



SLOVENSKI STANDARD SIST EN IEC 61968-13:2021

01-junij-2021

Nadomešča:
SIST EN 61968-13:2008

Združevanje aplikacij pri oskrbi z električno energijo - Sistemski vmesniki za upravljanje distribucije - 13. del: Skupni profili modela moči v distribuciji

Application integration at electric utilities - System interfaces for distribution management - Part 13: Common distribution power system model profiles

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN IEC 61968-13:2021](https://standards.iteh.ai/catalog/standards/sist/8927c6be-bd6e-4462-a200-00000055ac42/sist-en-iec-61968-13-2021)

Ta slovenski standard je istoveten z: **EN IEC 61968-13:2021**

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST EN IEC 61968-13:2021

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN IEC 61968-13:2021](https://standards.iteh.ai/catalog/standards/sist/8927c6be-bd6e-4462-a200-06066b35de42/sist-en-iec-61968-13-2021)

<https://standards.iteh.ai/catalog/standards/sist/8927c6be-bd6e-4462-a200-06066b35de42/sist-en-iec-61968-13-2021>

EUROPEAN STANDARD

EN IEC 61968-13

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2021

ICS 33.200

Supersedes EN 61968-13:2008 and all of its
amendments and corrigenda (if any)

English Version

Application integration at electric utilities - System interfaces for
distribution management - Part 13: Common distribution power
system model profiles
(IEC 61968-13:2021)

Intégration d'applications pour les services électriques -
Interfaces système pour la gestion de la distribution - Partie
13: Profils de modèle commun de système électrique de
distribution
(IEC 61968-13:2021)

Integration von Anwendungen in Anlagen der
Elektrizitätsversorgung - Systemschnittstellen für
Netzführung - Teil 13: Allgemeine Profile zur Modellierung
von Verteilnetzen
(IEC 61968-13:2021)

This European Standard was approved by CENELEC on 2021-04-20. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 61968-13:2021 (E)**European foreword**

The text of document 57/2311/FDIS, future edition 2 of IEC 61968-13, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61968-13:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-01-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-04-20

This document supersedes EN 61968-13:2008 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

iTech **Endorsement notice** **PREVIEW** (standards.iteh.ai)

The text of the International Standard IEC 61968-13:2021 was approved by CENELEC as a European Standard without any modification.

[SIST EN IEC 61968-13:2021](https://standards.iteh.ai/catalog/standards/sist/8927c6be-bd6e-4462-a200-0000055dc42/sist-en-iec-61968-13-2021)

<https://standards.iteh.ai/catalog/standards/sist/8927c6be-bd6e-4462-a200-0000055dc42/sist-en-iec-61968-13-2021>

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61970-600-1 ¹	NOTE	Harmonized as EN IEC 61970-600-1 ²
IEC 61970-600-2 ³	NOTE	Harmonized as EN IEC 61970-600-2 ⁴
IEC 61968-1	NOTE	Harmonized as EN IEC 61968-1
IEC 61970-456	NOTE	Harmonized as EN IEC 61970-456
IEC 61970-453	NOTE	Harmonized as EN 61970-453
IEC 61968-4:2019	NOTE	Harmonized as EN IEC 61968-4:2019 (not modified)
IEC 61968-8:2015	NOTE	Harmonized as EN 61968-8:2016 (not modified)
IEC 60909 (series)	NOTE	Harmonized as EN 60909 (series)
IEC 61850-7-3	NOTE	Harmonized as EN 61850-7-3
IEC 61968-3	NOTE	Harmonized as EN IEC 61968-3
IEC 62559-2:2015	NOTE	Harmonized as EN 62559-2:2015 (not modified)

¹ Under preparation. Stage at the time of publication: IEC PRVC 61970-600-1:2020.

² Under preparation. Stage at the time of publication: FprEN IEC 61970-600-1:2021.

³ Under preparation. Stage at the time of publication: IEC PRVC 61970-600-2:2020.

⁴ Under preparation. Stage at the time of publication: FprEN IEC 61970-600-2:2021.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/TS 61968-2	-	Application integration at electric utilities - System interfaces for distribution management - Part 2: Glossary	-	-
IEC 61968-11	2013	Application integration at electric utilities - System interfaces for distribution management - Part 11: Common information model (CIM) extensions for distribution	EN 61968-11	2013
IEC 61970-301	2020	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	EN IEC 61970-301	2020
IEC 61970-452	-	Energy management system application program interface (EMS-API) - Part 452: CIM static transmission network model profiles	EN 61970-452	-
IEC 61970-501	2006	Energy management system application program interface (EMS-API) - Part 501: Common Information Model Resource Description Framework (CIM RDF) schema	EN 61970-501	2006
IEC 61970-552	2016	Energy management system application program interface (EMS-API) - Part 552: CIMXML Model exchange format	EN 61970-552	2016
IEC 62325-301	-	Framework for energy market communications - Part 301: Common information model (CIM) extensions for markets	EN IEC 62325-301	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN IEC 61968-13:2021](#)

<https://standards.iteh.ai/catalog/standards/sist/8927c6be-bd6e-4462-a200-06066b35de42/sist-en-iec-61968-13-2021>



INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Application integration at electric utilities – System interfaces for distribution management –
Part 13: Common distribution power system model profiles**

**Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –
Partie 13: Profils de modèle commun de système électrique de distribution**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.200

ISBN 978-2-8322-9305-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	25
INTRODUCTION.....	28
1 Scope.....	29
2 Normative references	29
3 Terms, definitions and abbreviated terms	30
3.1 Terms and definitions.....	30
3.2 Abbreviated terms.....	31
4 Use Cases list	31
4.1 Use Cases related to the Common Distribution Power System Model Profiles.....	31
4.2 Use Case overview table.....	34
5 Distribution network modelling specificities and CIM related issues resolved	35
5.1 Feeder modelling	35
5.2 Partial-phase devices modelling.....	36
5.3 Manage LV cables in catalog	37
5.4 Observability Area (informative).....	38
6 CIM Distribution Power System Model Profiles	39
6.1 General.....	39
6.2 Top package General.....	43
6.3 Package Functional	45
6.3.1 General	45
6.3.2 Package Standard	58
6.4 Package ElectricalProperties	151
6.4.1 General	151
6.4.2 Package Standard	154
6.5 Package Topology	180
6.5.1 General	180
6.5.2 Package Standard	181
6.6 Package SteadyStateHypothesis.....	187
6.6.1 General	187
6.6.2 Package Standard	189
6.7 Package StateVariables	201
6.7.1 General	201
6.7.2 Package Standard	203
6.8 Package Geographical	206
6.8.1 General	206
6.8.2 Package Standard	207
6.9 Package DiagramLayout	210
6.9.1 General	210
6.9.2 Package Standard	212
6.10 Package Assets	217
6.10.1 General	217
6.10.2 Package Standard	218
6.11 Package AssetCatalog	228
6.11.1 General	228
6.11.2 Package Standard	233
6.12 Package Customers	252

6.12.1	General	252
6.12.2	Package Standard	253
7	Top package DataTypes	259
7.1	General.....	259
7.2	Package PrimitiveTypes.....	259
7.3	Package CIMDataTypes.....	260
7.4	Package CIMEnumerations	261
7.4.1	General	261
7.4.2	AsynchronousMachineKind enumeration.....	262
7.4.3	OrientationKind enumeration	262
7.4.4	AnchorKind enumeration.....	262
7.4.5	UndergroundStructureKind enumeration	262
7.4.6	WindGenUnitKind enumeration	263
7.4.7	SinglePhaseKind enumeration	263
7.4.8	PetersenCoilModeKind enumeration	263
7.4.9	SynchronousMachineKind enumeration	264
7.4.10	UnitSymbol enumeration.....	264
7.4.11	StructureSupportKind enumeration	269
7.4.12	WireMaterialKind enumeration	269
7.4.13	WindingConnection enumeration	270
7.4.14	TransformerControlMode enumeration	270
7.4.15	GeneratorControlSource enumeration	270
7.4.16	WireUsageKind enumeration	271
7.4.17	InUseStateKind enumeration	271
7.4.18	PhaseCode enumeration	271
7.4.19	SVCControlMode enumeration	272
7.4.20	StructureMaterialKind enumeration	272
7.4.21	CurveStyle enumeration	273
7.4.22	DeploymentStateKind enumeration	273
7.4.23	UnitMultiplier enumeration	273
7.4.24	RegulatingControlModeKind enumeration	274
7.4.25	RetiredReasonKind enumeration	275
7.4.26	AssetLifecycleStateKind enumeration	275
7.4.27	PSREventKind enumeration.....	275
7.4.28	Source enumeration	276
7.4.29	AssetKind enumeration.....	276
7.4.30	OperationalLimitDirectionKind enumeration	277
7.4.31	BusbarConfiguration enumeration.....	277
7.4.32	CableShieldMaterialKind enumeration	277
7.4.33	AssetModelUsageKind enumeration.....	277
7.4.34	WireInsulationKind enumeration	278
7.4.35	SynchronousMachineOperatingMode enumeration	278
7.4.36	CableOuterJacketKind enumeration.....	279
7.4.37	CableConstructionKind enumeration	279
7.4.38	HydroPlantStorageKind enumeration	279
7.4.39	BreakerConfiguration enumeration.....	280
7.5	Package CompoundTypes	281
Annex A (informative)	Use case	282
A.1	Overview.....	282

A.2	Provision of DSO network model and state to TSO	282
A.2.1	Description of the use case	282
A.2.2	Diagrams of use case	285
A.2.3	Technical details.....	286
A.2.4	Step by step analysis of use case	286
A.2.5	Information exchanged	291
A.2.6	Requirements (optional)	291
A.2.7	Common terms and definitions.....	291
A.2.8	Custom information (optional).....	291
Annex B (informative)	Extensions and proposals.....	292
B.1	Package Functional	292
B.1.1	Package Standard	292
B.1.2	Package (Informative) InfIEC61970	320
B.1.3	Package (Informative) InfExtensions.....	321
B.2	Package ElectricalProperties	325
B.2.1	General	325
B.2.2	Package Standard	326
B.3	Package Assets	326
B.3.1	Package Standard	326
B.3.2	Package (Informative) InfIEC61968	327
B.3.3	Package (Informative) InfExtensions.....	329
B.4	Package AssetCatalog	332
B.4.1	Package Standard	332
B.4.2	Package (Informative) InfIEC61968	337
B.4.3	Package (Informative) InfExtensions.....	340
B.5	Package Customers + Package Standard + PricingStructure.....	345
B.6	Top package DataTypes	345
B.6.1	Package EntsoeExtensionsTypes	345
B.6.2	Package NEKnoExtensionsTypes	347
Annex C (informative)	CDPSM MV/LV urban and rural network.....	350
Annex D (informative)	CDPSM MV/LV urban network.....	351
Annex E (informative)	CDPSM MV urban and rural network	352
Annex F (informative)	CDPSM usage in H2020 TDX-ASSIST	354
Annex G (informative)	Nuclear distribution network.....	360
Annex H (informative)	Observability Area concept	361
Annex I (informative)	CDPSM to CGMES conversion	363
Annex J (informative)	Norwegian Electrotechnical Committee (NEK) CDPSM Use Cases	365
J.1	General.....	365
J.2	Provision of Network Operator asset model to System Operator and Regulator	365
Bibliography	369
Figure 1	– Feeder containment principles	36
Figure 2	– UML Wire arrangement (informative).....	38
Figure 3	– Main steps for profiling CIM	39
Figure 4	– UML CDPSM profiles (informative).....	40

Figure 5 – CDPSM interoperability scheme	42
Figure 6 – Network Model Management overview	43
Figure 7 – Package diagram General::CDPSM Profiles	44
Figure 8 – Package diagram Functional::Functional	45
Figure 9 – Class diagram Functional::Functional_Core_Base	46
Figure 10 – Class diagram Functional::Functional_Core_connectivity_containment	46
Figure 11 – Class diagram Functional::Functional_Cuts and Jumpers	47
Figure 12 – Class diagram Functional::Functional_DC	47
Figure 13 – Class diagram Functional::Functional_AuxiliaryEquipment	48
Figure 14 – Class diagram Functional::Functional_Equivalent	48
Figure 15 – Class diagram Functional::Functional_Feeder	49
Figure 16 – Class diagram Functional::Functional_Generation	49
Figure 17 – Class diagram Functional::Functional_LoadModel	50
Figure 18 – Class diagram Functional::Functional_MeasControl	50
Figure 19 – Class diagram Functional::Functional_MeasMeas	51
Figure 20 – Class diagram Functional::Functional_Operation	52
Figure 21 – Class diagram Functional::Functional_OperationalLimits	53
Figure 22 – Class diagram Functional::Functional_Protection	53
Figure 23 – Class diagram Functional::Functional_SCADA	54
Figure 24 – Class diagram Functional::Functional_Status	54
Figure 25 – Class diagram Functional::Functional_Transformer	55
Figure 26 – Class diagram Functional::Functional_Wires_Base	56
Figure 27 – Class diagram Functional::Functional_Wires_Regulating	57
Figure 28 – Class diagram Functional::Functional_Wires_Switches	58
Figure 29 – Package diagram ElectricalProperties::ElectricalProperties	151
Figure 30 – Class diagram ElectricalProperties::ElectricalProperties	152
Figure 31 – Class diagram ElectricalProperties::ElectricalProperties_ConductingEquipments	153
Figure 32 – Class diagram Standard::Standard	154
Figure 33 – Package diagram Topology::Topology	180
Figure 34 – Class diagram Topology::Topology	181
Figure 35 – Package diagram SteadyStateHypothesis::SteadyStateHypothesis	187
Figure 36 – Class diagram SteadyStateHypothesis::SteadyStateHypothesis	188
Figure 37 – Class diagram StateVariables::StateVariables	201
Figure 38 – Class diagram StateVariables::StateVariables_inheritance	202
Figure 39 – Package diagram StateVariables::StateVariables	202
Figure 40 – Package diagram Geographical::Geographical	206
Figure 41 – Class diagram Geographical::Geographical	207
Figure 42 – Package diagram DiagramLayout::DiagramLayout	210
Figure 43 – Class diagram DiagramLayout::DiagramLayout	211
Figure 44 – Package diagram Assets::Assets	217
Figure 45 – Class diagram Assets::Assets	218
Figure 46 – Package diagram AssetCatalog::AssetCatalog	228

Figure 47 – Class diagram AssetCatalog::AssetCatalog-Operators	229
Figure 48 – Class diagram AssetCatalog::AssetInfo-Model-Constructor relationships	230
Figure 49 – Class diagram AssetCatalog::AssetInfos-Cables	231
Figure 50 – Class diagram AssetCatalog::AssetInfos-Transformers	232
Figure 51 – Class diagram AssetCatalog::AssetInfos Others	233
Figure 52 – Class diagram Customers::Customers	252
Figure 53 – Package diagram Customers::Customers	253
Figure 54 – Package diagram DataTypes::DataTypes	259
Figure 55 – Class diagram PrimitiveTypes::Primitives	259
Figure 56 – Class diagram CIMDataTypes::CIMDataTypes	260
Figure 57 – Class diagram CIMEnumerations::enumerations-CIM	261
Figure 58 – Class diagram CompoundTypes::CompoundTypes	281
Figure B.1 – Class diagram (Informative) InfIEC61970::Functional_WeatherStation	320
Figure B.2 – Class diagram (Informative) InfNEKExtensions::InfNEKSubstation	321
Figure B.3 – Class diagram (Informative) InfNEKExtensions::InfNEKLine	322
Figure B.4 – Class diagram (Informative) InfNEKExtensions::InfNEKAuxiliaryEquipment	322
Figure B.5 – Class diagram (Informative) InfEntsoeExtensions::InfEntsoeRateTemperature	325
Figure B.6 – Class diagram (Informative) InfCDPSMExtensions::InfCDPSMOrganisationRole	329
Figure B.7 – Class diagram (Informative) InfNEKExtensions::InfNEKOrganisationRole	331
Figure B.8 – Class diagram (Informative) InfIEC61968::Catalog-Entries	337
Figure B.9 – Class diagram (Informative) InfIEC61968::ShuntCompensatorInfo	338
Figure B.10 – Class diagram (Informative) InfCDPSMExtensions::InfCDPSMOrganisationRole	340
Figure B.11 – Class diagram (Informative) InfNEKExtensions::InfNEKLine	342
Figure B.12 – Class diagram (Informative) InfNEKExtensions::InfNEKWireEarthInfo	343
Figure C.1 – MV/LV urban and rural network on satellite map	350
Figure D.1 – MV/LV urban network on satellite map	351
Figure E.1 – MV urban and rural network on satellite map	352
Figure F.1 – Tool-set and Data sets used by EDF R&D	355
Figure F.2 – Network Data Set layout without model reductions	356
Figure F.3 – Aggregation of a downstream network	357
Figure F.4 – Result of several aggregations	358
Figure F.5 – DisNetSimpl Model reductions and other options examples	358
Figure F.6 – Network Pre-processing configuration Menu	359
Figure G.1 – Nuclear distribution network	360
Figure H.1 – Concept of observability area	361
Figure H.2 – Possibilities for TSOs data exchange with distribution-connected SGUs	362
Figure I.1 – Principle of PSR related class and Asset related class for CDPSM	363
Figure I.2 – Data Set transformation between CDSPM and CGMES	364
Table 1 – Document overview for IEC 61968-13	28
Table 2 – Identified Business Use Cases	32

Table 3 – Identified requirements	34
Table 4 – Business Use Cases related to CDP5M	34
Table 5 – Attributes of Standard::Accumulator	58
Table 6 – Association ends of Standard::Accumulator with other classes	59
Table 7 – Attributes of Standard::AccumulatorLimit	59
Table 8 – Association ends of Standard::AccumulatorLimit with other classes	59
Table 9 – Attributes of Standard::AccumulatorLimitSet	59
Table 10 – Association ends of Standard::AccumulatorLimitSet with other classes	60
Table 11 – Attributes of Standard::AccumulatorReset	60
Table 12 – Association ends of Standard::AccumulatorReset with other classes	60
Table 13 – Attributes of Standard::AccumulatorValue	61
Table 14 – Association ends of Standard::AccumulatorValue with other classes	61
Table 15 – Attributes of Standard::ACDCConverter	61
Table 16 – Association ends of Standard::ACDCConverter with other classes	62
Table 17 – Attributes of Standard::ACDCTerminal	62
Table 18 – Attributes of Standard::ACLineSegment	63
Table 19 – Association ends of Standard::ACLineSegment with other classes	63
Table 20 – Attributes of Standard::ACLineSegmentPhase	63
Table 21 – Association ends of Standard::ACLineSegmentPhase with other classes	64
Table 22 – Attributes of Standard::ActivePowerLimit	64
Table 23 – Association ends of Standard::ActivePowerLimit with other classes	64
Table 24 – Attributes of Standard::ActivityRecord	65
Table 25 – Attributes of Standard::Analog	65
Table 26 – Association ends of Standard::Analog with other classes	65
Table 27 – Attributes of Standard::AnalogControl	66
Table 28 – Association ends of Standard::AnalogControl with other classes	66
Table 29 – Attributes of Standard::AnalogLimit	66
Table 30 – Association ends of Standard::AnalogLimit with other classes	67
Table 31 – Attributes of Standard::AnalogLimitSet	67
Table 32 – Association ends of Standard::AnalogLimitSet with other classes	67
Table 33 – Attributes of Standard::AnalogValue	67
Table 34 – Association ends of Standard::AnalogValue with other classes	68
Table 35 – Attributes of Standard::ApparentPowerLimit	68
Table 36 – Association ends of Standard::ApparentPowerLimit with other classes	68
Table 37 – Attributes of Standard::AuxiliaryEquipment	69
Table 38 – Association ends of Standard::AuxiliaryEquipment with other classes	69
Table 39 – Attributes of Standard::BaseVoltage	69
Table 40 – Attributes of Standard::BasicIntervalSchedule	70
Table 41 – Attributes of Standard::Bay	70
Table 42 – Association ends of Standard::Bay with other classes	70
Table 43 – Attributes of Standard::Breaker	71
Table 44 – Association ends of Standard::Breaker with other classes	71
Table 45 – Attributes of Standard::BusbarSection	72

Table 46 – Association ends of Standard::BusbarSection with other classes	72
Table 47 – Attributes of Standard::Clamp	73
Table 48 – Association ends of Standard::Clamp with other classes	73
Table 49 – Attributes of Standard::Command	74
Table 50 – Association ends of Standard::Command with other classes	74
Table 51 – Attributes of Standard::ConductingEquipment	74
Table 52 – Association ends of Standard::ConductingEquipment with other classes	75
Table 53 – Attributes of Standard::Conductor	75
Table 54 – Association ends of Standard::Conductor with other classes	75
Table 55 – Attributes of Standard::ConformLoad	76
Table 56 – Association ends of Standard::ConformLoad with other classes	76
Table 57 – Attributes of Standard::ConformLoadGroup	76
Table 58 – Association ends of Standard::ConformLoadGroup with other classes	77
Table 59 – Attributes of Standard::ConformLoadSchedule	77
Table 60 – Association ends of Standard::ConformLoadSchedule with other classes	77
Table 61 – Attributes of Standard::ConnectivityNode	78
Table 62 – Association ends of Standard::ConnectivityNode with other classes	78
Table 63 – Attributes of Standard::ConnectivityNodeContainer	78
Table 64 – Association ends of Standard::ConnectivityNodeContainer with other classes	78
Table 65 – Attributes of Standard::Connector	79
Table 66 – Association ends of Standard::Connector with other classes	79
Table 67 – Attributes of Standard::Control	79
Table 68 – Association ends of Standard::Control with other classes	80
Table 69 – Attributes of Standard::CsConverter	80
Table 70 – Association ends of Standard::CsConverter with other classes	80
Table 71 – Attributes of Standard::CurrentLimit	81
Table 72 – Association ends of Standard::CurrentLimit with other classes	81
Table 73 – Attributes of Standard::CurrentTransformer	81
Table 74 – Association ends of Standard::CurrentTransformer with other classes	82
Table 75 – Attributes of Standard::Cut	82
Table 76 – Association ends of Standard::Cut with other classes	83
Table 77 – Attributes of Standard::DayType	83
Table 78 – Attributes of Standard::Disconnecter	84
Table 79 – Association ends of Standard::Disconnecter with other classes	84
Table 80 – Attributes of Standard::Discrete	85
Table 81 – Association ends of Standard::Discrete with other classes	85
Table 82 – Attributes of Standard::DiscreteValue	85
Table 83 – Association ends of Standard::DiscreteValue with other classes	86
Table 84 – Attributes of Standard::EarthFaultCompensator	86
Table 85 – Association ends of Standard::EarthFaultCompensator with other classes	86
Table 86 – Attributes of Standard::EnergyArea	87
Table 87 – Attributes of Standard::EnergyConsumer	87

Table 88 – Association ends of Standard::EnergyConsumer with other classes.....	87
Table 89 – Attributes of Standard::EnergyConsumerPhase	88
Table 90 – Association ends of Standard::EnergyConsumerPhase with other classes	88
Table 91 – Attributes of Standard::EnergySource.....	88
Table 92 – Association ends of Standard::EnergySource with other classes	89
Table 93 – Attributes of Standard::Equipment	89
Table 94 – Association ends of Standard::Equipment with other classes.....	90
Table 95 – Attributes of Standard::EquipmentContainer	90
Table 96 – Association ends of Standard::EquipmentContainer with other classes	90
Table 97 – Attributes of Standard::EquivalentEquipment.....	91
Table 98 – Association ends of Standard::EquivalentEquipment with other classes.....	91
Table 99 – Attributes of Standard::EquivalentInjection	91
Table 100 – Association ends of Standard::EquivalentInjection with other classes	92
Table 101 – Attributes of Standard::ExternalNetworkInjection	92
Table 102 – Association ends of Standard::ExternalNetworkInjection with other classes	92
Table 103 – Attributes of Standard::FaultIndicator	93
Table 104 – Association ends of Standard::FaultIndicator with other classes	93
Table 105 – Attributes of Standard::Feeder.....	93
Table 106 – Association ends of Standard::Feeder with other classes	94
Table 107 – Attributes of Standard::Fuse.....	94
Table 108 – Association ends of Standard::Fuse with other classes.....	95
Table 109 – Attributes of Standard::GeneratingUnit.....	95
Table 110 – Association ends of Standard::GeneratingUnit with other classes	95
Table 111 – Attributes of Standard::GeographicalRegion	96
Table 112 – Attributes of Standard::Ground	96
Table 113 – Association ends of Standard::Ground with other classes.....	96
Table 114 – Attributes of Standard::GroundDisconnecter	97
Table 115 – Association ends of Standard::GroundDisconnecter with other classes.....	97
Table 116 – Attributes of Standard::GroundingImpedance	97
Table 117 – Association ends of Standard::GroundingImpedance with other classes	98
Table 118 – Attributes of Standard::HydroGeneratingUnit.....	98
Table 119 – Association ends of Standard::HydroGeneratingUnit with other classes.....	98
Table 120 – Attributes of Standard::HydroPowerPlant.....	99
Table 121 – Association ends of Standard::HydroPowerPlant with other classes	99
Table 122 – Attributes of Standard::HydroPump.....	99
Table 123 – Association ends of Standard::HydroPump with other classes	100
Table 124 – Attributes of Standard::IdentifiedObject	100
Table 125 – Attributes of Standard::Jumper	101
Table 126 – Association ends of Standard::Jumper with other classes.....	101
Table 127 – Attributes of Standard::Junction.....	102
Table 128 – Association ends of Standard::Junction with other classes	102
Table 129 – Attributes of Standard::Limit	102
Table 130 – Attributes of Standard::LimitSet	103