(1 – 1·10^{3})$ Pa $(1·10^{3} – 1,3·10^{5})$ Pa (7 – 1000) kPa	$U_{0,95} = 4,6·10^{-3}$ Pa + $1,8·10^{-4}$ *p* $U_{0,95} = 7,0·10^{-2}$ Pa + $1,8·10^{-5}$*p* $U_{0,95}$ = (2,6-20) Pa	*p* — pressure measured in pascals, this is an interpolating formula
156	Instruments measuring absolute pressure: Secondary measuring standards of the unit of pressure in the field of absolute pressure	$(1 – 1·10^{3})$ Pa	$U^{o}_{0,95} = 7,2·10^{-3}$ Pa + $1,0·10^{-4}$·*p*, where *p* is the pressure being measured	
		$(1·10^{3} – 1,3·10^{5})$ Pa	$U^{o}_{0,95} = 8,0·10^{-1}$ Pa + $1,0·10^{-5}$·*p*, where *p* is the pressure being measured	
		$(1,3·10^{5} – 1·10^{6})$ Pa	$U_{0,95}$ = (5 – 36) Pa	
157	Working measuring standards of the unit of absolute pressure, measurement transducers of absolute pressure	$(1 – 1·10^{6})$ Pa	$U_{0,95}$ = (5-500) Pa	
158	Vacuum-backed piston gauges, digitals manometers, absolute pressure calibrators	(0 – 1) MPa	$U_{0,95}$ = (5-500) Pa	
159	Vibratory frequency barometers	(0,5 – 280) kPa	$U_{0,95}$ = (5-100) Pa	
MEASUREMENTS OF PHYSICAL-CHEMICAL COMPOSITION AND PROPERTIES OF SUBSTANCES				
160	On-line process control gas chromatograph for determination of the component composition and impurities in natural gas, associated gases, liquefied gases, unstable gas condensate, etc.	(0,001 – 99,97) %	$U^{o}_{0,95}$ = (0,6–0,001) %	
161	Dynamic humidity generators	Dew point temperature (minus 100 – 60) ºC	$U_{0,95}$ = 0,1 ºC	
		Moisture molar fraction (0 – 23000) mil^{-1}	$U_{0,95}$ = 0,01 mil^{-1} (in the range from 0 to 0,5 mil^{-1}) $U^{o}_{0,95}$=2 %	
162	Gas humidity measurement instruments, including humidity meters, wet-and-dry bulb hygrometers, humidity transducers, thermohygrometers	Dew point temperature (minus 100 – 60) ºC	$U_{0,95}$=0,1 ºC	
		Moisture molar fraction (0 – 23000) mil^{-1}	$U_{0,95}$ =0,01 mil^{-1} (in the range from 0 to 0,5 mil^{-1}) $U^{o}_{0,95}$=2 %	

1	2	3	4	5
163	Gas analyzers, analytical and gas mixing setups, gas mixture and vapor-gas mixture generators, pure gas and zero-grade air generators, permeation tubes for gases and vapors, vapor-phase gas mixture generators	Mole fraction (0 – 100) %	$U_{0,95}$= 0,15·10^{-8} % (in the range from 0 to 1,5·10^{-8} %) $U^{o}_{0,95}$ = (10 – 5·10^{-6}) % (in the range from 1,5·10^{-8} to 100 %)	
		Mass concentration (0 – 1·10^{6}) mg/m^{3}	$U_{0,95}$ = (5·10^{-6}) mg/m^{3} (in the range from 0 to 1,0·10^{-6} mg/m^{3}) $U^{o}_{0,95}$ = (5 – 1) % (in the range from 1,0·10^{-6} to 1,0·10^{6} mg/m^{3})	
		Permeation rate (1,0·10^{-5} – 50) µg/min	$U^{o}_{0,95}$ = (5 – 1,5) %	
		(0 – 50) % LEL	$U_{0,95}$ = 0,025 % LEL (in the range from 0 to 1 % LEL) $U^{o}_{0,95}$ = (2,5 – 0,6) % (in the range from 1 to 50 % LEL)	
164	Ethanol vapor generators	(20 – 2000) mg/m^{3}	$U^{o}_{0,95}$= 0,5 %	
165	Analyzers of the ethanol content	(0 – 0,50) mg/l (0,50 – 2,00) mg/l	$U_{0,95}$= 0,0025 mg/l $U^{o}_{0,95}$= 0,5 %	
166	Gas measuring instruments (inert gases, permanent gases, chemically active gases, hydrocarbons incl. oil vapors, freons etc), incl.: gas analyzers, gas alarm devices, gas detectors, measuring systems and measuring channels, gas analysis setups and air pollution control stations, detector tubes, gas analyzers for medical purposes	Volume fraction (0 – 100) %	$U_{0,95}$ = 0,15·10^{-8} % (in the range from 0 to 1,5·10^{-8} %) $U^{o}_{0,95}$ = (10 – 5·10^{-6}) % (in the range from 1,5·10^{-8} to 100 %)	
		Mass concentration (0 – 1·10^{6}) mg/m^{3}	$U_{0,95}$ = (5·10^{-6}) mg/m^{3} (in the range from 0 to 1,0·10^{-6} %) $U^{o}_{0,95}$ = (5 – 1) % (in the range from 1,0·10^{-6} to 1,0·10^{6} %)	
		(0 – 50) % LEL (50 – 100) % LEL	$U_{0,95}$ = 0,025 % LEL (in the range from 0 to 1 % LEL) $U^{o}_{0,95}$ = (2,5 – 0,6) % (in the range from 1 to 50 % LEL) $U^{o}_{0,95}$ = 0,6 %	
		(0 – 10) LEL ·m	$U_{0,95}$ = 0,025 % LEL·m (in the range from 0 to 1 % LEL·m) $U^{o}_{0,95}$ = 1 % (in the range from 1 to 10 % LEL·m)	
		(0 – 300000) ppm·m	$U_{0,95}$ = 0,025 ppm·m (in the range from 0 to 0,5 ppm·m) $U^{o}_{0,95}$ = 0,3 % (in the range from 0,5 to 3000000 ppm·m)	
167	Aerosol particle counters (air particle counters)	Number concentration of particles with particle size registration channels from 10 nm: (0 – 1·10^{9}) particles/m^{3}	$U_{0,95}$= 5 particles/m^{3} (in the range from 0 to 100 particles/m^{3}) $U^{o}_{0,95}$ = 5 %	

1	2	3	4	5
		$(1·10^9 – 1·10^{14})$ particles/m^3	(in the range from more than 100 to $1·10^9$ particles/m^3) $U^o_{0,95}$ = 10 %	
168	Smoke meters (emission testers)	Light opacity coefficient: (0 – 100) %	$U_{0,95}$ = 0,3 %	
169	Aerosol photometers	Filter penetration coefficient: (0 – 100) %	$U^o_{0,95}$ = (3,8 – 3,2) %	
		Mass concentration: (0 – 1000) mg/m^3	$U_{0,95}$ = 0,076 mg/m^3 (in the range from 0 to 0,02 mg/m^3) $U^o_{0,95}$ = (3,8 – 3,2) % (in the range from more than 0,02 to 1000 mg/m^3)	
170	Aerosol analyzers (dust meters)	Mass concentration: (0 – 15000) mg/m^3 Light transmission coefficient: (0 – 100) %	$U_{0,95}$ = 0,076 mg/m^3 (in the range from 0 to 0,02 mg/m^3) $U^o_{0,95}$ = (10 – 3,2) % (in the range from more than 0,02 to 15000 mg/m^3) $U_{0,95}$ = (0,3 – 0,6) %	
171	Instruments measuring fractional distribution of mass concentration of aerosol particles, including PM10, PM2,5, PM1 (aerosol analyzers, dust meters, impactors, cyclone separators)	Mass concentration: (0 – 15000) mg/m^3 Aerodynamic diameter: (0,5 – 100) µm	$U_{0,95}$ = 0,076 mg/m^3 (in the range from 0 to 0,02 mg/m^3) $U^o_{0,95}$ = (10 – 3,2) % (in the range from more than 0,02 to 15000 mg/m^3) $U^o_{0,95}$ = 10 %	
172	Particle size analyzers for liquids and powders	(0,01 – 5000) µm	$U^o_{0,95}$ = (7 - 5) %	
173	Particle counters for liquids (liquid particle counters)	Number concentration of particles with particle size registration channels from 10 nm: $(0 – 1·10^{14})$ particles/cm^3	$U_{0,95}$ = 8 particles/cm^3 (in the range from 0 to 100 particles/cm^3) $U^o_{0,95}$ = 8 % (in the range from more than 100 to $1·10^{14}$ particles/cm^3)	
174	Light air ion counters	$(10 – 2·10^6)$ particles/cm^3	$U^o_{0,95}$ = 20 %	
175	Dust explosion safety control instruments (rock dusting control devices)	Mass fraction of inert dust: (0 – 100) %	$U_{0,95}$ = (0,1-3) %	
176	Analyzers of composition and physical-chemical properties of oil and oil products	(0 – 60) %	$U_{0,95}$ = $0,25·10^{-4}$ % (in the range from 0 to $1·10^{-4}$ %) $U^o_{0,95}$ = (25 – 1,5) % (in the range from $1·10^{-4}$ to 60 %)	
177	Analyzers of water in liquid, solid and dry substances and materials (moisture meters)	(0 – 100) %	$U_{0,95}$ = $0,5·10^{-4}$ % (in the range from 0 to $1·10^{-3}$ %) $U^o_{0,95}$ = (5 – 0,0025) % (in the range from $1·10^{-3}$ to 100 %)	
178	Analyzers of flashpoint, cloud point/freezing point/no-flow	(minus 70 – 300) ºC	$U_{0,95}$ = (6 – 0,5) ºC	

1	2	3	4	5
	point/maximum temperature of filterability			
179	Analyzers of dissolved gases in liquids (O_2, O_3, Cl_2, H_2, CO_2 and ets.)	(0 – 100) % (0 – 20000) µg/dm^3	$U_{0,95}$ = 0,15·10^{-8} % (in the range from 0 to 1,5·10^{-8} %) $U^o_{0,95}$ = (10 – 5·10^{-6}) % (in the range from 1,5·10^{-8} to 100 %)	
180	Analyzers of dissolved gases in dielectric oil	(0 – 10000) ppm	$U_{0,95}$ = 0,025 ppm (in the range from 0 to 0,5 mil^{-1}) $U^o_{0,95}$ = (5 – 0,5) % (in the range from 0,5 to 10000 mil^{-1})	
181	Turbidity analyzers (turbidimeters)	(0 – 4000) NTU	$U_{0,95}$ = 0,007 NTU (in the range from 0 to 1 NTU)	
			$U^o_{0,95}$ =2 % (in the range from more than 1 to 4000 NTU)	
182	Analyzers of water, soil, sediments, food, etc. for oil products	(0 – 1000) mg/l	$U_{0,95}$ =0,125 mg/l (in the range from 0 to 0,5 mg/l)	
			$U^o_{0,95}$ = (25 – 5) % (in the range from 0,5 to 1000 mg/l)	
183	Titrators	(0,0001 – 100) %	$U_{0,95}$ = (1,3 – 0,045) %	
		(1·10^{-4} – 500) mg	$U^o_{0,95}$ = (2,5–0,5) %	
		(0 – 14) pH	$U_{0,95}$ = (0,25 – 0,025) pH	
184	Photometric flame analyzers	Mass concentration (0 – 3000) mg/dm^3 Detection limit (0,01 – 10) mg/dm^3	$U_{0,95}$ = 0,002 mg/dm^3 (in the range from 0 to 0,01 mg/dm^3) $U^o_{0,95}$ = (20 – 2,5) % (in the range from 0,01 to 3000 mg/dm^3)	
185	Laboratory and industrial grade pH/pX measuring instruments and transducer, ion meters, redoxometers	(minus 20 – 20) pH/pX (minus 2000 – 2000) mV (minus 5 – 95) ˚C pH: (0 – 14) pX: (1 – 7)	$U^o_{0,95}$ = 0,02 % $U^o_{0,95}$ = 0,05 %	
186	Liquid analyzers: conductometric analyzers, salinity meters, total dissolved salts meters, conductometric signaling devices and concentration meters	(1·10^{-6} – 100) Sm/m (0,001 – 150) g/l	U_p= 0,1 % U_p= 0,5 %	
187	Conductometric setups	(1·10^{-4} – 100) Sm/m (minus 5 – 95) ˚C	$U^o_{0,95}$ = 0,1 %	
188	Electrical conductivity measuring channels as a part of hydrophysical probes (stationary, ship, cable, lost, drifting, and autonomous) for measuring electrical	(0,1 – 7) Sm/m (0,1 – 2) relative units (0,1 – 42) PSU	$U^o_{0,95}$ = 0,1 %	

1	2	3	4	5
	conductivity, optical-to-electric converters and seawater salinity			
189	Working measurement standards of kinematic viscosity	$(4 \cdot 10^{-7} – 1 \cdot 10^{-1})$ m^2/s	$U^o_{0,95} = 0{,}002$	
190	Glass viscometers, capillary viscometers, automatic viscometers	$(4 \cdot 10^{-7} – 1 \cdot 10^{-1})$ m^2/s	$U^o_{0,95} = 0{,}1$ %	
191	Rotating viscometers, rheometers	$(1 \cdot 10^{-3} – 1 \cdot 10^{6})$ Pa·s	$U^o_{0,95} = 0{,}2$ %	
192	Relative viscosity meters (VU and VZ), viscosity cups	(10 – 300) s	$U^o_{0,95} = 1{,}5$ %	
193	Falling sphere viscometers	$(0{,}5 – 1 \cdot 10^{7})$ mPa·s	$U^o_{0,95} = 0{,}2$ %	
194	In-line viscometers, viscometers for immersion method, vibrating viscosimeters, oscillating viscosimeters, bar viscometers, Stabinger viscometer	$(1 – 1 \cdot 10^{7})$ mPa·s	$U^o_{0,95} = 0{,}05$ %	
195	Falling-number analyzers	(1 – 1000) s	$U^o_{0,95} = 0{,}5$ %	
196	Secondary measuring standards of the unit of density: - hydrostatic weighing setups; - automatic laboratory density meters	(650 – 2000) kg/m^3	$U_{0,95} = 2 \cdot 10^{-3}$ kg/m^3	
197	Secondary measuring standards of the unit of in-flux density	(280 – 2000) kg/m^3	$U_{0,95} = 2 \cdot 10^{-2}$ kg/m^3	
198	Automatic density meters, in-flux density meters, immersion-type density meters, density measuring channels of in-lux mass meters and measuring systems	(0 – 3000) kg/m^3	$U_{0,95} = 4 \cdot 10^{-2}$ kg/m^3	
199	Automatic laboratory density meters	(0 – 3000) kg/m^3	$U_{0,95} = 1 \cdot 10^{-3}$ kg/m^3	
200	Glass pycnometers, pressure metal pycnometers, pycnometer setups	(0,1 – 23000,0) kg/m^3	$U_{0,95} = 1 \cdot 10^{-3}$ kg/m^3	
201	Gas density gages	(0,1 – 400,0) kg/m^3	$U_{0,95} = 0{,}09$ %	
202	Aerometers	(650 – 1850) kg/m^3	$U_{0,95} = 0{,}09$ kg/m^3	
203	Liquid and gas chromatographs	Volume fraction, mass fraction (0 – 100) % Mass concentration $(0 – 1 \cdot 10^{6})$ mg/m^3	$U_{0,95} = (8 \cdot 10^{-5} – 1{,}0)$ % $U_{0,95} = (5 \cdot 10^{-1} – 9 \cdot 10^{3})$ mg/m^3	
204	Chromatograph/mass spectrometer, mass-selective detectors	Volume fraction, mass fraction (0 – 100) % Mass concentration $(0 – 1 \cdot 10^{6})$ mg/m^3	$U_{0,95} = (8 \cdot 10^{-5} – 1{,}0)$ % $U_{0,95} = (5 \cdot 10^{-1} – 9 \cdot 10^{3})$ mg/m^3	
205	Emission spectrometers	Mass fraction of the element (0,0006 – 89) %	$U_{0,95} = (0{,}0001 – 0{,}9)$ %	
206	Pressure aerometers	(300 – 650) kg/m^3	$U_{0,95} = 0{,}4$ kg/m^3	
207	Reference measures of pressure of a solid	(200 – 22000) kg/m^3	$U_{0,95} = 1{,}8 \cdot 10^{-3}$ kg/m^3	
208	Ash content analyzers	(0 – 90) %	$U_{0,95} = 3$ %	

1	2	3	4	5
THERMOPHYSICAL AND TEMPERATURE MEASUREMENTS				
209	Standard platinum resistance thermometers (SPRT)	(minus 200 – 1100) °C	$U_{0,95} = (1{,}4\cdot10^{-4} – 4\cdot10^{-2})$ °C	
210	Equipment for implementation of reference points, temperature measures	(minus 189,3442 – 3000) °C	$U_{0,95} = (1{,}4\cdot10^{-4} – 2\cdot10^{-3})$ °C	
211	Platinum rhodium-platinum thermoelectric transducers, precious metal thermoelectric transducers	(231,928 – 1084,62) °C (300 – 1200) °C	$U_{0,95} = (2\cdot10^{-3} – 2\cdot10^{-2})$ °C $U_{0,95}$ = 0,7 °C	
212	Rhodium-platinum thermoelectric transducers, precious metal thermoelectric transducers	(660,323 – 1768,4) °C (600 – 1800) °C	$U_{0,95} = (2\cdot10^{-3}–2\cdot10^{-1})$ °C $U_{0,95}$ = (0,7 – 1,5) °C	
213	Base metal thermocouples	(minus 200 – 2500) °C	$U_{0,95}$ = (0,8 – 3,5) °C	
214	Resistance temperature transducers (thermometers), thermometer sets	temperature range of (minus 200 – 850) °C differential temperature range of (0 – 180) °C	$U_{0,95}$ = (0,004 - 0,1) °C	
215	Temperature calibrators and dry-block thermostats	(minus 200 – 1800) °C (0,01 – 4000) Ω (minus 0,1 – 12) V (0 – 50) мA	$U_{0,95}$ = (0,01 – 20) °C	
216	Temperature calibrators and liquid thermostats	(minus 100 – 1100) °C (0,01 – 4000) Ω (minus 0,1 – 12) V (0 – 50) mA	$U_{0,95}$ = (0,01 – 20) °C	
217	Bimetal thermometers	(minus 200 – 300) °C	$U_{0,95}$ = 1,0 °C	
218	Manometric thermometers	(minus 100 – 300) °C	$U_{0,95}$ = 1,0 °C	
219	Solid-state thermometers, quartz thermometers	(minus 80 – 300) °C	$U_{0,95}$ = (0,007 – 0,01) °C	
220	Digital thermometers, thermometers with harmonized digital signal	(minus 200 – 2500) °C (0 – 24) мA (0 – 12) B	$U_{0,95}$ = (0,009 – 0,6) °C	
221	Liquid-in-glass thermometers	(minus 80 – 300) °C	$U_{0,95}$ = (0,03 – 0,4) °C	
222	Secondary temperature transducers, measuring control devices	(minus 200 – 2500) °C	$U_{0,95}$ = (0,01 – 30) °C	
223	Reference tungsten strip lamps (spectral radiance)	(800 – 2100) ˚C	$U_{0,95}$ = (0,2 – 2,0) °C	
224	Reference tungsten strip lamps (color)	(900 – 3000) ˚C	$U_{0,95}$ = (0,4 – 4,0) °C	
225	Narrow band radiation thermometers, reference narrow band radiation thermometers	(250 – 15000) °C	$U_{0,95}$ = (2,0 – 6,5) °C	
226	Spectral-ratio radiation thermometers	(250 – 3500) °C	$U_{0,95}$ = (2,0 – 6,5) °C	
227	Reference blackbody sources, infrared calibrators	(220 – 273) K (0 – 3000) °C	$U_{0,95}$ = (0,3 – 0,6) K $U_{0,95}$ = (0,6 – 6,0) °C	

1	2	3	4	5
228	Reference total radiation radiation thermometers and narrow band radiation thermometers	(220 – 273) K (0 – 3000) °C	$U_{0,95}$ = (0,3 – 0,6) K $U_{0,95}$ = (0,6 – 6,0) °C	
229	Total radiation thermometers and narrow band radiation thermometers, radiation thermometers, infrared thermometers	(220 – 273) K (0 – 400) °C (400 – 3000) °C	$U_{0,95}$ = (0,8 – 2,0) K $U_{0,95}$ = (0,8 – 6,5) °C	
230	Thermographic instruments, reference thermographic instruments, infrared sensitive cameras	(220 – 273) K (0 – 3000) °C	$U_{0,95}$ = (0,8 – 2,0) K $U_{0,95}$ = (0,8 – 6,5) °C	
231	Blackbody sources for radiance, total	(40 – 61·10^{3}) W/(sr·m^{2}) (1·10^{-4} – 15) W/sr	$U_{0,95}$ = 1,5·10^{-2} $U_{0,95}$ = 2,4·10^{-2}	
		(40 – 61·10^{3}) W/(sr·m^{2}) (1·10^{-4} – 15) W/sr	$U_{0,95}$ = 3·10^{-2} $U_{0,95}$ = 5·10^{-2}	
		(40 – 61·10^{3}) W/(sr·m^{2}) (1·10^{-4} – 15) W/sr	$U_{0,95}$ = 3·10^{-2} $U_{0,95}$ =5·10^{-2}	
232	Radiometers, infrared detectors	(40 – 61·10^{3}) W/(sr·m^{2}) (1·10^{-4} – 15) W/sr	$U^{o}_{0,95}$ = 3 %	
		(40 – 61·10^{3}) W/(sr·m^{2}) (1·10^{-4} – 15) W/sr	$U^{o}_{0,95}$ = 5 %	
233	Instruments measuring thermal conductivity of solids	(0,02 – 500) W/(m·K) (90 – 1100) K	$U^{o}_{0,95}$ = 1 %	
234	Instruments measuring density of heat flow rate	(2 – 100) W/m^{2} (250 - 350) K	$U^{o}_{0,95}$ = 1 %	
235	Instruments measuring thermal (heat) resistance	(0,2 – 6) m^{2}·K/W (250 – 350) K	$U^{o}_{0,95}$ = 1 %	
236	Instruments measuring heat-transfer resistance	(0,4 – 6,5) m^{2}·K/W (250 – 350) K	$U^{o}_{0,95}$ = 1 %	
237	Working measuring standards – thermal conductivity measures	(0,02 – 500) W/(m·K)	$U^{o}_{0,95}$ = 1%	
238	Instruments for specific heat capacity measurement of solids, reference measures of specific heat capacity	(465 – 1654) J/(kg·K) (273,15 – 700) K	$U^{o}_{0,95}$ = 0,1 %	
239	Instruments measuring temperature conductivity	(1·10^{-7} – 40·10^{-7}) m^{2}/c (273,15 – 700) K	$U^{o}_{0,95}$ = 1 %	
240	Measures of volumetric calorific value based on hydrocarbon gases or natural gas	(3 – 90) MJ/m^{3}	$U^{o}_{0,95}$ = 0,1 %	
241	Measures of specific calorific value, measures of heat of dissolution and reaction based on solid and liquid materials	(12638 – 45890) kJ/kg (5 – 1200) J	$U^{o}_{0,95}$ = 0,013 % $U^{o}_{0,95}$ = 0,07 %	
242	Bomb calorimeters	(2 – 40) KJ	$U_{0,95}$ = 0,05 %	
243	Gas calorimeters for natural gas, high and low calorific gases	(3 – 90) MJ/m^{3}	$U^{o}_{0,95}$ = 0,2 %	
244	Instruments measuring heat of dissolution, reaction, phase changes	(5 – 1200) J	$U^{o}_{0,95}$ = 0,07 %	
245	Secondary standards of linear thermal expansion coefficient of	± (0,01·10^{-6} – 100·10^{-6}) K^{-1} (90 – 3000) K	$U_{0,95}$ = (0,12·10^{-8} –76·10^{-8}) K^{-1}	

1	2	3	4	5
	solids, dilatometers and measures			
246	Working standards of linear thermal expansion coefficient of solids	± $(0,05 \cdot 10^{-6} – 100 \cdot 10^{-6})$ К$^{-1}$ (90 – 3000) К	U = $(1 \cdot 10^{-7} – 7,6 \cdot 10^{-8})$ К$^{-1}$	
247	Measures of linear thermal expansion coefficient (LTEC)	± $(0,01 \cdot 10^{-6} – 100 \cdot 10^{-6})$ К$^{-1}$ (90 – 3000) К	$U_{0,95} = (0,12 \cdot 10^{-8} – 76 \cdot 10^{-8})$ К$^{-1}$	
248	Interference, comparator, optical dilatometers and push-rod dilatometers	± $(0,05 \cdot 10^{-6} – 100 \cdot 10^{-6})$ К$^{-1}$ (90 – 3000) К	$U_{0,95} = (0,1 \cdot 10^{-7} – 8 \cdot 10^{-7})$ К$^{-1}$	
249	Instruments for complex thermomechanical analysis of materials	temperature (90 – 3000) К	$U_{0,95}$ = (0,2 – 9) К	
		relative elongation ±0,3	$U_{0,95} = 0,3 \cdot 10^{-3}$	
		linear expansion $(0,02 \cdot 10^{-3} – 0,8)$ mm	$U_{0,95} = 4 \cdot 10^{-6}$ мм	
		linear thermal expansion coefficient ± $(0,05 \cdot 10^{-6} – 30 \cdot 10^{-6})$ К$^{-1}$	$U_{0,95} = (0,2 \cdot 10^{-7} - 10 \cdot 10^{-7})$ К$^{-1}$	
		elastic modulus $(10^{-3} – 10^{16})$ Pa	$U_{0,95} = (5 \cdot 10^{-5} - 5 \cdot 10^{4})$ Pa	
		mechanical loss tangent (0,00005 – 100)	$U^{o}_{0,95}$ = 3 %	
		force $(10^{-4} – 5 \cdot 10^{6})$ N	$U^{o}_{0,95}$ = (5 – 1) %	
		mass $(1 \cdot 10^{-3} – 1 \cdot 10^{3})$ g	$U^{o}_{0,95}$ = (5 - 1) %	
		frequencies mechanical vibrations (1 – 200) Hz	$U^{o}_{0,95}$ = (3 - 5) %	
250	Combined thermal analysis instruments, thermal analyzers, synchronous thermogravimeters, thermogravimetric and differential thermal analysis devices	temperature (273 – 700) К	$U^{o}_{0,95}$ = (2 – 3) %	
		quantity of heat (0 – 1200) J	$U^{o}_{0,95}$ = (2 – 5) %	
		Specific heat of phase and structural transformations (10 – 1000) kJ/kg	$U^{o}_{0,95}$ = (2 - 5) %	
		Specific heat capacity (250 – 1654) kJ/(kg·K)	$U^{o}_{0,95}$ = (3 - 7) %	
		Mass (10 мг – 5 г)	$U^{o}_{0,95}$ = (3 – 5) %	
251	Differential scanning calorimeters	Temperature (273 – 700) К	$U^{o}_{0,95}$ = (1 – 5) %	
		Quantity of heat (0 – 1200) J	$U^{o}_{0,95}$ = (2 – 5) %	
		Specific heat of phase and structural transformations (10 – 1000) kJ/kg	$U^{o}_{0,95}$ = (2 – 4) %	
		Specific heat capacity (250 – 1654) kJ/(kg·K)	$U^{o}_{0,95}$ = (2,5 – 7) %	
	TIME AND FREQUENCY MEASUREMENTS			
252	Electronic-computer frequency meters, frequency synthesizers, frequency comparators	$(1 \cdot 10^{-2} – 50 \cdot 10^{6})$ Hz	$U_{0,95}$ = (0,003 – 0,6) Hz	
253	Period meters, impulse meters	$(1 \cdot 10^{-6} – 3 \cdot 10^{2})$ s	$U_{0,95} = (1 \cdot 10^{-7} – 1 \cdot 10^{-4})$ relative units	

1	2	3	4	5
MEASUREMENTS OF ELECTRIC AND MAGNETIC VALUES				
254	Working (secondary) measuring standards of volt	(1 – 10) V	$U_{0,95} = 3 \cdot 10^{-8}$ B	
255	Measures of EMF and DC voltage	(1 – 10) V	$U_{0,95} = (0{,}013\text{-}2) \cdot 10^{-7}$ B	
256	Voltmeters and DC voltage calibrators	$(10^{-9} – 10^{3})$ V	$U_{0,95} = 2 \cdot 10^{-6}$	
257	DC potentiometers	(0,1 – 10) V	$U^{o}_{0,95} = 0{,}0001$ %	
258	Instruments for verification of voltmeters, voltage calibrators	$(1 \cdot 10^{-5} – 1000)$ V	$U^{o}_{0,95} = 2 \cdot 10^{-4}$ %	
259	Secondary measurement standards REN-2 and REN-2M	20 Hz – 30 MHz $(1 \cdot 10^{-3} – 300)$ V	$U^{o}_{0,95} = (2 \cdot 10^{-5} - 5 \cdot 10^{-4})$	
260	Thermoelectrical voltage transducers	(0,1 – 1000) V 10 Hz – 30 MHz	$U^{o}_{0,95} = 0{,}0013$	
261	Thermoelectrical voltage transducers	$(2 \cdot 10^{-3} – 1 \cdot 10^{3})$ V 10 Hz – 1 MHz	$U_{0,95} = (3 \cdot 10^{-6} – 1{,}5 \cdot 10^{-4})$	
262	AC voltage calibrators	2 mV – 1000 V 10 Hz – 1 MHz	$U_{0,95} = (2 \cdot 10^{-4} – 2 \cdot 10^{-3})$	
263	AC voltmeter	2 mV – 1000 V 10 Hz – 1 MHz	$U_{0,95} = (3 \cdot 10^{-5} – 1 \cdot 10^{-3})$	
264	Secondary measuring standards of AC voltage	(0,1 – 10) V (30 – 2000) MHz	$U^{o}_{0,95} = (0{,}05 – 1)$ %	
265	Compensated diode voltmeters	(0,1 – 10) V 30 MHz – 1500 MHz	$U^{o}_{0,95} = (0{,}02 – 0{,}07)$ %	
266	Electronic voltmeters V7-83, VK3-78, VK3-78A	(0,1 – 10) V 30 MHz – 2000 MHz	$U^{o}_{0,95} = (0{,}05 – 1)$ %	
267	Wideband AC voltage calibrators N5-6/1	(30 – 1500) MHz (0,1 – 3) V	$U^{o}_{0,95} = (0{,}07 – 1)$ %	
268	Setups measuring DC, calibrators and current meters	$(1 \cdot 10^{-7} – 30)$ A	$U^{o}_{0,95} = (0{,}001 – 0{,}03)$ %	
269	DC measures and calibrators	$(1 \cdot 10^{-16} – 1 \cdot 10^{-5})$ A	$U^{o}_{0,95} = (2 – 0{,}02)$ %	
270	Setups for realization and measurement of low direct currents	$(1 \cdot 10^{-15} – 1 \cdot 10^{-5})$ A	$U_{0,95} = (2 – 0{,}02)$ %, realization $U_{0,95} = (5 – 0{,}003)$ %, measurement	
271	Electrometric amplifiers, amperemeters	$(1 \cdot 10^{-8} – 1 \cdot 10^{-5})$ A	$U^{o}_{0,95} = (0{,}03 – 0{,}003)$ %	
272	Electrometric amplifiers and amperemeters	$(1 \cdot 10^{-13} – 1 \cdot 10^{-9})$ A	$U^{o}_{0,95} = (0{,}5 – 0{,}03)$ %	
273	Electrometric amplifiers, amperemeters, voltmeters-electrometers	$(1 \cdot 10^{-16} – 1 \cdot 10^{-5})$ A	$U^{o}_{0,95} = (5 – 0{,}003)$ %	
274	Electrostatic charge meters, universal and electrometric voltmeters, electrometers	$(5 \cdot 10^{-12} – 2 \cdot 10^{-5})$ C	$U^{o}_{0,95} = 0{,}02$ %	
275	Electric charge surface density meters	$(0{,}2 \cdot 10^{-5} – 1 \cdot 10^{-5})$ C/m^{2}	$U^{o}_{0,95} = 0{,}05$ %	
276	Electrostatic intensity meters	$1 \cdot 10^{6}$ V/m	$U^{o}_{0,95} = 1{,}2$%	
277	Electrostatic potential meters	$3 \cdot 10^{4}$ V	$U^{o}_{0,95} = 0{,}4$ %	
278	Working measurement standards of alternating current	$(1 \cdot 10^{-3} – 25)$ A $(20 – 10^{6})$ Hz	$U^{o}_{0,95} = (4 \cdot 10^{-5} – 1 \cdot 10^{-4})$	
279	Transducers, calibrators, digital and analog meters instruments	$(10^{-3} – 25)$ A $(20 – 10^{6})$ Hz	$U_{0,95} = (4 \cdot 10^{-5} – 1 \cdot 10^{-4})$	
280	Thermoelectrical current transducers	$(1 \cdot 10^{-3} – 25)$ A $(20 – 2 \cdot 10^{5})$ Hz	$U^{o}_{0,95} = (4 \cdot 10^{-5} – 1 \cdot 10^{-4})$	
281	AC shunts	1 mA – 100 A	$U^{o}_{0,95} = (5 \cdot 10^{-5} – 2 \cdot 10^{-4})$	

1	2	3	4	5
		10 Hz – 100 kHz		
282	Reactivity calibrators	(from minus 25 to minus 0,1) (from plus 0,1 to plus 0,7) relative units	$U°_{0,95}$ = 1,5 %	
283	Reactivity measuring instruments	from minus 25 to minus 0,1) (from plus 0,1 to plus 0,7) relative units	$U°_{0,95}$ = 5 %	
284	Instruments measuring mean counting rate of impulses of current from neutron-flux detectors	(0,5 – 10^6) impulses/s	$U°_{0,95}$ = (20 – 1) %	
285	AC Calibrators and AC amperemeters	1 mA – 100 A 10 Hz – 100 kHz	$U°_{0,95}$ = ($4·10^{-5}$ – $1·10^{-3}$)	
286	AC voltmeters	(0,1 – 100) V 10 Hz – 30 MHz	$U°_{0,95}$ = (0,2–0,02) %	
287	Secondary (working) DC resistance standards	(10^{-4} – 10^{12}) Ω	$U°_{0,95}$ = ($2·10^{-2}$–$1·10^{-5}$) %	
288	Single-value resistance measures	(10^{-6} – 10^{15}) Ω (10^{-4} – 10^{10}) Ω	$U°_{0,95}$ = (0,1–$1·10^{-5}$) % $U°_{0,95}$ = ($2·10^{-3}$–$5·10^{-5}$) %	
	Multivalue resistance measures	(10^{-3} – 10^{12}) Ω	$U°_{0,95}$ = (0,05–$5·10^{-5}$) %	
	Resistance meters	(10^{-6} – 10^{15}) Ω	$U°_{0,95}$ = (1–0,005) %	
	Coil resistance meters	(10^{-6} – 200) Ω	$U°_{0,95}$ = 0,2 %	
289	AC and DC shunts	1 μΩ – 1kΩ 1 mA – 15 kA	$U°_{0,95}$ = (0,01 – 1) %	
290	Secondary (working) AC resistance standards	1 мΩ – 100 MΩ up to 10 MHz	$U°_{0,95}$ = (0,02–$1·10^{-4}$) %	
291	Resistance calibrators	(10^{-3} – 10^{10}) Ω	$U°_{0,95}$ = ($5·10^{-3}$–$5·10^{-5}$) %	
292	AC resistance measures	1 mΩ – 100 MΩ 0 Hz – 10 MHz	$U°_{0,95}$=(0,1–$1·10^{-4}$) %	
293	Multivalue AC resistance measures	(10^{-2} – 10^8) Ω 0 Hz – 10 MHz	$U°_{0,95}$ = ($1·10^{-1}$–$1·10^{-4}$) %	
294	AC resistance calibrators	(10^{-2} - 10^8) Ω 0 Hz – 10 MHz	$U°_{0,95}$ = ($1·10^{-4}$ – 0,1) %	
295	Single-value conductivity measure Multivalue conductivity measures	50 Hz – 100 kHz (1 – 10^{-8}) S	$U°_{0,95}$ = (0,3 – 0,002) %	
296	AC bridges, immittance meters (for resistance), impedance meters, admittance meters	(10^{-3} – 10^8) Ω	$U°_{0,95}$ = (0,3 – $5·10^{-5}$) %	
297	Secondary (working) capacitance standards	1 pF – 10 μF up to 1 MHz	$U°_{0,95}$ = (0,3 – $5·10^{-5}$) %	
298	Capacitance measures:	up to 30 MHz 1 fF – 1 F	$U°_{0,95}$ = (0,3 – $5·10^{-5}$) %	

1	2	3	4	5
	small capacitance measures high-frequency capacitance measures high capacitance measures	1 fF –10 pF 1 kHz (100 – 1000) pF 1 MHz 100 µF – 1 F 50 Hz – 1 kHz	$U^o_{0,95}$ = (0,3 – 5·10^{-5}) % $U^o_{0,95}$ = (0,1 – 0,02) % $U^o_{0,95}$ = (5 – 0,03) %	
299	Capacitance boxes and measuring capacitors AC bridges, immittance meters (for capacitance), RLC-meters, impedance meters, capacitance measuring instruments	up to 30 MHz 1 FF – 10 mF up to 30 MHz 1 fF – 1 F	$U^o_{0,95}$ = (0,5 – 5·10^{-5}) % $U^o_{0,95}$ = (0,1 – 5·10^{-4}) %	
300	Capacitance calibrators	1 fF – 1 F 0 Hz – 30 MHz	$U^o_{0,95}$ = (1·10^{-4} - 1) %	
301	Secondary (working) inductance standards	10 nH – 1 kH	$U^o_{0,95}$ = (0,1 – 0,001) %	
302	Inductance measures, inductance boxes	10 nH – 10 kH up to 100 MHz	$U^o_{0,95}$ = (10 – 0,01) %	
303	AC bridges, immittance meters (for inductance) RLC-meters, impedance meters, inductance measuring instruments	10 nH – 10 kH up to 100 MHz	$U^o_{0,95}$ = (5 – 0,01) %	
304	Inductance meters, inductance calibrators	10 nH – 10 kH 0,001 Hz – 100 MHz	$U^o_{0,95}$ = (1 – 1·10^{-3}) %	
305	Working mutual inductance standards, mutual inductance boxes	1 мкН – 10 mH up to 50 kHz	$U^o_{0,95}$ = (0,1 – 0,01) %	
306	Secondary (working) loss angle tangent standards	D = 0,5·10^{-5} – 1 where C = 10 pF – 10 µF up to 1 MHz	$U_{0,95}$ = (0,3·10^{-5} + 0,001·D), where D is measuring loss angle tangent	
307	Single-value and multivalue loss angle tangent measures	10^{-5} – 1 where C = 1 pF – 100 mF up to 10 MHz	$U_{0,95}$ = (10^{-5} + 0,001·D), where D is measuring loss angle tangent	
308	AC bridges, immittance meters (for loss angle tangent), RLC-meters, Loss angle tangent measuring instruments, loss meters	(1·10^{-5} – 1) up to 10 MHz (1·10^{-4} – 1) where C = 1 pF – 10 µF	$U_{0,95}$ = (1·10^{-5} – 1·10^{-4}) $U_{0,95}$ = 0,005·D, where D is measuring loss angle tangent	
309	Quality factor measures, quality-factor meters, AC bridges, immittance meters (for Quality factor), RLC-meters	1 – 600 (0,05 – 30) MHz	$U^o_{0,95}$ = (15–0,2) %	
310	High-voltage capacitance bridges, insulation parameters measuring instruments	C = 1 pF – 1 µF D = 1·10^{-5} – 1 50 Hz	$U^o_{0,95}$ (C) = (0,01 – 0,1) % $U_{0,95}$ (D) = (1·10^{-5} + 0,005 D)	
311	High-voltage measuring capacitors High-voltage loss angle tangent measures	10 pF – 10 nF up to 100 kV D = 10^{-4} – 1 where C = 10 pF – 0,1 µF up to 100 kV	$U^o_{0,95}$ = (0,005 – 1) %	
312	High-voltage capacitance transducers (PVE)	(6 – 100) kV	$U^o_{0,95}$ = (0,1 – 0,01) %	
313	Measuring voltage transformers	up to 100 kV	$U^o_{0,95}$ = (0,01 – 0,5) %	

1	2	3	4	5
314	Electrical conductivity measures (metals and alloys)	(0,4 – 60) MS/m	$U^o_{0,95}$ = (3 – 0,5) %	
315	Electrical conductivity measuring instruments	(0,4 – 60) MS/m	$U^o_{0,95}$ = (7 – 1,5) %	
316	Materials (measures) of permittivity, complex permittivity, measuring cells	ε = 1 – 100 up to 10 MHz	$U^o_{0,95}$ = (5 – 0,01) %	
317	Partial discharge meters	1 pC – 10 nC	$U^o_{0,95}$ = (15 – 1) %	
318	Capacitance voltage dividers	k = 1 – 10000 up to 100 kV	$U^o_{0,95}$ = (1 – 0,01) %	
319	Inductive dividers	0,001 – 100	$U^o_{0,95}$ = $(10\cdot10^{-6} – 1\cdot10^{-6})$ %	
320	Voltage divisors, high-voltage probes	К = (1 – 10000) AC voltage (1 – 100) kV DC voltage (1 – 130) kV	$U^o_{0,95}$ = (0,01 – 5) % $U^o_{0,95}$ = (0,01 – 5) %	
321	High-voltage measuring voltage transducers	(1 – 100) kV	$U^o_{0,95}$ = (0,01 – 5) %	
322	High-voltage measuring systems, kilovoltmeters, voltage sources, devices for measuring electric strength of insulation	AC voltage (1 – 100) kV DC voltage (1 – 130) kV	$U^o_{0,95}$ = (0,2 – 5) % $U^o_{0,95}$ = (0,2 – 5) %	
323	Partial discharge meters and calibrators	(1 – 10) pC (11 – 10000) pC	U = 1 pC $U^o_{0,95}$ = (1 – 15) %	
324	Working AC active and reactive electrical power standards	(0 – 10000) W (1 – 2500) Hz	$U_{0,95}$ = $(14\cdot10^{-4}$ — $47\cdot10^{-4})$ %	
325	Instrument current transformers	0,5 – 30000 A/ 1; 5 A (40 – 70) Hz	$U^o_{0,95}$ = (0,01 — 0,2) %	
326	Instrument current transformers	(0,01 – 5000) A	$U^o_{0,95}$ = (0,05 — 0,01) %	
327	Wattmeters and varometers	(0 – 30000) W (VAr) (1 – 2500) Hz PF = from minus 1 to 1	$U^o_{0,95}$ = $(14\cdot10^{-4}$ — $47\cdot10^{-4})$ %	
328	Instrument power converters	(0 – 30000) W (1 – 2500) Hz PF = from minus 1 to 1	$U^o_{0,95}$ = $(14\cdot10^{-4}$ — $47\cdot10^{-4})$ %	
329	Instruments measuring power factor	PF = from minus 1 to 1 (40 – 70) Hz	$U_{0,95}$ = (0,0001 - 0,01)	
330	Power calibrators	(0 – 30000) W (1 – 2500) Hz	$U^o_{0,95}$ = $(14\cdot10^{-4}$ — $47\cdot10^{-4})$ %	
331	Active and reactive energy meters or Watt-hour meters and var-hour meters	(0 – 200) A (0 – 1000) V	$U^o_{0,95}$ = $(14\cdot10^{-4}$ — $47\cdot10^{-4})$ %	
332	DC electric energy meters	up to 10 V on electric current channel (0 – 1000) V	$U_{0,95}$ = $2\cdot10^{-5}$	
333	Setups for calibration of AC electric energy meters	(0 – 200) A (0 – 1000) V	$U^o_{0,95}$ = $(2\cdot10^{-3}$— $5\cdot10^{-3})$ %	
334	Setups for calibration of multifunctional instruments measuring electric energy	(0 – 200) A (0 – 1000) V (1 – 25000) Hz	$U^o_{0,95}$ = $(3\cdot10^{-3}$ — $5\cdot10^{-3})$ %	

1	2	3	4	5
335	Power quality analyzers and Instruments for electrical grids parameters measuring	Voltage (root-mean-square value – r.m.s.) Unom (1 – 500) V from 0,01Unom to 2Unom	$U_{0,95} = 2 \cdot 10^{-5}$	
		First harmonic voltage from 0,01Unom to 2Unom	$U_{0,95} = 2 \cdot 10^{-5}$	
		AC frequency (40 – 80) Hz	$U_{0,95}$ = 0,00005 Hz	
		Voltage deviation (0 – 100) %	$U_{0,95} = 5 \cdot 10^{-5}$	
		Voltage asymmetry factor in negative sequence and zero sequence (0 – 20) %	$U_{0,95}$ = 0,015 %	
		Total harmonic distortion of voltage and current (0 – 100) %	$U_{0,95}$ = (0,001 - 0,003) %	
		Harmonic coefficient of voltage and current of order h from 2 to 50 (0 – 50) %	$U_{0,95}$ = (0,001 - 0,003) %	
		Voltage of positive sequence, zero sequence and negative sequence from 0,01Unom to 2Unom	$U_{0,95}$ = 0,0005 V	
		Voltage dip depth (10 – 100) %	$U_{0,95}$ = 0,02 %	
		Voltage dip duration (0,02 – 600) c	$U_{0,95}$ = 0,001 c	
		Short-term flicker dose indicator 0,2 – 10	$U^{o}_{0,95}$ = 1 %	
		Long-term flicker dose indicator 0,2 – 10	$U^{o}_{0,95}$ = 1 %	
		Electrical current (r.m.s.) (0,1 – 3000) A	$U^{o}_{0,95}$ = (0,01 - 0,05) %	
		Phase angle between voltage and current of the first harmonic of a single phase (0 – 360)°	$U_{0,95}$ = 0,003°	
336	Instruments of vector measurements of electrical voltage and current	(0 – 1000) V (0,001 – 100) A (40 – 70) Hz (0 – 360)°	$U_{0,95} = 3 \cdot 10^{-5}$ $U_{0,95} = 3 \cdot 10^{-5}$ $U_{0,95}$ = 0,00005 Hz $U_{0,95}$ = 0,003°	
337	Instruments measuring magnetic induction of a stationary field	$(1 \cdot 10^{-8} – 1,2)$ T $(1 \cdot 10^{-6} – 5 \cdot 10^{-2})$ T/A (0 ± 4)°; (90 ± 4)°	$U^{o}_{0,95} = (10 – 6 \cdot 10^{-5})$ % $U^{o}_{0,95} = (10 – 4 \cdot 10^{-5})$ %	
338	Instruments measuring magnetic induction of an alternating field in the frequency field of (0 – 20) kHz	$(1 \cdot 10^{-6} – 1 \cdot 10^{-3})$ T/A $(1 \cdot 10^{-3} – 20)$ Wb/T $(5 \cdot 10^{-8} – 1 \cdot 10^{-3})$ T $(1 – 10^{4})$ B/ T	$U^{o}_{0,95}$ = (10 – 0,05) % $U^{o}_{0,95}$ = (1 – 0,1) % $U^{o}_{0,95}$ = (10 – 0,3) % $U^{o}_{0,95}$ = (10 – 0,1) %	
339	Instruments measuring magnetic flux	$(1 \cdot 10^{-6} – 0,1)$ Wb $(1 \cdot 10^{-4} – 10^{-2})$ Wb/A	$U^{o}_{0,95}$ = (10 – 0,15) % $U^{o}_{0,95}$ = 0,1 %	
340	Instruments measuring magnetic moment	$(1 \cdot 10^{-6} – 10^{3})$ $A \cdot m^2$ $(1 \cdot 10^{-5} – 3 \cdot 10^{-2})$ $Wb/(A \cdot m^2)$ $(1 \cdot 10^{-4} – 30)$ $(A \cdot m^2)/A$	$U^{o}_{0,95}$ = (10 – 0,3) %	

1	2	3	4	5
341	Instruments measuring magnetic induction gradient	$(1 \cdot 10^{-6} – 1)\ T \cdot m^{-1}$ $(1 \cdot 10^{-5} – 2 \cdot 10^{-1})\ T \cdot m^{-1} \cdot A^{-1}$	$U^{o}_{0,95}$ = (30 – 3) % $U^{o}_{0,95}$ = (10 – 1) %	
342	Instruments measuring DC characteristics of soft magnetic materials	$(1 \cdot 10^{-5} – 0,1)$ Wb (magnetic flux linkage) $(1 \cdot 10^{-3} – 1 \cdot 10^{3})$ A (magneto motive force)	$U^{o}_{0,95}$ = (5 – 0,5) % $U^{o}_{0,95}$ = (1 – 0,2) %	
343	Instruments measuring magnetic susceptibility and magnetic permeability of para-, dia- and weakly ferromagnetic materials	$1 \cdot 10^{-5} – 10$ (susceptibility) 1 – 20 (permeability)	$U_{0,95}$ = (15 – 1,5) % $U_{0,95}$ = (5 – 0,5) %	
344	Instruments measuring characteristics of magnetically hard material	$(1 \cdot 10^{3} – 3 \cdot 10^{5})$ A/m (coercive force)	$U^{o}_{0,95}$ = (5 – 2) %	
345	Phase calibrators	(0 – 360) ° 0,01 Hz – 20 MHz	$U_{0,95}$ = (0,02 – 0,005)°	
346	Instruments measuring phase offsets	(0 – 360) ° 0,01 Hz – 20 MHz	$U_{0,95}$ = (0,01 – 0,003)°	
	OPTICAL AND OPTICAL-PHYSICAL MEASUREMENTS			
347	Standard setups (automatic polarimeters)	Angle of rotation of plane of polarization (minus 45 – 45)°	$U_{0,95}$ = 0,0015°	
348	Automatic and semi-automatic polarimeters, visual saccharimeters	Angle of rotation of plane of polarization (minus 90 – 90)°	$U_{0,95}$ = 0,0015°	
349	Refractometers PVO, NPVO (Pulfrich refractometers, Abbe refractometers, immersion refractometers, specific refractometers)	Refraction index (1,25 – 1,94)	$U_{0,95} = (2,5 \cdot 10^{-5} – 0,5 \cdot 10^{-3})$	
350	Differental refractometers and interference refractometers	Index of refraction difference Δ n = (0,01 – 0,02) in the range of (1,00 – 2,00)	$U_{0,95} = (2,5 \cdot 10^{-7} – 2,5 \cdot 10^{-5})$	
351	Colorimeters	Color coordinates: X (2,5 – 109,0) Y (1,4 – 98,0) Z (1,7 – 107,0) Chromaticity coefficients: x (0,0039 – 0,7347) y (0,0048 – 0,8338)	$U_{0,95}$ = (0,25 – 1) $U_{0,95}$ = (0,005 – 1)	
352	Spectrophotometers, photoelectric colorimeters	Wavelength range: (180 – 2500) nm Eransmittance factor (0,1 – 99) %	$U_{0,95}$ = (0,25 – 1) nm $U_{0,95}$ = (0,3 – 0,6) %	
353	Measures of spectral regular-transmission factors in the wavelength range from 0,2 µm to 2,5 µm, measures of integrated and reduced regular-transmission factors	(1 – 95) %	$U_{0,95}$ = (0,3 – 0,6) %	
354	Microplate photometers and immunoassay analysers and immunochemistry analyzers	Optical density (0 – 4,0) B	$U_{0,95}$ = (0,002 – 0,006) B	
355	Infrared analyzers of liquid, solid, and granulated substances and materials	Spectral coefficient of diffuse reflection (0 – 100) %	$U_{0,95}$ = 2 %	

1	2	3	4	5
356	X-ray diffractometers	(minus 115 – 220)° (30 – 100) % (by peak intensities ratio)	$U_{0,95}$ = (0,0075 – 0,25)° $U_{0,95}$ = (0,75 – 1,7) %	
357	Measuring transducers and measuring channels of meteorological optical range and regular-transmission factor of atmosphere of stationary, portable and distance multifunctional meteorological stations	(10 – 50000) m (0 – 100) %	$U^{o}_{0,95}$ = (1-5) % $U_{0,95}$ = 0,2 %	
MEASUREMENTS OF CHARACTERISTICS OF IONIZING RADIATION AND NUCLEAR CONSTANTS				
358	Secondary measuring standards – dosimetric facilities for x-rays air kerma, exposure, ambient dose equivalent, personal dose equivalent, directional dose equivalent and their rates	(5 – 300) kV ($1 \cdot 10^{-6}$ – 10) Gy ($3 \cdot 10^{-8}$ – $3 \cdot 10^{-1}$) C/kg ($1 \cdot 10^{-7}$ – 1) Gy/s ($3 \cdot 10^{-9}$ – $3 \cdot 10^{-2}$) A/kg ($1 \cdot 10^{-6}$ – 10) Sv ($1 \cdot 10^{-7}$ – $1 \cdot 10^{-2}$) Sv/s	$U^{o}_{0,95}$ = 1,2 %	
359	Secondary measuring standards – dosimetric facilities for gamma radiation air kerma, exposure, ambient dose equivalent, personal dose equivalent, directional dose equivalent and their rates	(0,06 – 3) MeV ($1 \cdot 10^{-7}$ – 20) Gy ($3 \cdot 10^{-9}$ – $6 \cdot 10^{-1}$) C/kg ($1 \cdot 10^{-8}$ – $2 \cdot 10^{-2}$) Gy/s ($3 \cdot 10^{-10}$ – $6 \cdot 10^{-4}$) A/kg ($1 \cdot 10^{-7}$ – 10) Sv ($1 \cdot 10^{-8}$ – $1 \cdot 10^{-2}$) Sv/s	$U^{o}_{0,95}$ = 1,5 %	
360	Secondary measuring standards – dosimeters with ionization chambers for x-rays and gamma radiation air kerma, exposure and their rates	(0,005 – 3) MeV ($1 \cdot 10^{-7}$ – 20) Gy ($3 \cdot 10^{-9}$ – $6 \cdot 10^{-1}$) C/kg ($1 \cdot 10^{-8}$ – 2) Gy/s ($3 \cdot 10^{-10}$ – $6 \cdot 10^{-2}$) A/kg	$U^{o}_{0,95}$ = 1,3 %	
361	Working measuring standards – x-ray radionuclide sources ^{55}Fe, ^{109}Cd	($1 \cdot 10^{-10}$ – $2 \cdot 10^{-4}$) Gy/s ($3 \cdot 10^{-12}$ – $6 \cdot 10^{-6}$) A/kg	$U^{o}_{0,95}$ = 2 %	
362	Working measuring standards – x-ray dosimetric calibration facilities	(5 – 300) kV ($1 \cdot 10^{-8}$ – 200) Gy ($3 \cdot 10^{-10}$ – 6) C/kg ($1 \cdot 10^{-9}$ – 2) Gy/s ($3 \cdot 10^{-11}$ – $6 \cdot 10^{-2}$) A/kg ($1 \cdot 10^{-8}$ – 10) Sv ($1 \cdot 10^{-9}$ – $3 \cdot 10^{-2}$) Sv/s	$U^{o}_{0,95}$ = 1,5 %	
363	Working measuring standards – reference dose-area (air kerma-area) product meters	(40 – 250) kV ($1 \cdot 10^{-7}$ – 10) Gy·m^2 ($1 \cdot 10^{-9}$ – $3 \cdot 10^{-2}$) Gy·m^2/s	$U^{o}_{0,95}$ = 4 %	
364	High-accuracy dosimeters for air kerma and exposure	($2 \cdot 10^{-9}$ – $1 \cdot 10^{-1}$) R s^{-1} ($2 \cdot 10^{-11}$ – $1 \cdot 10^{-3}$) Gy/s ($2 \cdot 10^{-10}$ – 30) Gy ($2 \cdot 10^{-11}$ – 10^{-3}) Sv/s ($2 \cdot 10^{-10}$ – 30) Sv	$U^{o}_{0,95}$ = 1,3 %	
365	Measuring instruments – dose-area (air kerma-area) product meters	($1 \cdot 10^{-7}$ – 10) Gy·m^2 ($1 \cdot 10^{-9}$ – $3 \cdot 10^{-2}$) Gy·m^2/s	$U^{o}_{0,95}$ = 4 %	
366	Measuring instruments – dose-length (air kerma-length) product meters	($3 \cdot 10^{-5}$ – 500) Gy·cm ($3 \cdot 10^{-6}$ – 20) Gy·cm/s	$U^{o}_{0,95}$ = 5 %	
367	Working measuring standards – reference calorimeters for energy flux	(5 – 200) kV ($2 \cdot 10^{-5}$ – $2 \cdot 10^{-3}$) W	$U^{o}_{0,95}$ = 7 %	

1	2	3	4	5
368	Measuring instruments – x-ray energy flux sources	$(2 \cdot 10^{-5} – 2 \cdot 10^{-3})$ W	$U^o_{0,95}$ = 20 %	
369	Measuring instruments – instruments for non-invasive measurement of anode voltage of x-ray diagnostic machines (kV-meters)	(22 – 150) kV	$U^o_{0,95}$ = 2 %	
370	Working measuring standards – gamma radiation sources ^{137}Cs, ^{60}Co, ^{226}Ra, ^{241}Am, ^{57}Co	$(1 \cdot 10^{-10} – 2 \cdot 10^{-4})$ Gy/s $(3 \cdot 10^{-12} – 6 \cdot 10^{-6})$ A/kg	$U^o_{0,95}$ = 1,4 %	
371	Working measuring standards – gamma radiation dosimetric calibration facilities	(0,06 – 3) MeV $(1 \cdot 10^{-9} – 10)$ Gy $(3 \cdot 10^{-11} – 3 \cdot 10^{-1})$ C/kg $(1 \cdot 10^{-10} – 1 \cdot 10^{-2})$ Gy/s $(3 \cdot 10^{-11} – 3 \cdot 10^{-4})$ A/kg $(1 \cdot 10^{-9} – 10)$ Sv $(1 \cdot 10^{-10} – 1 \cdot 10^{-2})$ Sv/s	$U^o_{0,95}$ = 1,4 %	
372	Working measuring standards – transportable gamma radiation dosimetric calibration facilities	(0,06 – 0,7) MeV $(1 \cdot 10^{-9} – 2 \cdot 10^{-1})$ Gy $(3 \cdot 10^{-11} – 6 \cdot 10^{-3})$ C/kg $(1 \cdot 10^{-10} – 2 \cdot 10^{-4})$ Gy/s $(3 \cdot 10^{-12} – 6 \cdot 10^{-6})$ A/kg	$U^o_{0,95}$ = 1,4 %	
373	Measuring instruments – radionuclide dosimetric sources	$(1 \cdot 10^{-10} – 2 \cdot 10^{-4})$ Gy/s $(3 \cdot 10^{-12} – 6 \cdot 10^{-6})$ A/kg	$U^o_{0,95}$ = 1,4 %	
374	Measuring instruments – dosimeters and personal dosimetric systems	$(1 \cdot 10^{-8} – 10)$ Sv $(3 \cdot 10^{-11} – 5 \cdot 10^{-3})$ Sv/s	$U^o_{0,95}$ = 1,3 %	
375	Measuring instruments – dosimetric irradiation facilities	$(1 \cdot 10^{-9} – 2 \cdot 10^{3})$ Gy $(3 \cdot 10^{-11} – 60)$ C/kg	$U^o_{0,95}$ = 1,4 %	
376	Working measuring standards – dosimeters for x-rays and gamma radiation air kerma, exposure, ambient dose equivalent, personal dose equivalent and directional dose equivalent measurements	(0,005 – 3) MeV $(1 \cdot 10^{-9} – 200)$ Gy $(3 \cdot 10^{-11} – 6)$ C/kg $(1 \cdot 10^{-10} – 2)$ Gy/s $(3 \cdot 10^{-12} – 6 \cdot 10^{-2})$ A/kg $(1 \cdot 10^{-9} – 10)$ Sv $(1 \cdot 10^{-10} – 3 \cdot 10^{-2})$ Sv/s	$U^o_{0,95}$ = 1,3 %	
377	Working measuring standards – gamma radiation sources ^{137}Cs, ^{60}Co, ^{226}Ra, ^{241}Am, ^{57}Co, ^{75}Se, ^{192}Ir, ^{153}Gd	$(3 \cdot 10^{-11} – 2 \cdot 10^{-3})$ Gy/s $(9 \cdot 10^{-13} – 6 \cdot 10^{-5})$ A/kg	$U^o_{0,95}$ = 1,4 %	
378	Working measuring standards – x-ray radionuclide sources ^{55}Fe, ^{109}Cd, ^{125}I	$(1 \cdot 10^{-11} – 2 \cdot 10^{-5})$ Gy/s $(3 \cdot 10^{-13} – 6 \cdot 10^{-7})$ A/kg	$U^o_{0,95}$ = 1,9 %	
379	Measuring instruments – d dosimeters for x-rays and gamma radiation air kerma, exposure, ambient and directional dose equivalents	$(1 \cdot 10^{-9} – 200)$ Gy $(3 \cdot 10^{-11} – 6)$ C/kg $(1 \cdot 10^{-10} – 2)$ Gy/s $(3 \cdot 10^{-12} – 6 \cdot 10^{-2})$ A/kg $(1 \cdot 10^{-9} – 10)$ Sv $(1 \cdot 10^{-10} – 3 \cdot 10^{-2})$ Sv/s	$U^o_{0,95}$ = 1,3 %	
380	Measuring instruments – dosimeters for air kerma, exposure, ambient and directional dose equivalents	$(1 \cdot 10^{-9} – 200)$ Gy $(3 \cdot 10^{-11} – 6)$ C/kg $(1 \cdot 10^{-10} – 2)$ Gy/s $(3 \cdot 10^{-12} – 6 \cdot 10^{-2})$ A/kg $(1 \cdot 10^{-9} – 10)$ Sv $(1 \cdot 10^{-11} – 3 \cdot 10^{-2})$ Sv/s	$U^o_{0,95}$ = 1,3 %	
381	Working measuring standards – dosimetric calibration facilities (absorbed dose to water)	$(1 \cdot 10^{-1} – 1 \cdot 10^{2})$ Gy	$U^o_{0,95}$ = 2 %	

1	2	3	4	5
382	Working measuring standards – dosimetric measuring instruments (absorbed dose to water)	$(1 \cdot 10^{-1} – 1 \cdot 10^{2})$ Gy	$U^{o}_{0,95}$ = 2 %	
383	Measuring instruments – dosemeters of absorbed dose for special purposes	$(1 \cdot 10^{-1} – 1 \cdot 10^{2})$ Gy	$U^{o}_{0,95}$ = 1,3 %	
384	Working measuring standards – dosimeters for pulse x-rays	(50 – 600) keV $(8 \cdot 10^{-8} – 1 \cdot 10^{2})$ C/kg $(3 \cdot 10^{-6} – 6 \cdot 10^{3})$ Gy $(3 \cdot 10^{-6} – 6 \cdot 10^{3})$ Sv $(8 \cdot 10^{-9} – 3 \cdot 10^{-2})$ A/kg $(3 \cdot 10^{-7} – 1)$ Gy/s $(3 \cdot 10^{-7} – 1)$ Sv/s	$U_{0,95}$ = 5 %	
385	Working measuring standards – dosimeters for pulse photon radiation	(0,05 – 3) MeV $(8 \cdot 10^{-6} – 1 \cdot 10^{-2})$ C/kg	$U^{o}_{0,95}$ = 5 %	
386	Measuring instruments – dosimeters for pulse x-rays	$(8 \cdot 10^{-8} – 1)$ C/kg $(3 \cdot 10^{-6} – 60)$ Gy $(3 \cdot 10^{-6} – 60)$ Sv $(8 \cdot 10^{-9} – 3 \cdot 10^{-2})$ A/kg $(3 \cdot 10^{-7} – 1)$ Gy/s $(3 \cdot 10^{-7} – 1)$ Sv/s	$U^{o}_{0,95}$ = 5 %	
387	Measuring instruments – sources of pulse x-rays	$(8 \cdot 10^{-8} – 1 \cdot 10^{2})$ C/kg pulse frequency is less than 1000 Hz	$U^{o}_{0,95}$ = 6 %	
388	Measuring instruments – dosimetric facilities for pulse x-rays	$(3 \cdot 10^{-4} – 3)$ C/kg	$U^{o}_{0,95}$ = 6 %	
389	Secondary measuring standards for beta radiation absorbed dose in tissue-equivalent material: - beta radiation sources: ^{147}Pm, ^{204}Tl, ^{90}Sr + ^{90}Y; - measuring facilities	$(1 \cdot 10^{-3} – 1 \cdot 10^{2})$ Gy $(1 \cdot 10^{-5} – 1)$ Gy/s $(1 \cdot 10^{-5} – 1 \cdot 10^{2})$ Gy $(1 \cdot 10^{-8} – 1)$ Gy/s	$U^{o}_{0,95}$ = 5 %	
390	Working measuring standards for beta radiation absorbed dose in tissue-equivalent material: - beta radiation sources: ^{147}Pm, ^{204}Tl, ^{90}Sr + ^{90}Y; - measuring facilities	$(1 \cdot 10^{-5} – 1 \cdot 10^{2})$ Gy $(1 \cdot 10^{-8} – 1)$ Gy/s $(1 \cdot 10^{-5} – 1 \cdot 10^{2})$ Gy $(1 \cdot 10^{-8} – 1)$ Gy/s	$U^{o}_{0,95}$ = 7 %	
391	Measuring instruments of beta radiation absorbed dose in tissue-equivalent material: - beta radiation sources: ^{147}Pm, ^{204}Tl, ^{90}Sr + ^{90}Y; - electronic dosimeters with direct indication; - solid-state dosimeters; - processing installations	$(1 \cdot 10^{-5} – 1 \cdot 10^{3})$ Gy $(1 \cdot 10^{-8} – 1)$ Gy/s $(1 \cdot 10^{-3} - 1 \cdot 10^{5})$ Gy $(1 \cdot 10^{-5} – 10)$ Gy/s $(1 – 1 \cdot 10^{6})$ Gy (1 – 10) Gy/s $(1 – 1 \cdot 10^{6})$ Gy (1 – 10) Gy/s	$U^{o}_{0,95}$ = 3 %	
392	Secondary measuring standards: radionuclide sources of neutrons, measuring setups, dosimeters	$(1 \cdot 10^{3} – 1 \cdot 10^{14})$ s^{-1} $(1 \cdot 10^{4} – 1 \cdot 10^{10})$ $s^{-1}m^{-2}$ $(5 \cdot 10^{-4} – 5 \cdot 10^{2})$ μSv/s	$U^{o}_{0,95}$ = 1,2 %	
393	Working (reference) measuring standards – neutron sources	$(1 \cdot 10^{2} – 1 \cdot 10^{9})$ s^{-1} $(1 \cdot 10^{4} – 1 \cdot 10^{10})$ $s^{-1}m^{-2}$ $(5 \cdot 10^{-4} – 5 \cdot 10^{2})$ μSv/s $(1 \cdot 10^{3} – 1 \cdot 10^{9})$ s^{-1} $(1 \cdot 10^{4} – 1 \cdot 10^{10})$ $s^{-1}m^{-2}$	$U^{o}_{0,95}$ = 1,2 %	

1	2	3	4	5
394	Working (reference) measuring standards – radiometers of neutron fluence rate	$(1 \cdot 10^8 – 1 \cdot 10^{15})$ $s^{-1}m^{-2}$ $(1 \cdot 10^3 – 5 \cdot 10^8)$ $s^{-1}m^{-2}$ $(1 \cdot 10^4 – 1 \cdot 10^{15})$ $s^{-1}m^{-2}$	$U^o_{0,95}$ = 1,5 %	
395	Measuring instruments – neutron dosimeters (neutron dose-rate meters)	$(5 \cdot 10^{-4} – 10^6)$ μSv/s	$U^o_{0,95}$ = 1,5 %	
396	Measuring instruments – neutron radiometers (neutron fluence-rate meters)	$(1 \cdot 10^3 – 1 \cdot 10^{15})$ $s^{-1}m^{-2}$	$U^o_{0,95}$ = 1,5 %	
397	Secondary measuring standards – solutions of alpha-, beta-, and gamma-emitting radionuclides	$(1 \cdot 10^4 – 1 \cdot 10^8)$ Bq g^{-1}	$U_{0,95}$ = 1,5 %	
398	Working measuring standards – photon radionuclide sources	$(2 – 2 \cdot 10^{11})$ Bq $(5 - 5 \cdot 10^8)$ s^{-1} $(10 – 1 \cdot 10^8)$ $s^{-1}m^{-2}$	$U^o_{0,95}$ = 1 %	
399	Secondary measuring standards – sources of alpha-, beta-, and photon radiation	$(2 – 2 \cdot 10^{11})$ Bq $(5 – 5 \cdot 10^4)$ 1/s $(5 \cdot 10^3 – 5 \cdot 10^8)$ $1/(s \cdot m^2)$	$U_{0,95}$ = 1 %	
400	Working measuring standards – alpha radionuclide sources (OSAI, P9, etc.)	$(2 – 2 \cdot 10^{11})$ Bq $(5 – 5 \cdot 10^8)$ s^{-1} $(10 – 1 \cdot 10^8)$ $s^{-1} \cdot m^{-2}$	$U^o_{0,95}$ = 1 %	
401	Working measuring standards – beta radionuclide sources (SO, ORIBI, etc.)	$(2 – 2 \cdot 10^{11})$ Bq $(5 – 5 \cdot 10^8)$ s^{-1} $(10 – 1 \cdot 10^8)$ $s^{-1} \cdot m^{-2}$	$U^o_{0,95}$ = 1 %	
402	Working measuring standards – solutions of alpha-, beta-, and gamma-emitting radionuclides	$(1 \cdot 10^3 – 1 \cdot 10^8)$ Bq	$U^o_{0,95}$ =1 %	
403	Working measuring standards – radionuclide sources of special purpose	$(1 – 1 \cdot 10^{12})$ Bq $(1 \cdot 10^2 – 1 \cdot 10^6)$ $Bq \cdot kg^{-1}$ $(5 – 5 \cdot 10^5)$ 1/s $(5 \cdot 10^3 – 5 \cdot 10^8)$ $1/(s \cdot m^2)$ $(5 \cdot 10^3 – 5 \cdot 10^8)$ $1/(s \cdot sr)$	$U_{0,95}$ = 3 %	
404	Secondary measuring standards – radiometric setups of alpha-, beta-, and photon radionuclide	$(1 – 1 \cdot 10^{13})$ Bq $(5 – 5 \cdot 10^5)$ 1/s $(5 \cdot 10^3 – 5 \cdot 10^8)$ $1/(s \cdot sr)$	$U^o_{0,95}$ = 0,5 %	
405	Measuring instruments – dosimeters-radiometers of alpha- and beta radionuclide, RDM monitors, surface contamination radiometers (MKS – PM 1403, DKS-96, MKS-01SA, etc.)	$(2 – 1 \cdot 10^6)$ $min^{-1} \cdot cm^{-2}$ (α) $(6 – 1 \cdot 10^6)$ $min^{-1} \cdot cm^{-2}$ (β)	$U^o_{0,95}$ = 5 %	
406	Measuring instruments – radioemeters- dose calibrators (RIS-A1, ISOMED, CURIEMENTOR,CAPINTEC, PET-DOSE)	$(1 \cdot 10^6 – 5 \cdot 10^9)$ Bq	$U^o_{0,95}$ = 5 %	
407	Measuring instruments – spectrometers-radiometers, radiometers (RSU-01Signal M, DigiDart, MKGB-01”RADEK”, MKS A, SICh, etc.)	$(0,05 – 1,5 \cdot 10^5)$ Bq (α) $(1 – 2 \cdot 10^5)$ Bq (β) $(1 – 1 \cdot 10^5)$ Bq (γ) $(5 – 1 \cdot 10^4)$ Bq kg^{-1} (γ)	$U^o_{0,95}$ = 6 %	

1	2	3	4	5
408	Measuring instruments – scintillation liguid radiometers of beta radionuclide (RZhS-07, TRICARB 255-3170TR, Quantulis 1220, etc.)	$(2 – 1·10^{7})$ Bq	$U^{o}_{0,95}$ = 5 %	
409	Radiometers of beta-radiation	$(2 – 2·10^{5})$ Bq	$U^{o}_{0,95}$ = 5 %	
410	Measuring instruments – radiometers of volumetric activity of natural radioactive gases	$(1 – 2·10^{6})$ $Bq·m^{-3}$	$U^{o}_{0,95}$ = 5 %	
411	Measuring instruments – radiometers of volumetric activity of natural radioactive aerosols	$(1 – 1·10^{6})$ $Bq·m^{-3}$	$U^{o}_{0,95}$ = 5 %	
412	Secondary measuring standards – gamma-emitting Ra-226 based radionuclide sources, Ra-226 solutions	(0,001 – 200) mg $(0,1 – 1·10^{6})$ ng $(3,7 – 3,7·10^{7})$ Bq	$U^{o}_{0,95}$ =1 %	
413	Working measuring standards – gamma-emitting Ra-226 based radionuclide sources, Ra-226 solutions	(0,001 – 200) mg $(0,1 – 1·10^{6})$ ng $(3,7 – 3,7·10^{7})$ Bq	$U^{o}_{0,95}$ = 1 %	
414	Measuring instruments – gamma-emitting Ra-226 based radionuclide sources	(0,001 – 100) mg $(0,1 – 1·10^{6})$ ng $(3,7 – 3,7·10^{7})$ Bq	$U^{o}_{0,95}$ = 1 %	
415	Secondary measuring standards – radiometric and dosimetric installations of industrial accelerators	(0,1 – 50) MeV $(1·10^{12} – 1·10^{21})$ s^{-1} $(1·10^{10} – 1·10^{19})$ $s^{-1}·cm^{-2}$ $(1·10^{10} – 1·10^{21})$ cm^{-2} $(1·10^{-1} – 1·10^{3})$ W $(1·10^{-2} – 1·10^{2})$ W cm^{-2} $(1·10^{-1} – 1·10^{3})$ J cm^{-2}	$U^{o}_{0,95}$ = 1,8 %	
416	Secondary measuring standards – radiometric and dosimetric installations of medical accelerators	(1 – 50) MeV $(1·10^{10} – 1·10^{16})$ s^{-1} $(1·10^{8} – 1·10^{14})$ $s^{-1}·cm^{-2}$ $(1·10^{9} – 1·10^{16})$ cm^{-2} $(1·10^{-4} – 1·10^{2})$ W $(1·10^{-5} – 10)$ W cm^{-2} $(1·10^{-3} – 1·10^{3})$ J cm^{-2}	$U^{o}_{0,95}$ = 1,8 %	
417	Measuring instruments – high-accuracy radiometers for flux, flux density and fluence of electrons	(0,1 – 15) MeV $(1·10^{10} – 1·10^{22})$ s^{-1} $(1·10^{8} – 1·10^{19})$ $s^{-1}·cm^{-2}$ $(1·10^{9} – 1·10^{21})$ cm^{-2}	$U^{o}_{0,95}$ = 1,8 %	
418	Measuring instruments – high-accuracy dosimeters for energy flux, energy flux density and energy fluence of electron and bremsstrahlung radiation	(1 – 50) MeV $(1·10^{-4} – 10^{4})$ W $(1·10^{-5} – 1·10^{2})$ W cm^{-2} $(1·10^{-3} – 1·10^{3})$ J cm^{-2}	$U^{o}_{0,95}$ = 1,8 %	
MEDICAL MEASURING INSTRUMENTS				
419	Equipment for bioanalytical measurements, such as instrumentation for polymerase chain reaction, including Real-Time PCR, DNA Thermal Cyclers, PCR Analyzers	(1 – 50) g/kg $(10^{12} – 10^{19})$ molecules/µl	$U^{o}_{0,95}$ = 12 % $U^{o}_{0,95}$ = 11 %	
420	Immunological analyzers	(1 – 70) nmol/l	$U^{o}_{0,95}$ = 11 %	
421	Biological fluids analyzers	$(1·10^{-3} – 100)$ g/dm^{3} $(1·10^{-3} – 500)$ $mmol/dm^{3}$ (0 – 2,5) OD units	$U^{o}_{0.95}$ = 7 %	

1	2	3	4	5
422	Haemotological analyzers	RBC: $(0{,}2\cdot10^{12} – 9{,}9\cdot10^{12})$ dm^{-3} WBC: $(0{,}02\cdot10^{9} – 99{,}9\cdot10^{9})$ dm^{-3} HGB: (3 – 300) mg/dm^3	$U^o_{0.95}$ = 7 % $U^o_{0.95}$ = 5 %	
423	Urine analyzers	(3 – 35) $mmol/dm^3$ (0,3 – 10) g/l (1,0 – 1,2) g/ml pH: (1 – 12)	$U^o_{0,95}$ = 10 % $U_{0,95}$ = 0,02	
424	Haemoglobinometers	(0,4 – 0,5) OD units (3 – 300) mg/dm^3	$U^o_{0,95}$= 5 %	
ELEMENTS OF MEASURING SYSTEMS				
425	Informational (informative) measuring systems (IMS) for electricity metering, IMS for quality control of electric energy, electrical network parameters and telemetry, current-measuring complexes of IMS, IMS elements, measuring channels of automated measuring and information system for electric power fiscal accounting	(0 – 20) mA	$U_{0,95}$ = 0,02 mA	
		(minus 100 – 100) mV	$U_{0,95}$ = 0,01 mV	
		(0 – 10) V	$U_{0,95}$ = 0,01 V	
		1 Hz – 16 kHz	$U_{0,95}$ = 0,0001 kHz	
		(minus 200 – 2500) °C	$U_{0,95}$ = 0,03°C	
		$(10^{-2} – 10^{5})$ Ω	$U_{0,95}$ = 0,02 Ω	
		$(10^{-3}$ – 750) V	$U_{0,95}$ = 0,01 V	
		$(10^{-4}$ – 240) A	$U_{0,95}$ = 0,01 A	
		kW·h (depending on the ranges and uncertainties of measuring instruments, used in MS)	$U_{0,95}$ = 0,02 kW·h	
426	Informational (informative) measuring systems (IMS) of wide (targeted) use, developed for serial and single-unit production in accordance with the scope of accreditation, IMS complexes, IMS channels, IMS elements	Output signals of process parameter sensors with output electrical frequency signals (0,01 Hz – 1000) kHz Direct current, (0 – 2000) mA Direct and alternating voltage (minus 100 – 100) V	$U_{0,95}$ = (0,003-0,6) Hz $U_{0,95}$ = (0,0013-0,160) mA $U_{0,95}$ = 0,02 V	
427	Multichannel measuring systems designed for measurements of hydrological parameters of the aquatic environment of seas and oceans, including marine and oceanological probing devices and profilometers, hydrological measuring equipment of drifting, towed, automatic, inhabited and autonomous surface and underwater vehicles with measuring channels and measuring transducers	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
428	Multichannel measuring systems and complexes designed for measurements of meteorological parameters of atmospheric environment (lowest atmospheric layer), including: measuring equipment of automatic and maintained meteorological stations for	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	

1	2	3	4	5
	synoptical observations (weather stations), profilometers, equipment for meteorological support of land and sea-based aviation, shipboard weather stations with measuring channels and measuring transducers			
429	Measuring systems, mobile measuring complexes, measuring channels (using joint, closed series and indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
2, ul. Fedyuninskogo, Lomonosov, St. Petersburg 198412				
MEASUREMENTS OF MECHANICAL QUANTITIES				
430	Reference accelerometers of 1st order	$(1\cdot10^{-3} – 500)$ m/s^2	$U^o_{0,95}$ = (4,4 – 0,0003) %	
431	Reference turntables of 2nd order	$(1\cdot10^{-3} – 10)$ m/s^2	$U^o_{0,95}$ = (4,4 – 0,0003) %	
432	Reference centrifuges of 2nd order	(5 – 500) m/s^2	$U^o_{0,95}$ = 0,01 %	
433	Reference doubled centrifuges of 2nd order	(5 – 100) m/s^2 (0,5 – 30) Hz	$U^o_{0,95}$ = 0,02 %	
434	High-accuracy accelerometers	$(1\cdot10^{-3} – 3500)$ m/s^2	$U^o_{0,95}$ = (0,006 – 0,0003) %	
435	Reference dynamic angular encoders. Measuring angle transducers	0,4” – 360^0	$U_{0,95}$ = 0,1″	
436	Measurement instruments and calibration setups of angular vibration	f = (0,1 – 100) Hz φ = $(5\cdot10^{-5} – 1)$ rad ώ = $(1,5\cdot10^{-3} – 12)$ rad/s ε = $(2\cdot10^{-1} – 350)$ rad/s^2	$U^o_{0,95}$ = 0,5 %	
437	Angular accelerators	$(2\cdot10^{-1} – 500)$ rad/s^2	$U^o_{0,95}$ = 0,5 %	
438	Tachometers, stroboscopes, rotational velocity sensors	$(1\cdot10^{-2} – 1\cdot10^{4})$ rad/s (0,01 – 99999,99) r/min	$U^o_{0,95}$ = 0,01 %	
439	Tachometers, stroboscopes, rotational velocity sensors	(0,1 – 600000) r/min	$U_{0,95}$ = (0,02 – 10) %	
		$(1\cdot10^{-2} – 6\cdot10^{4})$ rad/s	$U_{0,95}$ = (0,02 – 10) %	
		$(1\cdot10^{-2} – 2,5\cdot10^{4})$ Hz	$U_{0,95}$ = (0,02 – 10) %	
		$(1\cdot10^{-2} – 100)$ m/s	$U_{0,95}$ = (0,1 – 10) %	
440	Calibration tachometer setups, calibration taxometric setups	$(0,1 – 6\cdot10^{3})$ rad/s	$U^o_{0,95}$ = 0,01 %	
441	Instruments measuring angular velocity, setups for realization of angular velocities by rotation method	$(5\cdot10^{-8} – 20)$ rad/s	$U_{,95} = 4,4\cdot10^{-9}$ rad/s	
442	Gyroscopic measuring instruments, angular velocity sensors (AVS)	$(5\cdot10^{-8} – 200)$ rad/s	$U_{0,95} = 4,4\cdot10^{-9}$ rad/s	
443	Electromechanical counters	$(0,1 – 10^{5})$ rotations	$U^o_{0,95}$=0,01 %	
444	Relative gravimeters	6000 mGal	$U_{0,95}$ = 5 μGal	
445	Absolute gravimeters	(9,77 – 9,85) m/s^2 (977 – 985) Gal	$U_{0,95}$ = 5 μGal	

1	2	3	4	5
446	Gravimetric polygons	Values of g (9,77 – 9,85) m/s^2 (977 – 985) Gal Values of g difference (0 – 500) 10^{-5} m/s^2 (5 – 500) mGal	$U_{0,95}$ = 10 μGal	
447	Decelerometers, instruments measuring coefficient of traction	(0 – 9,81) m/s^2 0,00 – 1,00	$U_{0,95}$ = 0,1 % $U_{0,95}$ = 0,01	
448	Calibrators and signal simulators of rotation frequency primary transducers	(1·10^{-2} – 2,5·10^4) Hz	$U_{0,95}$ = (0,001 – 10) %	
449	Instruments measuring linear speed, bullet speed recorders, ballistic recorders	(1 – 2000) m/s	$U_{0,95}$ = (0,1 – 5) %	
450	Instruments measuring linear speed, including laser anemometers	(1·10^{-2} – 100) m/s	$U_{0,95}$ = (0,1 – 10) %	
451	Torque meters, setups for realization of torque	(1 – 300) kN·m	$U_{0,95}$ = (0,1 – 5) %	
452	Tachograph programming devices. Instruments measuring and controlling vehicle motion parameters	(0,1 – 999999,9) km (0 – 400) km/h (0 – 48) h	$U_{0,95}$ = 0,05 % $U_{0,95}$ = 1 km/h $U_{0,95}$ = 1 s/days	
MEASUREMENTS OF FLOW PARAMETERS, FLOW RATE, LEVEL, AND VOLUME				
453	Hydrodynamic measuring facilities, measuring pools	(0,02 – 20) m/s	$U^o_{0,95}$ = (1,0 – 0,4) %	
454	Instruments measuring water flow speed	(0,005 – 25) m/s	$U^o_{0,95}$ = (1 – 15) %	
455	Aerodynamic measuring facilities	(0,05 – 100) m/s	$U_{0,95}$ = (0,0006 +0,01V) m/s, where V is air speed, m/s	
456	Instruments measuring air-speed and direction	(0,05 – 100) m/s (0 – 360)°	$U_{0,95}$ = (0,0006 +0,01V) m/s, $U_{0,95}$ = ± 2° where V is air speed, m/s	
457	Calibration facilities for calibration of pipe provers (ball and small provers)	(0,02 – 45) m^3	$U^o_{0,95}$ = (0,01 – 0,05) %	
458	Pipe provers (ball and small provers)	Nominal capacity of calibrated section: from 0,005 to 45 m^3	$U^o_{0,95}$ = (0,03 – 0,1) %	
459	Calibration facilities for liquid volume and volumetric flow meters	Nominal capacity of calibrated section: from 0,1 to 120 m^3 from 0,01 to 10000 m^3/h	$U^o_{0,95}$ = (0,015 – 0,2) %	
460	Calibration facilities for liquid mass and mass flow meters	от 0,01 до 10000 t/h	$U^o_{0,95}$ = (0,03 – 0,2) %	
461	Calibration facilities for fuel dispenser	(0,5 до 3) t (0,5 до 3) m^3	$U^o_{0,95}$ = (0,04 – 0,3) % $U^o_{0,95}$ = (0,05 – 0,3) %	
462	Liquid volume, volumetric flow, mass, mass flow meters	(0,012 – 320) m^3/h (0,012 – 320) t/h	$U^o_{0,95}$ = (0,1 – 5) % $U^o_{0,95}$ = (0,1 – 5) %	
463	Flow meters and fluid meters for open channels	at level up to 6 m at flow rate of (0,05 – 6,0) m/s	$U_{0,95}$ = (0,2 – 1) % $U_{0,95}$ = (1 – 5) %	
464	Information-processing devices for metering systems for oil, gas and oil products: measuring units of flow, volume and mass	Input signals: (0,1 – 40000) Hz (0,4 – 20) mA (1 – 5) V	$U^o_{0,95}$ = 0,001 % $U_{0,95}$ = 0,003 mA $U_{0,95}$ = 0,005 V	

1	2	3	4	5
	of liquids, measuring and computing complexes, gas volume equalizers, programmable control systems	(0 – 10) V	$U_{0,95}$ = 0,005 V	
465	Gas volume and volumetric flow meters	$(3{,}3 \cdot 10^{-6} – 36)\ m^3/s$	$U_{0,95}$ = (0,5 – 5) %	
466	Measures of capacity (tank provers, vehicle tanks)	$(0{,}01 – 50)\ m^3$	$U_{0,95}$ = (0,006 - 0,5) %	
467	Measuring transducers and measuring channels of air speed of stationary, portable distance multifunctional meteorological stations for measuring air speed	(0,05 – 80) m/s	$U_{0,95}$ = 1 r/min	
468	Measuring channels of systems, stations, complexes for measuring level of liquids (water level of water channels)	(0 – 40) m (40 – 90) m	$U_{0,95}$ = (5,78 – 40,4) mm $U_{0,95} = (0{,}02 \cdot 10^{-2} – 0{,}06 \cdot 10^{-2})$ mm	
469	Tank provers	$(0{,}001 – 3)\ m^3$	$U_{0,95}$ = (0,006 – 3,0) %	
	PRESSURE MEASUREMENTS, VACUUM MEASUREMENTS			
470	Secondary measuring standards of unit of pressure for dynamic pressure	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz $(1 \cdot 10^{-5} – 10)$ s	$U^o_{0,95}$ = (0,7 – 1,2) %	
471	Harmonic pressure setups	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz	$U^o_{0,95}$ = 6,0 %	
472	Periodic pressure manometers	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz	$U^o_{0,95}$ = (1,3 – 4,0) %	
473	Impulsive pressure manometers	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(1 \cdot 10^{-5} – 10)$ s	$U^o_{0,95}$ = (1,1 – 4,0) %	
474	Harmonic pressure exciters	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz	$U^o_{0,95}$ = (1,6 – 6,0) %	
475	Impulsive pressure exciters	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(1 \cdot 10^{-5} – 10)$ s	$U^o_{0,95}$ = (1,1 – 6,0) %	
476	Harmonic pressure transducers and manometers	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz	$U^o_{0,95}$ = (3,0 – 6,0) %	
477	Impulsive pressure transducers and manometers	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(1 \cdot 10^{-5} – 10)$ s	$U^o_{0,95}$ = (3,0 – 6,0) %	
478	Periodic pressure transducers and manometers	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz $P_{ст}$ up to 5 MPa	$U^o_{0,95}$ = (3,0 – 8,0) %	
479	Harmonic pressure exciters	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz	$U^o_{0,95}$ = (3,5 – 8,0) %	
480	Impulsive pressure exciters	$(1 \cdot 10^2 – 25 \cdot 10^6)$ Pa $(1 \cdot 10^{-5} – 10)$ s	$U^o_{0,95}$ = (3,5 – 8,0) %	
481	Periodic pressure exciters	$(1 \cdot 10^2 – 25 \cdot 10^6$ Pa $(5 \cdot 10^{-1} – 1 \cdot 10^4)$ Hz $P_{ст}$ до 5 MPa	$U^o_{0,95}$ = (3,5 – 12,0) %	
	VIBROACOUSTIC MEASUREMENTS			
482	Measuring instruments and calibration setups of seismic vibrations parameters. Seismometers and seismic transducers	$(5 \cdot 10^{-7} – 1{,}0)$ m/s (0,001 – 1000) Hz f = 0,001 – 30 Hz $X = 10^{-4} – 2 \cdot 10^{-2}$ m $V = 1 \cdot 10^{-7} – 1{,}0$ m/s $a = 4 \cdot 10^{-7} – 10\ m/s^2$	$U^o_{0,95}$ = 0,01 %	
483	Seismic setups	$(10^{-6} – 10)\ m/s^2$ (0,001 – 100) Hz	$U^o_{0,95}$ = 0,01 %	

1	2	3	4	5
484	Secondary measurement standards of units of displacement, velocity and acceleration for oscillation motion of a solid	$(1\cdot10^{-8} – 5\cdot10^{-2})$ m $(1\cdot10^{-4} – 1\cdot10^{-1})$ m/s $(1\cdot10^{-3} – 1\cdot10^{3})$ m/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$=(1,6 – 3,0) %	
485	Calibration vibration shakers of 1st order	$(2\cdot10^{-8} – 1\cdot10^{-1})$ m $(1\cdot10^{-4} – 1\cdot10^{-1})$ m/s $(1\cdot10^{-1} – 1\cdot10^{3})$ m/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$ = (0,6 – 4,0) %	
486	Vibration-measuring instruments and vibration-measuring transducers of 1st order	$(1 – 1\cdot10^{4})$ m/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$ = (0,3 – 3,0) %	
487	Calibration vibration shakers of 2nd order	$(2\cdot10^{-8} – 1\cdot10^{-1})$ m $(1\cdot10^{-4} – 1\cdot10^{-1})$ m/s $(1\cdot10^{-1} – 1\cdot10^{3})$ m/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$ = (1,6 – 6,0) %	
488	Vibration-measuring instruments and vibration-measuring transducers	$(1\cdot10^{-7} – 1)$ m $(1\cdot10^{-4} – 1)$ m/s $(1\cdot10^{-3} – 1\cdot10^{4})$ m/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$ = (0,6 – 3,0) %	
489	Vibration-measuring instruments and vibration-measuring transducers. Vibrating information-measuring and controlling systems	$(1\cdot10^{-8} – 1)$ m $(1\cdot10^{-6} – 10)$ m/s $(1\cdot10^{-5} – 1\cdot10^{5})$ м/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$=(1,2 – 12,0) %	
490	Combined piezoelectric vibration-measuring transducers (impedance heads)	(1 – 8000) Hz	$U^o_{0,95}$=3,0 %	
491	Vibration analyzers	$(1\cdot10^{-8} – 1)$ m $(1\cdot10^{-6} – 10)$ m/s $(1\cdot10^{-5} – 1\cdot10^{5})$ m/s^2 $(1\cdot10^{-1} – 2\cdot10^{4})$ Hz	$U^o_{0,95}$ = (1,2 – 12,0) %	
492	Charge amplifiers	$(1\cdot10^{-2} – 1\cdot10^{4})$ mV/pC $(1\cdot10^{-1} – 1\cdot10^{5})$ Hz	$U^o_{0,95}$ = 1,2 %	
493	Parametric excitation setups of 1st order	$(1\cdot10^{1} – 4\cdot10^{3})$ m/s^2 $(2\cdot10^{2} – 5\cdot10^{4})$ µs	$U^o_{0,95}$ = (6,0 - 8,0) %	
494	Setups with peak shock accelerometer of 1st order	$(1\cdot10^{1} – 1\cdot10^{6})$ m/s^2 $(18 – 5\cdot10^{4})$ µs	$U^o_{0,95}$ = (6,0 - 8,0) %	
495	Setups with peak shock accelerometer of 2nd order	$(1\cdot10^{1} – 1\cdot10^{4})$ m/s^2 $(2\cdot10^{2} – 5\cdot10^{4})$ µs	$U^o_{0,95}$ = (6,0 – 10,0) %	
496	Shock accelerometer	$(1\cdot10^{1} – 1\cdot10^{6})$ m/s^2 $(18 – 5\cdot10^{4})$ µs	$U^o_{0,95}$ = (9,0 – 13,0) %	
497	Instruments measuring shock velocity	$(1\cdot10^{-1} – 3\cdot10^{1})$ m/s	$U^o_{0,95}$ = (3,0 – 4,0) %	
498	Instruments measuring impact energy	(0 – 2) J	$U^o_{0,95}$ = 6,0 %	
499	Angular accelerometers	$(2\cdot10^{-1} – 25\cdot10^{4})$ rad/s $(0,5 – 4\cdot10^{3})$ Hz	$U_{0,95}$ = (1 – 10) %	

1	2	3	4	5
500	Measuring channels of systems, stations, complexes, hydrologic probes for measuring sound velocity in liquids	(1402 – 1560) m/s	$U_{0,95}$ = (0,12 – 0,58) m/s	
OPTICAL AND OPTICAL-PHYSICAL MEASUREMENTS				
501	Instruments measuring solar irradiation: working measuring standards of 2nd order, actinometers, pyranometers, measuring channels of systems, stations and complexes	(10 – 1600) W/m^2	$U_{0,95}$ = (0,98·10^{2} –23,1·10^{-2}) W/m^2	
ELEMENTS OF MEASURING SYSTEMS				
502	Multichannel measurement systems for measuring hydrological parameters of the aquatic environment of seas and oceans, including marine and oceanological probing devices and profilometers, hydrological measuring equipment of drifting, towed, automatic, inhabited and autonomous surface and underwater vehicles with measuring channels and measuring transducers	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
503	Multichannel measurement systems and complexes for measuring meteorological parameters of atmospheric environment (lowest atmospheric layer), including: measuring equipment of automatic and maintained meteorological stations for synoptical observations (weather stations), profilometers, equipment for meteorological support of land and sea-based aviation, shipboard weather stations with measuring channels and measuring transducers	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
504	Measuring systems, mobile measuring complexes, measuring channels (using joint, closed series and indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
19, ul. Chaynoe ozero, Toksovo, Vsevolozhsk district, Leningrad region 188664				
MEASUREMENTS OF ELECTRIC AND MAGNETIC VALUES				
505	Instruments measuring magnetic induction of a stationary field	(1·10^{-8} – 1·10^{-3}) T (1·10^{-6} – 5·10^{-2}) T/A (0 ± 4)^{o}; (90 ± 4)^{o}	$U^{o}_{0,95}$ = (10–6·10^{-5}) % $U^{o}_{0,95}$ = (10–4·10^{-5}) % $U_{0,95}$ = (6" – 60’)	

1	2	3	4	5
506	Instruments measuring magnetic moment	$(1\cdot10^{-6} – 10^{3})$ A·m^2 $(1\cdot10^{-5} – 3\cdot10^{-2})$ Wb/(A·m^2) $(1\cdot10^{-4} – 30)$ (A·m^2)/A	$U^o_{0,95}$ = (10–0,3) %	
507	Instruments measuring magnetic susceptibility and magnetic permeability of para-, dia- and slightly ferromagnetic materials	$1\cdot10^{-5}$ – 10 (susceptibility) 1 – 20 (permeability)	$U^o_{0,95}$ = (15–1,5) % $U^o_{0,95}$ = (5–0,5) %	
ELEMENTS OF MEASURING SYSTEMS				
508	Measuring systems, mobile measuring complexes, measuring channels (using joint, closed series and indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
Sosnovka Park, Vyborgsky district, St. Petersburg 194354				
MEASUREMENTS OF GEOMETRIC QUANTITIES				
509	Distance-measuring devices	(0 – 3500) m	$U_{0,95}$ = (0,001 – 0,5) mm	
510	Electronic total station	(1 – 10000) m (0 – 360)º	$U_{0,95} = (0,2 + 1\cdot10^{-6}L)$ mm, $U_{0,95}$ = (0,2 – 5)" where L is a value numerically equal to length in millimeters	
Bldg. 5B, 29, Kozhevennaya liniya V.O., St. Petersburg 199106				
MEASUREMENTS OF ELECTRIC AND MAGNETIC VALUES				
511	Current transformers	(5 – 5000) A/1; 5 A (50; 60) Hz	$U^o_{0,95}$ = 0,01 %	
512	AC and DC shunts	$(6\cdot10^{-6}$ – 800) Ом 1 мА – 10 kA 50 Гц – 100 kHz	$U^o_{0,95}$ = 0,01 %	
513	High-voltage capacitance scaling transducers (PVE)	(6 – 330/√3) kV/ (100/3 – 230) V (50; 60) Hz	$U^o_{0,95}$ = 0,01 %	
514	Voltage transducers	(1 – 330/√3) kV/ (100/3 – 230) V (50; 60) Hz	$U^o_{0,95}$ = 0,01 %	
ELEMENTS OF MEASURING SYSTEMS				
515	Measuring systems, mobile measuring complexes, measuring channels (using joint, closed series and indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	In accordance with the scope of accreditation for all types of measurements (including indirect measurements)	
2, Verkhnyaya Podstepnovka, Volzhsky district, Samara region 443004				
MEASUREMENTS OF FLOW PARAMETERS, FLOW RATE, LEVEL, AND VOLUME				
516	Flow meters, volume and volumetric flow meters, volume and volumetric flow devices	(0,0025 – 7,5) m^3/h (0,05 – 40) m^3/h (0,9 – 500) m^3/h (2,5 – 10000) m^3/h when using a section with a volume of 2,8 m^3 (2,5 – 10000) м^3/ч when using a section with a volume of 22 m^3	$U_{0,95}$ = (0,02 – 5,0) % $U^o_{0,95}$ = 0,02 % $U^o_{0,95}$ = 0,015 % $U^o_{0,95}$ = 0,063 % $U^o_{0,95}$ = 0,024 %	
167, ul. Volchanskaya, Belgorod, 308009				
MEASUREMENTS OF FLOW PARAMETERS, FLOW RATE, LEVEL, AND VOLUME				
517	Flow meters, volume and volumetric flow meters, volume and volumetric flow devices	(4 – 3100) m^3/h	$U_{0,95}$ = (0,1 – 5) %	

1	2	3	4	5
518	Mobile facilities, fuel-dispensing units, oil dispensers	(5 – 160) l/min	$U_{0,95}$ = (0,1 – 1,0) %	
519	Hydrocarbon metering systems and stations, loading systems	(20 – 800) m^3/h	$U_{0,95}$ = (0,03 – 5,0) %	
520	Calibration facilities for calibration of pipe provers (ball and small provers)	(0,02 – 40) m^3	$U_{0,95}$ = (0,03 – 1,0) %	
521	Liquid volume, volumetric flow, mass, mass flow meters	(20 – 800) m^3/h	$U_{0,95}$ = (0,1 – 5,0) %	
Bldg. Ж, 3-7, 24th liniya V.O., St. Petersburg, 199106				
MEASUREMENTS OF ELECTRIC AND MAGNETIC VALUES				
522	High-voltage dividers and transducers	К = (1 – 10000) AC voltage (1 – 165) kV DC voltage (0,1 - 165) kV	 U^o = (0,1 – 5) % U^o = (0,1 – 5) %	
523	High-voltage measuring systems, kilovoltmeters	AC voltage (1 – 165) kV DC voltage (0,1 – 165) kV	U^o = (0,2 – 5) % U^o = (0,2 – 5) %	
524	Partial discharge measuring instruments and calibrators	(1 – 10) pC (11 – 10000) pC	$U_{0,95}$ = 1 pC U^o = (5 – 15) %	

NOTES:

1. $U_{0,95}$ is expanded uncertainty expressed in the units of the measured value;
   $U^o_{0,95}$ is relative expanded uncertainty expressed in % or in fractions of a unit.
2. In cases when an extended uncertainty is represented by a range of values, first range should be attributed to the lower value of the range, and the second range should be attributed to the upper value of the range. Expanded uncertainty values corresponding to the intermediate values of the measured quantity can be calculated by linear interpolation.

Acting Director General D.I. Mendeleyev Institute for Metrology		Anton N. Pronin
Authorized position	Signature	Name