

ICS 29.240.01
CCS F 21



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 43259.301-2024

**Energy management system application program interface
(EMS-API) - Part 301: Common information model (CIM) base**

能量管理系统应用程序接口（EMS-API）第301部分：公共信息模型（CIM）基
础

(English Translation)

Issued on: December 31, 2024

Implemented on: July 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 CIM Specification	
4.1 Overview	
4.2 CIM modeling notation	
4.3 CIM Package	
4.4 CIM Classes and Relationships	
4.4.1 Class	
4.4.2 Generalization	
4.4.3 Simple Association	
4.4.4 Aggregation	
4.5 CIM model concepts and examples	
4.5.1 Concept	
4.5.2 Containers, device hierarchy and naming	
4.5.2.1 Container structure	
4.5.2.2 IdentifiedObject Class	
4.5.3 Naming Model	
4.5.4 Connection Relationship Model	
4.5.4.1 Connection relationship description	
4.5.4.2 Connection relationship and container example	
4.5.5 Inheritance Hierarchy	
4.5.6 Transformer model	
4.5.7 Transformer Tap Modeling	
4.5.7.1 Generalized Tap Modeling	
4.5.7.2 Modeling of voltage regulating transformer	
4.5.7.3 Regulating transformer table modeling	
4.5.7.4 Modeling of Linear Phase-Shifting Transformer	
4.5.7.5 Modeling of symmetric and asymmetric phase shifters	
4.5.7.5.1 Public Information	

- 4.5.7.5.2 Symmetrical Phase Shifter
- 4.5.7.5.3 Quadrature booster
- 4.5.7.5.4 Asymmetric phase shifter
- 4.5.7.5.5 In-phase transformer and symmetrical phase shifter
- 4.5.7.5.6 In-phase transformer and asymmetrical phase shifter
- 4.5.7.6 Tabular Modeling of Phase-Shifting Transformer
- 4.5.7.7 Tap control
- 4.5.8 Phase modeling
- 4.5.9 Grounding Equipment Modeling
 - 4.5.9.1 Grounding Equipment Modeling Use Case
 - 4.5.9.2 Model
 - 4.5.9.3 CIM Instance Model Example
- 4.5.10 Cutting tools, fixtures and jumper models
- 4.5.11 Measurement and control
 - 4.5.11.1 Measurement Overview
 - 4.5.11.2 Control Overview
 - 4.5.11.3 Use of measurement related classes
 - 4.5.11.4 Measurement correlation
- 4.5.12 Regulation control model
- 4.5.13 CIM DC Model
 - 4.5.13.1 Introduction
 - 4.5.13.2 Basic design of HVDC
 - 4.5.13.3 HVDC power flow modelling
 - 4.5.13.4 Data Model
 - 4.5.13.5 Example Figure
- 4.5.14 Static VAR Compensator Voltage Regulation Characteristics
 - 4.5.14.1 Background
 - 4.5.14.2 CIM Model
- 4.5.15 ICCP Configuration Model
 - 4.5.15.1 Configuration Use Case
 - 4.5.15.2 Information Model
- 4.5.16 Feeder Model
- 4.5.17 Control Area Modeling
- 4.6 Modeling Guidelines
 - 4.6.1 Model changes

- 4.6.2 CIM Modification Process
- 4.6.3 Changes to the CIMUML model
- 4.6.4 Modification of CIM standard documents
- 4.6.5 Deprecation
- 4.6.6 CIM subset
- 4.7 Modeling Tools
- 4.8 User Implementation Rules
 - 4.8.1 Rules outside UML
 - 4.8.2 Number of Terminals in ConductingEquipment Object
 - 4.8.3 Nominal quantity
 - 4.8.4 Data Types
- 4.9 CIM Modeling Example
- 5 Detailed Model
 - 5.1 Overview
 - 5.2 Context
- 6 Base package
 - 6.1 Overview
 - 6.2 Domain Package
 - 6.2.1 Overview
 - 6.2.2 Active Power Class (ActivePower) Data Type
 - 6.2.6 Admittance data type
 - 6.2.7 AngleDegrees data type
 - 6.2.8 AngleRadians data type
 - 6.2.9 Apparent Power Data Type
 - 6.2.10 Area data type
 - 6.2.11 Boolean Basic Type
 - 6.2.12 Capacitance Data Type
 - 6.2.14 Classification data type
 - 6.2.15 Conductance data type
 - 6.2.17 CostPerEnergyUnit data type
 - 6.2.18 CostPerHeatUnit data type
 - 6.2.19 CostPerVolume Data Type
 - 6.2.20 CostRate Data Type
 - 6.2.21 Currency Enumeration Type
 - 6.2.22 CurrentFlow Data Type

- 6.2.23 Damping (system frequency characteristics) class (Damping) data type
- 6.2.24 Date Class (Date) Basic Type
- 6.2.25 DateInterval composite type
- 6.2.26 DateTime Basic Type
- 6.2.27 DateTimeInterval composite type
- 6.2.28 Decimal Basic Type
- 6.2.29 DecimalQuantity composite type
- 6.2.30 Displacement data type
- 6.2.31 Duration Class (Duration) Basic Type
- 6.2.32 Emission data type
- 6.2.33 Floating point class (Float) basic type
- 6.2.34 FloatQuantity data type
- 6.2.35 Frequency data type
- 6.2.36 Heat Rate Class (HeatRate) Data Type
- 6.2.37 Hours data type
- 6.2.38 Impedance data type
- 6.2.39 Inductance Data Type
- 6.2.41 Integer Basic Type
- 6.2.42 IntegerQuantity Data Type
- 6.2.43 KiloActivePower data type
- 6.2.44 Length data type
- 6.2.45 Mass data type
- 6.2.46 Minutes data type
- 6.2.47 Money Data Type
- 6.2.48 MonthDay Basic Type
- 6.2.49 MonthDayInterval Composite Type
- 6.2.50 Per Unit (PU) Data Type
- 6.2.51 Percentage (PerCent) data type
- 6.2.52 Pressure data type
- 6.2.53 Reactance Data Type
- 6.2.55 Reactive Power Class (ReactivePower) Data Type
- 6.2.56 RealEnergy data type
- 6.2.57 Resistance Data Type
- 6.2.59 RotationSpeed data type
- 6.2.60 Seconds data type