Eskom	Standard	Medupi Power Station Project

Title: **KKS Coding and Labelling Standard**

Document Identifier:	**348-630398**
Alternative Reference Number:	**200-3340**
Area of Applicability:	**Medupi Power Station Project**
Functional Area:	**Configuration Management**
Revision:	**5**
Total Pages:	**42**
Review Period:	**February 2026**
Disclosure Classification:	**Controlled Disclosure**

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Date: 21-04-2023	Date:	Date:	Date:

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Tables

1. Introduction

To ensure the standardised application of plant coding and labelling on allocated equipment for effective use in all management and information systems. Existing plant coding and labelling shall be used as far as practically possible.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this standard is to specify the detailed requirements for the Medupi Power Station Project by ensuring the plant get labelled with the correct codes and equipment descriptions.

2.1.2 Applicability

This standard shall be applicable for all plant and equipment on the Medupi Power Station Project that require plant coding and labelling.

2.1.3 Effective date

Date of authorisation of the standard.

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition and/or revision of the documents listed in the following paragraphs.

2.2.1 Normative

[1] VGB-B 105 E KKS Guidelines 2010

[2] VGB-B 106 E – KKS – Part A Application Commentaries

[3] VGB-B 106 B1 E – KKS – Part B1 Identification in Mechanical Engineering 2004

[4] VGB-B 106 B2 E – KKS – Part B2 Identification in Civil Engineering 2004

[5] VGB-B 106 B3 E – KKS – Part B3 Identification of Electrical and C&I Engineering 2004

[6] VGB-B 106 B4 E – KKS – Part B4 Identification of C&I in Process Systems 2004

[7] ESKSCAAC6 Specification for the Identification of the contents of pipelines and vessels

[8] ISO 10007 Guidelines for Configuration Management

[9] ISO 9001 Quality Management Systems - Requirements

[10] IEC 61355-1 Documentation and Record Management Standard

2.2.2 Informative

[11] 348-885912 Medupi Power Station Project Standard Abbreviations

[12] 348-882024 The Application of KKS Plant Coding

[13] 348-694071 KKS Key Part – Fossil Power Station

[14] 348-885912 Medupi Power Station Project Alpha Power Station Standard Abbreviations KKS 02

[15] Corrosion Protection Specification of Project Alpha

2.3 Definitions

Term	Explanation
Basic colour	A colour that indicates the group of fluids to which the contents of a pipeline or vessel belongs.
Clad/cladding	The external protective metal sheath of the insulation of a pipeline or vessel.
Colour code indicator(s)	One or two colours that are applied in addition to the basic colour to indicate the specific contents.
Description	A description given to a process, structure, point of installation, component or equipment.
Label	Identification of process, structure, point of installation, component or equipment by means of approved fixing methods, materials and ergonomic requirements.
Lagged	Indicates an insulated pipe or vessel that has no external protective sheath.
Stencil	A stencil is a thin sheet of material, such as paper, plastic, wood or metal, with letters or a design cut from it, used to produce the letters or design on an underlying surface by applying pigment through the cut-out holes in the material. The key advantage of a stencil is that it can be reused to repeatedly and rapidly produce the same letters or design.

2.4 Abbreviations

Abbreviation	Explanation
CM	Configuration Management
C&I	Control and Instrumentation
DC	Direct Current
IEC	International Electro-technical Commission
ISO	International Organization for Standardization
KKS	Kraftwerk Kennzeichen System – German abbreviation for (Power Plant Classification system)
KPA’s / KPI’s	Key Performance Areas / Indicators
MCB	Micro Circuit Breaker
MV	Medium Voltage
PLC	Programmable logic controller
PVC	Polyvinyl chloride
P&ID	Piping and Instrumentation Diagram
QMS	Quality Management System
TM	Eskom’s Medupi Project Execution Team

Abbreviation	Explanation
VGB	Technische Vereinigung Der Grosskraftwerks Betreiber E.V (Major Power Plant Users Association)

2.5 Roles and Responsibilities

a) Responsible

Those who do the work to achieve the task. There is at least one role with a participation type of responsible, although others can be delegated to assist in the work required.

b) Accountable (also approver or final approving authority)

The one ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those responsible. In other words, an accountable must sign off (approve) work that responsible provides. There **must** be only one accountable specified for each task or deliverable.

c) Consulted (sometimes counsel)

Those whose opinions are sought, typically subject matter experts; and with whom there is two-way communication.

d) Informed

Those who are kept up-to-date on progress, often only on completion of the task or deliverable; and with whom there is just one-way communication.

Table 1: RACI Matrix

Task	CM Lead Project Engineer	Document Controller	System Engineer	Lead Project Engineers	Contracts Managers	CM/KKS Technicians	Document Manager
Ensure that design activities are executed in line with the KKS Coding and Labelling Standard.	**A**	I	I	R	I	R	I
Ensure that changes to designs are managed according to the ECM Process.	R	I	R	**A**	I	R	I
Ensure that contractors and external design authorities comply with CM requirements.	**A**	I	I	R	R	R	I
Capture the configuration of the plant in the EDMS.	**A**	I	C	C	I	R	I
Verify the configuration of systems prior to baseline approval.	**A**	I	R	C/I	I	R	I
Ensure that documents are correctly identified.	I	R	I	I	I	C	**A**
Ensure that plant, system and components is correctly identified.	**A**	I	R	R	I	R	I
Report on the status of the plant and its configuration information.	**A**	I	I	R	I	R	I

2.6 Related/Supporting Documents

VGB-B 105 E KKS Guidelines 2010

240-100523028 Medupi Power Station Labelling User Requirement Specification

3. Document Content

3.1 Plant Identification

3.1.1 Plant Labelling

Plant coding is the cornerstone of Configuration Management and related information systems. It is of utmost importance that a standardised application thereof is used. The structure should include all equipment that shall have a maintenance strategy and shall assist in operating and maintenance activities.

3.1.2 Coding System

The KKS plant coding system has been adopted by Eskom and Power Stations. The coding system has been developed by the VGB with a set of guidelines. Refer to the references for a detailed explanation on the application of KKS (C&I, Electrical, Mechanical & Civil).

3.2 Plant Labelling

Plant labelling is the physical label that is fixed to the plant. The purpose of plant label is to unambiguously distinguish between plant items and to ensure that a one to one correlation exist between the identification of the item on the plant and the identification of the item in the information systems and related documentation. The manufacturing of the label shall be from an approved equipment / label list.

3.2.1 Labels

Because of the diversity of a plant that has to be labelled one cannot standardise on the material, size and type of label. This standard shall therefore distinguish between the different plant areas and types of labels to be used. Spacing in the KKS number shall be used when labels are manufactured.

3.2.2 Label Material

The following material shall be used for the different plant areas. Refer to Table: 2 below.

PLANT AREA	LABEL MATERIAL TYPE	BACK PLATE MATERIAL TYPE
Boiler	Anodised Aluminium	Anodised Aluminium
Turbine	Anodised Aluminium	Anodised Aluminium
Ash Plant	Anodised Aluminium	Anodised Aluminium
Coal Plant	Anodised Aluminium	Anodised Aluminium
Water Treatment Plant	Stainless Steel	Stainless Steel
BOP and LP Services	Anodised Aluminium	Anodised Aluminium

Switchgear and Panels	White Graflux	N/A
Internal panels/cubicles	Colour coded plastic	N/A
Transformers and structures	Cromadeck	Pre manufactured stand or wall mounted
Room Identification	Cromadeck (orange background with black text)	

Table 2 : Label material

3.2.3 Label Engraving

a) Engraving on the labels is Arial Monospaced MT font

b) Standard vertical characters must be used. Narrow (condensed), broad (extended) characters are not acceptable.

c) If the label description is too long to fit in one line and requires to go over multiple lines, it should be spread evenly across the height of the label.

3.2.4 Ergonomic Requirements

a) Consistency shall be maintained when fitting new labels regarding material, labels shall be fitted in such a manner not to hamper routine operation and maintenance activities.

b) Labels should be fitted in a position where they can be easily seen without compromising identity of exact equipment.

c) Labels shall be mounted so that the text runs in a horizontal plane reading from left to right to the nearest fixed point that is being described.

d) For labels that have to be mounted vertically due to space constraints, the method of text reading shall be from bottom to top. This excludes cable labels.

e) Label fixing devices e.g. rivets, self-tappers, adhesives, ext. shall not penetrate the equipment housing or constitute a potential source of corrosion. All labels must be securely fitted to the plant.

f) Labels or back plates/brackets shall not have sharp edges or protrude in such a way as to pose a safety risk.

g) Valve labels shall not be installed on hand wheels and labels shall not cover equipment specification plates.

3.2.5 Environmental Factors

a) All labels shall be able to withstand the following for at least 30 years:

b) Rain

c) Hail

d) Temperature variance as required by plant

e) Wind and Dust erosion

f) Ultra Violet rays (sun)

g) Corrosion

3.3 Plant Labels

3.3.1 Label Type GA

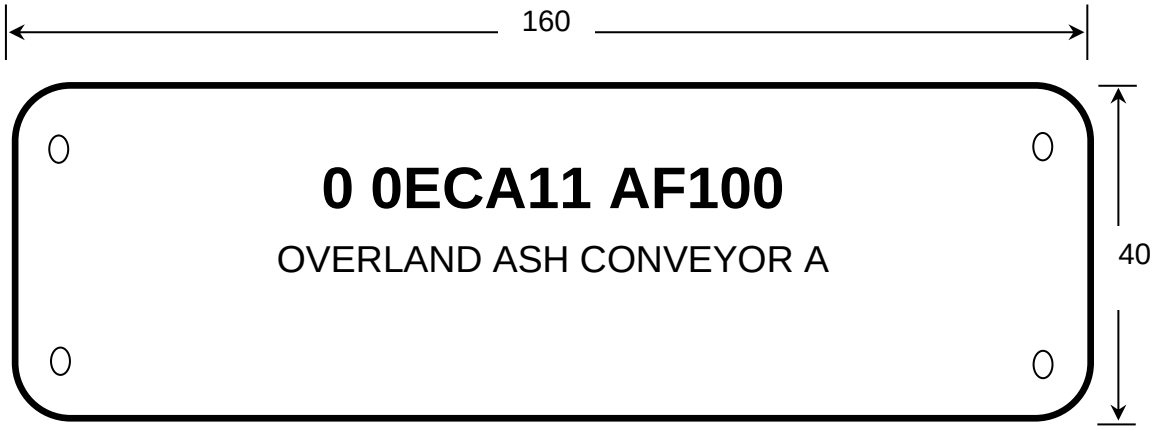


Figure 1: Mechanical Plant System Identification Label

a) **Material:** Refer to Table: 2
1.5mm Thick

b) **Fixing Holes:** 4x4mm Dia. (To be drilled only when fitted with a back plate)
7,5mm from Sides

c) Engraving:

- Characters Fill In Colour: Black
- Alphanumeric Characters: 7mm High
- Description Characters: 5mm High

3.3.2 Label Type GB

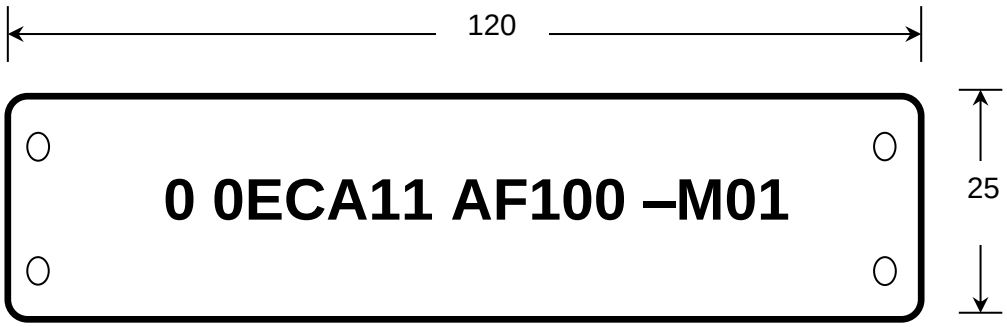


Figure 2: Mechanical Plant Component Identification Label

a) **Material:** Refer to Table: 2 (1.5mm Thick Corner radius: 4mm)

b) **Fixing Holes:** 2 x 4mm Dia. (To be drilled only when fitted with a back plate)
On centre line 7,5mm from Sides

c) Engraving:

- Characters Fill In Colour: Black
- Alphanumeric Characters: 7mm High

3.3.3 Label Type GC

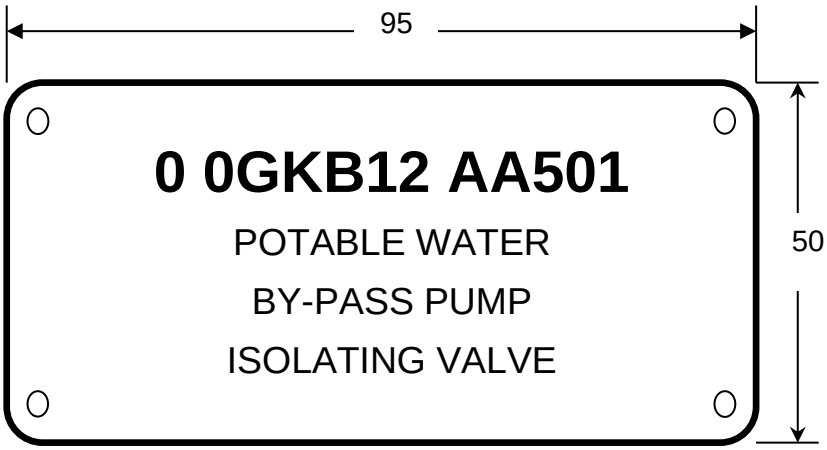


Figure 3: Mechanical Plant Component Identification Label

a) **Material:** Refer to Table: 2 (1.5mm Thick Corner radius: 4mm)

b) **Fixing Holes:** 4 X 4mm Dia. (To be drilled only when fitted with a back plate)
7,5mm from Sides

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 7mm High
- Description Characters: 5mm High

3.3.4 Label Type GD

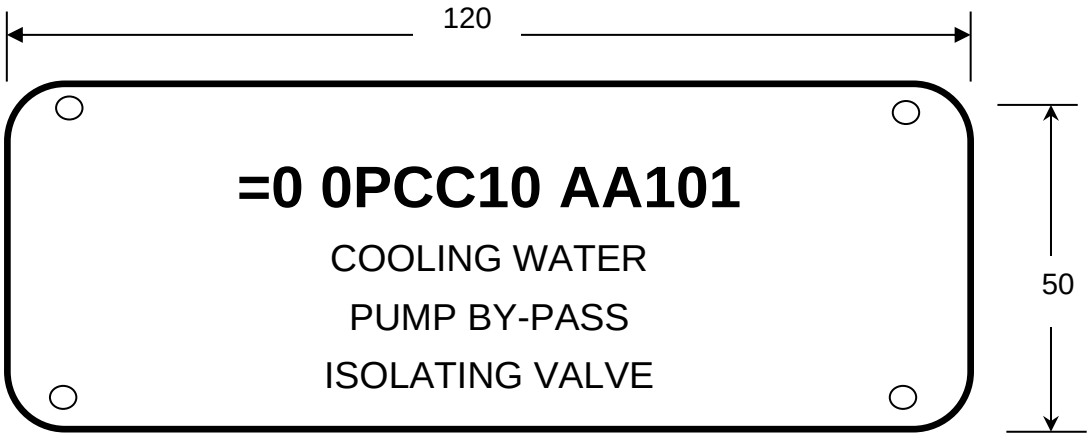


Figure 4: Process Code Labels for Process Control Equipment on Local Control Panels, Mimics and Control Panels

a) **Material:** Refer to Table: 2 (1.5mm Thick Corner radius: 4mm)

b) **Fixing Holes:** 4 X 4mm Dia. (To be drilled only when fitted with a back plate)
7,5mm from Sides

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 7mm High
- Description Characters: 5mm High

3.3.5 Label Type GE

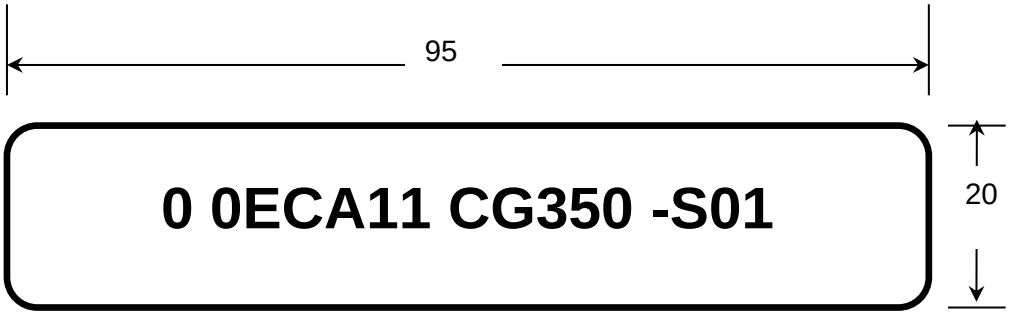


Figure 5: Field Device Label for Process Control Equipment / Room Identification

a) **Material:** Refer to Table: 2 (1.5mm)

b) Engraving:

- Alphanumeric Characters: 4mm High

3.3.6 Label Type GF

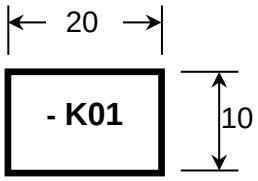


Figure 6: Identification Label inside Process Control and Electrical Equipment

a) Material: Refer to Table: 2 (1.5mm)

b) Engraving:

- Alphanumeric Characters: 3mm High, font – Arial, Colour: black

3.3.7 Label Type GG

Point of installation code labels for:

- Process control equipment
- Local Control Stations
- Marshalling Boxes, Junction Boxes, etc.

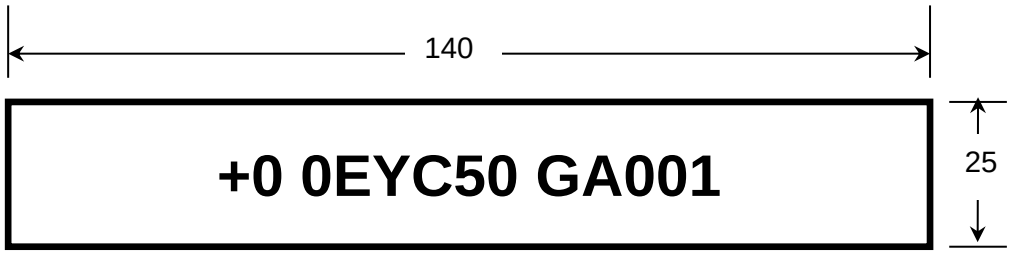


Figure 7: Point of Installation Code Labels

a) **Material:** Refer to Table: 2 (1.5mm)

b) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 10mm High, font - Arial

3.3.8 Label Type GH

Point of Installation Code Labels for Process Control and Electrical Equipment such as:

- PLC's Measurement Panels
- Protection Panels Measurement Racks
- Local Alarm Panels, etc.

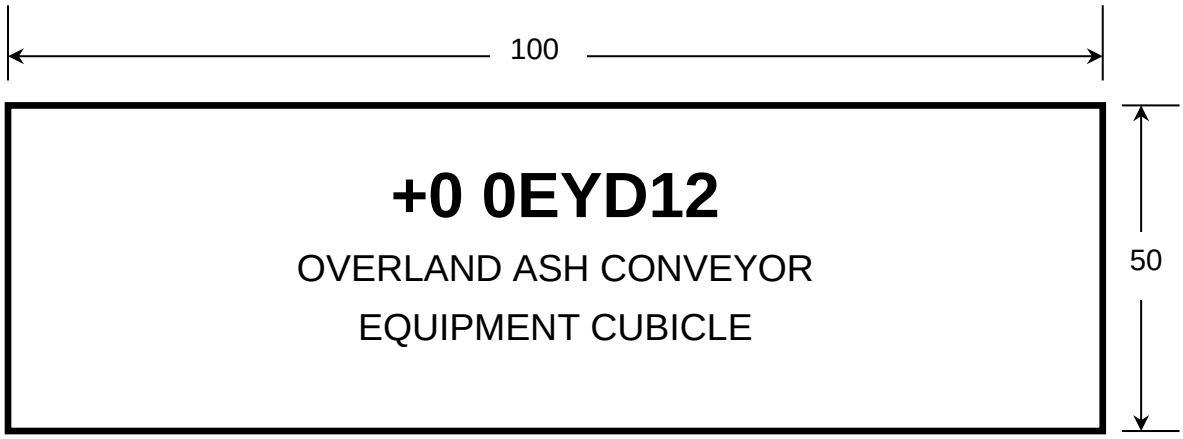


Figure 8: Point of Installation Code Labels

a) Material: Refer to Table: 2 (1.5mm)

b) Engraving:

- Characters Fill In Colour: Black
- Alphanumeric Characters: 10mm High, font - Arial
- Description Characters: 5mm High, font - Arial

3.3.9 Label Type GI

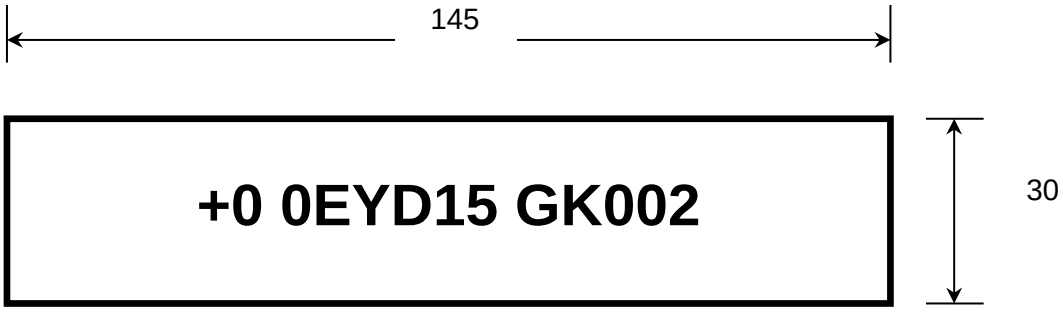


Figure 9: Point of Installation Code Label for Process Control Panels and Equipment

a) Material: Refer to Table: 1 (1,5mm Thick)

b) Engraving:

- Alphanumeric Characters: 10mm High

3.3.10 Label Type EA

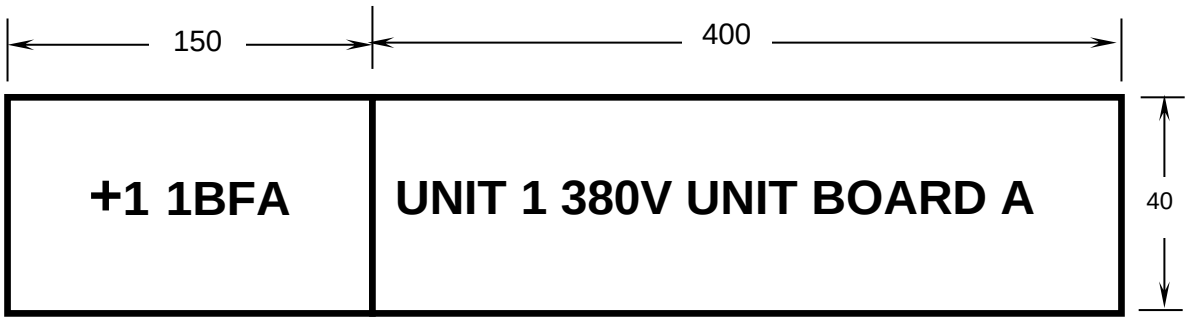


Figure 10: Board Main Label

a) Material: Refer to Table: 2 (1.5mm)

b) Fixing Holes: Aluminium sliding holder, no drilling into electrical or process control panels

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 20mm High
- Description Characters: 15mm High, font

3.3.11 Label Type EB

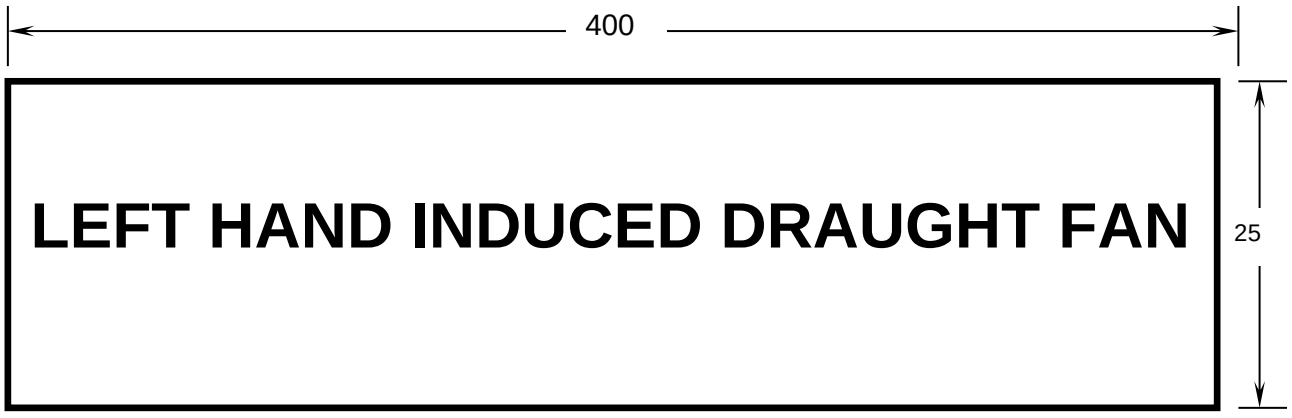


Figure 11: Electrical Board Sub Section

a) Material: Refer to Table: 2 (1.5mm)

b) Fixing Holes: Aluminium sliding holder, no drilling into electrical or process control panels

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 20mm High

3.3.12 Label Type EC

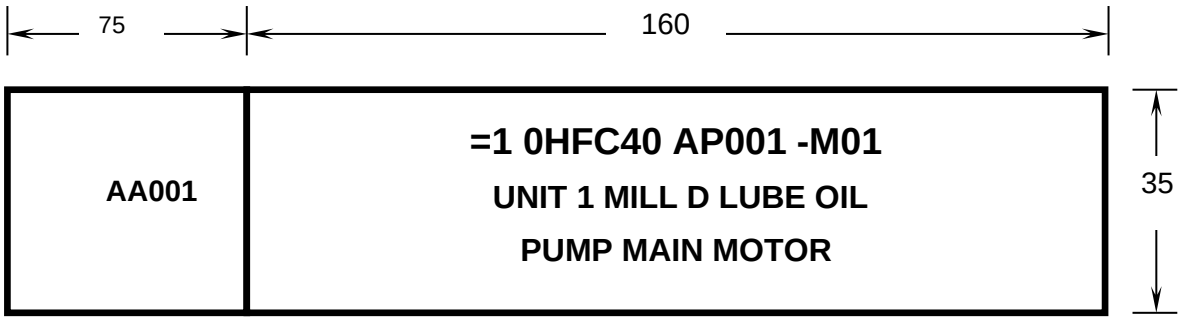


Figure 12: Isolator Labels

a) Material: Refer to Table: 2 (1.5mm thick)

b) Fixing Holes: Aluminium sliding holder, no drilling into electrical or process control panels

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 10mm High, font - Arial
- Description Characters: 10mm High, font - Arial

3.3.13 Label Type ED

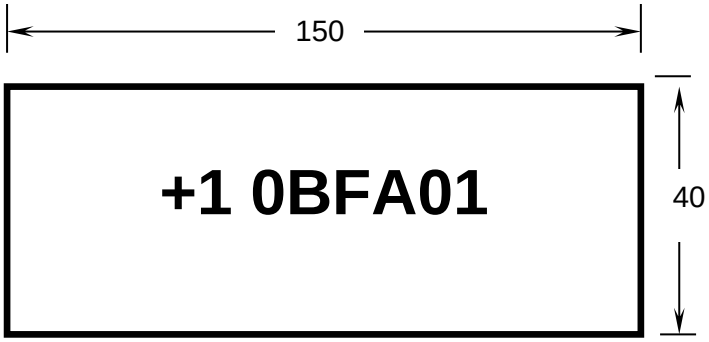


Figure 13: Cubicle Identification Label

a) Material: Refer to Table: 2 (1.5mm Thick)

b) Fixing: Aluminium sliding holder, no drilling into electrical or process control panels

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 20mm High
- Numeric Characters: 20mm High

3.3.14 Label Type EE

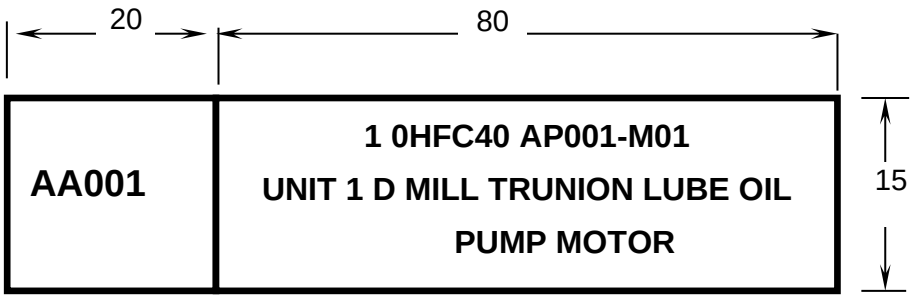


Figure 14: Terminal Label with Tier Co-ordinate

a) Material: Refer to Table: 2 (1.5mm Thick)

b) Fixing Holes: Aluminium sliding holder, no drilling into electrical or process control panels

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 3mm High
- Description Characters: 3mm High

3.3.15 Label Type EF

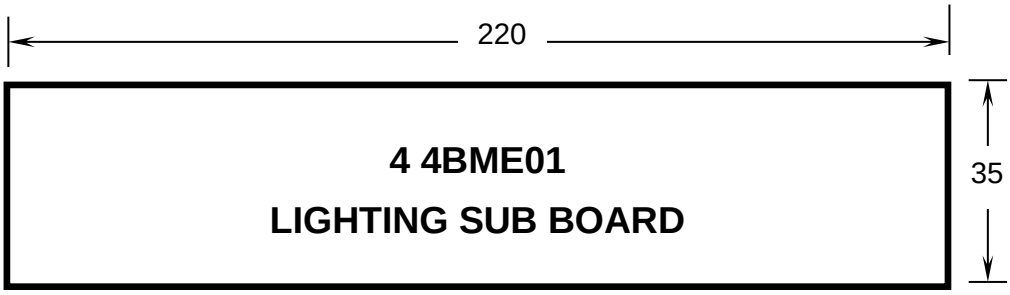


Figure 15: Lighting Distribution Board Label

a) Material: Refer to Table: 1 (1.5mm Thick)

b) Fixing Holes: Adhesive

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 10mm High, font - Arial
- Description Characters: 10mm High, font – Arial

3.3.16 Label Type EG

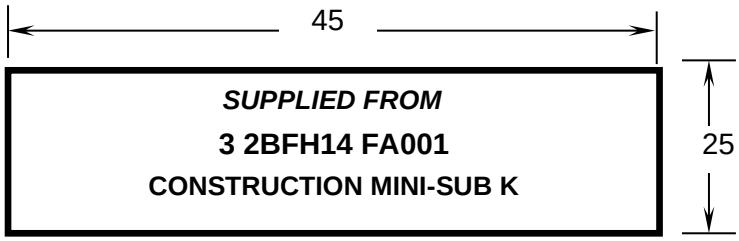


Figure 16: Distribution Boards Information Labels

a) Material: Refer to Table: 2 (1.5mm Thick)

b) Fixing Holes: Adhesive

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 4mm High
- Description Characters: 3mm High

3.3.17 Label Type EH

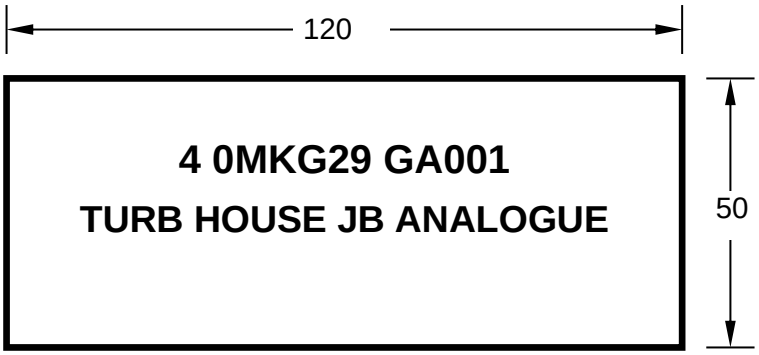


Figure 17: Junction Box Label

a) Material: Refer to Table: 1 (1.5mm Thick)

b) Fixing Holes: Adhesive

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 10mm High
- Description Characters: 10mm High

3.3.18 Label Type EI

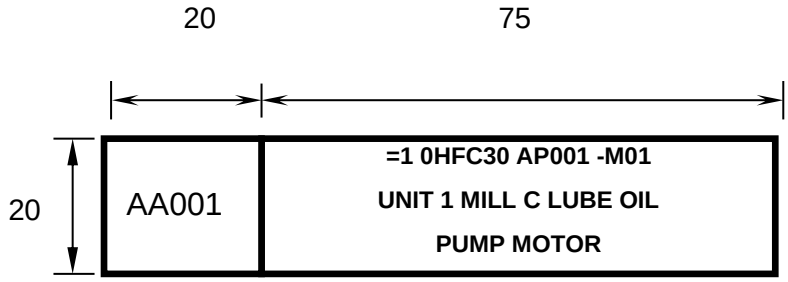


Figure 18: MCB Label

a) **Material:** Refer to Table: 1 (1.5mm Thick)

b) **Fixing Holes:** Adhesive / Sliding holder

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 4mm High
- Description Characters: 3mm High

3.3.19 Label Type EJ

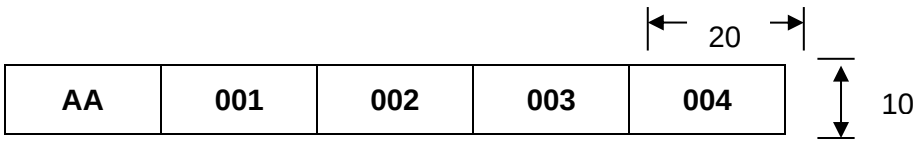


Figure 19: MCB Labels

a) **Material:** Refer to Table: 1 (1.5mm Thick Corner radius: 4mm)

b) **Fixing Holes:** Adhesive

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 3mm High

3.3.20 Label Type EK

Label Type EL

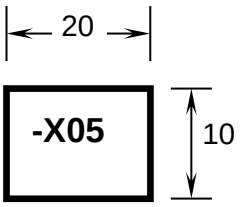


Figure 20: Terminal Label

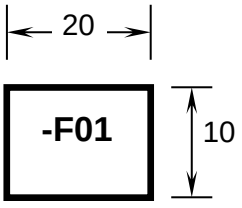


Figure 21: Electrical Component Label

a) **Material:** Refer to Table: 2 (1.5mm Thick Corner radius: 4mm)

b) **Fixing Holes:** Adhesive

c) Engraving:

- Characters Fill In Colour : Black
- Alphanumeric Characters: 3mm High

3.3.21 Label Type EM

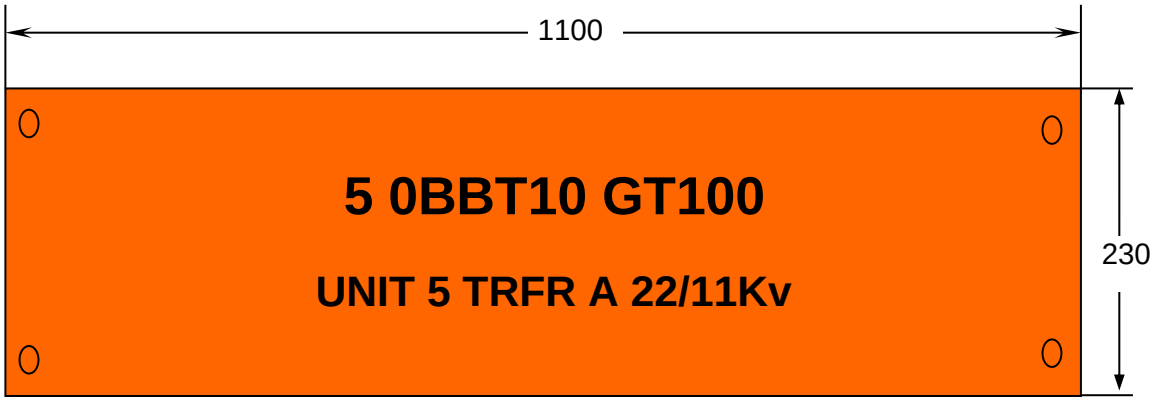


Figure 22: Transformer, Structure and Building Identification Label

a) **Material:** Refer to Table: 1 (1.5mm Thick)

b) **Fixing Holes:** 4 X 10mm Dia. 7.5mm from sides

c) **Text:**

- Cut out characters
- Characters in Black Engineering Grade 7 Years Vinyl.
- Alphanumeric Characters: 60mm High
- Description Characters: 40mm High

3.3.22 Label Type EM.1

Figure 23: Structure Related Label (Not Electrical Switchgear)

a) **Material**: Orange Chromadeck 1 mm Thick

b) **Fixing holes**: 4 off 4 mm in diameter (to be drilled on request only); 7 mm from sides

c) **Text:**

- Cut out characters
- Characters in Black Engineering Grade 7 Years Vinyl.
- KKS code characters: 60 mm High
- Description text characters: 40 mm High

3.3.23 Label Type EM.2

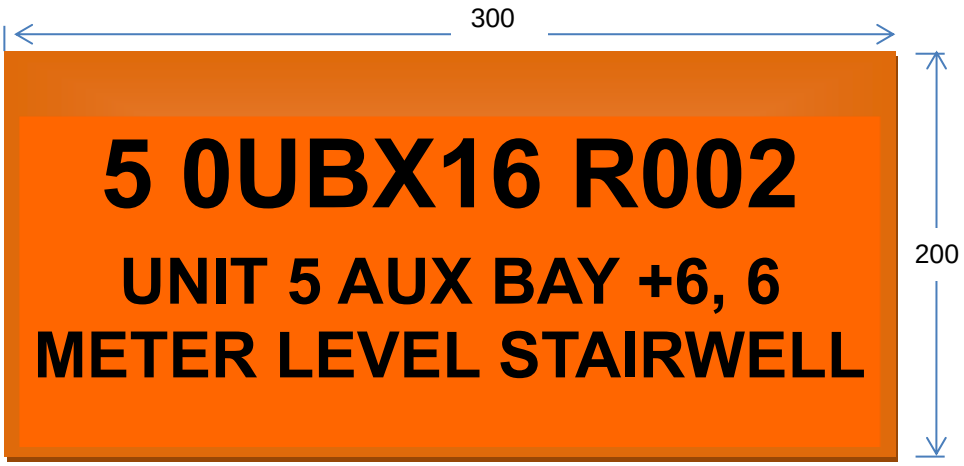


Figure 24: Label to be used Inside Buildings where a Description is required in a Room / Area

a) **Material:** Orange Chroma deck 1mm Thick

b) **Fixing holes:** 4 off 4 mm in diameter (to be drilled on request only); 7 mm from sides

c) **Text:**

- Cut out characters
- Characters in Black Engineering Grade 7 Years Vinyl.
- Characters colour: Black
- KKS code characters: 30 mm High
- Description text characters: 20 mm High

3.4 Back Plates

Examples of back plates, this design shall be used for labels requiring a back plate.

3.4.1 Back Plate Type BB

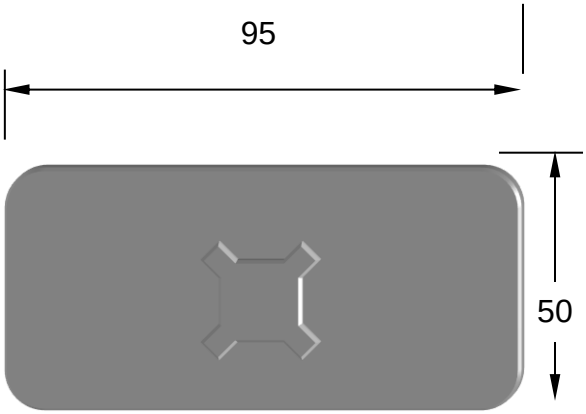


Figure 25: Back Plate Type BB

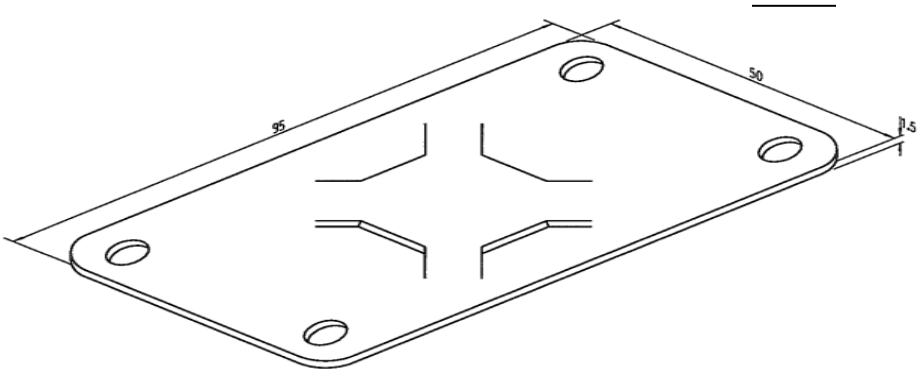


Figure 26: Back Plate Type BB

3.4.2 Back plate Type BC

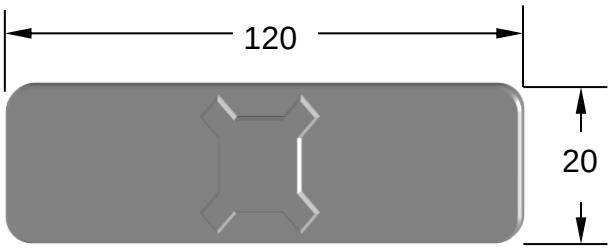


Figure 27: Back Plate Type BC

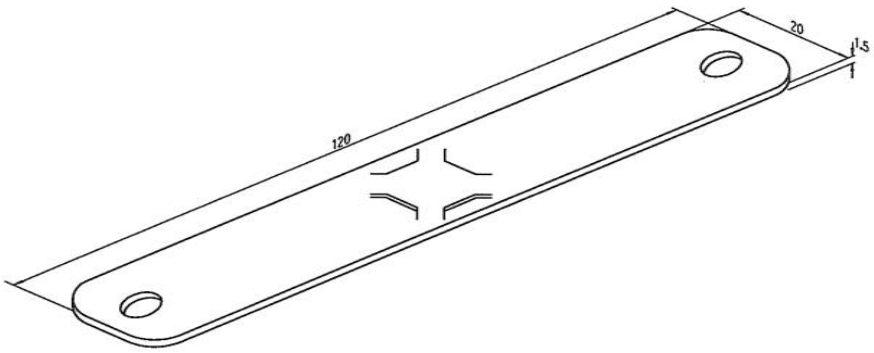


Figure 28: Back Plate Type BC

3.5 Piping Labels

3.5.1 Non-lagged Piping Less than or Equal to 50mm

Pipelines of diameter less than or equal to 50mm are to be painted in the basic colour over their full length. Colour code indicator bands are to be superimposed around the pipes, a suitable mechanical label is to be strapped around the pipes and a direction of flow to be painted as showed in Figure 29 below.

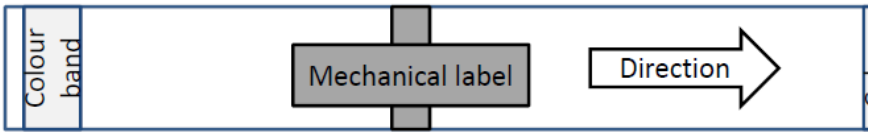


Figure 29: mechanical label is to be strapped around the pipes

The indicators shown in Figure 29 above are to be placed at 10 m intervals nominally along the length of the pipe and adjacent to valves, wall and floor penetrations. The direction of flow arrows are of white colour with dimensions in accordance figure 30 below. For the length of the arrow please refer to Table 3 below.

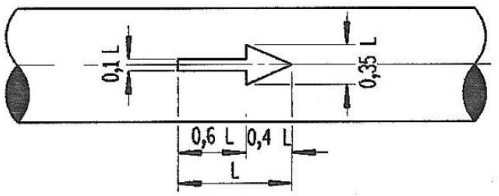


Figure 30: Direction of flow on a pipe

Dimensions and arrangement of descriptive identification legends for pipelines and vessels

Table C.1 — Dimensions of legends for pipelines and vessels

Outside diameter mm	Legend height mm	Chemical hazard legend height mm	Direction of flow arrow Length mm
Up to 50	20	20	75
51 to 100	25	25	100
101 to 150	38	50	150
151 to 225	50	100	200
226 to 300	75	150	300
301 to 600	100	150	300
Above 600	150	150	300

Table 3 : Dimensions of Legends for Pipelines and Vessels

For basic colours, colour code indicator band colours to be used for various pipes carrying various medium please refer to Eskom document number ESKSCAAC6. For the basic colour and colour code indicator band paint specifications please refer to the Corrosion Protection Specification of Project Alpha.

3.5.2 Non-lagged Piping Greater than 50mm

Pipelines of diameter greater than 50mm are to be painted in the basic colour over their full length. In cases of long exposed sections of large diameter pipes, due consideration shall be given to the costs incurred with regard to the use of a basic colour over the full length. Colour code indicator bands are to be superimposed around the pipes, a KKS code label is to be stencilled along the pipe length, a medium description to be stencilled along the pipe length and a direction of flow to be stencilled as showed in Figure 31 below.

Figure 31: Non-lagged Piping Greater than 50mm

The height of the letters used on the KKS code and medium description stencilling is superimposed on a 'rectangular area' in accordance with table 3 above. The direction of flow arrows are of white colour with dimensions in accordance figure 30 above. For the length of the arrow please refer to Table 3 above. The indicators shown in Figure 31 above are to be placed at 10 m intervals nominally along the length of the pipe and adjacent to valves, wall and floor penetrations.

For basic colours, colour code indicator band colours to be used for various pipes carrying various medium please refer to Eskom document number ESKSCAAC6. For the basic colour and colour code indicator band paint specifications please refer to the Corrosion Protection Specification of Project Alpha.

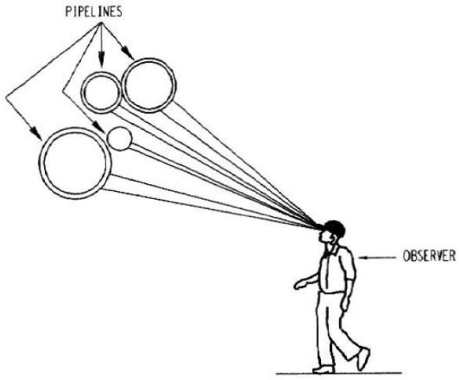
3.5.3 Lagged Piping Protected with Cladding

Pipelines lagged and protected with cladding do not require painting in basic colour over their full length, however colour code indicator bands are to be superimposed around the cladding, a KKS code label is to be stencilled along the cladding length, a medium description to be stencilled along the cladding length as well as a direction of flow to be stencilled as showed in Figure 31 above. The height of the letters used on the KKS code and medium description stencilling is superimposed on a 'rectangular area' in accordance with table 3 above. The indicators shown in Figure 31 above are to be placed at 10 m intervals nominally along the length of the pipe and adjacent to valves, wall and floor penetrations.

For colour code indicator band colours to be used for various pipes carrying various medium please refer to Eskom document number ESKSCAAC6. For the colour code indicator band paint specifications please refer to the Corrosion Protection Specification of Project Alpha.

3.5.4 Multiple Pipeline Runs

Colour identification, descriptive identification and labels are positioned on multi-pipeline runs such that the identification of all pipes in the run is clearly visible from an observation position as shown in figure 32 below.



NOTE — Extract from SABS 0140-3:1992.

Figure 32: Pipe visibility of multiple colour pipes

3.5.5 Vessels

3.5.5.1 Round Vessels

Round vessels are to be stencilled as showed in Figure 33 below. The height of the letters used on the KKS code and medium description stencilling is superimposed on a ‘rectangular area’ in accordance with table 3 above.

Figure 33: Round Vessels stencil example

For the stenciling paint specifications for the vessels please refer to the Corrosion Protection Specification of Project Alpha.

3.5.5.2 Square Vessels

Square vessels are to be labelled using a manufacture’s name plate as showed in Detail A below. The height of the letters used on the KKS code and description must be visible at eye level.

Figure 34: Square vessels Detail A

Alternatively label Type EM used to label transformers, structures and buildings can be used to label the square vessels as shown in Detail B below. The label to be fixed on a flat surface of the vessel using adhesive or to be fixed on a bracket using rivets similarly to Detail A above. The KKS code and description on the EM label must be visible at eye level.

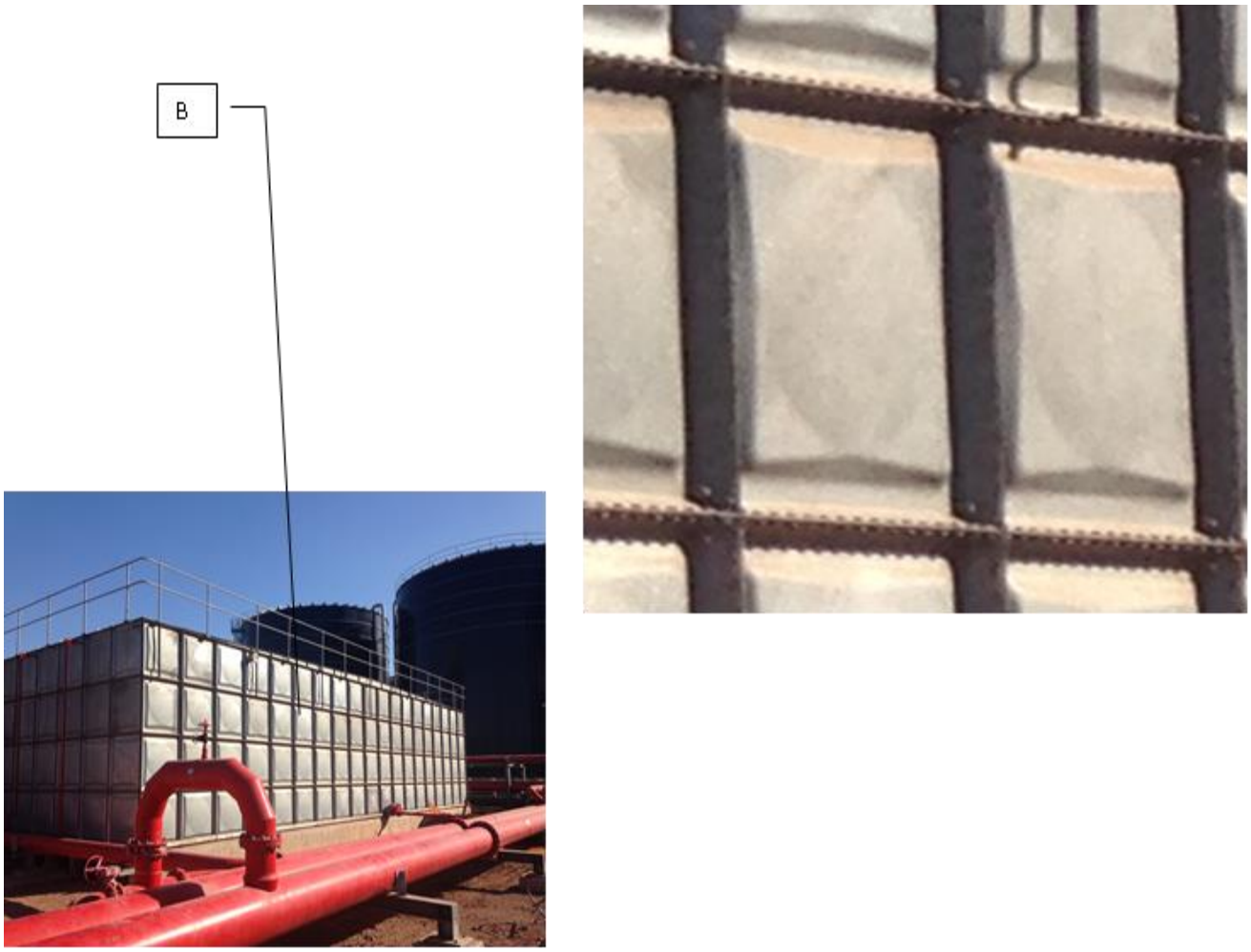


Figure 35: Square vessels Detail B

3.6 Cable Racking Labels

Cable rack/tray coding is the identification of cable racks/trays according to the location, voltage level and type of rack/tray. The cable rack/tray number format shall be as follows:

TOTAL PLANT	SYSTEM CODE	EQUIPMENT UNIT CODE	TYPE OF RACK
0	0 UGB11	BQ101	C&I tray 1
0	0 UGB21	BQ101	LV tray 1
0	0 UGB31	BQ101	MV tray 1

Table 4 : cable Rack/Tray Number Format

NOTE: Table 4 above to be used on racks/trays that have not been labelled yet on site, current labelling done already on racks/trays on site to remain as is.

The KKS code for the rack/tray to be stencilled and clearly visible from an observation position as shown in Figure 36 below.

Figure 36: Cable rack/tray stencilled example

The height of the letters used on the KKS code is to be ‘50mm high and black in colour as shown in Figure 37 below.

Figure 37: Cable rack/tray stencilling height

The KKS codes are to be placed at 10 m intervals nominally along the length of the horizontal and vertical racks/ trays as well as adjacent to T-junctions as shown in Figure 38 below.

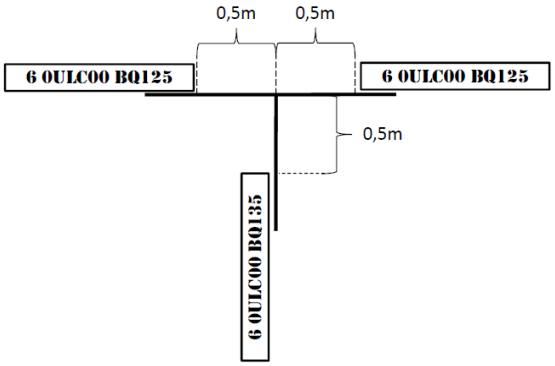


Figure 38: Cable racks/tray horizontal and vertical KKS code spacing

When the rack/tray is changing direction or penetrating a floor or wall opening the KKS code is to be placed as shown in Figure 39 below.

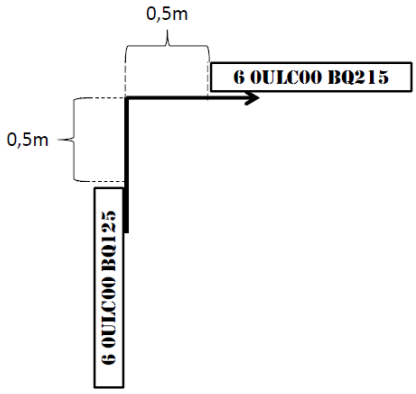


Figure 39: Cable racks/tray KKS code spacing wall penetrating

For the stencilling paint specifications for the rack/tray please refer to the Corrosion Protection Specification of Project Alpha.

3.7 Cranes and Crawl Beam Labels

The KKS code for the crane or crawl beam is to be stencilled in black and to be clearly visible from an observation position as shown in Figure 40 below with the height of the text being 50% of the beam height.

Figure 40: KKS code placing on Cranes & Crawl beams

For the stencilling paint specifications to be used for the crane or crawl beam please refer to the Corrosion Protection Specification of Project Alpha.

3.8 Stairwells, CAT Ladders and Pipe Supports Labels

3.8.1 Stairwells

Stairwells to be labelled using label Type EM.2. The label is to be installed on stairwell points of entry.

3.8.2 Pipe Supports

Pipe supports to be labelled using any available mechanical label in this specification.

3.9 Cable Labels

3.9.1 Internal Cables

3.9.1.1 Label Type EN

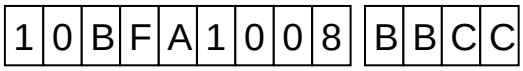


Figure 41: Cable label for Type EN

All internal cables to be labeled with standard PVC K Type flexible cable marker carrier strips and attached on both ends with suitable cable ties (T18R or T30R, depending on cable thickness).

3.9.2 External Cables

3.9.2.1 Label Type EP

Figure 42: Cable label for Type EP

a) Label size: 10x90mm
b) Alphanumeric Characters: 5mm
c) Material: Stainless Steel
d) Thickness: 0.6mm
e) Fixing Holes: 2 holes, size 4mm diameter
f) All cables must be labeled on both sides of wall and cabinet penetrations.

3.10 Cable Number Structure

The VGB standard of numbering cables shall be used, where Level 1 is coded according to the source, followed by a four-digit counting number. For bidirectional cables, the KKS code of the source or destination which is the earlier in the alphabet of the two termination points shall be used.

CABLE NUMBERS COUNTING RULES

0001 - 0999 = Power cables > 1 kV

1001 - 1999 = Power cables < or = 1 kV

2001 - 3999 = Process cables > 60 V

4001 - 9999 = Process cables < or = 60 V

4001 -7000 = Control Cables < or = 60V

8001 -9999 = Control and Instrumentation Cables < or = 60V

Computer cables, i.e. optic fibre, shall fall in the "8" series.

To ensure that cable numbers are not duplicated, an additional classification is required. This consists of four alpha characters, the first two (BB) identifying the F1 and F2 functions of the destination of the cable, and the second two (CC) identifying the contractor responsible for the design of the cable.

For example: N NAAANNNN BB CC

3.10.1 Cable Information Capturing

The following table represents the fields within the Cable Database and needs to be captured with each newly allocated or revised cable number.

REF	FIELD DESCRIPTION	WHERE TO FIND THE INFORMATION
1	Drawing Number	Cable detail schedule
2	Drawing Revision Number	
3	Cable Number	Refer to cable number section
4	Cable Type	
5	KKS Code From	Plant KKS
6	KKS Code to	Plant KKS
7	Contractor Identification	
8	Description	Plant description
9	Remarks	Any additional information

Table 5 : Cable Database Fields

3.11 Plant Descriptions

Although the plant code is sufficient to uniquely identify the plant, the need still exists to describe the plant with a plant functional description. This is especially required when lists of KKS codes are reviewed. The KKS code does not clearly differentiate between e.g. left hand and right hand or between pump inlet and outlet. These problems could be overcome by forcing the users to always refer to the P&ID.

The allocation of item descriptions is useless if it does not clearly describe the function of the item.

On Project Medupi there are a number of applications where plant descriptions are used e.g. plant labels, information systems etc. and the need therefore exists to standardise on the application thereof. This standard deals with the allocation of descriptions in the two main areas being plant labels and information systems.

3.11.1 Plant Label Description

The need exists to structure the description in such a way that the most meaningful description can be obtained from the minimum number of characters:

a) Descriptions on plant labels shall be in English

b) The description shall clearly describe the function of the item

c) Descriptions shall be as short as possible without compromising on description accuracy

d) All abbreviations used in descriptions shall be in accordance with the Medupi Power Station Project Standard Abbreviations (348-885912)

e) All descriptions must adhere to all requirements stipulated in the KKS coding standard (NMP 45-7)

f) All plant shall be coded as specified in NMP 45-7.

g) Descriptions shall follow the format as in section 14.2 in conjunction with the equipment list template attached.

h) Descriptions shall only be used once reviewed and approved by Configuration Management on an equipment list.

i) Descriptions must be in form of the template 348-671390

j) All descriptions shall be in capital letters

3.11.2 Format and Label Descriptions

The format of the description shall follow the format of the KKS code. It is implicit that the descriptions must always be unique and is compiled as follows:

6 0HDW61 AP001 -M01			
UNIT	SYSTEM	EQUIPMENT FUNCTION	COMPONENT TYPE
THE DESCRIPTION AS FOLLOWS:			
UNIT 6	BOILER ASH REMOVAL	SLUICE PUMP AND HOPPER SEALING PUMP 1	MOTOR

Table 6 : Unitised labelling break down example

Example for common plant:

00GKB18 GK001 –H01			
UNIT	SYSTEM	EQUIPMENT FUNCTION	COMPONENT TYPE
THE DESCRIPTION AS FOLLOWS:			
_	POTABLE HEADER TANK	LOCAL CONTROL PANAL	ALARM UNIT

Table 7 : Common plant labelling break down example

4. Process for Monitoring

4.1 Key Performance Areas and Indicators

The following Key Performance Areas / Indicators (KPAs / KPIs) shall be measured, analysed and reported. The Process Owner shall be accountable, and assign the responsibility at the frequency as indicated below, documented as part of the QMS measurement, analysis and improvement initiative.

Key Performance Area	Key Performance Indicator	Target	Measure Frequency	Responsible	Record
Plant labelling status	PBS dashboard	All plants, systems, and components	3 months cycle	CM Lead Project Engineer	Register
Plant audit	P&ID's, GA's & equipment list/s match as-built status	All plants, systems, and components	As per plant commission /completion.	CM/KKS Technicians	Register
Design base is coded and labelled according to standard	Eskom configuration management department acceptance	All design base submissions	As per plant commission /completion.	Contractors and external design authorities	SPO

Table 8 : KPAs/KPIs

4.2 Document Review and Self-Assessment

The "Process Owner" identified on the front page of this document along with departmental personnel and the project QMS Engineer shall undertake a "self-check" review of the process defined in this document at six monthly intervals, commencing from the effective date of this document, to check:

a) the process / procedure operational integrity

b) process efficiency

c) the level of stakeholder knowledge and implementation.

Participants and results of the "self-check" review shall be documented by the Process Owner in the "Self-Assessment Checklist" ***(Template No. 348-655890)*** included as an Appendix to this standard which shall be submitted via SharePoint to Medupi Documentation Department Help Desk by the Process Owner once completed.

Process Owner shall proceed with any revision requirements in line with Medupi Procedures, 348-653867 "Development and Change of Medupi QMS Documents" and 348-883808 "Document and Record Management".

4.2.1 Revision Period

All QMS documents shall undergo a 3-yearly compulsory revision.

4.3 Training Requirements

No project specific training required to implement the process documented in this document beyond normal job function.

5. Acceptance

This document has been seen and accepted by:

Name	Designation
Mandla Nkosi	CM Line Manager
Mduduzi Dhlamini	CM Snr Technician

6. Revisions

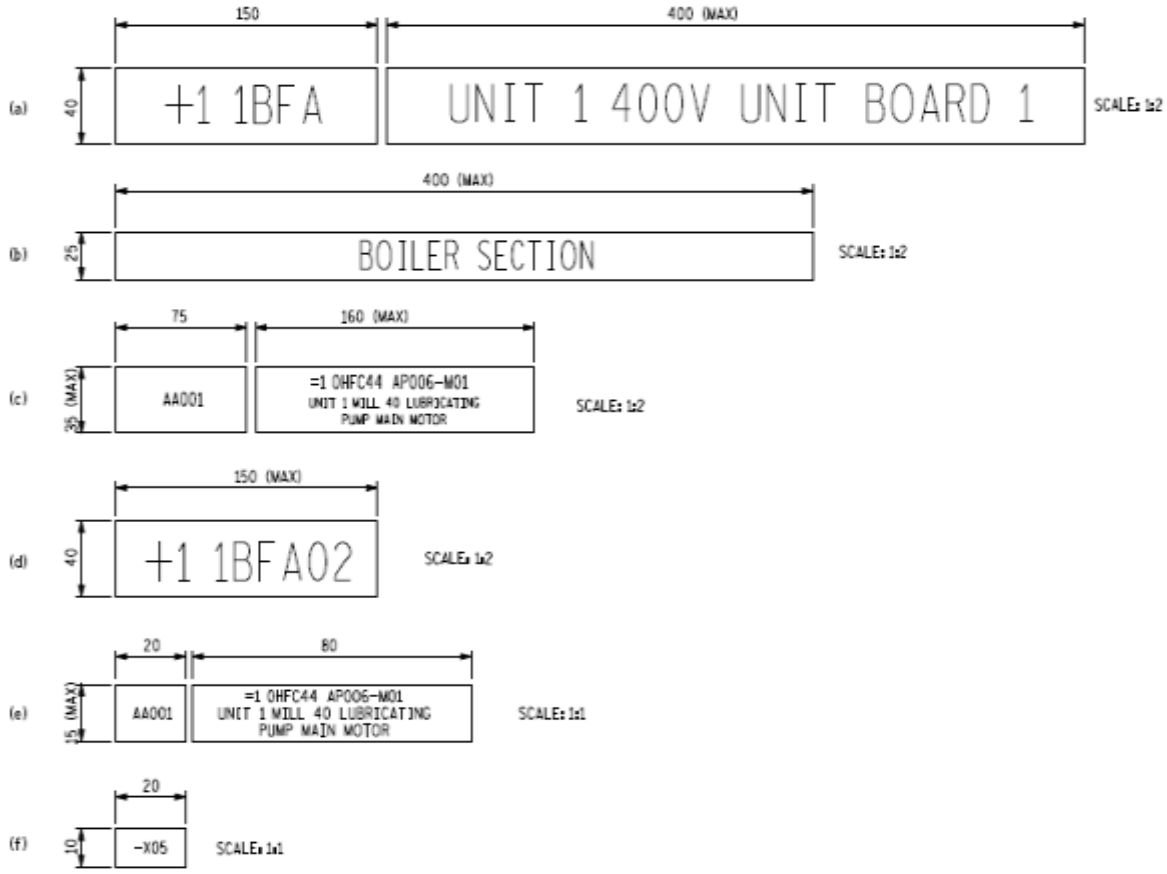
Date	Rev.	Compiler	Remarks
February 2023	6	M Dhlamini	• Document is due for the 3 yearly review. • Added self-assessment • Transferred the information to the document template rev 5. • Added KPA's/KPI's process for monitoring
October 2017	5	X Gubuza	• Document is due for the 3 yearly review.
December 2015	4	R Smal	• Changed the document from a procedure to a standard to conform to the Medupi QA requirements. • Remove RACI, KPA/KPI's and self-assessment. • Some typographical improvements made. • Duplicate information removed. • Label material grades added. • Engraving font added.

7. Development Team

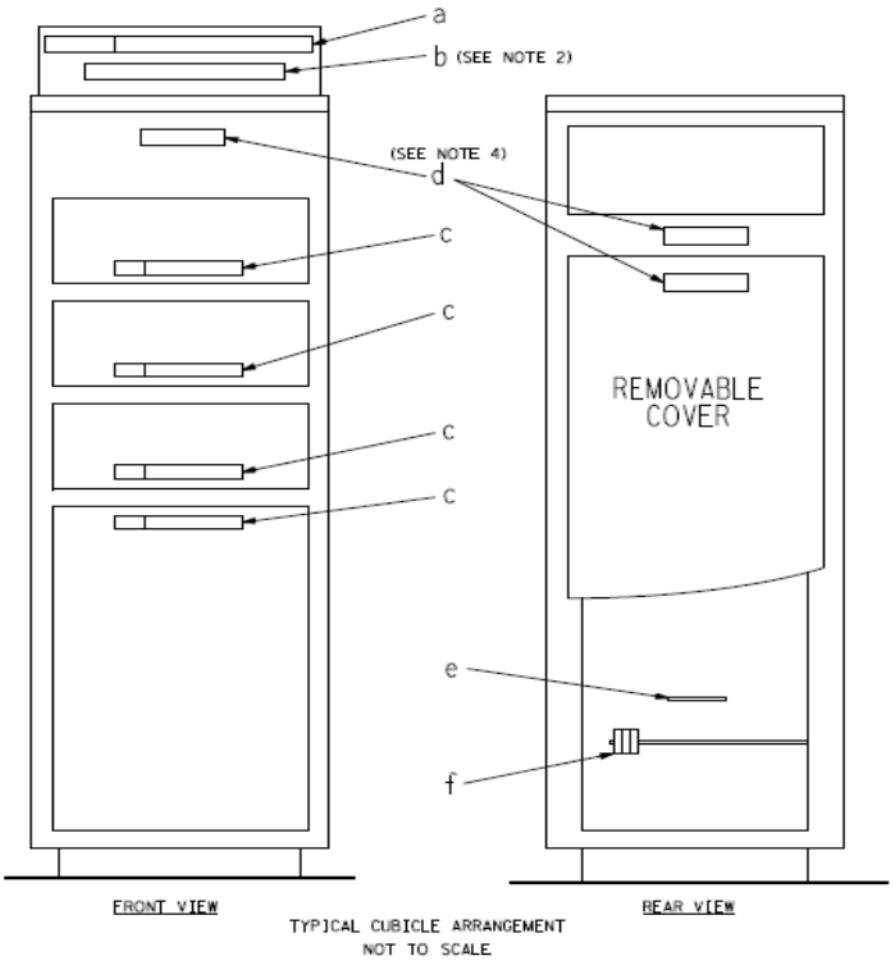
The following people were involved in the development of this document:

- Mandla Nkosi
- Mduduzi Dhlamini

Figure 43: MV, LV & DC Switchgear Label Positions



Note: Label panels as per example:



Label type EJ (To be used with label type EE)

BA	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015

MINIATURE CIRCUIT BREAKERS

Use label type EE for MCB process identification, applied with label type EJ

BA001	=1 0EYG11 GA106 FIELD MARSHALLING PANEL
BA002	=1 0EYG11 GA115 FIELD MARSHALLING PANEL
BA003	=1 0EYG11 GA107 FIELD MARSHALLING PANEL
BA004	=1 0EYG11 GA114 FIELD MARSHALLING PANEL
BA005	=1 0EYG11 GA130 FIELD MARSHALLING PANEL
BA006	
BA007	
BA008	
BA009	
BA010	
BA011	
BA012	
BA013	
BA014	
BA015	

MEDUPI POWER STATION PROJECT	Template Identifier	348-671390	Rev	2
	Document Identifier	xxxx	Rev	xx
	Effective Date	Mar-23		
	Next Review Date	Mar-28		

(System Description) EQUIPMENT / LABEL LIST

Elem. Syst.	Contractor Tag No	Item KKS Tag	Long Description	Label description (60 charaters)	Len	TEXT TOP LINE	TEXT MIDDLE LINE	TEXT BOTTOM LINE	Label Material	Label Type	Label Qty	Back Plate	Fixing Material	CONTROLLING DOCUMENT	Remarks
					0	0	0	0							
					0	0	0	0							
					0	0	0	0							
					0	0	0	0							
					0	0	0	0							
					0	0	0	0							
					0	0	0	0							

Figure 43: Labelling List Template (348-671390)

Appendix A - Process Self-Assessment Checklist

Eskom	MEDUPI POWER STATION PROJECT	Template Identifier	348-655890	Rev	2
		Document Identifier	348-10032865	Rev	0
		Effective Date	January 2022		
		Next Review Date	January 2025		

TITLE: Document Self-Assessment Checklist

Discipline: **Configuration Management**	Applicable Document No.: **348-630398**	Self-Assessment Date: **19 / 04 / 2023**

Item No	Ref Section	Self-Assessment Question	Compliant			Comment
			Yes	Part	No	
1	3.3	Are you using the correct label size for your plant, system, and component?	✖			
2	3.2.2	Are you using the correct label material for your plant, system, and component?	✖			
3	3.11	Is your plant label description according to the standard?	✖			

Comments:

Self-Assessment by:	Name: Mduduzi Dhlamini	Position: Snr. Configuration Management Technician	Revision Required: No	Planned Revision Date: February 2026

Attendees: