



**SLOVENSKI STANDARD**  
**oSIST prEN 61869-13:2019**  
**01-april-2019**

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**Merilni transformatorji - 13. del: Samostojni koncentrador**

Instrument Transformers - Part 13: Standalone Merging Unit

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

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**ICS:**

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
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# 38/599/CDV

## COMMITTEE DRAFT FOR VOTE (CDV)

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IEC TC 38 : INSTRUMENT TRANSFORMERS	
SECRETARIAT: Italy	SECRETARY: Mr Filippo Frugoni
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 13,TC 57,TC 85,TC 95	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input checked="" type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING <b>Attention IEC-CENELEC parallel voting</b> 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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## INSTRUMENT TRANSFORMERS –

### Part 13: Stand-alone merging unit (SAMU)

#### FOREWORD

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

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

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

228  
229  
230

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.

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

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



234 This document contains specific requirements for a stand-alone merging units having a digital  
235 output and is to be used with IEC 61869-9:2016, *Digital Interface for instrument transformers*,  
236 and the relevant specific requirements standard for the instrument transformer concerned. It  
237 is also to be read in conjunction with, and is based on, IEC 61869-6:2016, *Additional General*  
238 *requirements for low-power instrument transformers*, which in turn is based on IEC 61869-  
239 1:2007, *General requirements*.

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

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

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

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

250 An overview of the planned set of standards at the date of publication of this document is  
251 given below. The updated list of standards issued by IEC TC 38 is available at the website:  
252 [www.iec.ch](http://www.iec.ch)

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PRODUCT FAMILY STANDARDS	PRODUCT STANDARD	PRODUCTS	OLD STANDARD	
<b>61869-1</b> GENERAL REQUIREMENTS FOR INSTRUMENT TRANSFORMERS	<b>61869-2</b>	ADDITIONAL REQUIREMENTS FOR CURRENT TRANSFORMERS	60044-1 60044-6	
	<b>61869-3</b>	ADDITIONAL REQUIREMENTS FOR INDUCTIVE VOLTAGE TRANSFORMERS	60044-2	
	<b>61869-4</b>	ADDITIONAL REQUIREMENTS FOR COMBINED TRANSFORMERS	60044-3	
	<b>61869-5</b>	ADDITIONAL REQUIREMENTS FOR CAPACITOR VOLTAGE TRANSFORMERS	60044-5	
	<b>61869-6</b> ADDITIONAL GENERAL REQUIREMENTS FOR LOW-POWER INSTRUMENT TRANSFORMERS	<b>61869-7</b>	ADDITIONAL REQUIREMENTS FOR ELECTRONIC VOLTAGE TRANSFORMERS	60044-7
		<b>61869-8</b>	ADDITIONAL REQUIREMENTS FOR ELECTRONIC CURRENT TRANSFORMERS	60044-8
		<b>61869-9</b>	DIGITAL INTERFACE FOR INSTRUMENT TRANSFORMERS	
		<b>61869-10</b>	ADDITIONAL REQUIREMENTS FOR LOW-POWER PASSIVE CURRENT TRANSFORMERS	
		<b>61869-11</b>	ADDITIONAL REQUIREMENTS FOR LOW-POWER PASSIVE VOLTAGE TRANSFORMERS	60044-7
		<b>61869-12</b>	ADDITIONAL REQUIREMENTS FOR COMBINED ELECTRONIC INSTRUMENT TRANSFORMERS AND COMBINED STAND-ALONE INSTRUMENT TRANSFORMERS	
		<b>61869-13</b>	STAND-ALONE MERGING UNIT	
		<b>61869-14</b>	ADDITIONAL REQUIREMENTS FOR CURRENT TRANSFORMERS FOR DC APPLICATIONS	
	<b>61869-15</b>	ADDITIONAL REQUIREMENTS FOR VOLTAGE TRANSFORMERS FOR DC APPLICATIONS		

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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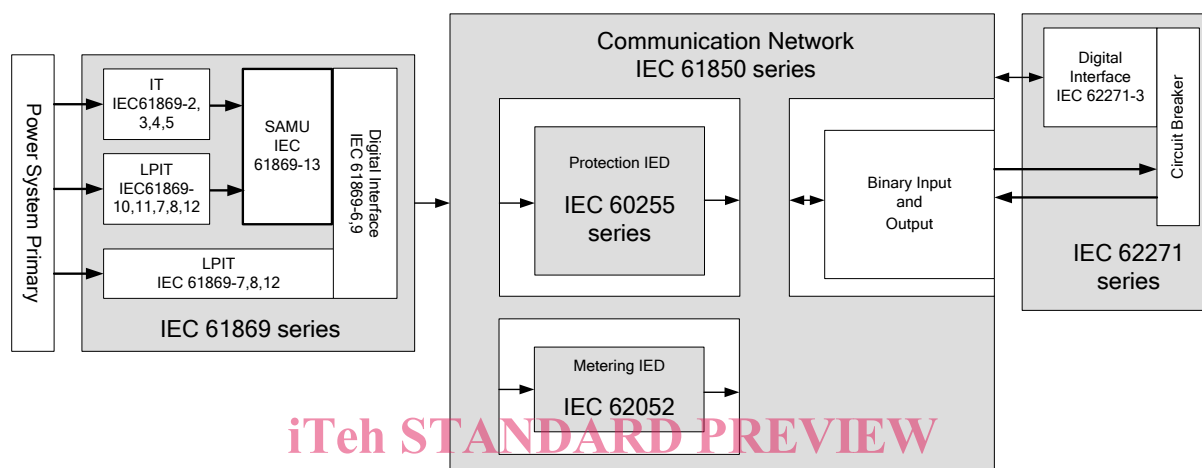
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267

## INTRODUCTION

268 **General**

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



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

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

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

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

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

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

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

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

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

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## INSTRUMENT TRANSFORMERS –

### Part 13: Stand-alone Merging Unit (SAMU)

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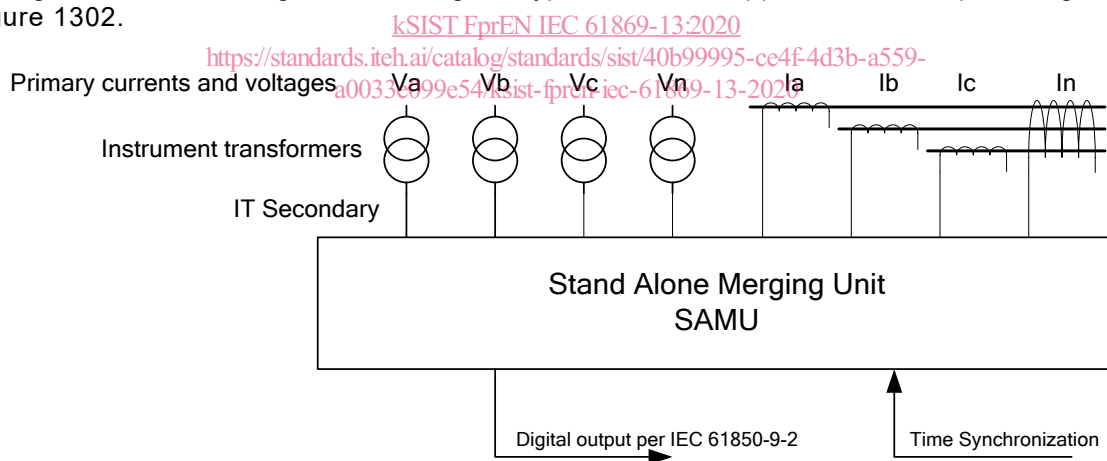
#### 309 1 Scope

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

311 This part of IEC 61869 is a product standard and covers only additional requirements for  
312 stand-alone merging units (SAMUs) used for AC applications having rated frequencies from  
313 15 Hz to 100 Hz. The digital output format specification is not covered by this document. It is  
314 standardized in IEC 61869-9 as an application of IEC 61850, which specifies the power utility  
315 communication architecture.

316 This document covers SAMUs having standardized analogue inputs (for example: 1 A, 5 A,  
317  $3,25\text{ V} / \sqrt{3}$  or  $100\text{ V} / \sqrt{3}$ ) provided by instrument transformers compliant with relevant product  
318 standards (both valid and withdrawn e.g., IEC 61869-2 to IEC 61869-5, IEC 61869-10, IEC  
319 61869-11, IEC 60044-1 to IEC 60044-6, IEC 60185, IEC 60186, IEEE C57.13), and aims to  
320 convert them to the digital output compliant with IEC 61869-9. Other input and output types  
321 are out of the scope of this document. Appropriate SAMU functionality can be combined with  
322 switchgear controller functionality defined in IEC 62271-3 or other IED functionality defined in  
323 IEC 60255 (all parts).

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

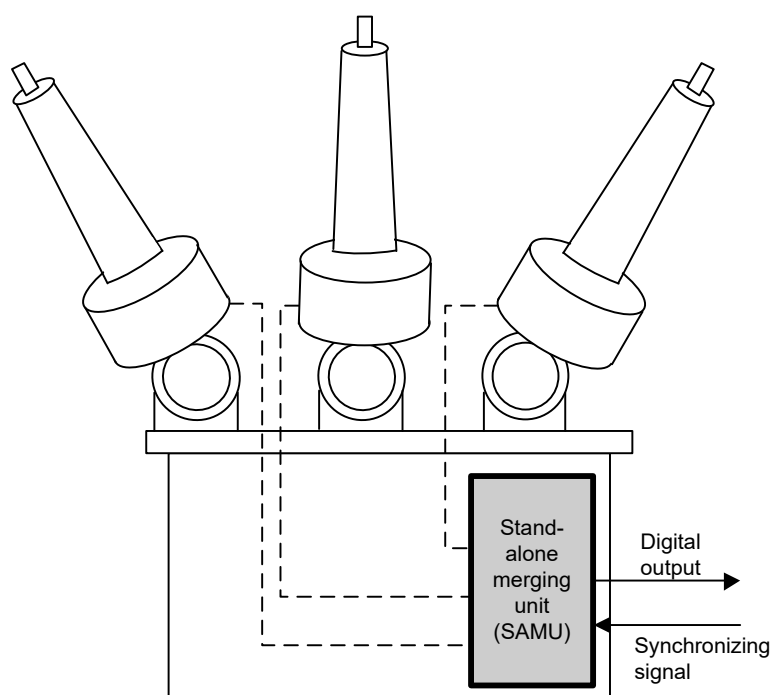


326

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

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

330



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IEC

Figure 1303 – Stand-alone merging unit application example

331

## 2 Normative reference

332

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

<https://standards.iteh.ai/catalog/standards/sist/40b99995-ce4f-4d3b-a559-a0033e099e54/ksist-fpren-iec-61869-13-2020>

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 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 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 measuring relays and protection equipment – Section 3: Seismic tests*

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

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

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

347

- 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*  
 371 *measurement techniques – Ripple on d.c. input power port immunity test, Amendment 1:2001,*  
 372 *Amendment 2:2008*
- 373 IEC 61000-4-18:2006, *Electromagnetic compatibility (EMC) – Part 4-18 Testing and*  
 374 *measurement techniques – Damped oscillatory wave immunity test, Amendment 1:2010*
- 375 IEC 61000-4-29:2000, *Electromagnetic compatibility (EMC) – Part 4-29 Testing and*  
 376 *measurement techniques – Voltage dips, short interruptions and voltage variations on d.c.*  
 377 *input power port immunity tests*
- 378 CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment - Emission requirements*
- 379 IEC 61869-1:2007, *Instrument transformers – Part 1: General requirements*
- 380 IEC 61869-2:2012, *Instrument transformers – Part 2: Additional requirements for current*  
 381 *transformers*
- 382 IEC 61869-6:2016, *Instrument transformers – Part 6: Additional general requirements for low-*  
 383 *power instrument transformers*
- 384 IEC 61869-9:2016, *Instrument transformers – Part 9: Digital interface for instrument*  
 385 *transformers*

386 IEC 61869-10:2017, *Instrument transformers – Part 10: Additional requirements for low-power*  
387 *passive current transformers*

388 IEC 61869-11:2017, *Instrument transformers – Part 11: Additional requirements for low-power*  
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.