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Instrument Transformers - Part 13: Standalone Merging Unit

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Ta slovenski standard je istoveten z: prEN IEC 61869-13:2019

[kSIST FprEN IEC 61869-13:2020](https://standards.iteh.ai/catalog/standards/sist/40b99995-ce4f-4d3b-a559-a0033e099e54/ksist-fpren-iec-61869-13-2020)

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ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
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FUNCTIONS CONCERNED: <input checked="" type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

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TITLE:

Instrument Transformers - Part 13: Standalone Merging Unit

PROPOSED STABILITY DATE: 2022

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CONTENTS

1			
2			
3	FOREWORD		6
4	INTRODUCTION		9
5	1 Scope		10
6	2 Normative reference		11
7	3 Terms and definitions		13
8	3.1 General terms and definitions		13
9	3.2 Terms and definitions related to dielectric ratings and voltages		14
10	3.3 Terms and definitions related to current ratings		14
11	3.4 Terms and definitions related to accuracy		15
12	3.7 Index of abbreviations and symbols		16
13	4 Normal and special service conditions		16
14	4.3 Special service conditions		16
15	4.3.3 Ambient temperature		16
16	5 Ratings		16
17	5.3 Rated insulation levels		16
18	5.3.2 Rated primary terminal insulation level		16
19	5.3.3 Other requirements for primary terminal insulation		16
20	5.3.4 Between-section insulation requirements		17
21	5.3.5 Insulation requirements for secondary terminals		17
22	5.3.1301 Insulation requirements for SAMU inputs from instrument transformers		17
23	5.5 Rated output		17
24	5.6 Rated accuracy class		17
25	5.6.1301 Accuracy requirements for SAMU IT channels		18
26	5.6.1301.1 Standard accuracy classes for SAMU current channels		
27	measuring accuracy class designation		18
28	5.6.1301.2 SAMU current channels with protection accuracy class designation		20
29	5.6.1301.3 Standard accuracy classes for SAMU current channels with protection		
30	accuracy class designation		21
31	5.6.1302 Standard accuracy classes for SAMU voltage channels		22
32	5.6.1303 SAMU inputs from current transformers		22
33	5.6.1304 SAMU inputs from voltage transformers		23
34	5.6.1305 SAMU settings		23
35	6 Design and construction		23
36	6.11 Electromagnetic compatibility (EMC)		23
37	6.11.3 Requirements for immunity		23
38	6.11.3.601 General		23
39	6.11.3.608 Electrical fast transient burst		25
40	6.11.3.609 Oscillatory wave immunity		25
41	6.11.3.1301 Voltage ripple on DC power supply		25
42	6.11.3.1302 Gradual shutdown and start-up test		25
43	6.11.4 Requirement for transmitted overvoltages		25
44	6.11.601 Emission requirements		25
45	6.13 Markings		25
46	6.13.1301 Terminal markings		26
47	6.13.1302 Rating plate markings		26
48	6.13.1303 Marking durability		29

49	6.607 Vibrations	29
50	7 Tests	30
51	7.1 General.....	30
52	7.1.2 List of tests	30
53	7.2 Type tests	30
54	7.2.1 General	30
55	7.2.2 Temperature-rise test	31
56	7.2.3 Impulse voltage withstand test on primary terminals	31
57	7.2.4 Wet test for outdoor type transformers	31
58	7.2.5 Electromagnetic compatibility tests	31
59	7.2.5.2.601 General.....	31
60	7.2.5.2.603 Harmonic and interharmonic disturbance test.....	31
61	7.2.5.2.604 Slow voltage variation test	32
62	7.2.5.2.605 Voltage dips and short interruption test.....	32
63	7.2.5.2.606 Surge immunity test	32
64	7.2.5.2.607 Conducted immunity tests (150 kHz to 80 MHz)	32
65	7.2.5.2.608 Conducted immunity tests (0 Hz to 150 kHz).....	32
66	7.2.5.2.609 Electronic fast transient/burst test.....	33
67	7.2.5.2.610 Damped oscillatory wave immunity test.....	33
68	7.2.5.2.611 Electrostatic discharge test.....	33
69	7.2.5.2.612 Power-frequency magnetic field immunity test.....	33
70	7.2.5.2.613 Pulse magnetic field immunity test.....	33
71	7.2.5.2.614 Damped oscillatory magnetic field immunity test	33
72	7.2.5.2.615 Radiated, radiofrequency, electromagnetic field immunity test	33
73	7.2.5.2.1301 Voltage ripple on DC power supply.....	34
74	7.2.5.2.1302 Gradual shutdown.....	34
75	7.2.5.601 EMC emission tests	34
76	7.2.6 Test for accuracy.....	34
77	7.2.6.601 General	34
78	7.2.6.1301 Test for error at limiting conditions for protection rated current channels.....	35
79	7.2.6.1302 High-pass filter cut-off frequency measurement	36
80	7.2.8 Enclosure tightness test at ambient temperature.....	36
81	7.2.9 Pressure test for the enclosure	36
82	7.2.601 Low-voltage component voltage withstand test	36
83	7.2.601.2 Application of the test voltage	36
84	7.2.601.3 Power-frequency voltage withstand test.....	37
85	7.2.601.4 Impulse voltage withstand test.....	37
86	7.2.1301 Climatic environmental requirements	37
87	7.2.1301.1 Dry-heat test – Operational.....	37
88	7.2.1301.2 Cold test – Operational	38
89	7.2.1301.3 Dry-heat test at maximum storage temperature.....	38
90	7.2.1301.4 Cold test at minimum storage temperature	38
91	7.2.1301.5 Damp-heat test	38
92	7.2.1301.6 Cyclic temperature with humidity.....	38
93	7.2.1302 Mechanical tests.....	38
94	7.2.1302.1 Vibration	38
95	7.2.1302.2 Shock	38
96	7.2.1302.3 Bump	38
97	7.2.1302.4 Seismic.....	38

98	7.3	Routine tests.....	38
99	7.3.1	Power-frequency voltage withstand test on primary terminals	38
100	7.3.2	Partial discharge measurement.....	38
101	7.3.3	Power-frequency voltage withstand test between sections	39
102	7.3.4	Power-frequency voltage withstand test on secondary terminals	39
103	7.3.5	Test for accuracy	39
104	7.3.6	Verification of markings	39
105	7.3.601	Power-frequency voltage withstand test for low-voltage components	39
106	7.4	Special tests	39
107	7.4.601	Vibration tests	39
108	7.4.601.1	Vibrations test for secondary parts.....	39
109	7.4.601.2	Vibration test for primary parts.....	39
110	7.4.601.2.1	Vibration test for primary parts during short-time current.....	39
111	7.5	Sample tests	39
112	8	Rules for transport, storage, erection, operation and maintenance.....	40
113	9	Safety.....	40
114	9.1301	General.....	40
115	9.1302	Product safety requirements	40
116	Annex 13A (informative)	Measurement chain accuracy class considerations	41
117	Annex 13B (informative)	Measurement examples of switching and lightning surge	
118		voltage in gas-insulated switchgear	43
119	Annex 13C (normative)	Low power instrument transformer inputs	54
120	13C.1	Introduction.....	54
121	13C.2	Accuracy class.....	54
122	13C.3	Rated input voltage.....	54
123	13C.4	LPIT input insulation requirements	54
124	13C.5	LPIT input connectors	54
125	13C.6	LPIT Input impedance	55
126	13C.7	Input topology	55
127	13C.8	Auxiliary power supply output	55
128	13C.9	LPIT specific SAMU Settings	55
129	13C.10	Testing	56
130	Bibliography.....		57
131			
132	Figure 1301	SAMU position in relation to other devices in the functional chain	9
133	Figure 1302	– Stand-alone merging unit (concept example).....	10
134	Figure 1303	– Stand-alone merging unit application example.....	11
135	Figure 1304	– Specified input current time constant T_I	15
136	Figure 1305	– Dynamic range concept example	20
137	Figure 1306	– SAMU ports subjected to EMC tests	31
138	Figure 1307	– C-O-C-O duty cycle	35
139	Figure 13A.1	– SAMU application example	41
140	Figure 13B.1	– constructional example of GIS with typical surge voltage sources	43
141	Figure 13B.2	– Measured 550kV GIS construction	44
142	Figure 13B.3	– Measurement results showing a switching surge peak voltage	
143		magnitude caused by the DS operation in Figure 13B.2	45
144	Figure 13B.4	– Measured 275kV GIS construction	46

145	Figure 13B.5 – Switching and lightning surge voltage waveforms.....	47
146	Figure 13B.6 – Switching surge voltage measurement setup on a 550kV GIS	
147	with/without an insulating flange surge absorber	48
148	Figure 13B.7 – Switching surge voltage measurement results when the DS was	
149	operated with/without the surge absorber.....	49
150	Figure 13B.8 – CT secondary circuit configuration for the 500 kV GIS	50
151	Figure 13B.9 – DS control circuit configuration for the 500 kV GIS test	50
152	Figure 13B.10 – Waveforms of switching surge voltage at measured point I (see Table	
153	13B.3).....	51
154	Figure 13B.11 – Block diagram of the electronic VT with amplifier tested in the 500 kV	
155	GIS system	52
156	Figure 13B.12 – Lightning surge voltage as a function of surge absorbing capacitor	
157	value.....	52
158	Figure 13B.13 – Lightning surge voltage as a function of coaxial cable length	53
159		
160	Table 1301 – Insulation requirements for SAMU inputs	17
161	Table 1302 – Limits of current error and phase error for SAMU measuring accuracy	
162	current channels	19
163	Table 1303 – Limits of current errors for SAMU TPS class rated protection accuracy	
164	current channels	21
165	Table 1304 – Limits of voltage error and phase error for SAMU voltage channels	22
166	Table 1305 – SAMU TCTR class settings.....	23
167	Table 1306 – SAMU TVTR class settings.....	23
168	Table 1307 – Immunity requirements and tests.....	24
169	Table 1308 – Acceptance criteria for EMC immunity tests.....	25
170	Table 1309 – SAMU rating plate markings	27
171	Table 1310 – Ratings exposed through IEC 61850-7-4	29
172	Table 1311 – Mechanical vibration tests applied to the enclosure port	30
173	Table 10 – List of tests.....	30
174	Table 13A.1 – Combined accuracy class table	41
175	Table 13B.1 – Measurement results showing switching and lightning surge voltage	
176	recorded for the setup in Figure 13B.4	46
177	Table 13B.2 – Measurement results of switching surge voltage on CT secondary circuit.....	50
178	Table 13B.3 – Measurement results showing the switching surge voltage coupling to	
179	the DS control circuit	50
180	Table 13C1 – ITRat setting units.....	55
181		
182		

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSTRUMENT TRANSFORMERS –

Part 13: Stand-alone merging unit (SAMU)

FOREWORD

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International Standard IEC 61869-13 has been prepared by IEC technical committee 38: Instrument transformers.

The text of this standard is based on the following documents:

FDIS	Report on voting
38/XX/FDIS	38/XX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is Part 13 of IEC 61869, published under the general title *Instrument transformers*.

This document contains specific requirements for a stand-alone merging units having a digital output and is to be used with IEC 61869-9:2016, *Digital Interface for instrument transformers*, and the relevant specific requirements standard for the instrument transformer concerned. It is also to be read in conjunction with, and is based on, IEC 61869-6:2016, *Additional General requirements for low-power instrument transformers*, which in turn is based on IEC 61869-1:2007, *General requirements*.

This Part 13 follows the structure of IEC 61869-1:2007 and IEC 61869-6:2016 and supplements or modifies its corresponding clauses.

When a particular subclause of Part 1 or Part 6 is not mentioned in this Part 13, that subclause applies. When this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 or Part 6 is to be adapted accordingly.

For additional clauses, subclauses, figures, tables, annexes or note, the following numbering system is used:

- clauses, subclauses, tables, figures and notes that are numbered starting from 1301 are additional to those in Part 1 and Part 6;
- additional annexes are lettered 13A, 13B, etc.

An overview of the planned set of standards at the date of publication of this document is given below. The updated list of standards issued by IEC TC 38 is available at the website: www.iec.ch

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PRODUCT FAMILY STANDARDS	PRODUCT STANDARD	PRODUCTS	OLD STANDARD
61869-1 GENERAL REQUIREMENTS FOR INSTRUMENT TRANSFORMERS	61869-2	ADDITIONAL REQUIREMENTS FOR CURRENT TRANSFORMERS	60044-1 60044-6
	61869-3	ADDITIONAL REQUIREMENTS FOR INDUCTIVE VOLTAGE TRANSFORMERS	60044-2
	61869-4	ADDITIONAL REQUIREMENTS FOR COMBINED TRANSFORMERS	60044-3
	61869-5	ADDITIONAL REQUIREMENTS FOR CAPACITOR VOLTAGE TRANSFORMERS	60044-5
	61869-6 ADDITIONAL GENERAL REQUIREMENTS FOR LOW-POWER INSTRUMENT TRANSFORMERS	61869-7	60044-7
		61869-8	60044-8
		61869-9	
		61869-10	
		61869-11	60044-7
		61869-12	
		61869-13	
		61869-14	
		61869-15	

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253

254 The committee has decided that the contents of this document will remain unchanged until the
 255 stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to
 256 the specific document. At this date, the document will be

- 257 • reconfirmed,
 258 • withdrawn,
 259 • replaced by a revised edition, or
 260 • amended.

261

262 The National Committees are requested to note that for this document the stability date
 263 is 2023 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE
 264 DELETED AT THE PUBLICATION STAGE.

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266

INTRODUCTION

General

This document is an IEC 61869 series product standard which defines additional requirements for a stand-alone merging unit (SAMU). The SAMU output may be used by many devices and is therefore of interest to multiple technical committees: in addition to TC 38, e.g.: TC 57: Power systems management and associated information exchange, TC 95: Measuring relays and protective equipment, TC 13: Electrical energy measurement and control, TC 85: Measuring equipment for electrical and electromagnetic quantities, and TC 17: High-voltage switchgear and controlgear as shown in Figure 1301.

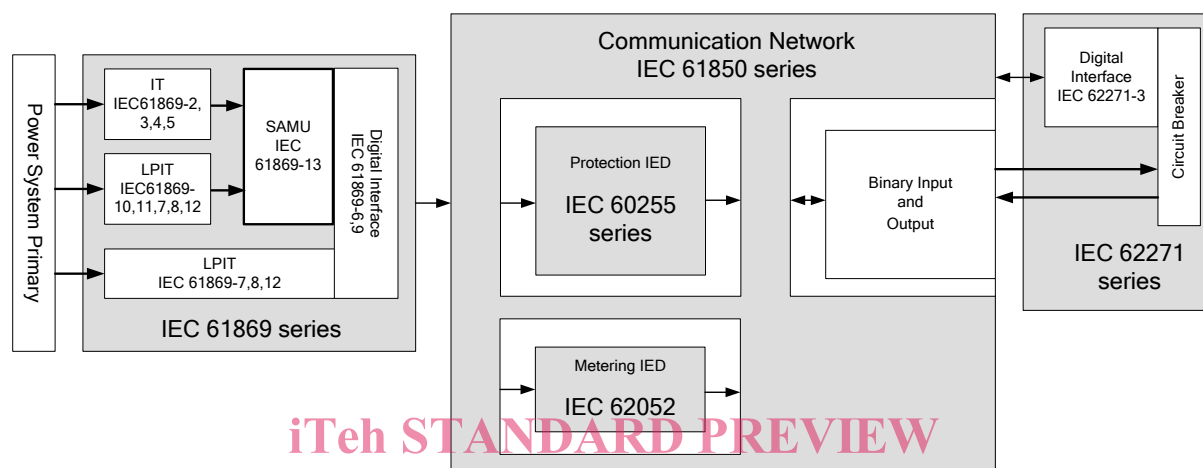


Figure 1301 SAMU position in relation to other devices in the functional chain

Position of this document in relation to TC57 IEC 61850 (all parts)

IEC 61850 (all parts) is a standard series used to define various aspects of power utility communications. Its applicability to this document is inherited through IEC 61869-9 which defines applicable sample rates and a digital interface in accordance with IEC 61850-9-2 and related standards.

Position of this document in relation to TC 95 IEC 60255 (all parts)

IEC 60255 (all parts) standardizes the design and performance aspects applicable to measuring relays and protection equipment used in the various fields of electrical engineering. Since the SAMU is an integral part of the digital substation-based protection system, its EMC performance and environmental aspects are considered for harmonization with IEC 60255-1, IEC 60255-26 and safety aspects defined in IEC 60255-27.

Position of this document in relation to TC 13 IEC 62052 (all parts) and IEC 62053 (all parts)

IEC 62052 (all parts) and IEC 62053 (all parts) provide standardization in the field of AC and DC electrical energy measurement and control. Since the SAMU digital output may be used as input to energy measurement devices its accuracy and EMC performance aspects should be considered; but are not fully defined in this edition.

Position of this document in relation to TC 17 IEC 62271 (all parts)

IEC 62271 (all parts) applies to AC switchgear and controlgear designed for indoor and/or outdoor installation and for operation at service frequencies up to and including 60 Hz on systems having rated voltages above 1 000 V. Similar to IEC 62271-3 which defines the switchgear interface based on IEC 61850, this document defines the SAMU which may be installed inside the same switchgear cabinet and is therefore subject to the same environmental stress.

INSTRUMENT TRANSFORMERS –

Part 13: Stand-alone Merging Unit (SAMU)

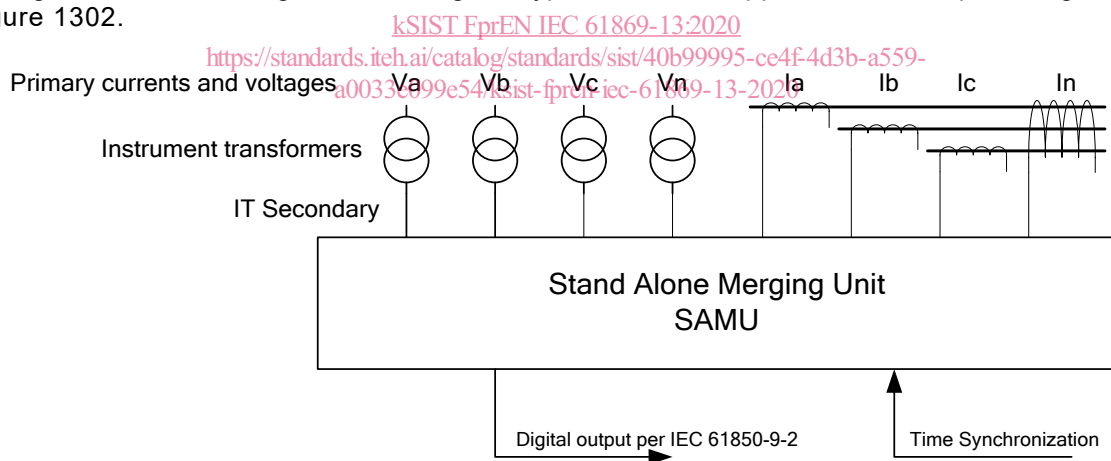
1 Scope

Clause 1 of IEC 61869-1:2007 is applicable, with the following addition:

This part of IEC 61869 is a product standard and covers only additional requirements for stand-alone merging units (SAMUs) used for AC applications having rated frequencies from 15 Hz to 100 Hz. The digital output format specification is not covered by this document. It is standardized in IEC 61869-9 as an application of IEC 61850, which specifies the power utility communication architecture.

This document covers SAMUs having standardized analogue inputs (for example: 1 A, 5 A, 3,25 V / $\sqrt{3}$ or 100 V / $\sqrt{3}$) provided by instrument transformers compliant with relevant product standards (both valid and withdrawn e.g., IEC 61869-2 to IEC 61869-5, IEC 61869-10, IEC 61869-11, IEC 60044-1 to IEC 60044-6, IEC 60185, IEC 60186, IEEE C57.13), and aims to convert them to the digital output compliant with IEC 61869-9. Other input and output types are out of the scope of this document. Appropriate SAMU functionality can be combined with switchgear controller functionality defined in IEC 62271-3 or other IED functionality defined in IEC 60255 (all parts).

The general block diagram showing a typical SAMU application example is given in Figure 1302.

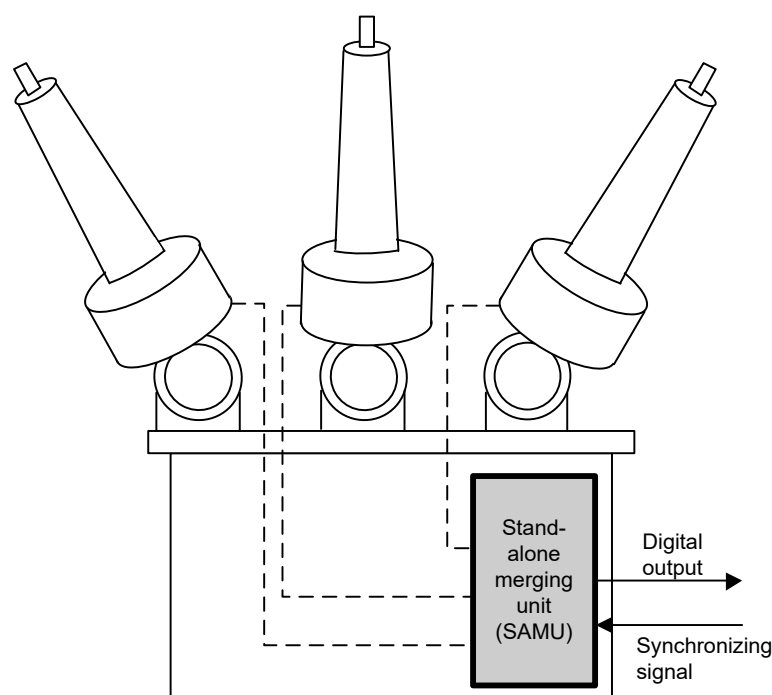


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Figure 1302 – Stand-alone merging unit (concept example)

An application example showing a three-phase dead tank circuit breaker equipped with bushing type current transformers and a stand-alone merging unit mounted inside the breaker control cabinet is shown in Figure 1303.

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Figure 1303 – Stand-alone merging unit application example

331

332 2 Normative reference

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333 Clause 2 of IEC 61869-1:2007 is applicable with the following additions:

334 IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

335 IEC 60255-1, *Measuring relays and protection equipment – Part 1: Common requirements*

336 IEC 60255-21-1, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on*
337 *measuring relays and protection equipment – Section One: Vibration tests (sinusoidal)*

338 IEC 60255-21-2, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on*
339 *measuring relays and protection equipment – Section Two: Shock and bump tests*

340 IEC 60255-21-3, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on*
341 *measuring relays and protection equipment – Section 3: Seismic tests*

342 IEC 60255-26, *Measuring relays and protection equipment – Part 26: Electromagnetic*
343 *compatibility requirements*

344 IEC 60255-27:2013, *Measuring relays and protection equipment – Part 27: Product safety*
345 *requirements*

346 IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and*
347 *measurement techniques – Electrostatic discharge immunity test*

- 348 IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and*
 349 *measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test,*
 350 *Amendment 1:2007, Amendment 2:2010*
- 351 IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and*
 352 *measurement techniques – Electrical fast transient/burst immunity test*
- 353 IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and*
 354 *measurement techniques – Surge immunity test*
- 355 IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and*
 356 *measurement techniques – Immunity to conducted disturbances, induced by radio-frequency*
 357 *fields, Corrigendum 1:2015*
- 358 IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8 Testing and*
 359 *measurement techniques – Power frequency magnetic field immunity test*
- 360 IEC 61000-4-9:2016, *Electromagnetic compatibility (EMC) – Part 4-9 Testing and*
 361 *measurement techniques – Impulse magnetic field immunity test*
- 362 IEC 61000-4-10:2016, *Electromagnetic compatibility (EMC) – Part 4-10 Testing and*
 363 *measurement techniques – Damped oscillatory magnetic field immunity test*
- 364 IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11 Testing and*
 365 *measurement techniques – Voltage dips, short interruptions and voltage variations immunity*
 366 *tests, Amendment 1: 2017*
- 367 IEC 61000-4-16:2015, *Electromagnetic compatibility (EMC) – Part 4-16 Testing and*
 368 *measurement techniques – Test for immunity to conducted, common mode disturbances in*
 369 *the frequency range 0 Hz to 150 kHz*
- 370 IEC 61000-4-17:1999, *Electromagnetic compatibility (EMC) – Part 4-17: Testing and*
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- 379 IEC 61869-1:2007, *Instrument transformers – Part 1: General requirements*
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 385 *transformers*

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 389 *passive voltage transformers*

390 **3 Terms and definitions**

391 Clause 3 of IEC 61869-1:2007, Clause 3 of IEC 61869-6:2016 and Clause 3 of IEC 61869-
 392 9:2016 apply with the following additions:

393 **3.1 General terms and definitions**

394 Port definitions given below are required for EMC testing terminology harmonization with IEC
 395 60255-26.

396 **3.1.1301**

397 **Port**

398 access to SAMU where electromagnetic energy or signals may be supplied or received or
 399 where the SAMU variables may be observed or measured

400 [SOURCE: IEC 60050-321:1986, 131-12-60, modified – replaced "device or network" by "SAMU"]

401 **3.1.1302**

402 **auxiliary power supply port**

403 port which provides SAMU AC or DC auxiliary energizing input

404 **3.1.1303**

405 **communication port**

406 port which provides interface with a communication and/or control system and is permanently
 407 connected to the SAMU

408 EXAMPLE Ethernet based digital output port, 1 PPS port, etc.

409 **3.1.1304**

410 **enclosure port**

411 physical boundary of the SAMU through which electromagnetic fields may radiate or impinge

412 [SOURCE: IEC 60050-321:1986, 445-07-04, modified – replaced "time relay" by "SAMU"]

413 **3.1.1305**

414 **functional earth port**

415 port which provides SAMU connection to earth for purposes other than electrical safety

416 **3.1.1306**

417 **input port**

418 port through which the SAMU is energized or controlled in order to perform its function(s)

419 EXAMPLE Current and voltage transformer inputs, etc.

420 **3.1.1307**

421 **output port**

422 port through which the SAMU produces predetermined changes

423 EXAMPLE Binary alarm output connected to substation battery, etc.

424 **3.1.1308**

425 **output stream**

426 combination of multiple output channels brought together into a single digital message

427 Note 1 to entry: All channels in the stream share a common time stamp and a common sample rate in accordance
 428 with IEC 61869-9.