RDS 81346 for Power Systems

Introduction

This A3 booklet presents the new common language for the Energy Power Sector, **RDS-PS**, and at the same time compare it with former RDS for Power Plants (PP) where relevant.

There is a **significant shift in mindset**, that you must be aware of to understand the new PS edition: The old ISO/TS 81346-10 (2015) are dealing with Power Plants (PP) where focus are on coding principles, to the new generic Power Systems (PS) where focus are on systems and system elements, which then are designated with RDS.

The new open standard, ISO 81346-10 (2022), known as RDS-PS, is now an International Standard (IS). Get started and spend some time to familiarize yourself with the **differences between old PP and new PS in this document**.

On the following pages we have drawn the line so you can compare **old PP (left side)** and **new PS (right side)**.

We hope that you will find this new document useful and look forward to seeing how the community uses this new approach of systems thinking to their benefit. Comments and feedback are most welcome!

Best regards,
Knowledge Center of Reference Designations
RDS 81346 Technique ApS

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	RDS-Power Plants (PP)	RDS-Power Systems (PS)	
A.	Fixed syntax	Flexible syntax	3
B.	Old aspect mindset	New multi aspect designation	4
C.	Old focus on code	New focus on structure	5
D.	No type aspect	Introduction to the new type aspect	6
E.	No copy effect	New method for copying design	7
F.	Division in parts	One Standard for all power systems	8
G.	Numbers used to subclassify	Numbers carry no information	9

RDS-Power Plants (PP)

Breakdown level		0	1		2	
Section		0	1	2	3	4
Number/type of data position	=	AN(N)	AAA	NN	AA	NNN

Prefix

Designation of main systems according to project-specific stipulation

Classification of systems and subsystems according to VGB-B 101

Subdivision of a system and/or subsystem e.g. in lines, sections

Classification of technical objects according to VGB-B 102

Numbering of technical objects

=T1	BDA10	QA001

=T1 Main system T1

BDA10 Medium voltage electrical supply system for safety services, voltage level 1 part of an electrical auxiliary power supply system → VGB-B 101

QA001 Circuit-breaker → VGB-B 102

Information in designation code:

“Circuit breaker, that is part of

Medium voltage electrical supply system for safety services, voltage level 1, in an Electrical auxiliary power supply system, in

Main system T1”

RDS-Power Systems (PS)

Breakdown level	0	1			2			...	X		
Number/type of data position	<X>	P	L	N	.	L	N	...	.	L	N

Topnode (optional)

Prefix

Prefix or “.” sign

Classification letter code

Number

<123>	=B1	=HD1	=QAB1

<123> Reference to context (optional)

=B1 Power supply system, transporting electric power → 1

=HD1 Supply system for electrical energy → 2

=QAB1 Electric circuit breaker → 3

RDS 81346 classification tables

Information in designation code:

“Circuit breaker 1 in

electrical energy supply system 1 in

the electrical power transportation system”

1: RDS 81346-10 table AA.1: Power systems
2: RDS 81346-10 table AA.2: Technical systems
3: RDS 81346-2 table 3: Component systems

RDS-Power Plants (PP)

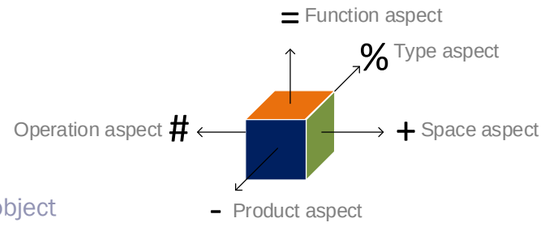
Aspects are used to specify the different abstraction level of systems and equipment

Equipment designation meaning:
Generator system C01, gear oil conveyance, drive motor 1, connection point 1

Equipment in RDS-PP represents the individual component and are identified by product number, settings, barcodes etc.

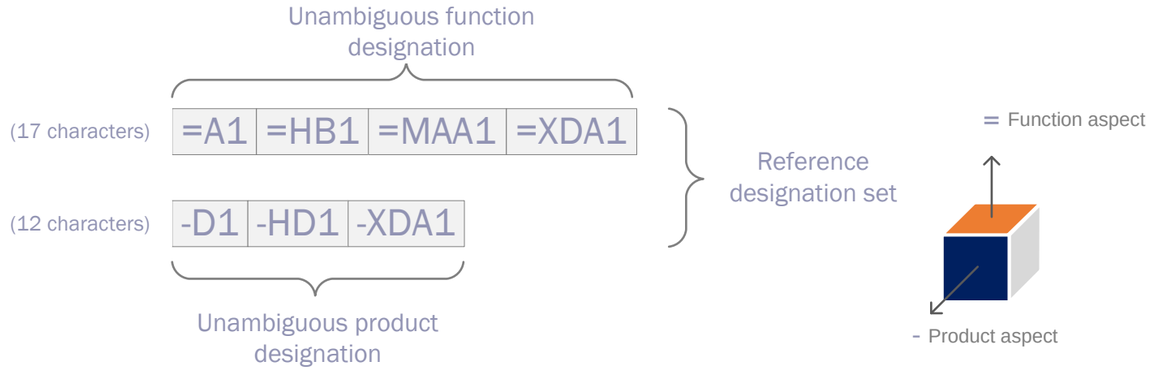
It is important to note the product aspect designation is in itself unambiguous. There is only a need to express two designations as a *reference designation set* when the two aspects product and functional are implemented by the same object.

RDS-Power Systems (PS)



Aspects are used to represent different viewpoints of object occurrences

RDS-PS can only designate the occurrence of an object and never the individual.



Function aspect meaning:

Wind turbine generator system, lubrication system, motor system, low voltage connection cable.

Product aspect meaning:

Support generator system, power transportation system, cable system.

Functional aspect:

The functional aspect is used in an function oriented system breakdown structure. This structure does not take into consideration how the systems is constructed.
In this example the cable is part of the motor in a function oriented view.

Product aspect:

The product aspect is used in an construction oriented breakdown structure. This structure does not take into consideration the function of the system but how the system is physically built.
In this example the cable physically part of the generator system.

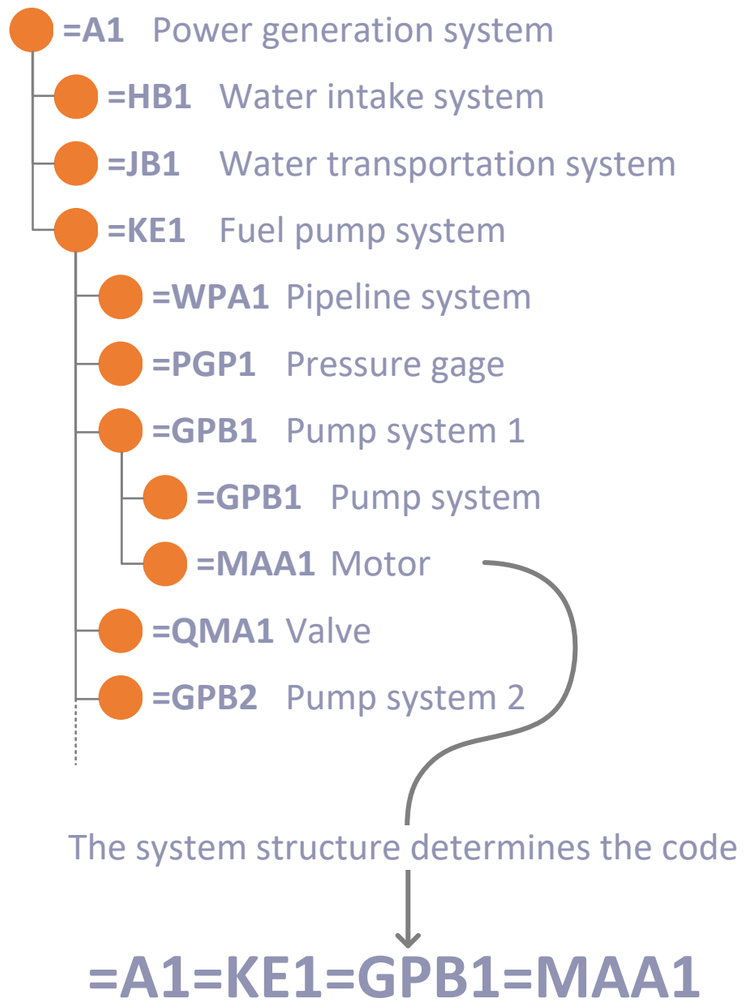
RDS-Power Plants (PP)

Code
In focus

=T1 BDA10 QA001	High pressure valve 1
=T1 JDA10 MA001	Valve motor 1
=T1 BDA10 QA011	Return flow valve 1
=T1 JDA10 MA021	Backup motor 2
=T1 BDA10 QA031	Backup motor 1
=T1 JDA11 MA001	System 3 motor 1
=T1 BDA12 QA101	Forward flow valve 1
=T1 JDA12 MA001	Valve motor 1

RDS-Power Systems (PS)

Structure
In focus



RDS-Power Plants (PP)

The 3 letter classification scheme in VGB-B 101 contains very specific codes, that classifies different types of systems

This is restricting the structure to a limited amount of types.
Some types might not be covered.

BBA	Medium voltage electrical main supply system 1, voltage level 1
BBB	Medium voltage electrical main supply system 1, voltage level 2
...	...
BFA	Low voltage electrical main supply system 1, voltage level 1
BFB	Low voltage electrical main supply system 1, voltage level 2
BFC	Low voltage electrical main supply system 1, voltage level 3
...	...

RDS-Power Systems (PS)

The new Type aspect %

The new 81346-1 has introduced the type aspect which makes it possible to structure as many type of systems as needed.

This makes the modelling options flexible and usable across all fields.

Power supply types structure

- **%HD1** High Voltage main supply system
- **%HD2** Medium Voltage main supply system
- **%HD3** Low Voltage main supply system

*Example of tailored company **type of** structure. **%HD1** is an **unambiguous reference** to a type of electrical supply system*

RDS-PS utilizes Reference designation set to describe how the same object is represented in two structures. This is usefull when referencing types.

The reference designation set below is both designating the system and the system type

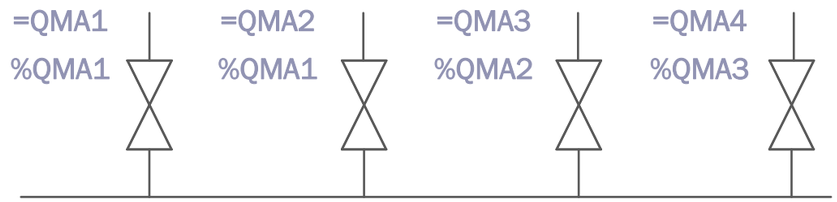
=A1.HD1 / %HD1

- Reference to the type of “High voltage main supply system”
- Unambiguous reference to the technical system

Type aspect %

Use cases

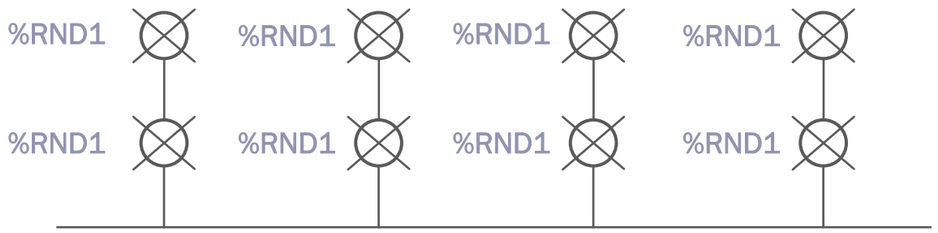
Utilizing the types aspect, there are significant potential to save time in tagging and design.
Units and technical systems designs may be reused throughout a system model.
RDS-Power Systems allows unambiguously identification of types, by having supporting documentation.



Supporting documentation

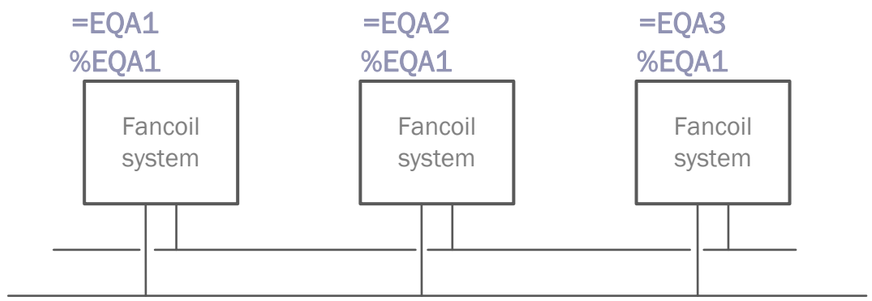
The valves are designated with a reference designation set.
They are represented both in the functional aspect and the type aspect

%QMA1	Valve diameter Ø50
%QMA2	Valve diameter Ø60
%QMA3	Valve diameter Ø55



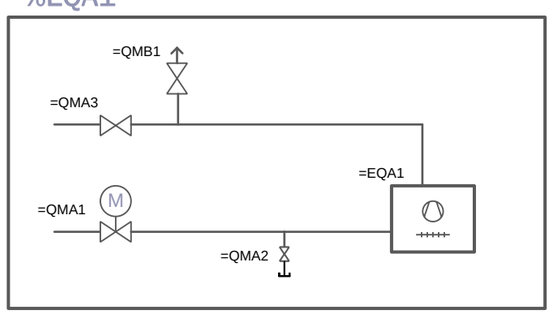
The sprinklers only get a type designation.
This allows a designer to copy information.

%RND1	Sprinkler type 1



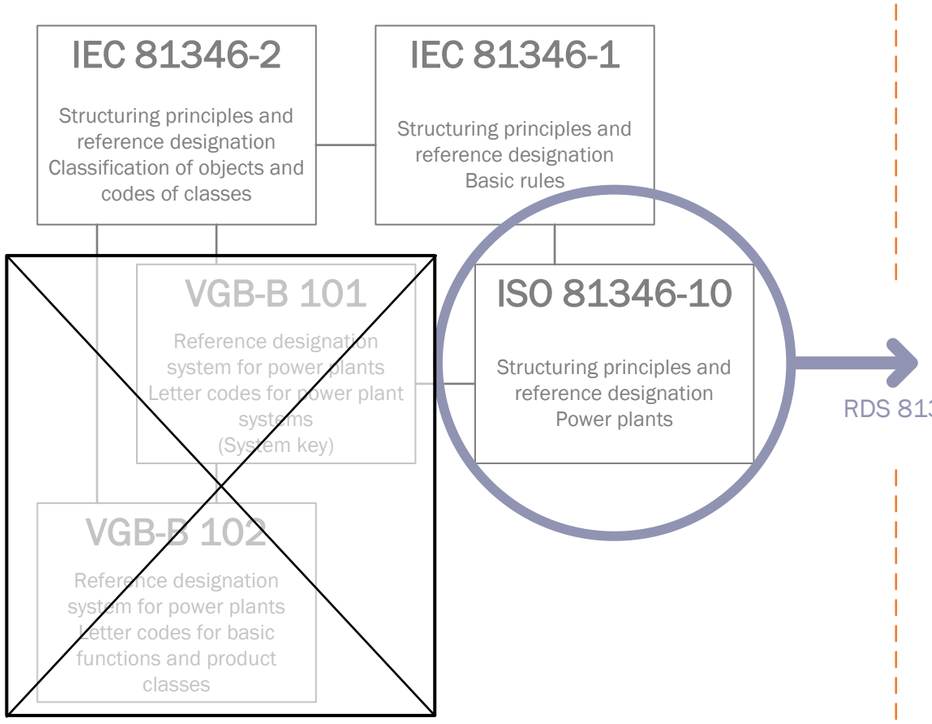
The fan coil systems are all the same type and are designated with the type aspect. Further information is found in the supporting documentation.

%EQA1



RDS-Power Plants (PP)

RDS-Power Plants (PP) relies on external classification schemes

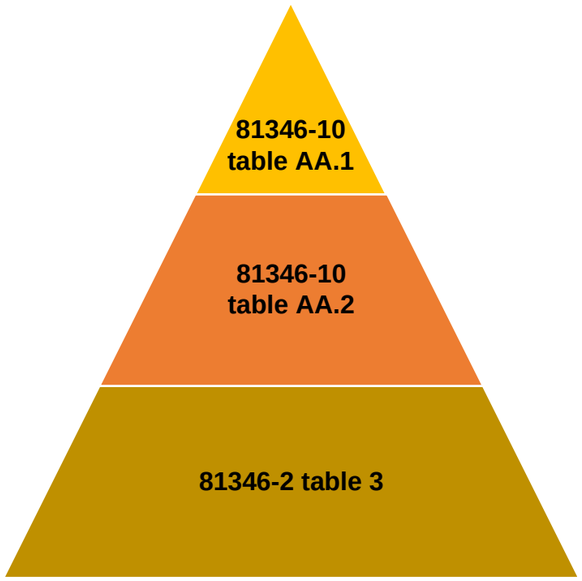


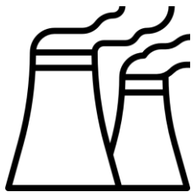
Expires 2021

RDS 81346 technique

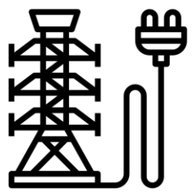
RDS-Power Systems (PS)

Domains share the same ruleset and classification.

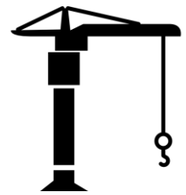




Nuclear power Systems



Power transport Systems

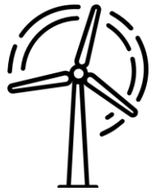


Power support Systems

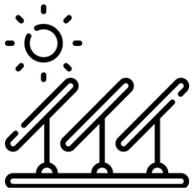
Storage Systems

Fuel transport Systems

Hydropower Systems



Wind power Systems



Solar power Systems

RDS-Power Plants (PP)

Some parts of the RDS-Power plants standard assign meaning to ranges of numbers

When numbers are given meaning it is possible to run out of numbers

TA	001	...	TA	099	Transformer
TA	101	...	TA	199	Frequency converter
TB	001	...	TB	099	Rectifier
TB	101	...	TB	199	inverter

RDS-Power Systems (PS)

Numbers has no meaning. Only letter codes are used to classify systems and components

All numbers are allowed, it is not possible to run out of numbers

No need for preceding numbers (i.e. “00” or “0”)

Code	Definition	Class name
TAA	Electric energy transforming object from AC to AC without change of the frequency	Transformer
TAB	Electric energy transforming object from DC to DC	DC/DC converter
TAC	Electric energy transforming object from AC to AC while changing the frequency	Frequency converter
TAD	Electric energy transforming object from AC to AC while shifting the angle between voltages and currents	Phase shifter
TBA	Electric energy converting object converting from AC to DC	Rectifier
TBB	Electric energy converting object converting from DC to DC	Inverter
TBC	Electric energy converting object converting from AC to DC or DC to AC	Bidirectional converter