

Quality Document (GSK) GSK-1607
Date of issue: 12.6.2017 Revision no.:3.0
Responsible: Einar Friðgeir Björnsson
Editor: Þórður Sigurbjartsson



00-General AKS Registration

Doc. no.: NA-00-STS-004

This standard technical description is subject to change without prior notice. The most current issue will at all times be located on the Norðurál website, www.nordural.is.

LIST OF ILLUSTRATIONS	3
LIST OF TABLES	3
1. PREFACE	4
2. AKS STRUCTURE	6
2.1. AKS Break Down Levels (BDL).....	6
2.2. AKS Point of installation.....	6
2.3. AKS Prefixes and Breakdown Symbols.....	7
3. AKS CODES	8
3.1. AKS Structure	8
3.2. Systems.....	9
3.3. Component	11
3.4. Synonyms.....	12
4. AKS NUMBERING	13
4.1. SN Numbering (System)	14
4.2. AN Numbering (Equipment) and CN Numbering (Component).....	15
4.3. Use of Numerals.....	16
4.3.1. SN Numbering.....	16
4.3.2. AN Numbering	18
4.3.3. Numbering of Valves.....	19
4.3.4. Equipment Numbering	20
4.3.5. Numbering Measurement Points	21
5. TYPE OF AKS.....	26
5.1. Process-related Code.....	26
5.2. Point of Installation Code.....	27
5.2.1. The coding of high-voltage cabinets in transformer stations and for distribution systems	27
5.3. Location Code.....	30
5.4. Example of Coding.....	31
5.5. AKS in Drawings	34
5.6. AKS on/for Documents.....	35
5.7. AKS Labelling in the Plant	35
6. SPECIFIC NA DEFINITIONS	36
6.1. Codification of Pots	36

6.2.	Codification of Aluminium Holding Furnace	38
7.	SPECIAL DEFINITIONS FOR NORDURÁL'S ELECTRICAL SYSTEMS	40
8.	AMENDMENTS	41
8.1.	Amendments to Version V 2.0.....	41
9.	BDL 1 SYSTEMS	42
10.	BDL 2 EQUIPMENT UNITS	64
11.	BDL 3 COMPONENTS.....	75

List of illustrations

Figure 1	Consecutive and decades numbering.	17
Figure 2	Decades numbering.	17
Figure 3	Consecutive numbering.	18
Figure 4	Decades numbering of pipe system.	19
Figure 5	Numbering valves with decades and hundreds	20
Figure 6	Numbering measurement points.	21
Figure 7	Example of measurement point coding.	22
Figure 8	Coding of part of a cooling system.	23
Figure 9	Use of process-related codes for the coding of valves and equipment.	24
Figure 10	Coding pipes, valves, measurements and equipment.	25
Figure 11	Coding of cabinets with shared busbar, one row	28
Figure 12	Coding of cabinets without shared busbar, one row	28
Figure 13	Coding of cabinets without shared busbar, not one row	28
Figure 14	Coding of low-voltage cabinets (+BH01....) and control cabinets (+CH01....)	29
Figure 15	Coding of pumping system, process-related code	31
Figure 16	Coding of pumping system, point-of-installation and location codes	32
Figure 17	Coding of pumping system, point-of-installation and location codes	33
Figure 18	Diagram of furnace	39

List of tables

Table 2.1	Symbols	7
Table 6.1	Codification of pots in potrooms	36
Table 6.2	Example of furnace coding	38

1. Preface

The KKS system (Kraftwerk Kennzeichen System), on which the AKS is based, was developed by German power plant engineers. The object of the system was to codify all the components of its equipment. All components, equipment units and systems are classified in three separate key steps, irrespective of what is being coded. The system is for designers, purchasers, those responsible for installation and operation and those responsible for repairs and maintenance.

More than 700 power plants globally now use KKS. Of these, approximately 100 operating power plants have revised older number systems and adopted KKS.

The aim of KKS is:

- To codify “locally” elements in plants (label) identical to the elements in technical documents (PID, lists and descriptions).
- To facilitate overviews.
- To assist operation, purchase of maintenance equipment and spare parts and other decisions on technical aspects.
- To save time, raw materials and costs.

The KKS system was used as the foundation for DIN EN 6779 “Codification of technical products and product documentation”. This code formed the basis for new codification systems such as:

- EKS for disposal plants (hazardous materials and waste)
- SKS for steel plants
- VKS for inventory systems
- WKS for water treatment plants
- SBE for shipbuilding plants
- GKS for quality management

The AKS system for aluminium smelter plants was developed by VAO in Iceland and GABO AT + PM in Germany.

The main benefits of AKS are:

- Structured documentation of technical equipment and information
- Identical identification of objects in the plant and in source documents
- Suitable for
 - actual cost and budget
 - production management
 - successful maintenance
 - cost-optimised spare part management through unique documentation cost control per production line

2. AKS Structure

2.1. AKS Break Down Levels (BDL)

AKS consists of four key levels and codifies from left to right into smaller and smaller units. The levels are:



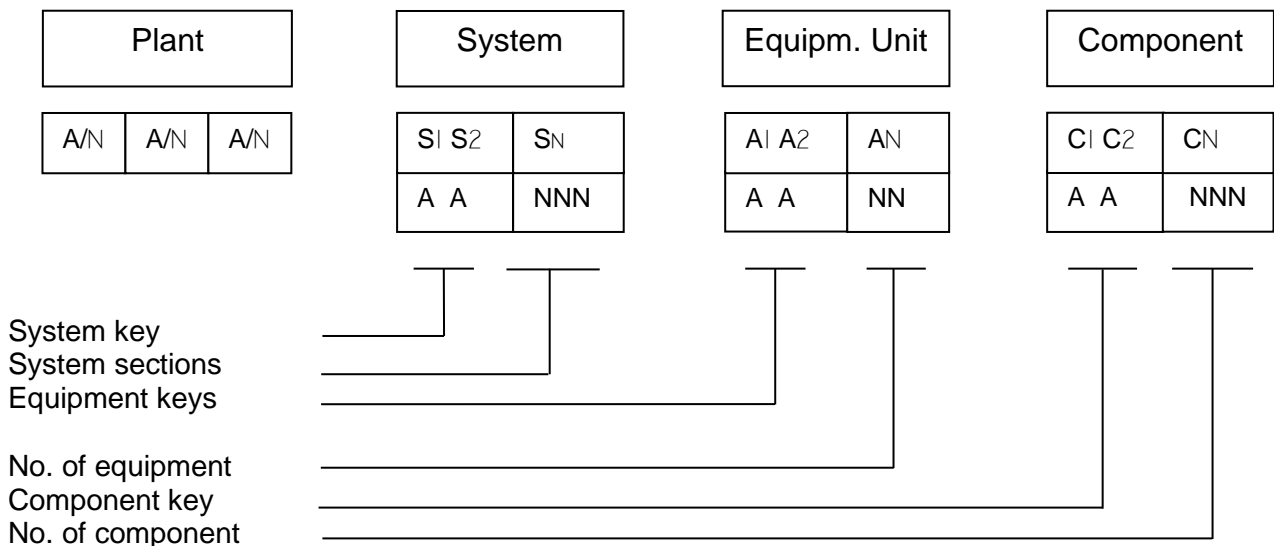
E.g.	Plant	Norðurál	CA NA
	System	Air compressor station 1	QE 010
	Equipment unit	Air compressor	AN 10
	Component	Electric motor	-M 10

2.2. AKS Point of installation

Each Level contains letters (A) for classifications, described in the AKS – Key Catalogues

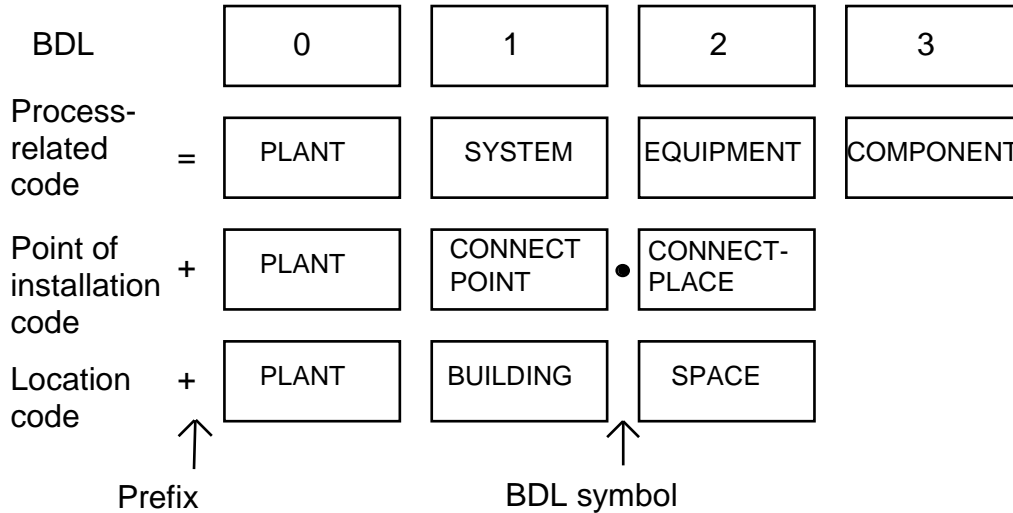
System keys	(specially developed)
Equipment keys	(copied)
Component keys	(DIN EN 6779, Part 2)

and numbers (N) to show the number of systems or number of system aspects and to count equipment and components. Each data field has its own name.



2.3. AKS Prefixes and Breakdown Symbols

The standard “DIN EN 6779, Part 1, Chapter 1” contains prefixes used to identify the different contents of AKS levels.



The main prefixes and breakdown symbols used in AKS are:

- = Equal, in front of process related codes
- . Full stop, separates the point of installation and location codes.
- Minus, used on BDL (Break Down Level) 3 for electrical items

The symbols used in DIN 6779 are according to Table 2.1 below.

Table 2.1 Symbols

Symbol	Name	Explanation
= =	Equals – equals	Links contiguous processes
=	Equals	Plant, can be divided into processes
+ +	Plus – plus	Location of equipment within e.g. a building
+	Plus	Location of equipment, e.g. inside a cabinet, point of
-	Minus	Represents components or units
*	Asterisk	Connection of all processes and components
:	Colon	Connection/connecting box
;	Semicolon	Signal, from processes
&	“And”	Document registration

3. AKS Codes

3.1. AKS Structure

The KKS has three different types of codes, which can be used together or separately. These codes are a process-related code, point of installation code and a location code. These codes are subdivided into 3 and 4 Break Down Levels (BDL).

These codes are generally used in the following manner:

Process-related code

Process-related identification of systems and items of equipment according to their function in mechanical, electrical and control and instrumentation engineering. For example, there are pipes, pumps, valves, motors, measurement sites, switches, transformers, etc.

Point of installation code

This code is only used in electrical power grid distribution together with process-related codes.

Location code

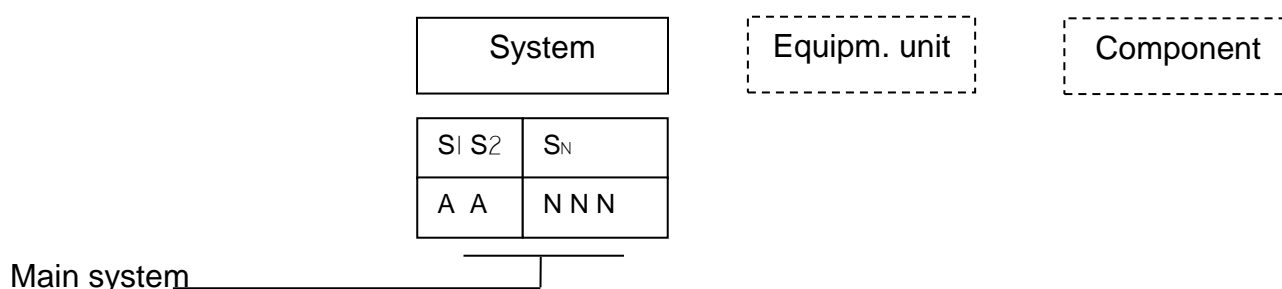
This category is generally not used

All AKS codes are registered in Chapters 9 to 11. These are:

- BDL 1 Systems
- BDL 2 Equipment units
- BDL 3 Components

3.2. Systems

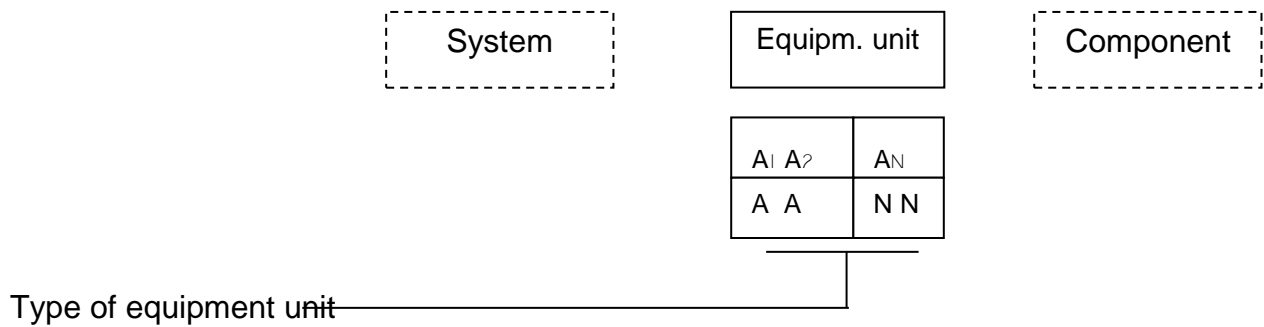
Systems are classified with S1 with capital letters of the Latin alphabet. The letters I and O may not be used.



- A Not used
- B Electrical power system
- C Control and instrumentation system
- D Not used
- E Alumina transporting system
- F Aluminium electrolysis system
- G Water supply and discharge system
- H Not used
- J Rodding plant
- K Cathode workshop
- L Cast house
- M Crust bath process
- N Not used
- P Cooling water system
- Q Service supply systems, other than electrical
- R Measuring equipment for the environment and research lab
- S Ventilation systems
- T Vehicles
- U Buildings
- V Not used
- W Not used
- X Not used
- Y Replacement spare parts
- Z Equipment of service departments

Equipment units

Codes for equipment are from DIN 6779, Part 2.

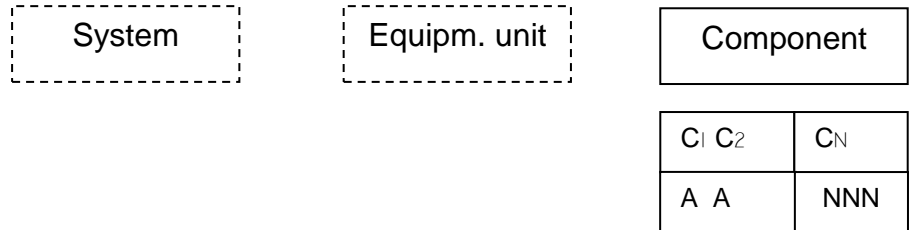


- A** Mechanical equipment
- B** Mechanical equipment
- C** Direct measuring circuits
- D** Closed control loops
- E** Measurement values and markings, digital and continuous
- F** Indirect measuring circuits
- G** Electrical equipment
- H** Subassemblies of main and heavy machinery
- K** Building sections

3.3. Component

Component

Codes for equipment are from DIN 6779, Part 2 and adapted to the requirements of aluminium smelters.



Component type _____

- Electrical components
- K** Mechanical components
- M** Mechanical components
- Q** Measurement, marking and control components (not electrical)
- X** Simple input signals
- Y** Simple output signals
- Z** Gated signals

3.4. Synonyms

DIN EN 6779, Part 2, provides general names for equipment units and components.

AKS codifies equipment and components independent of their design, even though different designs may have different names, such as shut-off valve, stop cock, isolating valve, rupturing diaphragm. In AKS, these are all “valves”.

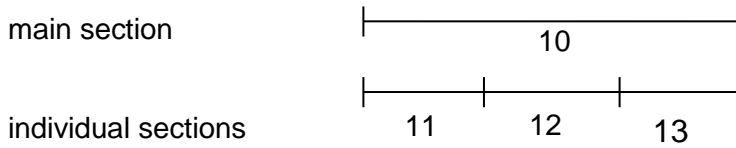
4. AKS Numbering

Only Arabic numerals (1, 2, 3 ... 0) are allowed, no Roman numerals.

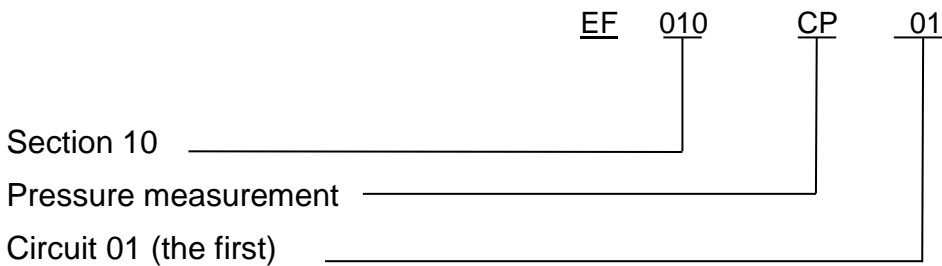
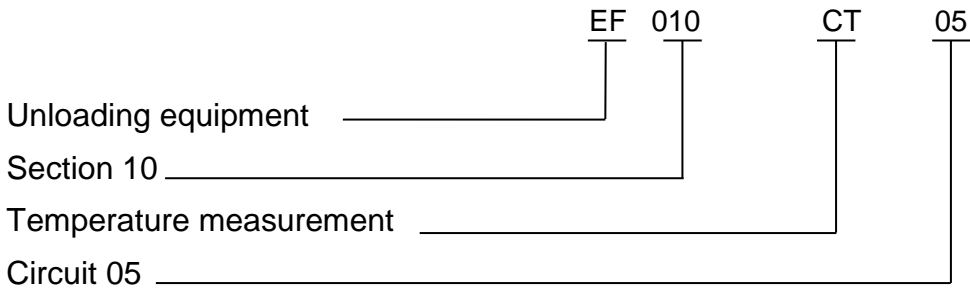
The basic rule is that numbering is optional.

To the extent, possible numbering shall:

- follow the medium flow
- be the current count
- be in accordance with groupings, e.g.

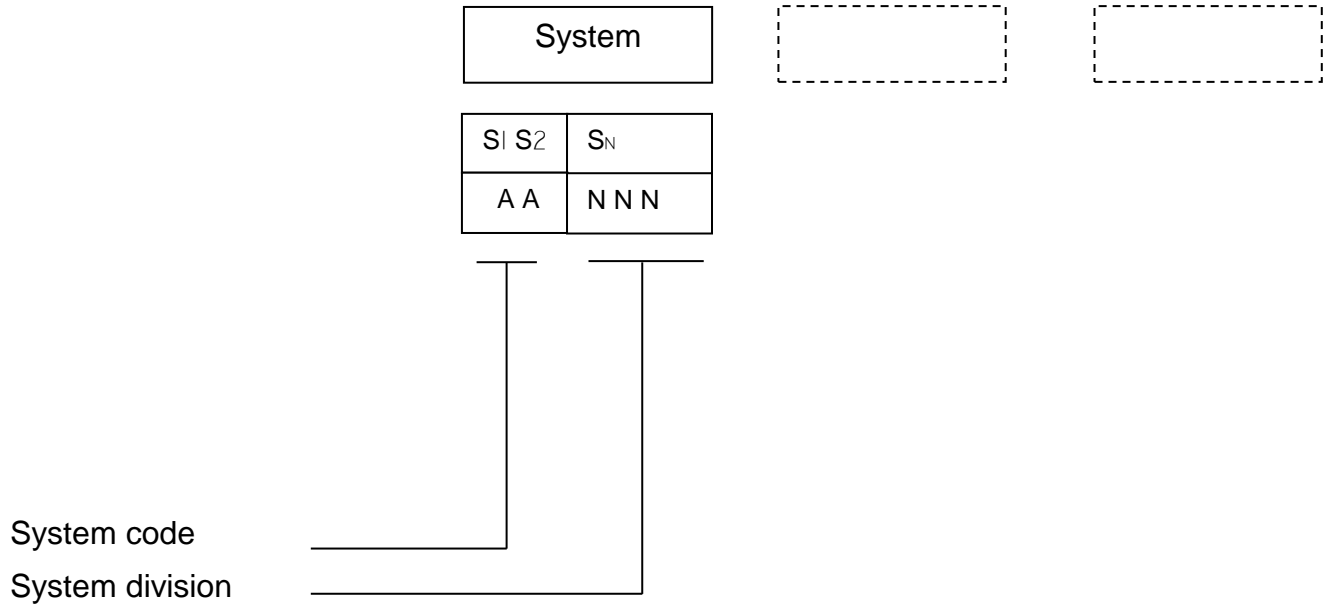


begin again, if something has changed from the left in the code.

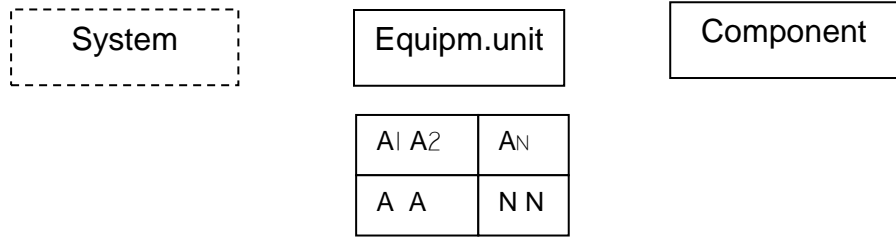


4.1. SN Numbering (System)

BDL 1 "Systems" divides systems according to their role.



4.2. AN Numbering (Equipment) and CN Numbering (Component)

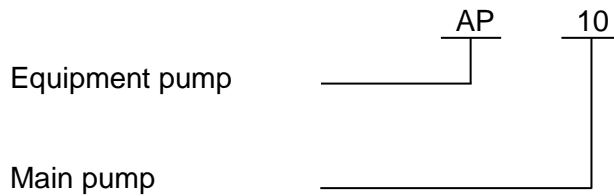


Equipment code

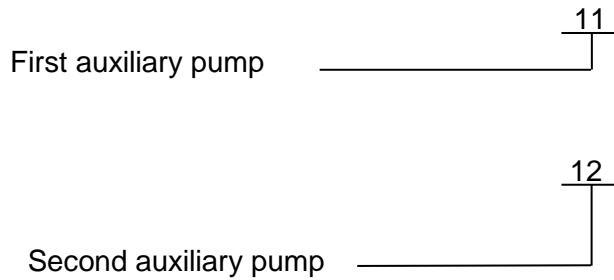
No. of equipment in section of a system

This numbering begins at zero if type of equipment changes.

A_N Numbering can reach decades e.g.



or on units e.g.



The rules for C_N numbering are the same as for A_N numbering.

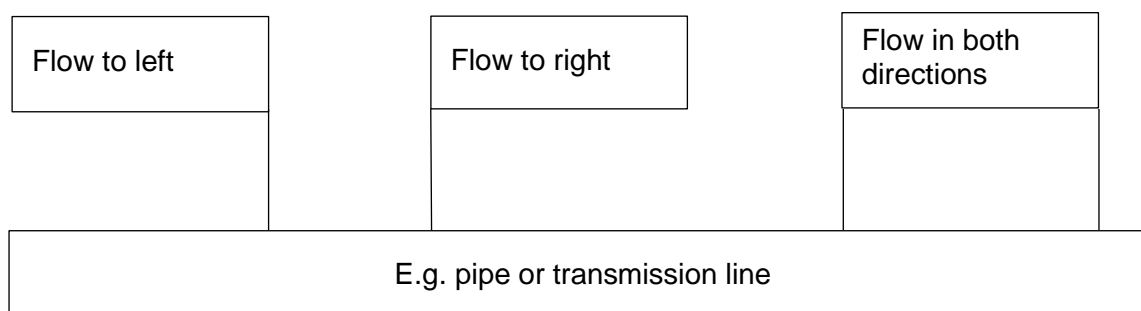
4.3. Use of Numerals

The AKS code allows the possibility for a certain level of flexibility in the use of numerals. The use of **S_N** numbers, **A_N** numbers and **C_N** numbers, and the rules set herein, are for guidance in AKS registration. Numbering and the use of numbers is optional in AKS.

Other methods of numbering may be used (e.g. in large and complicated systems).

Numbering with **S_N** and **A_N** numbers shall be, to the extent possible, in the direction of flow. In the event the flow has two directions, numbering shall be in the direction considered to be part of normal operations.

The flag depicted for clarification represents the direction of flow. A flag on one leg points in the direction of the flow, while a flag on two legs indicates that the flow is in both directions (see figure).



4.3.1. SN Numbering

Sn numbering follows the following main rules:

1. Numbering starts anew when one of the preceding code elements changes.
2. Numbering may be done in consecutive numbers (units) or in decades.
3. Numbering is, as a rule, in the direction of the flow.
4. Numbering is defined as being from left to right or from top to bottom.

Numbering can be in consecutive numbers (units) or in decades, depending on the system being coded each time.

Consecutive unit numbering is not used for tube systems; the numbering is to be in decades.

The pin markings in the figures below are used to demarcate systems or parts of systems.

The following three figures show the different possibilities that can be used.

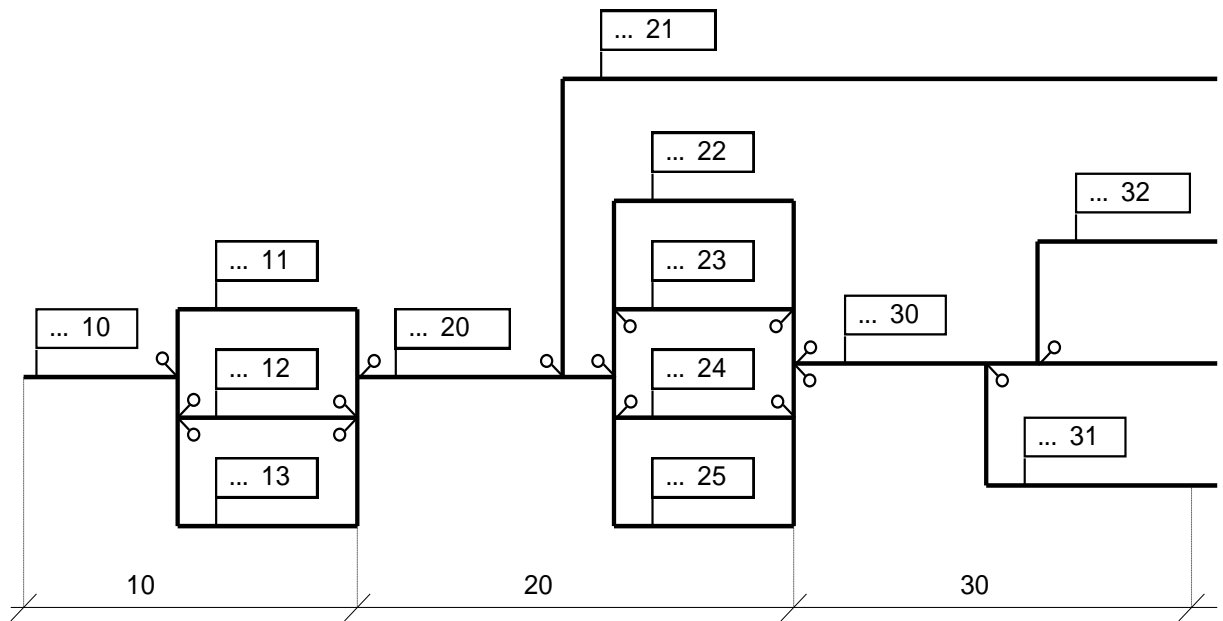


Figure 1 Consecutive and decades numbering.

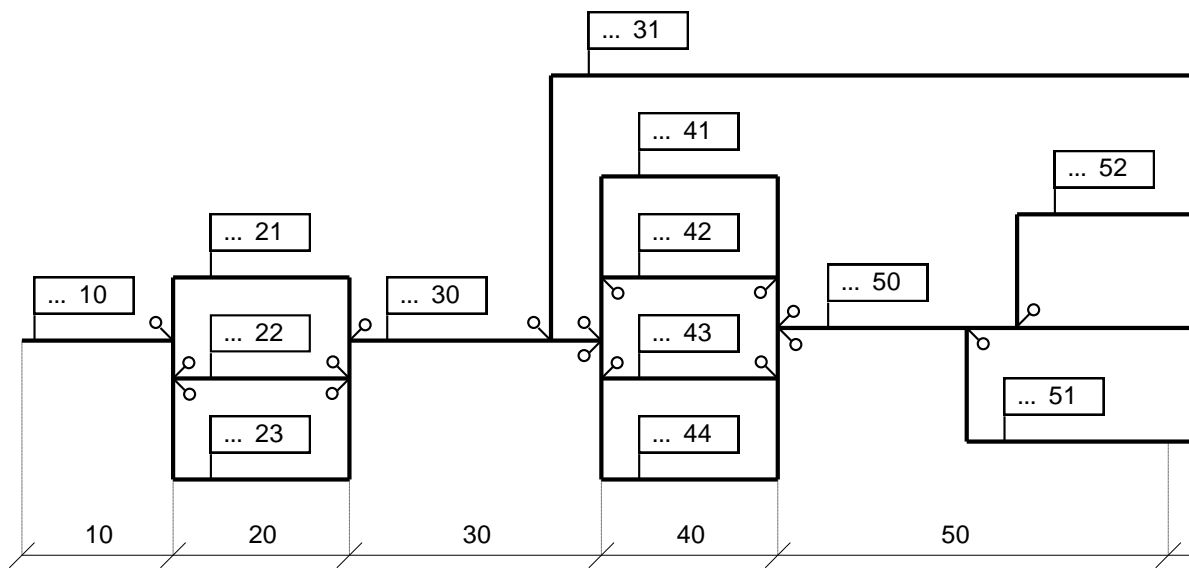


Figure 2 Decades numbering.

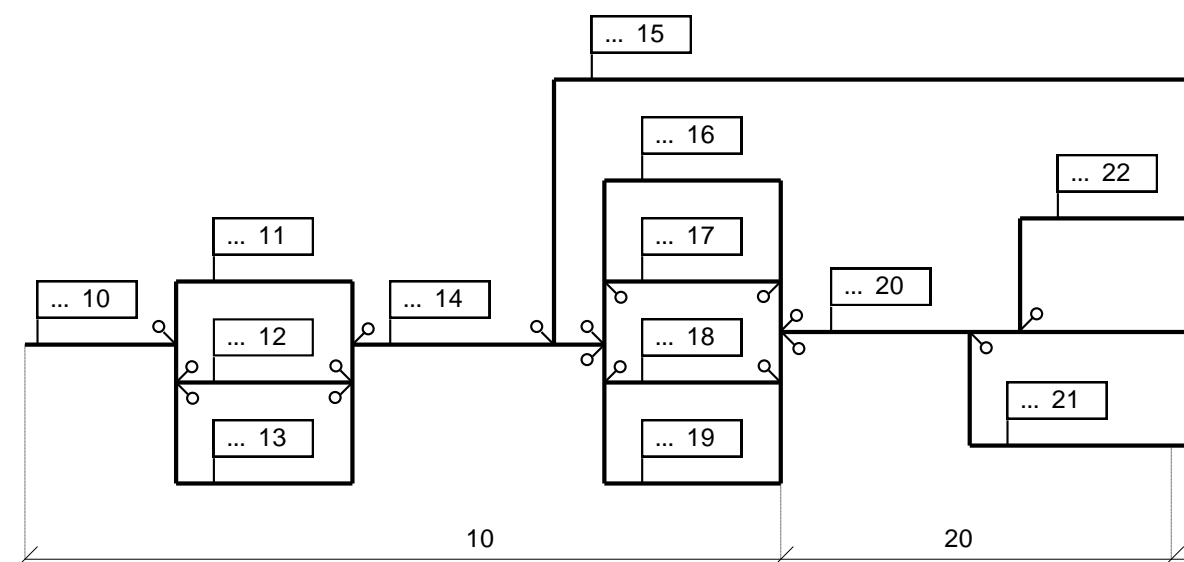


Figure 3 Consecutive numbering.

Numbering in decades is convenient in larger comprehensive systems. When decades numbering is used, it is modified for each system.

Decades numbering is used in main systems, while sub-systems are numbered using units.

Consecutive numbering is used within the same system or within the same part of a system where components are in serial connection.

4.3.2. AN Numbering

Numbering piping systems.

Normally, pipes are not coded, but where needed, the following rules apply:

Decades numbering shall be used for the identification of main piping systems, **10, 20, 30.....**, i.e. when the role/function changes, e.g. when their pressure, temperature, etc. changes.

Consecutive numbering shall be used for sub-piping systems, e.g. bypass, pipes for control valves, etc. and receive thus the numbering **11, 12, or 21, 22**, etc.

In the same manner, pipes for air and water drainage are numbered with **91, 92**, etc. The 9th decade is reserved for drainage. See **Error! Reference source not found..**

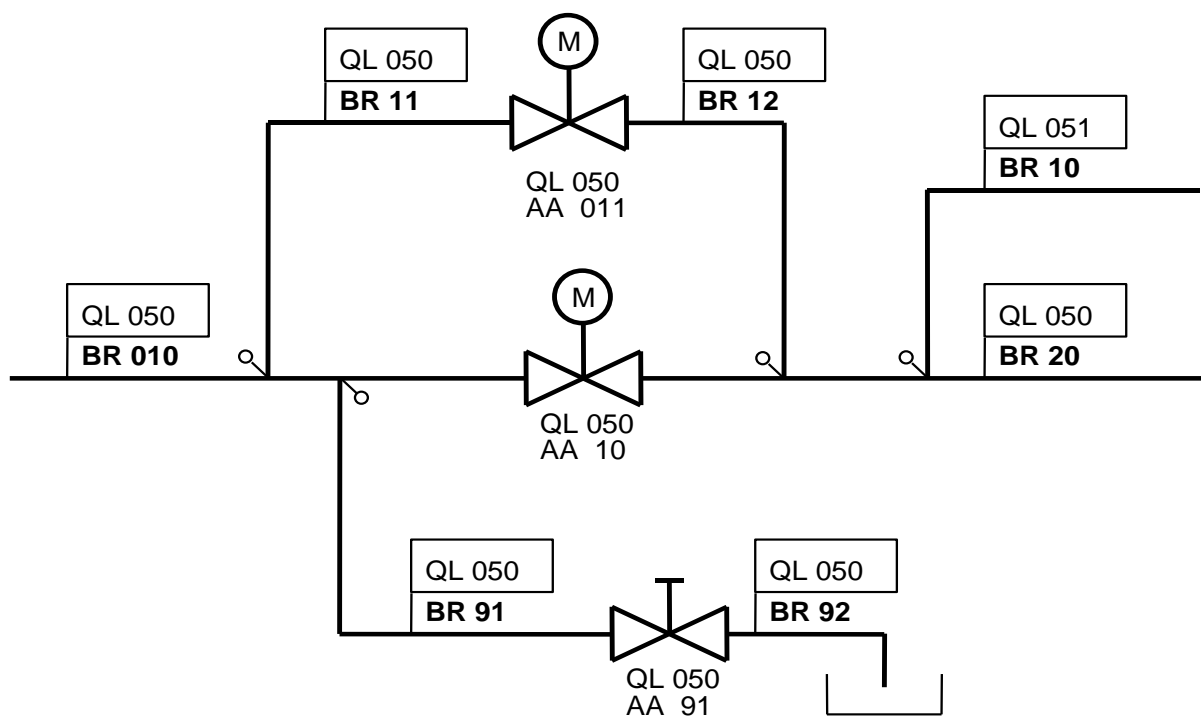


Figure 4 Decades numbering of pipe system.

4.3.3. Numbering of Valves

Decades numbering shall be used for valves in a main piping system, **10, 20, 30**, etc.

In sub-piping systems, valves such as bypass valves, control valves, etc. shall be numbered **11, 12** or **21, 22**, drainage valves **91, 92**, etc.

The decade number **9-** is for water drainage, air drainage and drainage in general.

Consecutive numbering is to be used here, e.g. **91, 92, 93**.....

It is also possible to reserve numbers for purposes other than drainage, such as sampling valves, instrument valves, etc. See Figure5.

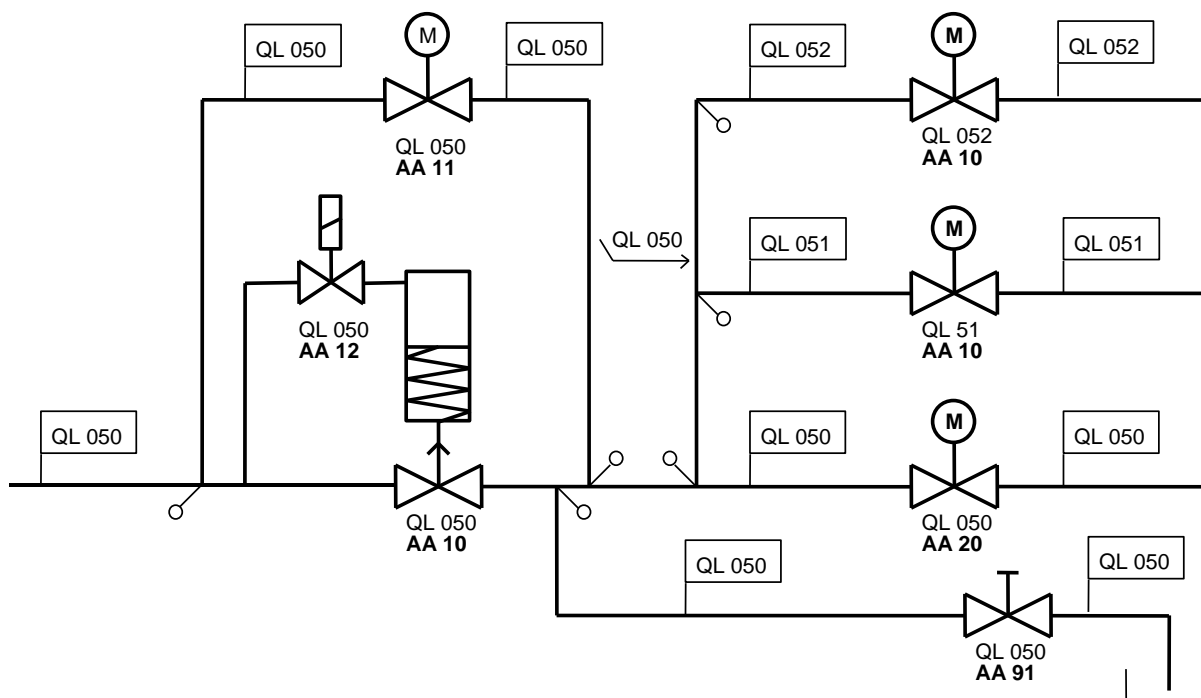


Figure5 Numbering valves with decades and hundreds

4.3.4. Equipment Numbering

Equipment such as pumps, tanks, pre-heaters, filters, coolers, etc. are numbered in with decades in main systems, **10, 20, 30**, etc.

Equipment in sub-systems, such as bypass filters, shall be numbered **11, 12** or **21, 22**, etc.

4.3.5. Numbering Measurement Points

Measurement points are numbered with consecutive numbers as follows:

Category	Definition
8	Digital meters that have control or warning roles, such as flow metres, thermometers, pressure gauges.
9	Analogue meters that have control or warning roles, remote measurements, such as flow metres, thermometers, pressure gauges.

Figures Figure 6 and Figure 7 provide an example. Figures Figure 8 to Figure 10 show the general use of the AKS code.

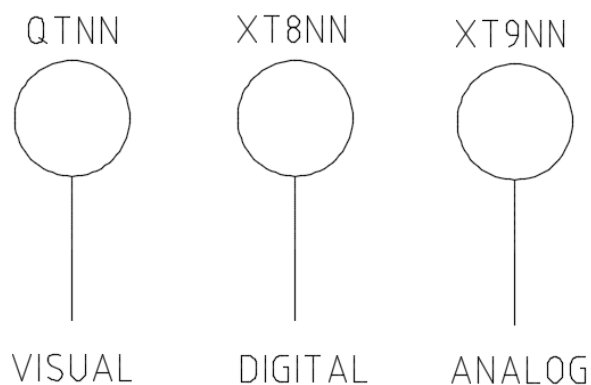


Figure 6 Numbering measurement points.

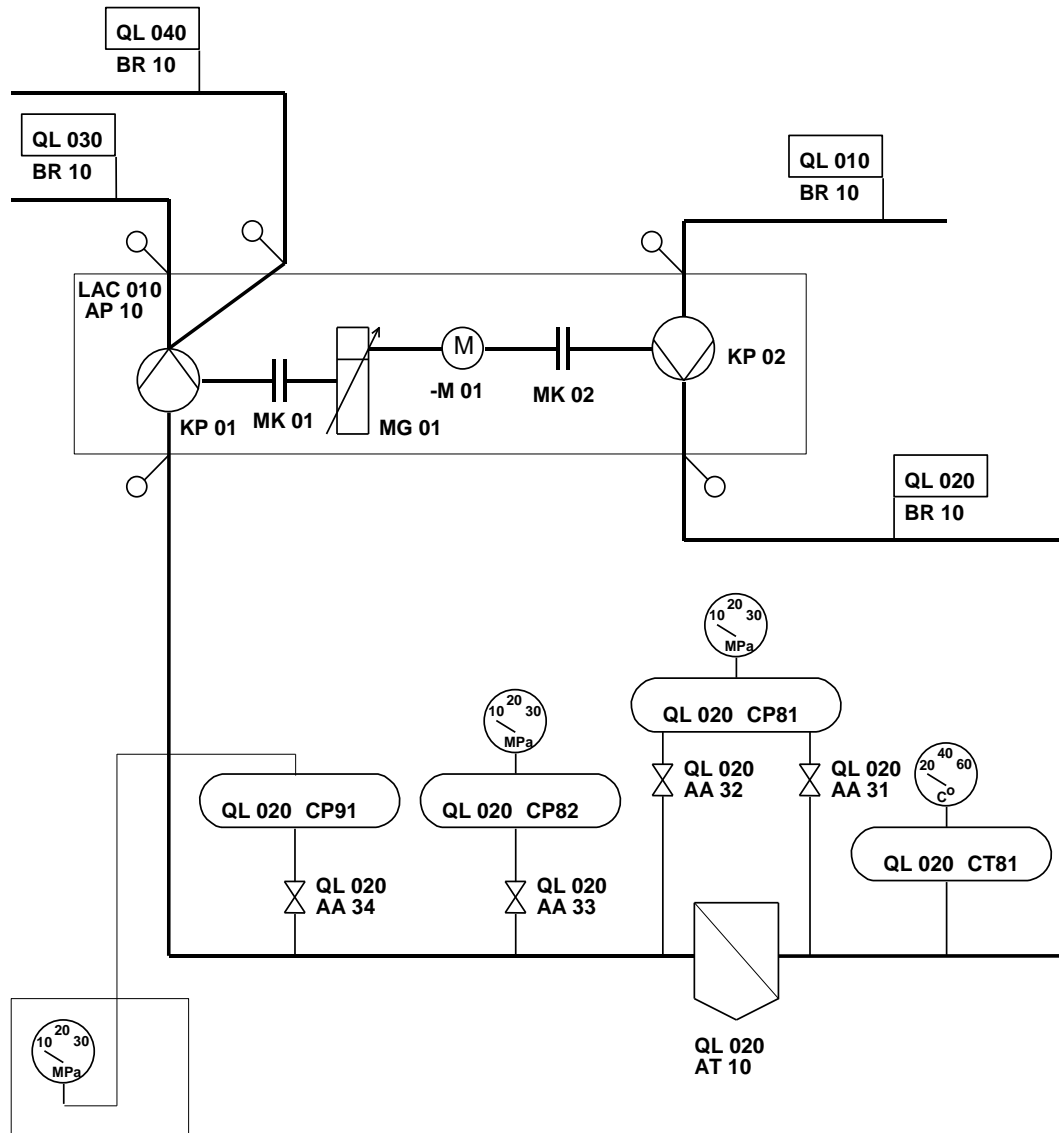


Figure 7 Example of measurement point coding.

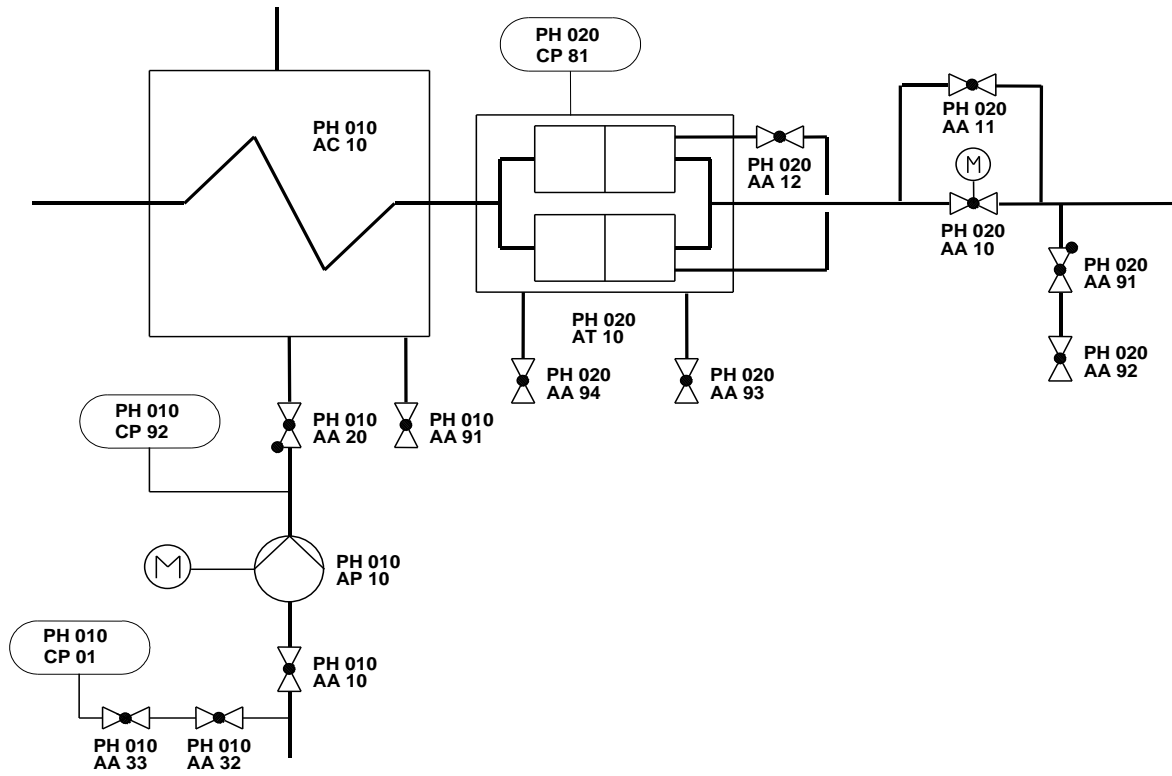


Figure 8 Coding of part of a cooling system.

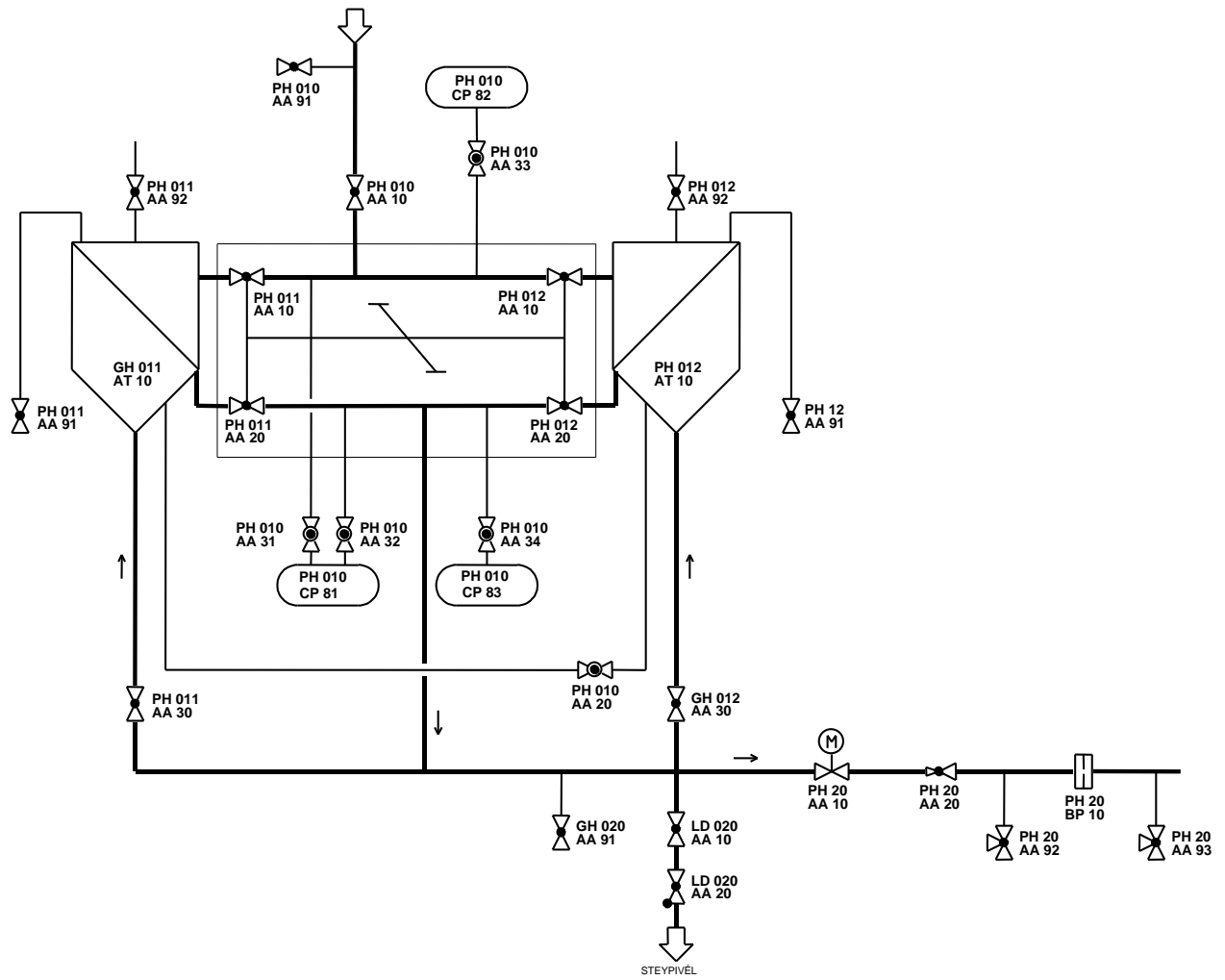


Figure 9 Use of process-related codes for the coding of valves and equipment.

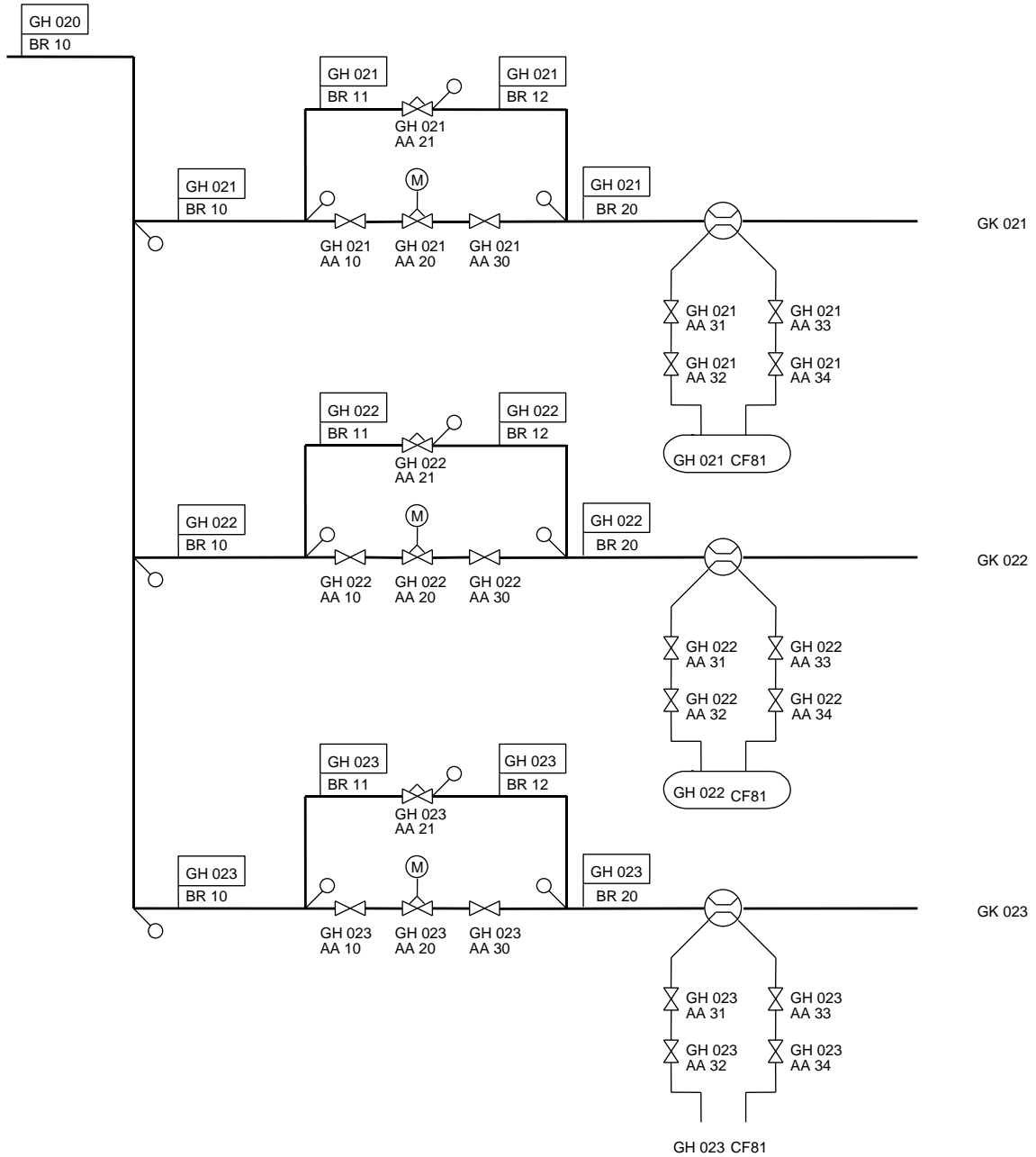
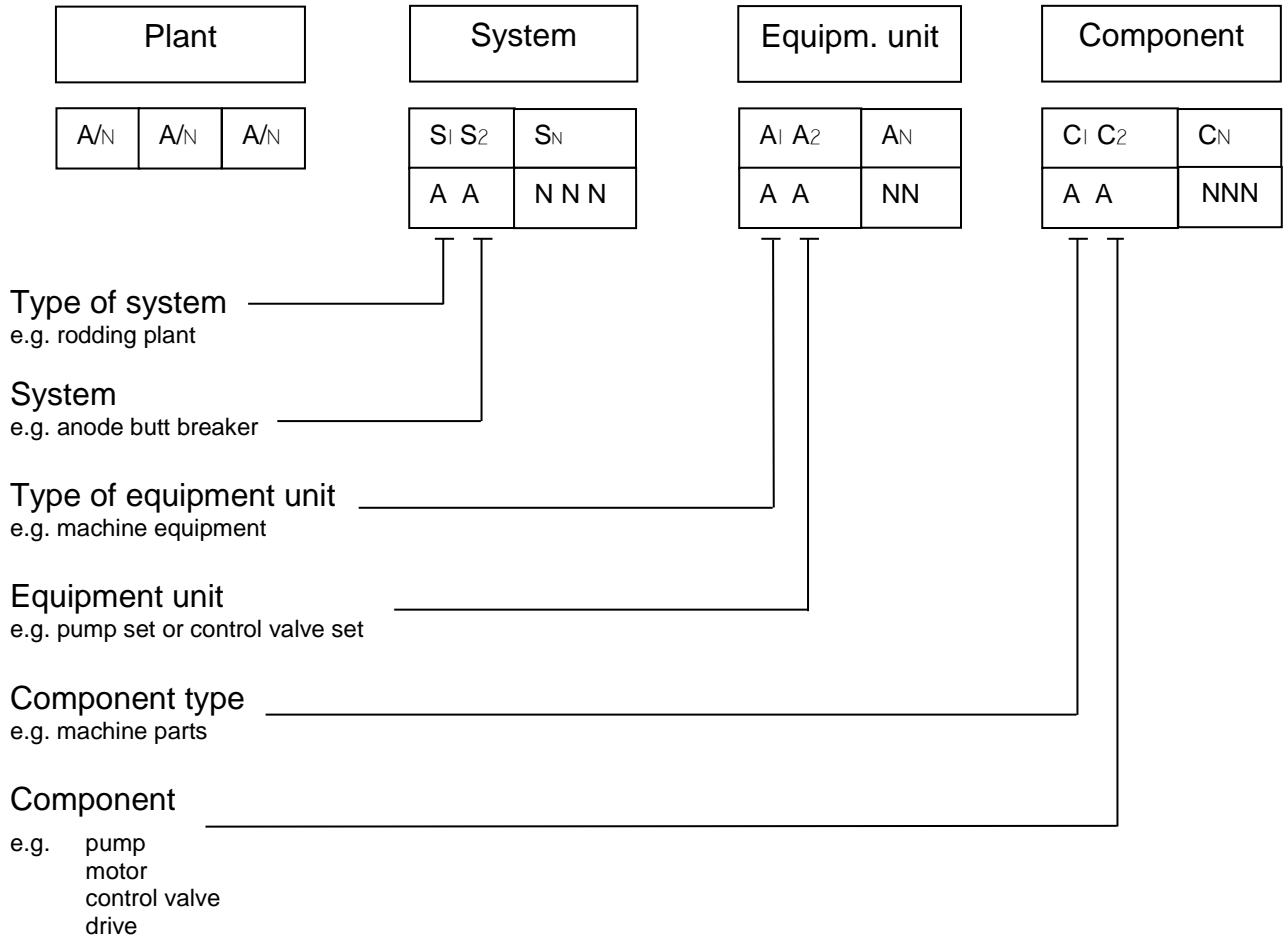


Figure 10 Coding pipes, valves, measurements and equipment.

5. Type of AKS

5.1. Process-related Code

Each AKS is hierarchy structured.



5.2. Point of Installation Code

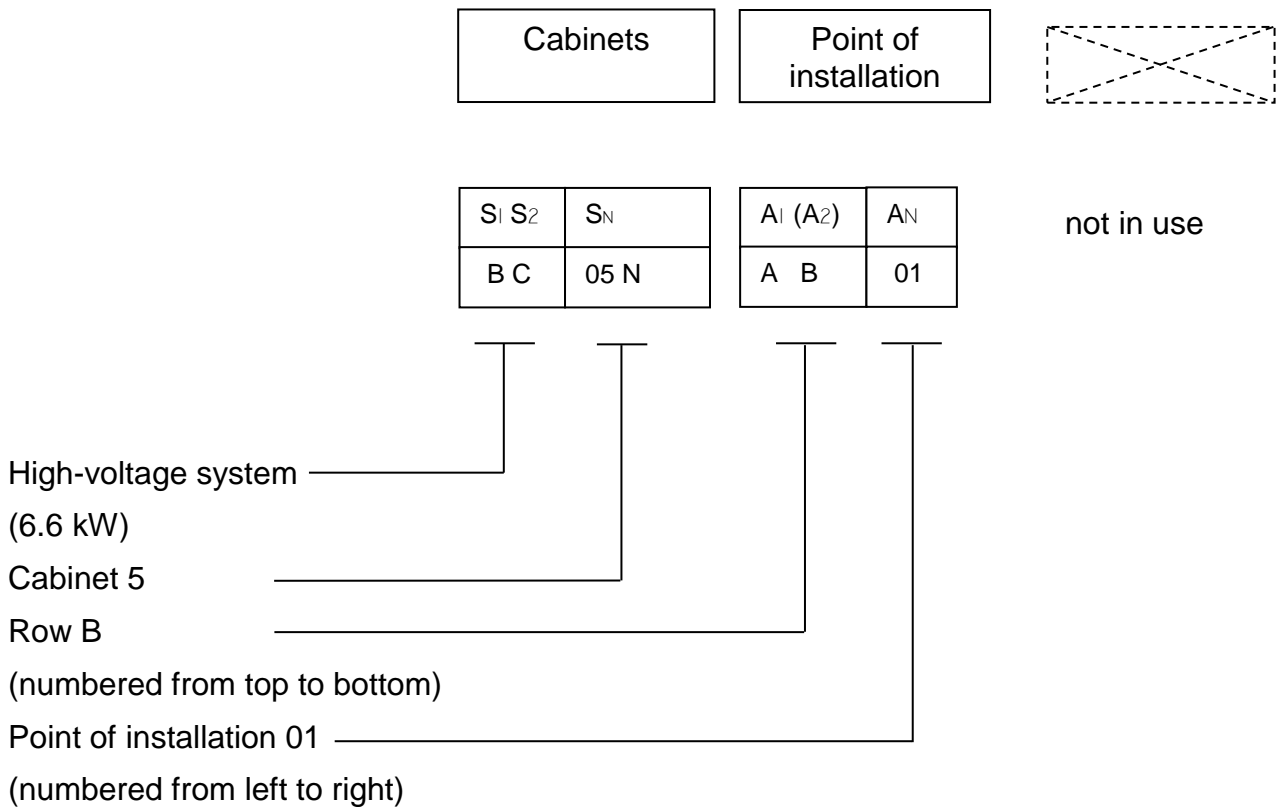
The electrical power system ($S_1=B$) and the control and instrumentation system ($S_1=C$) can also be coded according to the point of installation code.

5.2.1. The coding of high-voltage cabinets in transformer stations and for distribution systems

Coding of cabinets shall be according to the point-of-installation code and shall have the same code as the busbar in the cabinet in question when possible. This applies to high-voltage cabinets and for low-voltage and medium-voltage cabinets in distribution systems, see Figures Figure 11 to Figure 14.

Numbering in point-of-installation-codes is generally from top to bottom or from left to right.

The cabinets are numbered from left to right.



Figures Figure 11 to Figure 14 further clarify the structure of cabinets in AKS.

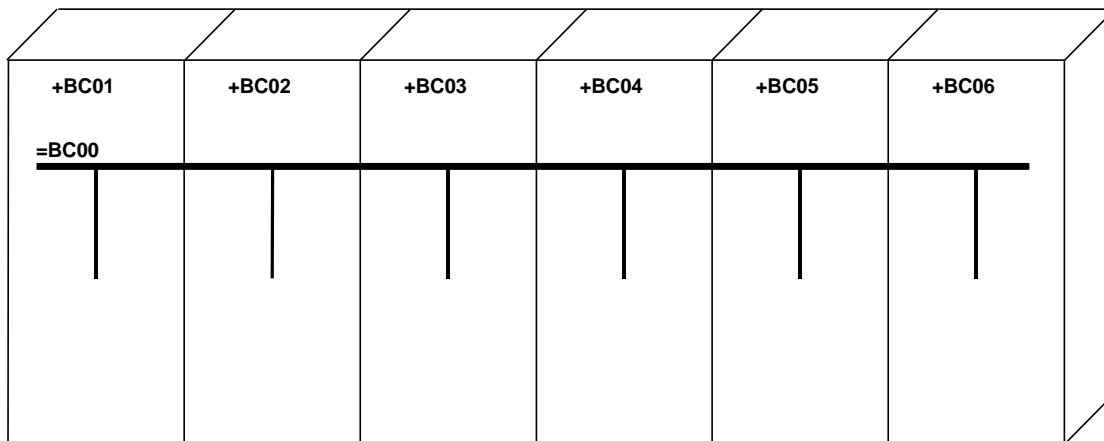


Figure 11 Coding of cabinets with shared busbar, one row

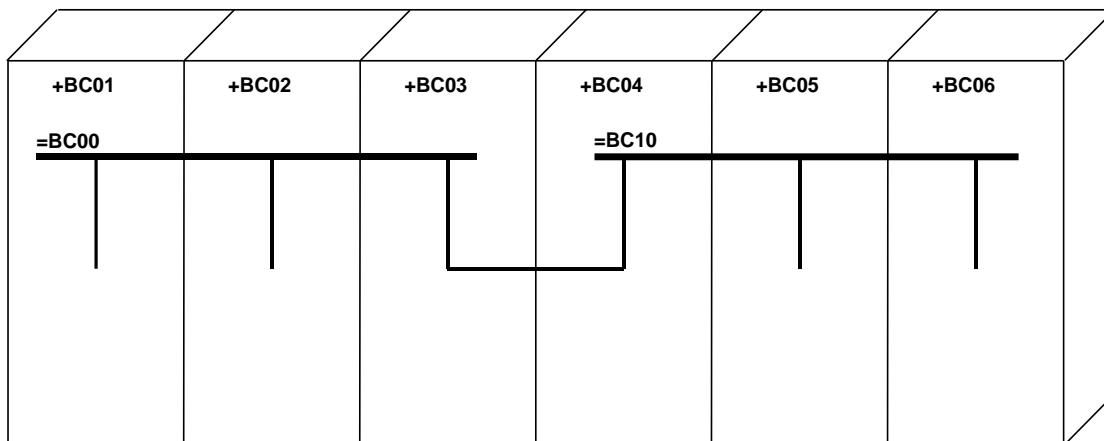


Figure 12 Coding of cabinets without shared busbar, one row

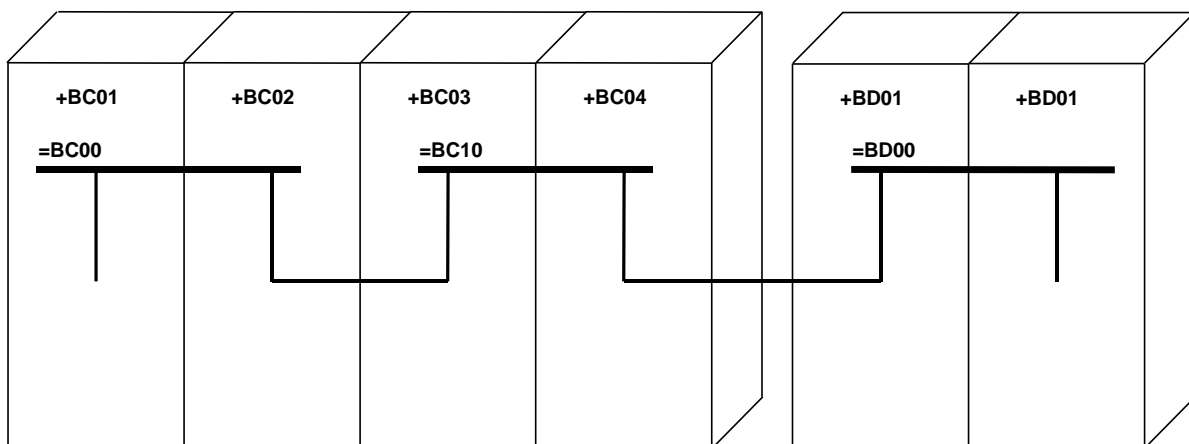


Figure 13 Coding of cabinets without shared busbar, not one row

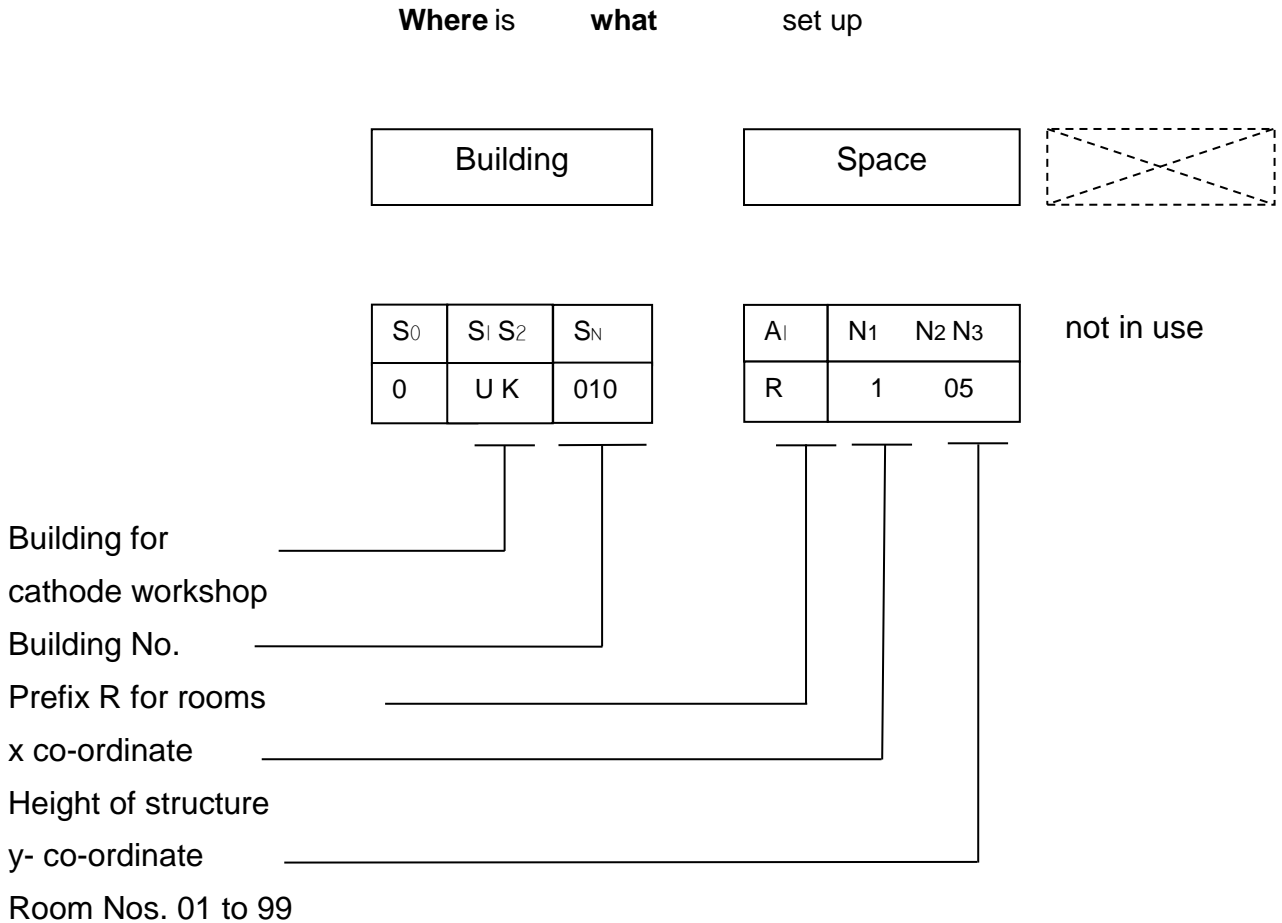
+BH01/+CH01	+BH02/+CH02	+BH03/+CH03	+BH04/+CH04	+BH05/+CH05	+BH06/+CH06	+BH07/+CH07

Figure 14 Coding of low-voltage cabinets (+BH01....) and control cabinets (+CH01....)

5.3. Location Code

A complete codification is needed parallel to the task-oriented codification, i.e. process related or point of installation. In addition, the location identification is used.

The location code always begins with “U”, while the next letter is generally the first letter in BDL 1, which applies to the role played by the installation in question.



Coding with location codes can be used in connection with maintenance orders:

Please go **there** and make repairs.

valve ___ in system _____

or

switch ___ in electrical equipment _____.

5.4. Example of Coding

CODING OF PUMPING SYSTEM

= PREFIXES FOR PROCESS-RELATED CODES

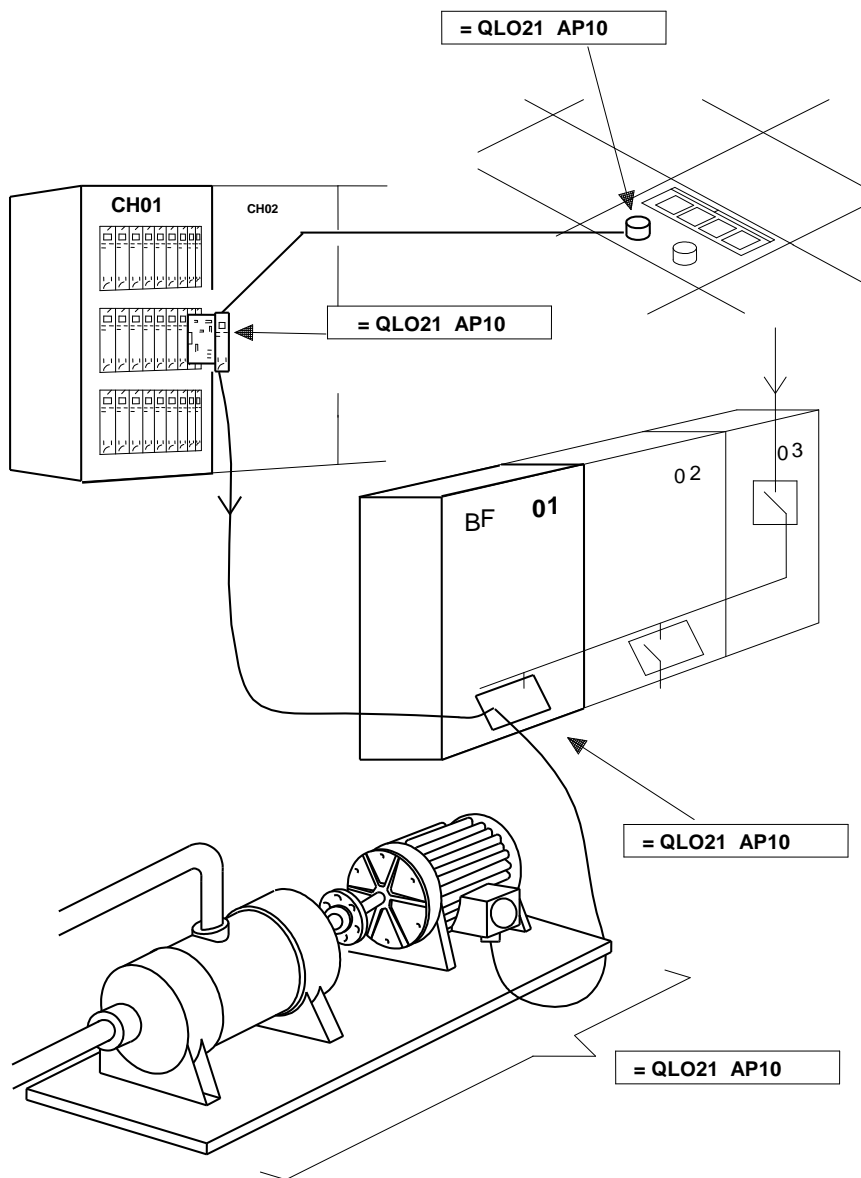


Figure 15 Coding of pumping system, process-related code

CODING OF PUMPING SYSTEM

+ PREFIXES FOR POINT OF INSTALLATION AND LOCATION CODES

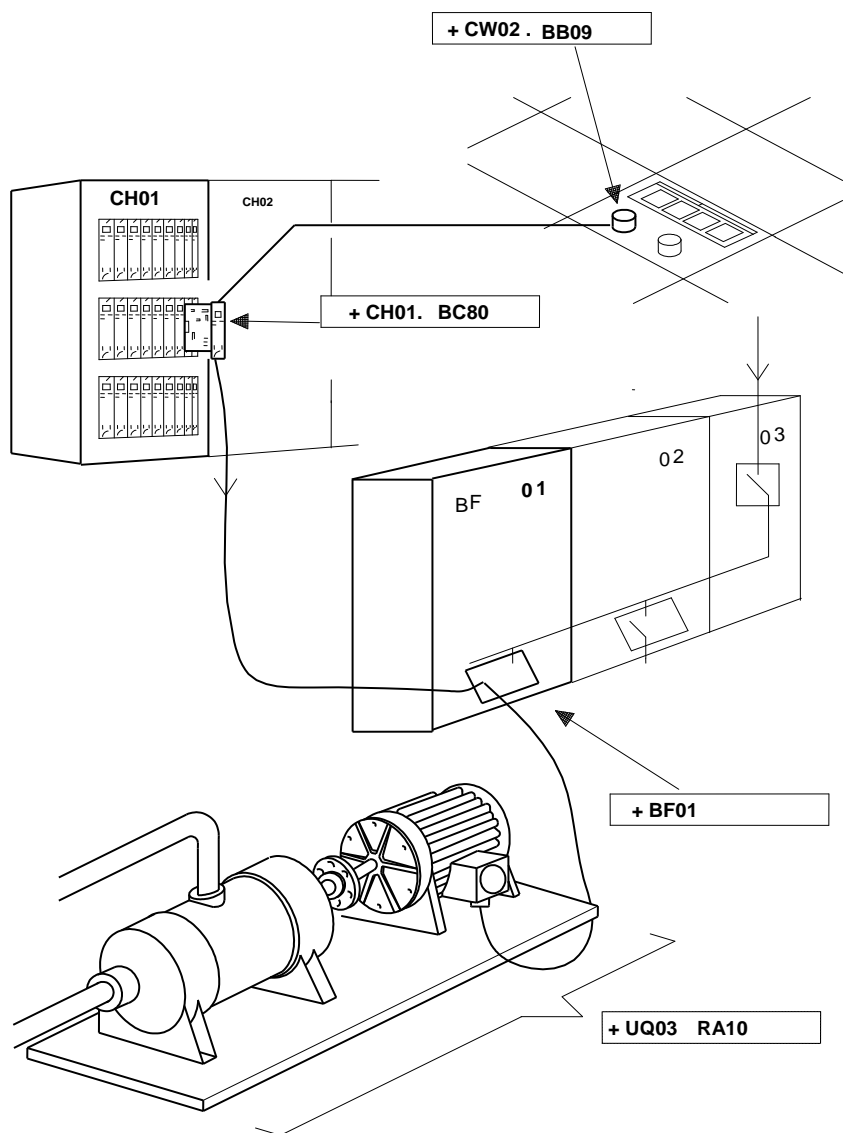


Figure 16 Coding of pumping system, point-of-installation and location codes

CODING OF PUMPING SYSTEM

- = PREFIX FOR PROCESS-RELATED CODE
- + PREFIXES FOR POINT OF INSTALLATION AND LOCATION CODES

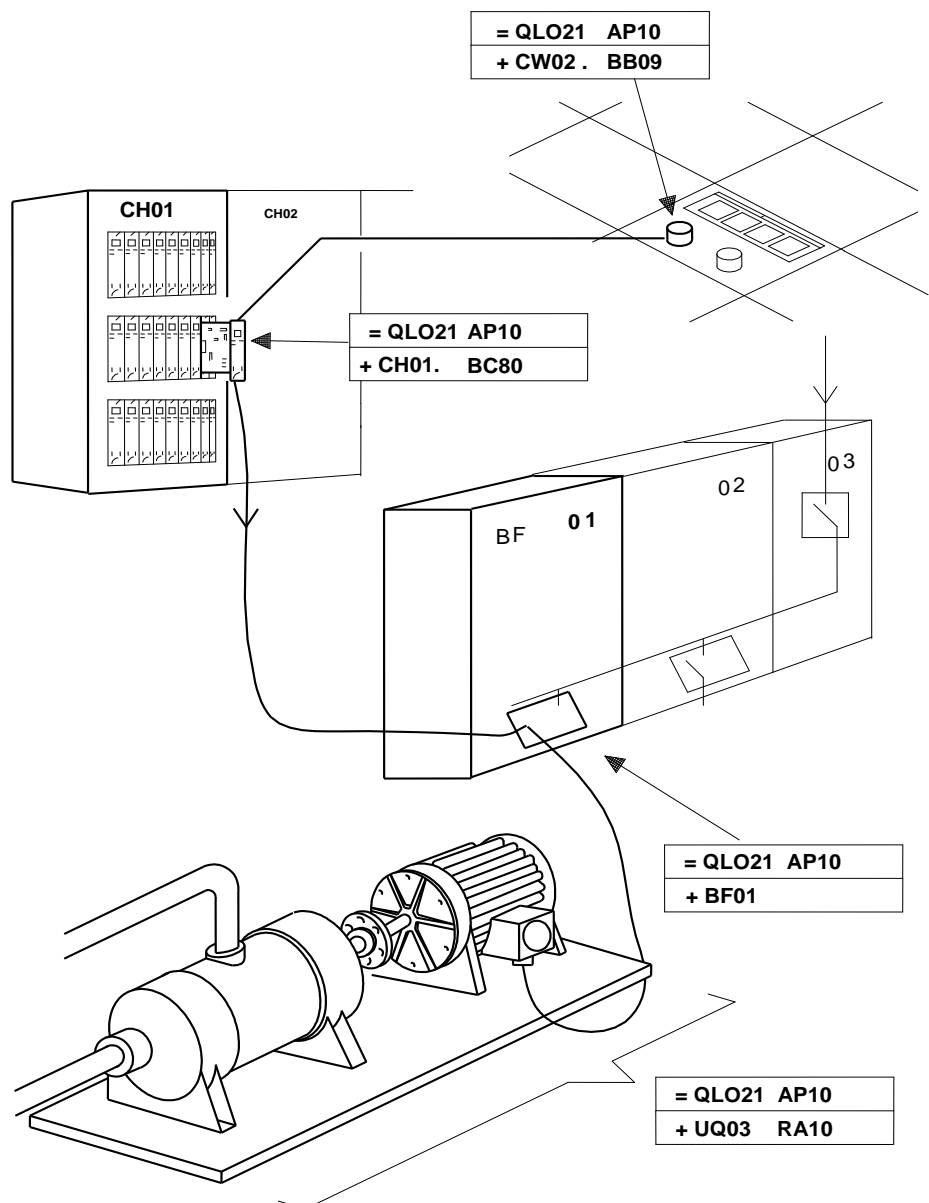


Figure 17 Coding of pumping system, point-of-installation and location codes

Implementation of AKS

The following sections contain guidelines to the implementation of AKS:

5.5. AKS in Drawings

Experience has shown that it is best to begin by AKS coding systems, equipment, components, structures and electrical equipment on drawings and plans in the following steps:

1. demarcating the process-related step by putting pin markings on process boundaries
2. insert code for equipment
3. numbering SN and AN

In some cases, there may not be enough room on a drawing for the AKS codes and each system may need more than one drawing or one drawing may show more than one system. In such cases, it may be most efficient to reprint the drawings from computer programmes and verify their reliability.

The computer programme that NA uses, SAP, allows the creation of databanks with technical information in conjunction with AKS codes, e.g. the diameter of valves and water flows per hour in water systems and much more.

5.6. AKS on/for Documents

If the drawings and their structure are in line with AKS system boundaries, the process-related code is the one that best describes the content of the drawing.

This code will be harmonised with the data code, where it describes different types of data, such as system diagrams, structure drawings and cable lists.

The document identification that has proved best consists of different codes:

1. plant no. / abbreviation
2. AKS
3. document type

Norðurál also specifies current equipment codes and drawing numbers as data codes in the final document identification.

5.7. AKS Labelling in the Plant

Each codified object must physically exist in the plant and be labelled. As a result, all labelling in the plant must be reviewed.

The following is recommended on the label:

1. AKS code
2. Name of equipment with AKS code

6. Specific NA Definitions

The letters of S₁ that are specifically defined for coding in AKS identification are E, F, J, K, L, M, N and T. Other letters that are used are according to KKS, while sub-groups are adapted for aluminium plants. The following are examples of the manner in which the letters are to be used.

6.1. Codification of Pots

Table 6.1 contains an example of the manner in which pots and associated processes can be coded.

Table 6.1 Codification of pots in potrooms

Name of system	AKS code		
	System code	Equipment code	Component code
Pot 30 in potroom			
Pot shell	FA 030	BU 10	
Pot lining	FA 030	BU 20	
Base and insulation	FA 030	BF 10	
Flex	FA 030	BQ 11	
Cathode bars	FA 030	BQ 12	
Cathodes	FA 030	BQ 13	
Alumina system of pot 30 in potroom			
Alumina container 1	FA 030	BB 10	
Alumina feeder 1	FA 030	BN 10	
Alumina container 2	FA 030	BB 20	
Alumina feeder 2	FA 030	BN 20	
Alumina container 3	FA 030	BB 30	
Alumina feeder 3	FA 030	BN 30	
Alumina container 4	FA 030	BB 40	
Alumina feeder 4	FA 030	BN 40	
Fluoride system of pot 30 in potroom			
Fluoride container	FA 030	BB 50	
Fluoride feeder	FA 030	BN 50	

Crust breakers of pot 30 in potroom			
Crust breaker 1	FA 030	AJ 10	
Crust breaker 2	FA 030	AJ 20	
Crust breaker 3	FA 030	AJ 30	
Anode beam equipment of pot 30 in potroom			
Anode beam jack 1	FA 030	AE 10	
Anode beam jack 2	FA 030	AE 20	
Anode beam jack 3	FA 030	AE 30	
Anode beam jack 4	FA 030	AE 40	
Gear 1	FA 030	AE 01	
Anode beam motor	FA 030	AE 01	-M 10
Gear 2	FA 030	AE 02	
Anode lock	FA 030	BQ 10	
Hood system			
Hoods	FH 000	BU 10	
End hood	FH 000	BU 20	
Exhaust cleaning system			
Exhaust duct connection	FH 000	AH 10	

6.2. Codification of Aluminium Holding Furnace

Example of coding for furnaces can be seen in Table 6.2. The example shows furnace No. 20, and LC 020 is the process-related code.

Table 6.2 Example of furnace coding

	AKS Codes	
Furnace No. 20		
Base	LC 020	BF 10
Insulation, refractory bricks	LC 020	BU 10
Steel sheeting	LC 020	BU 20
Door, opening devices	LC 020	AE 11
Furnace tilting system	LC 020	AE 12
Hydraulic system	LC 020	AP 10
Burner 1	LC 020	AV 10
Burner 2	LC 020	AV 12
Burner 3	LC 020	AV 13
Blower, air intake	LC 020	AN 10
Exhaust	LC 020	AN 20
Feeder equipment	LC 020	BR 10
Chutes	LC 020	BR 20

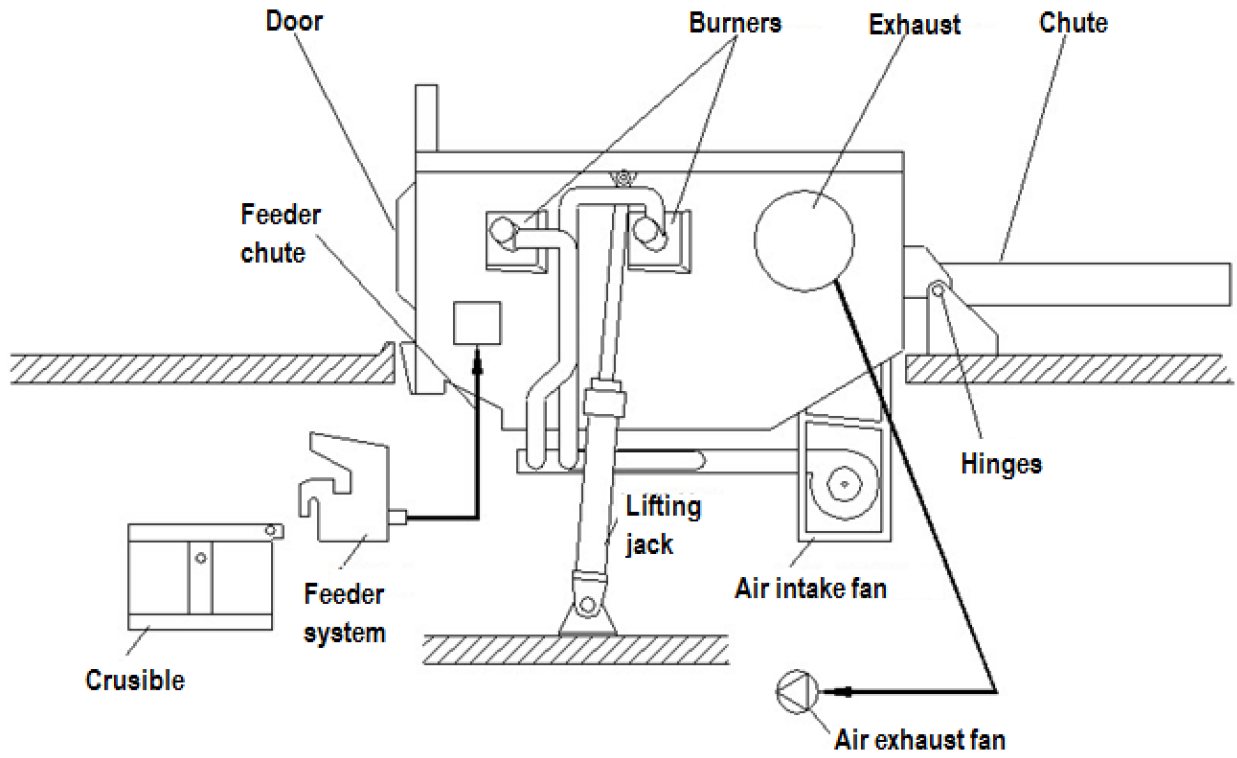


Figure 18 Diagram of furnace

7. Special Definitions for Norðurál's Electrical Systems

6 kW cables are defined with the code BF and the numeration 900

GS 1N (N = number) are to be "Circuit breakers"

GS 2N are to be "Disconnectors"

GS 3N are to be "Earth switches"

GS 4N are to be "Contact switches with relaying protection"

GS 5N are to be "DC current disconnectors"

GS 1N are to be "Current transformers"

GS 2N are to be "Voltage transformers"

Reserved codes for Norðurál's electrical systems in power stations

Power station 401 "BJ 001 to BJ 020" and "BH 001 to BH 020"

Power station 404 "BJ 021 to BJ 040" and "BH 021 to BH 040"

Power station 405 "BJ 041 to BJ 060" and "BH 041 to BH 060"

Power station 406 "BJ 061 to BJ 080" and "BH 061 to BH 080"

Power station 407 "BJ 081 to BJ 100" and "BH 081 to BH 100"

Power station 408 "BJ 101 to BJ 120" and "BH 101 to BH 120"

Power station 409 "BJ 121 to BJ 140" and "BH 121 to BH 140"

8. Amendments

8.1. Amendments to Version V 2.0

A comparison was made of version 2.0 and 2.1 which was available in .pdf format. A title page was prepared. Break Down Levels (BDL) and the handbook were merged into a single document.

BDL 3

Changes to the following:

QB changed to Not used

QF changed to Flow

QP changed to Pressure

QT changed to Temperature

GH changed to Fire extinguishing systems

LW changed to Flux equipment

Table 6.1 changed based on preferred set up

GN is also oil separators at 3rd level

Z at 3rd level not used Deleted.

07.06.2017-GJ at 2nd level changed from „Not used” to „Uninterruptible power supply (UPS)”

07.06.2017-LX at 1st level changed from „Not used” to „Magnetic stirrer”

9. BDL 1 Systems

Main system:

Systems are classified with S1 with the capital letters of the Latin alphabet. The letters I and O may not be used.

A	Not used
B	Electrical power system
C	Control and instrumentation system
D	Not used
E	Alumina transporting system
F	Aluminium electrolysis system
G	Water supply and discharge system
H	Not used
J	Rodding plant
K	Cathode workshop
L	Cast house
M	Crust bath process
P	Cooling water system
Q	Service supply systems, other than electrical
R	Measuring equipment for the environment and research lab
S	Ventilation systems (ancillary systems)
T	Vehicles
U	Buildings
V	Not used
W	Not used
X	Not used
Y	Replacement spare parts
Z	Equipment of service departments

B Power system

BA	Power transmission (220 kV)	
BB	Medium voltage power system (36 kV)	
BC	Rectifier transformer (36 kV)	
BD	Medium voltage power system (6.6 kV)	
BE	Not used	
BF	400V Power stations and tables	
BG	Not used	
BH	Not used	
BJ	400V Distributor panels and street cabinets	
BK	Not used	
BL	Street and outdoor lighting	
BM	Low-voltage distribution, emergency (UPS system)	
BN	Not used	
BP	Not used	
BQ	Not used	
BR	Not used	
BS	Capacitor installation	
BT	DC batteries and chargers	
BU	Not used	
DC	Distribution system, electrolysis	
BW	Not used	
BX	Not used	
BY	Rectifier control system	
BZ	Power system in general	(e.g. employee training and expert assistance)

C Control and Instrumentation System

- CA Protection interlocking system
- CB Functional group control system (PLC)
- CC Binary signal conditioning system
- CD Drive control interface system
- CE Alarm system
- CF Measurement
- CG Closed loop control system
- CH Protection
- CJ Process computer system (levels 2 & 3)
- CJ Process computer system (level 1)
- CL Access and surveillance system
- CM Control, measurement and labelling equipment
- CN Fire protection control system
- CP Not used
- CQ Not used
- CR Functional group control system
- CS Computer systems, combinations
- CT Switch controls
- CU Not used
- CV Marshalling racks
- CW Control desk in control room
- CX Not used
- CY Telephone systems – Data transmission system
- CZ Computers, equipment and systems

E Alumina transporting system

- EA Unloading system (from and including suction spout to expansion collar)
- EB Suction equipment (from and including expansion collar to and including gate valve in front of lift)
- EC Lift and silo re-fill equipment (lift from gate valve to and including distribution system on silo roof)
- ED Not used
- EE Alumina silo and exhaust equipment (port silo with exhaust and ventilation)
- EF Unloading system for alumina silos 310 & 360 (air skimming in bottom of silo to hand valves under feeder silos)
- EG Pure alumina transportation (transport capsule and conduits, from and including hand valves under feeder silos, with the exception of day silo for fume treatment plant)
- EH Not used
- EJ Not used
- EK Silo intermediate tank space – enriched alumina (silo for enriched alumina)
- EL Transport system from FTP to pot feed (transport capsules and related equipment for alumina transportation)
- EM Dense phase system to potrooms – enriched alumina
- EN Not used
- EP Not used
- EQ Not used
- EP Not used
- ES Not used
- ET Not used
- EU Not used
- EV Not used
- EW Not used
- EX Not used
- EY Control, regulating and protection system
- EZ Storage area

F Aluminium electrolysis system

- FA Pot superstructures
- FB Pots in potroom
- FC Not used
- FD Scrubbing system (from and including silo for pure alumina, to and including silo for enriched alumina)
- FE Not used
- FF Pot control systems
- FG Service cranes
- FH Hooding system (hoods and hoods)
- FJ Auxiliary cranes (other than service cranes together with transfer trailers)
- FK Not used
- FL Not used
- FM Not used
- FN Not used
- FP Not used
- FQ Not used
- FR Not used
- FS Ancillary systems (tools, auxiliary anode beam and wagons)
- FT Not used
- FU Crucibles and crucible cleaning station
- FV Not used
- FW Not used
- FX Not used
- FY ELAS – Pot controls
- FZ Electrolysis in general (e.g. employee training and expert assistance)

G Water supply and discharge system

GA	Not used
GB	Not used
GC	Not used
GD	Not used
GE	Not used
GF	Not used
GG	Not used
GH	Fire extinguishing systems
GJ	Not used
GK	Water distribution system, drinking water
GL	Not used
GM	Not used
GN	Discharge and sampling wells and oil separators
GP	Not used
GQ	Not used
GR	Domestic waste water piping and septic tanks
GS	Not used
GT	Not used
GU	Discharge water utilities
GV	Not used
GW	Not used
GX	Not used
GY	Not used
GZ	Not used



H Not used

HA Not used

HB Not used

HC Not used

HD Not used

HE Not used

HF Not used

HG Not used

HH Not used

HJ Not used

HK Not used

HL Not used

HM Not used

HN Not used

HP Not used

HQ Not used

HR Not used

HS Not used

HT Not used

HU Not used

HV Not used

HW Not used

HX Not used

HY Not used

HZ Not used

J Rodding plant

JA	Not used
JB	Conveyor belt system, loading area "Hvíta Torg"
JC	Thimble stripping and cleaning
JD	Shot blasting machines (anode, stub and thimble- blasters)
JE	Straightening machine (fork, rod, and stub- straightening)
JF	Fork cleaning (fork cleaning and water bath for dust collection)
JG	Cranes
JH	Graphite bath and heating system (fork, anode and cathode heating)
JJ	Not used
JK	Not used
JL	Induction heating furnace (all equipment in and on furnace space, with dust collection system)
JM	Not used
JN	Anode recycling
JP	Overhead monorails (overhead rails and cranes for anode forks and casting)
JQ	Hydraulic system for anode cleaning (gas, air and oil)
JR	Fork and stub repair (fork and stub repair)
JS	Ancillary equipment
JT	Anode conveyors and casting equipment All anode conveyors, lifts, turning tables and casting machine
JU	Anode cleaning equipment
JV	Dust collection systems for anode cleaning
JW	Storage and draining equipment for bath material from rodding plant
JX	Not used
JY	Control, regulating and protection system
JZ	Anode rodding plant general

K Cathode workshop

KA	Equipment of building for spent pot linings
KB	Pot crane 160 mtn
KC	Pot lining and equipment
KD	Not used
KE	Not used
KF	Pot compressor
KG	Cranes
KH	Distributor panels and power distribution
KJ	Not used
KK	Potshells lining
KL	Cathode heaters
KM	Not used
KN	Not used
KP	Not used
KQ	Not used
KR	Not used
KS	Not used
KT	Not used
KU	Not used
KV	Not used
KW	Not used
KX	Not used
KY	Control, regulating and protection system
KZ	Cathode workshop in general

L Cast house

- LA Aluminium cleaning station, skimming and weighing
- LB Liquid aluminium transportation
- LC Furnaces
- LD Aluminium casting machines
- LE Not used
- LF Not used
- LG Cranes
- LH Argon supply system
- LJ Not used
- LK Not used
- LL Not used
- LM Not used
- LN Aluminium dross system
- LP Not used
- LQ Gas system
- LR Not used
- LS Does not exist
- LT Solid aluminium transportation
- LU Filter equipment on fluid aluminium
- LV Metal feeder system
- LW Flux equipment
- LX Magnetic stirrer
- LY Control, regulating and protection system
- LZ Cast house in general

M Crust bath process

MA	Not used
MB	Not used
MC	Not used
MD	Not used
ME	Not used
MF	Fluorine
MG	Does not exist
MH	Not used
MJ	Does not exist
MK	Cooling of crust bath between potrooms B and C
ML	Recycling of covering material
MM	Not used
MN	Recycled bath conveying (transport of crust bath from first blow tank in crust bath processing to and with filling station for crane in pot room)
MP	Not used
MQ	Not used
MR	Not used
MS	Not used
MT	Not used
MU	Not used
MV	Not used
MW	Not used
MX	Not used
MY	Control, regulating and protection system
MZ	Not used

N Not used

NA Not used

NB Not used

NC Not used

ND Not used

NE Not used

NF Not used

NG Not used

NH Not used

NJ Not used

NK Not used

NL Not used

NM Not used

NN Not used

NP Not used

NQ Not used

NR Not used

NS Not used

NT Not used

NU Not used

NV Not used

NW Not used

NX Not used

NY Not used

NZ Not used

P Cooling water systems

PA	Seawater cooling system
PB	Not used
PC	Not used
PD	Not used
PE	Not used
PF	Not used
PG	Cooling water system, antifreeze (Glycol)
PH	Not used
PJ	Water cooling systems, rectifiers Diw-water
PK	Not used
PL	Cooling systems of aluminium casting machines
PM	Not used
PN	Not used
PP	Not used
PQ	Not used
PR	Not used
PS	Not used
PT	Not used
PU	Not used
PV	Not used
PW	Not used
PX	Not used
PY	Control, regulating and protection system
PZ	Not used

Q Service supply systems, other than electrical

- QA Not used
- QB Not used
- QC Not used
- QD Not used
- QE General air pressure systems
- QF Not used
- QG Not used
- QH Not used
- QJ Gas system
- QK Not used
- QL Not used
- QM Not used
- QN Not used
- QP Not used
- QQ Not used
- QR Not used
- QS Not used
- QT Not used
- QU Not used
- QV Not used
- QW Not used
- QX Not used
- QY Industrial control machines
- QZ Not used

R Measuring equipment for the environment and research lab

RA	Not used
RB	Not used
RC	Not used
RD	Not used
RE	Not used
RF	Not used
RG	Not used
RH	Not used
RJ	Not used
RK	Not used
RL	Not used
RM	Not used
RN	Not used
RP	Not used
RQ	Not used
RR	Laboratory
RS	Not used
RT	Not used
RU	Environmental measuring devices
RV	Not used
RW	Not used
RX	Not used
RY	Not used
RZ	Not used



S Not used

- SA Not used
- SB Not used
- SC Not used
- SD Not used
- SE Not used
- SF Not used
- SG Not used
- SH Not used
- SJ Not used
- SK Not used
- SL Not used
- SM Not used
- SN Not used
- SP Not used
- SQ Not used
- SR Not used
- SS Not used
- ST Not used
- SU Not used
- SV Not used
- SW Not used
- SX Not used
- SY Not used
- SZ Not used

T Vehicles

TA	Not used
TB	Not used
TC	Cars (Registered vehicles in the Vehicle Registry)
TD	Not used
TE	Not used
TF	Industrial trucks for potrooms
TG	Not used
TH	Not used
TJ	Industrial trucks for anode rodding plant
TK	Industrial trucks for potlining
TL	Industrial trucks for cast house
TM	Not used
TN	Not used
TP	Not used
TQ	Not used
TR	Not used
TS	Not used
TT	Industrial trucks of maintenance department
TU	Not used
TV	Not used
TW	Industrial trucks from storage
TX	Not used
TY	Not used
TZ	Not used

U Buildings

UA	Switchyard and distribution network
UB	Not used
UC	Not used
UD	Not used
UE	Dock area
UF	Aluminium electrolysis system
UG	Water supply and discharge system
UH	Not used
UJ	Anode rodding plant
UK	Cathode workshop and spent pot linings building
UL	Cast house
UM	Materials processing
UN	Not used
UP	Cooling water systems
UQ	Other utilities, excluding electrical
UR	Not used
US	Not used
UT	Workshop
UU	Not used
UV	Not used
UW	Warehouses
UX	Not used
UY	General services
UZ	Site, road system and fences

Y Replacement spare parts

YA Replacement and refurbished spare parts



W Not used

WA Not used

WB Not used

WC Not used

WD Not used

WE Not used

WF Not used

WG Not used

WH Not used

WJ Not used

WK Not used

WL Not used

WM Not used

WN Not used

WP Not used

WQ Not used

WR Not used

WS Not used

WT Not used

WU Not used

WV Not used

WW Not used

WX Not used

WY Not used

WZ Not used



X Not used

XA Not used

XB Not used

XC Not used

XD Not used

XE Not used

XF Not used

XG Not used

XH Not used

XJ Not used

XK Not used

XL Not used

XM Not used

XN Not used

XP Not used

XQ Not used

XR Not used

XS Not used

XT Not used

XU Not used

XV Not used

XW Not used

XX Not used

XY Not used

XZ Not used

Z Equipment of service departments

ZA	Electrical utility
ZB	Materials processing
ZC	Crane workshop
ZD	Not used
ZE	Not used
ZF	Electrolysis system
ZG	Not used
ZH	Not used
ZJ	Not used
ZK	Pot workshop
ZL	Not used
ZM	Canteen and housekeeping
ZN	Not used
ZP	Not used
ZQ	Not used
ZR	Not used
ZS	Security field
ZT	Vehicle workshop
ZU	Not used
ZV	Main workshop
ZW	Work schedule department
ZX	Not used
ZY	Storage area
ZZ	General maintenance department

10. BDL 2 Equipment Units

Main equipment units

A	Mechanical equipment
B	Mechanical equipment
C	Direct measuring circuits (A2 is according to DIN 19227, Part 1, September 1977, Table 1, letters)
D	Closed-loop control circuits (A2 is according to DIN 19227, Part 1, September 1977, Table 1, letters)
E	Analogue and binary signal conditioning
F	Indirect measuring circuits (A2 is according to DIN 19227, Part 1, September 1977, Table 1, letters)
G	Electrical equipment
H	Subassemblies of main or heavy machinery (only to be used in conjunction with main category M, main machines sets and X, heavy machinery)
J	Not used
K	Building sections
L	Not used
M	Not used
N	Not used
P	<i>Not used</i>
Q	<i>Not used</i>
R	<i>Not used</i>
S	<i>Not used</i>
T	<i>Not used</i>
U	<i>Not used</i>
V	<i>Not used</i>
W	<i>Not used</i>
X	<i>Not used</i>
Y	<i>Not used</i>
Z	<i>Not used</i>

A Mechanical equipment

- AA Valves, flaps, hatches, etc., including actuators, also manual, and other related equipment
- AB Valves, air curtains, partitions and related equipment
- AC Heat exchangers, heat transfer surfaces
- AD Safety equipment, fences, gates
- AE Turning, transfer and lifting equipment (also manual)
- AR Conveyor belts, feeders, escalators
- AG Diesel generators/machines
- AH Heating, cooling and ventilation equipment
- AJ Grinders, shredders, mincers and related equipment, only as part of process
- Ak Compacting and packaging equipment + scales, only as part of process
- AL Not used
- AM Mixers and agitators
- AN Air compressors and fans
- AP Pump units
- AQ Hoists and overhead travelling cranes
- AR Degassing
- AS Jacks, adjusting and tensioning equipment, non-electrical equipment (only to be used when the equipment is part of an integrated system)
- AT Cleaning, drying, filtering and separating equipment, excluding that under BT
- AU Braking, gearbox, coupling equipment, non-electrical converters
- AV Combustion equipment, burners
- AW Stationary tools and devices for maintenance work
- AX Testing and monitoring equipment for maintenance work
- AY Not used
- AZ Not used

B ***Mechanical equipment***

BA	Not used
BB	Storage equipment, reservoir equipment, tanks
BC	Not used
BD	Shafts, arms, scrapers and spades (used in production)
BE	Shafts (for erection and maintenance only)
BF	Foundations
BG	Not used
BH	Not used
BJ	Not used
BK	Anode changing tools
BL	Not used
BM	Not used
BN	Injector and ejector equipment
BP	Flow restrictors, limiters, orifices (not metering orifices)
BQ	Hangers, supports, racks, piping penetrations and doors
BR	Piping, ductwork, chutes, pipe and flexible connectors, toilets
BS	Silencers
BT	Flue gas catalytic converter modules
BU	Insulation, guards, sheathing
BV	Not used
BW	Not used
BX	Not used
BY	Not used
BZ	Not used

- C Direct measuring circuits (A2 is according to DIN 19227, Part 1, September 1977, Table 1, letters)**
- CA Analysis (e.g. of pollution in exhaust, chemical analysis of aluminium samples, etc.)
 - CB Combustion (for sensing fire, e.g. “eyes” at burners, compression meters, etc.)
 - CC Not used
 - CD Density
 - CE Electrical variables (e.g. efficiency, power, etc.)
 - CF Flow, rate (flow of e.g. fluids, air, materials, etc. Volume per time unit)
 - CG Distance, length, position, direction of rotation
 - CH Manual (input from manually operated equipment, e.g. switches, handles, buttons, etc.)
 - CJ Power (power in kW, measured or calculated, in electrical, mechanical, heat transfer systems)
 - CK Time (time measurement, can be both real time (clock) or time measured from a specific event)
 - CL Level (sensing height, e.g. material levels in silos but does not denote actual volume)
 - CM Moisture, humidity
 - CN Not used
 - CP Pressure (pressure measured as force per unit area)
 - CQ Quality variables (volume, analyses, material properties other than CD, CM, CV)
 - CR Radioactivity (material radioactivity, energy radioactivity from objects, e.g. antenna, x-ray lamp)
 - CS Velocity, speed, frequency (mechanical), acceleration
 - CT Temperature
 - CU Combined and other variables
 - CV Vibration, mechanical analysis (measurements and analysis of mechanical movements, e.g. vibration)
 - CW Weight/power (measurement of weight or power, e.g. scales, torquemeter, tension meters, etc.)
 - CX Unclassified (intended for single-occasion use for measuring instruments not on this list)
 - CY Event/status (two-position signal (off/on, right/wrong), e.g. position sensors and restricting switches)
 - CZ Location/dimensions (measurement of location, lengths and angles, e.g. in robots)

D	Closed-loop control circuits (A2 is according to DIN 19227, Part 1, September 1977, Table 1, letters)
DA	Analysis (e.g. of pollution in exhaust, chemical analysis of aluminium samples, etc.)
DB	Combustion (for sensing fire, e.g. “eyes” at burners, compression meters, etc.)
DC	Not used
DD	Density
DE	Electrical variables (e.g. efficiency, power, etc.)
DF	Flow, rate
DG	Distance, length, position, direction of rotation
DH	Manual (input from manually operated equipment, e.g. switches, handles, buttons, etc.)
DJ	Power (power in kW, measured or calculated, in electrical, mechanical, heat transfer systems)
DK	Time (time measurement, can be both real time (clock) or time measured from a specific event)
DL	Level (sensing height, e.g. material levels in silos but does not denote actual volume)
DM	Moisture, humidity
DN	Not used
DP	Pressure (pressure measured as force per unit area)
DQ	Quality variables (analysis, material properties other than DD, DM, DV)
DR	Radioactivity (material radioactivity, energy radioactivity from objects, e.g. antenna, x-ray lamp)
DS	Velocity, speed, frequency (mechanical), acceleration
DT	Temperature
DU	Combined and other variables
DV	Vibration, mechanical analysis (measurements and analysis of mechanical movements, e.g. vibration)
DW	Weight/power (measurement of weight or power, e.g. scales, torquemeter, tension meters, etc.)
DX	Unclassified (intended for single-occasion use for measuring instruments not on this list)
DY	Event/status(two-position signal (off/on, right/wrong), e.g. position sensors and restricting switches)
DZ	Location/dimensions (measurement of location, lengths and angles, e.g. in robots)

E Analogue and binary signal conditioning

- EA Open-loop control – PLC computers subject to external variables (dumb)
- EB Open-loop control PLC computers that calculate variables (intelligent) e.g. ELAS
- EC Open-loop control (free for use) Copy equipment
- ED Open-loop control (free for use) Printers
- EE Open-loop control (free for use)
- EF Data transport system (LAN) Data bush, computer net, conductors, fibre cables and the like
- EG Alarms (free for use)
- EH Alarms (free for use)
- EJ Alarms (free for use)
- EK Alarms (free for use)
- EL Operation of computer systems Software and related items
- EM PC computer stations (Workstation) Conventional computers
- EN Servers, computers for data communications and storing of work data
- EP PC computers (mainframe), computers that run programs for many users in real time, e.g. DEC ALPHA
- EQ Router, computer controlling data transport shortest way through computer net
- ER Switches and gateways, gates between two or more computer systems
- ES Transceiver, transforms data transport from one form to another
- ET Not used
- EU Combined analogue and binary signal conditioning
- EV Not used
- EW Protection equipment (free for use)
- EX Protection equipment (free for use)
- EY Protection equipment (free for use)
- EZ Protection equipment (free for use)

F Indirect measuring circuits

- FA Analysis (e.g. of pollution in exhaust, chemical analysis of aluminium samples, etc.)
- FB Combustion (for sensing fire, e.g. “eyes” at burners, compression meters, etc.)
- FC Not used
- FD Density
- FE Electrical variables (e.g. efficiency, power, etc.)
- FF Flow, rate (flow of e.g. fluids, air, materials, etc. Volume per time unit)
- FG Distance, length, position, direction of rotation
- FH Manual (input from manually operated equipment, e.g. switches, handles, buttons, etc.)
- FJ Power (power in kW, measured or calculated, in electrical, mechanical, heat transfer systems)
- FK Time (time measurement, can be both real time (clock) or time measured from a specific event)
- FL Level (sensing height, e.g. material levels in silos but does not denote actual volume)
- FM Moisture, humidity
- FN Not used
- FP Pressure (pressure measured as force per unit area)
- FQ Quality variables (volume, analyses, material properties other than FD, FM, FV)
- FR Radioactivity (material radioactivity, energy radioactivity from objects, e.g. antenna, x-ray lamp)
- FS Velocity, speed, frequency (mechanical), acceleration
- FT Temperature
- FU Combined and other variables
- FV Viscosity (vibrations, mechanical analysis)
- FW Weight/power (measurement of weight or power, e.g. scales, torquemeter, tension meters, etc.)
- FX Unclassified (intended for single-occasion use for measuring instruments not on this list)
- FY Vibration, expansion (event/status)
- FZ Location/dimensions (measurement of location, lengths and angles, e.g. in robots)

G Electrical equipment

- GA Cables
- GB Junction boxes and cable/busbar penetrations (free for use)
- GC Junction boxes and cable/busbar penetrations (free for use)
- GD Penetrations
- GE Current busbars
- GF Junction boxes and cable/busbar penetrations (free for use)
- GG Cable routes, trenches, ladders
- GH Electrical and instrumentation and control installation units identified as per process-related codes (e.g. cubicles, boxes)
- GJ Uninterruptible power supply (UPS)
- GK Information displays and operator control equipment for process computers and automation systems
- GL Not used
- GM Sub-junction boxes for public telecommunication services
- GN Not used
- GP Sub-distribution/junction boxes for lighting
- GQ Sub-distribution/junction boxes for power sockets
- GR DC generating equipment, batteries
- GS Switchgear equipment if not identified under process equipment
- GT Transformer equipment
- GU Converter equipment
- GV Structure-related earthing and lightning protection equipment, surge arrestors
- GW Cabinet power supply equipment
- GX Boxes or cabinets for electricity (ELV)
- GY Junction boxes for light-current systems, not public telecommunication systems)
- GZ Hangers, supports and racks for electrical and instrumentation and control equipment

H Subassemblies of main and heavy machinery (only to be used in conjunction with main category M, main machines sets and X, heavy machinery)

HA Machine stationary assembly

HB Machine rotating assembly

HC Not used

HD Bearing assembly

HE Not used

HF Not used

HG Not used

HH Not used

HJ Not used

HK Not used

HL Not used

HM Not used

HN Not used

HP Not used

HQ Not used

HR Not used

HS Not used

HT Not used

HU Not used

HV Not used

HW Not used

HX Not used

HY Not used

HZ Not used

J NOT USED

JA Not used
JB Not used
JC Not used
JD Not used
JE Not used
JF Not used
JG Not used
JH Not used
JJ Not used
JK Not used
JL Not used
JM Not used
JN Not used
JP Not used
JQ Not used
JR Not used
JS Not used
JT Not used
JU Not used
JV Not used
JW Not used
JX Not used
JY Not used
JZ Not used

K BUILDING SECTIONS

KA	Not used
KB	Concrete sections (floor, walls and supports)
KC	Not used
KD	Not used
KE	Not used
KF	Not used
KG	Interior fixtures
KH	Penetrations and doors
KK	Not used
KK	Not used
KL	Not used
KM	Not used
KN	Not used
KP	Not used
KQ	Load-bearing structures and supports (not concrete)
KR	Not used
KS	Not used
KT	Not used
KU	Cladding
KV	Not used
KW	Not used
KX	Not used
KY	Not used
KZ	Not used

11. BDL 3 Components

Classification of components

-	Electrical components
A	Not used
B	Not used
C	Not used
D	Not used
E	Not used
F	Not used
G	Not used
H	Not used
J	Not used
K	Mechanical components
L	Not used
M	Mechanical components
N	Not used
P	Not used
Q	Measurement, marking and control components (non-electrical)
R	Not used
S	Not used
T	Not used
U	Not used
V	Not used
W	Not used
X	Simple signals in – input to control equipment
Y	Simple signals out – output to control equipment

- **Electrical components**
- A Assemblies and subassemblies**
- B** Transducers for non-electrical to electrical variables and vice-versa
- C** Capacitators
- D** Binary elements, delay devices, memory devices
- E** Special components
- F** Protective devices
- G** Generators, power supplies
- H** Signalling devices
- K** Relays, contactors
- L** Inductors
- M** Motors
- N** Amplifiers, controllers
- P** Measuring instruments, testing equipment
- Q** Power switchgear
- R** Resistors
- S** Switches, selectors
- T** Transformers
- U** Modulators, converters from electrical to other electrical variables
- V** Tubes, semiconductors
- W** Transmission paths, waveguides, aerials
- X** Terminals, plugs, sockets
- Y** Electrical positioners, e.g. solenoids (not motors)
- Z** Terminations, balancing equipment, filters, limiters, cable terminations

K Mechanical components

KA	Gate valves, globe valves, dampers, cocks, rupture disks, orifices
KB	Gates, doors, dam boards
KC	Heat exchangers, coolers
KD	Vessels/tanks, pools, surge tanks (fluid systems)
KE	Turning, driving, lifting and towing gear
KF	Continuous conveyors, feeders
KG	Not used
KH	Not used
KJ	Compacting, size reduction machines
KK	Compacting, packaging machines
KL	Not used
KM	Mixers, agitators
KN	Compressors, blowers, fans
KP	Pumps
KQ	Not used
KR	Not used
KS	Other equipment (not found categorised)
KT	Cleaning machines, dryers, separators, filters
KU	Silencers (mufflers)
KV	Burners, grates
KW	Stationary tools and treatment machines for maintenance
KX	Not used
KY	Not used
KZ	Not used

M Mechanical components

MA	Not used
MB	Brakes
MC	Shock absorbers
MD	Not used
ME	Not used
MF	Foundations
MG	Gearboxes
MH	Not used
MJ	Not used
MK	Clutches, couplings
ML	Not used
MM	Engines (not electrical)
MN	Not used
MP	Not used
MQ	Not used
MR	Piping components, ductwork components
MS	Positioners, not electrical
MT	Turbines
MU	Transmission gear, non-electrical, converters and boosters other than couplings and gearboxes
MV	Not used
MW	Not used
MX	Not used
MY	Not used
MZ	Not used

Q	Measurement, marking and control components (non-electrical)
QA	Not used
QB	Not used
QC	Not used
QD	Not used
QE	Not used
QF	Flow, rate (flow of e.g. fluids, air, materials, etc. Volume per time unit)
QG	Not used
QH	Signalling devices
QJ	Not used
QK	Not used
QL	Not used
QM	Cameras
QN	Controllers, centrifugal regulators
QP	Pressure (pressure measured as force per unit area)
QQ	Not used
QR	Instrument piping
QS	Condensation chambers (datum reservoir) in measuring circuits
QT	Heat
QU	Converter equipment
QV	Not used
QW	Not used
QX	Not used
QY	Not used
QZ	Not used

X	Simple signals in – input to control equipment
XA	Analysis (e.g. of pollution in exhaust, chemical analysis of aluminium samples, etc.)
XB	Combustion (for sensing fire, e.g. “eyes” at burners, compression meters, etc.)
XC	Simple signals (in) (free for use)
XD	Simple signals (in) (free for use)
XE	Electrical variables (e.g. efficiency, power, etc.)
XF	Flow, rate (flow of e.g. fluids, air, materials, etc. Volume per time unit)
XG	Simple signals (in) (free for use)
XH	Manual (input from manually operated equipment, e.g. switches, handles, buttons, etc.)
XJ	Power (in kW measured or calculated, in electrical, mechanical, heat transfer systems)
XK	Time (time measurement, can be both real time (clock) or time measured from a specific event)
XL	Level (sensing height, e.g. material levels in silos but does not denote actual volume)
XM	Simple signals (in) (free for use)
XN	Simple signals (in) (free for use)
XP	Pressure (pressure measured as force per unit area)
XQ	Volume (actual volume of material, can be calculated from height if area is known)
XR	Radioactivity (material radioactivity, energy radioactivity from objects, e.g. antenna, x-ray lamp)
XS	Speed/frequency (speed or frequency of events, velocity, distance or number of repeated events over time)
XT	Temperature
XU	Combined signals (signal that can represent many signals in one signal)
XV	Vibration, mechanical analysis (measurements and analysis of mechanical movements, e.g. vibration)
XW	Weight/power (measurement of weight or power, e.g. scales, torquemeter, tension meters, etc.)
XX	Unclassified (intended for single-occasion use for measuring instruments not on this list)
XY	Event/status(two-position signal (off/on, right/wrong), e.g. position sensors and restricting switches)
XZ	Location/dimensions (measurement of location, lengths and angles, e.g. in robots)

Y Simple signals out – output from to control equipment

- YA Simple signals (out) (free for use)
- YB Combustion (controlling combustion, e.g. fuel, air)
- YC Simple signals (out) (free for use)
- YD Simple signals (out) (free for use)
- YE Electrical variables (e.g. efficiency, power, etc.)
- YF Flow (control of flow of e.g. fluids, air, materials, etc.)
- YG Simple signals (out) (free for use)
- YH Simple signals (out) (free for use)
- YJ Power
- YK Time (control of time signal, e.g. master clock in a system)
- YL Level (e.g. control of level in a liquids tank)
- YM Simple signals (out) (free for use)
- YN Simple signals (out) (free for use)
- YP Pressure (control of pressure e.g. working pressure of compressed air)
- YQ Volume (control/adjustment of volumes, e.g. dispensers for bagging machines (same as above))
- YR Radiation (control/adjustment of radiation, e.g. pre-tensioning x-ray lamps)
- YS Speed/frequency (control/adjustment of speed, e.g. motor speed)
- YT Temperature
- YU Combined signals (signal that can represent control of many variables in one signal)
- YV Valves (control of opening and closing of valves, orifices, lids and the like)
- YW Weight/power (control/adjustment of force, e.g. excitation control of electrical motor)
- YN Simple signals (out) (free for use)
- YY Event/status (control of switch, e.g. main switch)
- YZ Location/dimension (control of actuators, e.g. stops and the like)