Specification For Instrument Junction Boxes

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JGCS CONSORTIUM

CONTENTS

1 PURPOSE AND SCOPE

This specification covers the minimum technical requirements for Instrument Junction Boxes for Nghi Son Refinery and Petrochemical Project (NSRP PJ) in Vietnam.

2 REFERENCE DOCUMENTATION

2.1 Project Standards and Specification

The following specifications shall be read in conjunction with this specification.

S-000-1220-0001V	Basic Engineering Design Data (BEDD)
S-000-1378-0001V	Specification for Instrument Cables (3550-8550-SP-0010)
S-000-1378-0004V	Instrument Design and Installation Specification (3550-8550-SP-0011)
S-000-1370-0102V	Instrument Tag No & JB LP CAB CABLE Identification

2.2 International Standards

IEC60079-7	Electrical Apparatus for explosive gas atmospheres. Increased safety ‘e’.
IEC60079-10	Electrical Apparatus for explosive gas atmospheres. Classification of hazardous areas.
IEC60529	Specification for degrees of protection provided by enclosures (IP code)

3 DESIGN AND CONSTRUCTION

3.1 General

For details of site environmental conditions refer to Basic Engineering Design Data (BEDD) S-000-1220-0001V.

All field mounted junction boxes shall be suitable and certified for the area in which they are to be installed.

All field mounted junction boxes shall be fabricated from 316L stainless steel.

Cable entries shall be located in the bottom of the enclosure.

All entries shall be sealed with proprietary items suitably certified to maintain the overall integrity and certification of the enclosure.

Labels shall be attached to enclosures using stainless steel screws; the fixing shall not affect the certification or ingress protection rating. Refer to Para 4 for more detail.

JB numberings shall be in accordance with Instrument Tag No. & JB/LP/CAB/CABLE Identification S-000-1370-0102V

3.2 JB Specification and Requirements

Junction boxes shall be sized to be large enough to accommodate the required amount and type of terminals and to ensure adequate access and space for cable installation and termination.

Junction boxes shall be supplied fully fitted with terminals, mounting rails, accessories, etc.

Certification shall be Exe to IEC 60079-7 for use in areas classified Zone 1, Gas Group IIC, Temperature Class T4, as defined in IEC 60079-10.

For all Plant Areas, Refinery, Petrochemical, Utilities, Offsites & Jetty, Ingress Protection shall be minimum IP66 as defined in IEC 60529.

Junction boxes shall be fabricated from 316L stainless steel, all welded construction, with a minimum material thickness of 1.5mm for box and cover and 2.0mm for gland plate and shall have an electro polished surface finish. The front cover shall be hinged and removable; it shall be secured by stainless steel fixing screws which are retained when cover is opened.

Junction box cover and gland plate shall be sealed with a chemical resistant gasket.

Junction boxes shall be suitable for surface mounting and shall have 4 off external fixing lugs.

Junction boxes shall be fitted with an M10 internal/external grounding stud.

Junction boxes shall be fitted with a correctly certified Breather/Draining device having minimum Ingress Protection of IP66.

Removable gland plate shall be fitted to the bottom of the box only. In case of side gland plate for side cable entry is required, this shall be subject to employer approval. The gland plate shall be sized to accommodate the entries required and ensure that an allowance is made for access to tighten glands. The gland plate shall be predrilled by JB Vendor to provide entries for the total amount of cables that can be terminated in the box and all unused entries shall be fitted with a plug that is correctly certified to maintain the overall certification and ingress protection of the box. Where there are two vertical rows of terminals in the box the gland entry for the multicore cable shall be at end of left side of the gland plate.

All terminals shall be screw clamp type to suit stranded conductors up to 2.5mm2.
When the cable required is over 2.5mm2 conductor due to voltage drop, the terminal selected shall be suitable for the size of the conductor. Each OC shall inform the required terminal size to vendor.

The terminals shall be mounted in vertical row(s) and shall be complete with all necessary mounting rails, end stops, brackets, and jumper bars, etc.

The quantity of cable entries and terminal blocks provided in field junction boxes shall include additional capacity based on the 20% minimum spare conductor requirement for each multicore cable upon completion of the project.

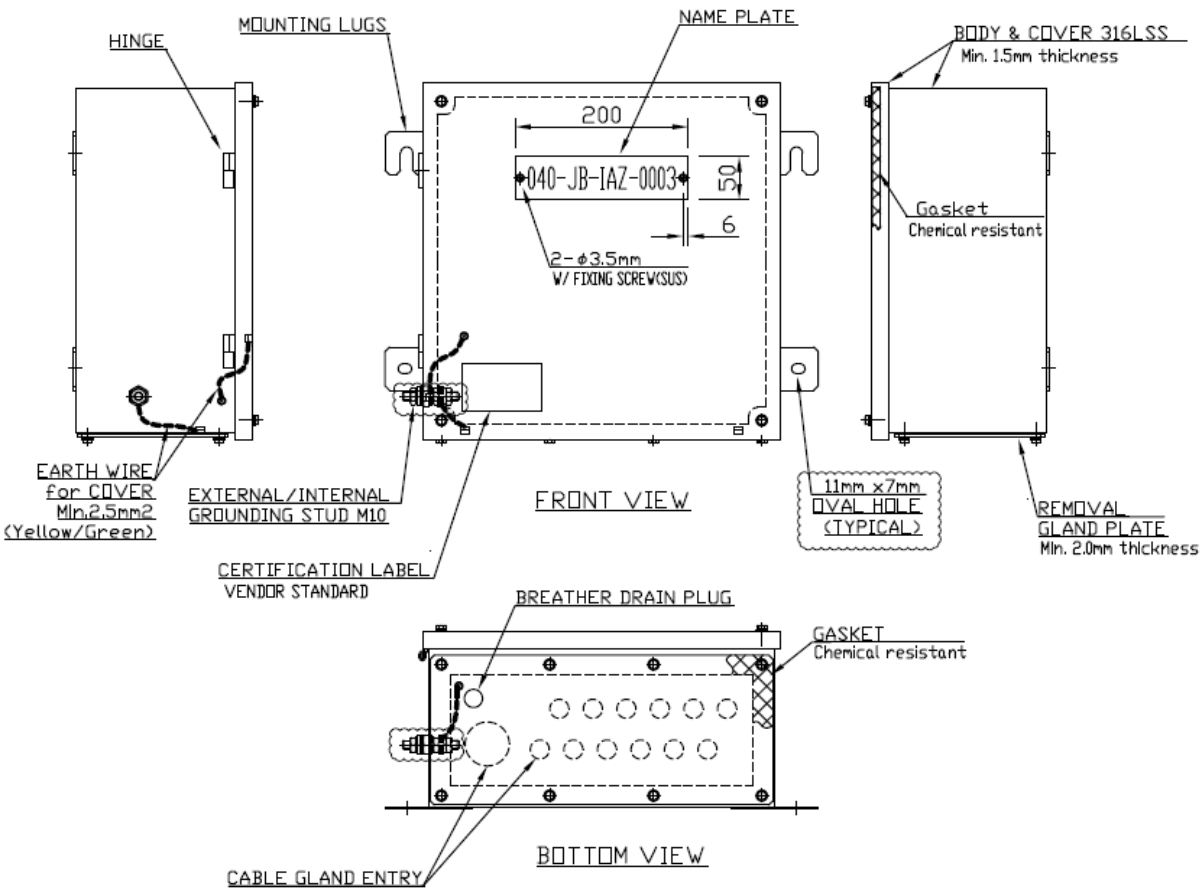
Terminals for Intrinsically Safe (IS) circuits where specified shall be in light blue colour.

Linking of terminals shall be by proprietary jumper bars. Flexible wire links shall not be used except to link terminals in separate rows.

Terminals shall be identified by means of pre printed plastic insert markers, black characters on white background; these shall be fitted to both sides of the terminals.

The front cover of each box shall have the facility to enable a label 200mm wide x 50mm high to be fitted by means of stainless steel screws, self locking nyloc hexagon nuts and washers without affecting the certification or ingress protection rating.

4 JUNCTION BOX OUTLINE



Name plate:
3 ply laminated plastic W200mm x H50mm x 3mm thick UV stabilised.
Colour : white/black/white or red/ white /red for fire & gas.
Edges and corners of finished label shall be chamfered.
Engraving: 1 line maximum 15 characters 25mm high letter.

Cable gland entry for branch cable shall be contained a minimum 20% spare.

5 JUNCTION BOX TYPE LIST

5.1 Terminal size for up to 2.5mm2 conductor

Material Code	Description	Terminal		Terminal Arrangement (Refer to Sec. 6)
		Q'ty	Color	
W-JBX-13-001	For 4 or 8 Pair main cable (Non-IS)	25p	Beige(*1)	Type 1
W-JBX-13-004	For 12 Pair main cable (Non-IS)	37p	Beige(*1)	Type 7
W-JBX-13-002	For 16 Pair main cable (Non-IS)	49p	Beige(*1)	Type 2
W-JBX-13-003	For 24 Pair main cable (Non-IS)	73p	Beige(*1)	Type 3
W-JBX-13-011	For 4 Triad main cable (Non-IS)	17p	Beige(*1)	Type 4
W-JBX-13-012	For 8 Triad main cable (Non-IS)	33p	Beige(*1)	Type 5
W-JBX-13-014	For 12 Triad main cable (Non-IS)	49p	Beige(*1)	Type 8
W-JBX-13-013	For 16 Triad main cable (Non-IS)	65p	Beige(*1)	Type 6
W-JBX-13-101	For 4 or 8 Pair main cable (IS)	25p	Light Blue	Type 1
W-JBX-13-104	For 12 Pair main cable (IS)	37p	Light Blue	Type 7
W-JBX-13-102	For 16 Pair main cable (IS)	49p	Light Blue	Type 2
W-JBX-13-103	For 24 Pair main cable (IS)	73p	Light Blue	Type 3
W-JBX-13-111	For 4 Triad main cable (IS)	17p	Light Blue	Type 4
W-JBX-13-112	For 8 Triad main cable (IS)	33p	Light Blue	Type 5
W-JBX-13-114	For 12 Triad main cable (IS)	49p	Light Blue	Type 8
W-JBX-13-113	For 16 Triad main cable (IS)	65p	Light Blue	Type 6

(*1) : Beige or vendor standard colour to be applied.

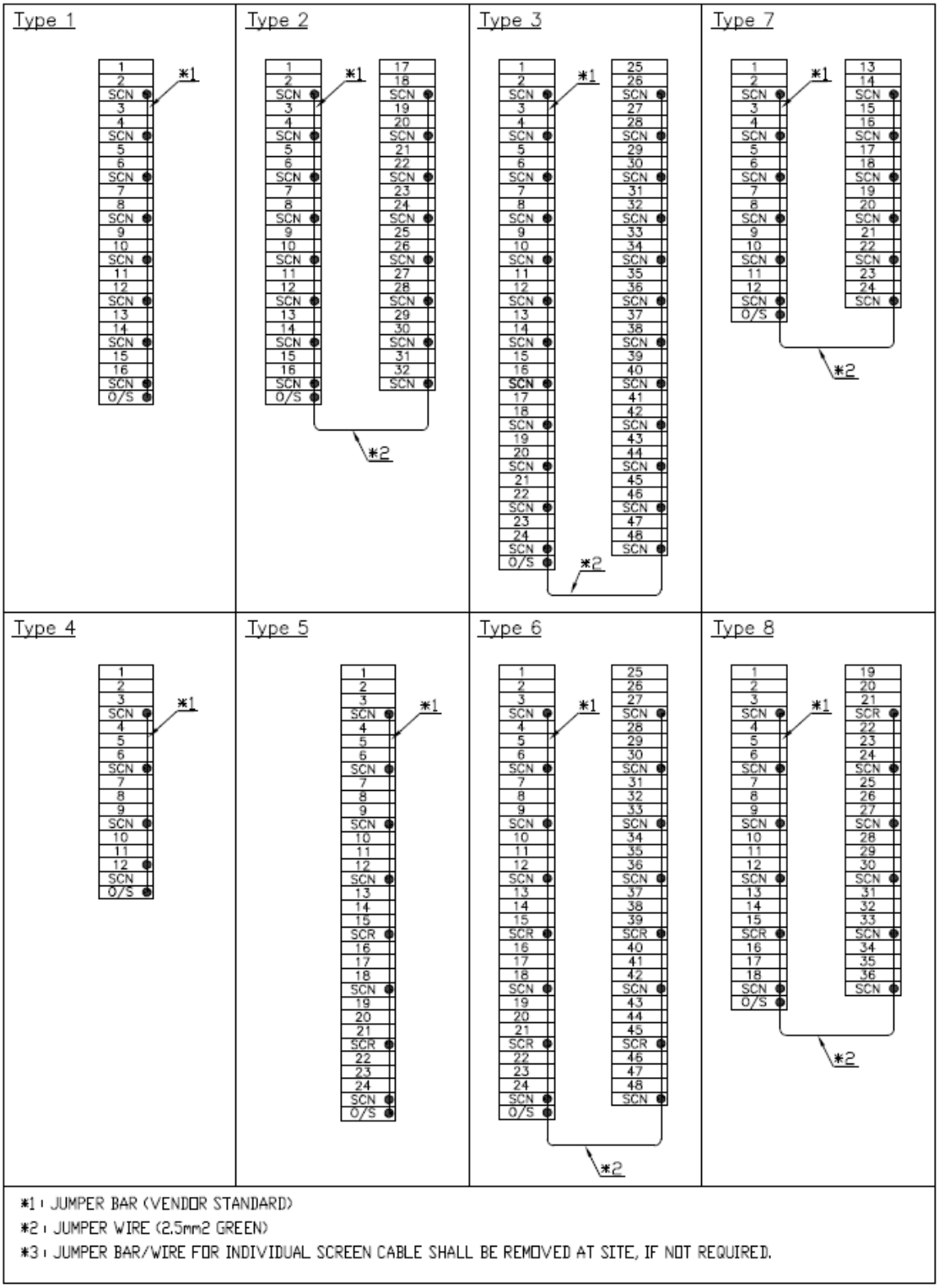
5.2 Special Terminal size for up to 6.0mm2 conductor

Material Code	Description	Terminal		Terminal Arrangement
		Q'ty	Color	(Refer to Sec. 6)
W-JBX-13-401	For 4 or 8 Pair main cable (Non-IS)	25p	Beige(*1)	Type 1(*2)
W-JBX-13-404	For 12 Pair main cable (Non-IS)	37p	Beige(*1)	Type 7(*2)
W-JBX-13-402	For 16 Pair main cable (Non-IS)	49p	Beige(*1)	Type 2(*2)
W-JBX-13-411	For 4 Triad main cable (Non-IS)	17p	Beige(*1)	Type 4(*2)
W-JBX-13-412	For 8 Triad main cable (Non-IS)	33p	Beige(*1)	Type 5(*2)
W-JBX-13-414	For 12 Triad main cable (Non-IS)	49p	Beige(*1)	Type 8(*2)
W-JBX-13-501	For 4 or 8 Pair main cable (IS)	25p	Light Blue	Type 1(*2)
W-JBX-13-504	For 12 Pair main cable (IS)	37p	Light Blue	Type 7(*2)
W-JBX-13-502	For 16 Pair main cable (IS)	49p	Light Blue	Type 2(*2)
W-JBX-13-511	For 4 Triad main cable (IS)	17p	Light Blue	Type 4(*2)
W-JBX-13-512	For 8 Triad main cable (IS)	33p	Light Blue	Type 5(*2)
W-JBX-13-514	For 12 Triad main cable (IS)	49p	Light Blue	Type 8(*2)

(*1) : Beige or vendor standard colour to be applied.

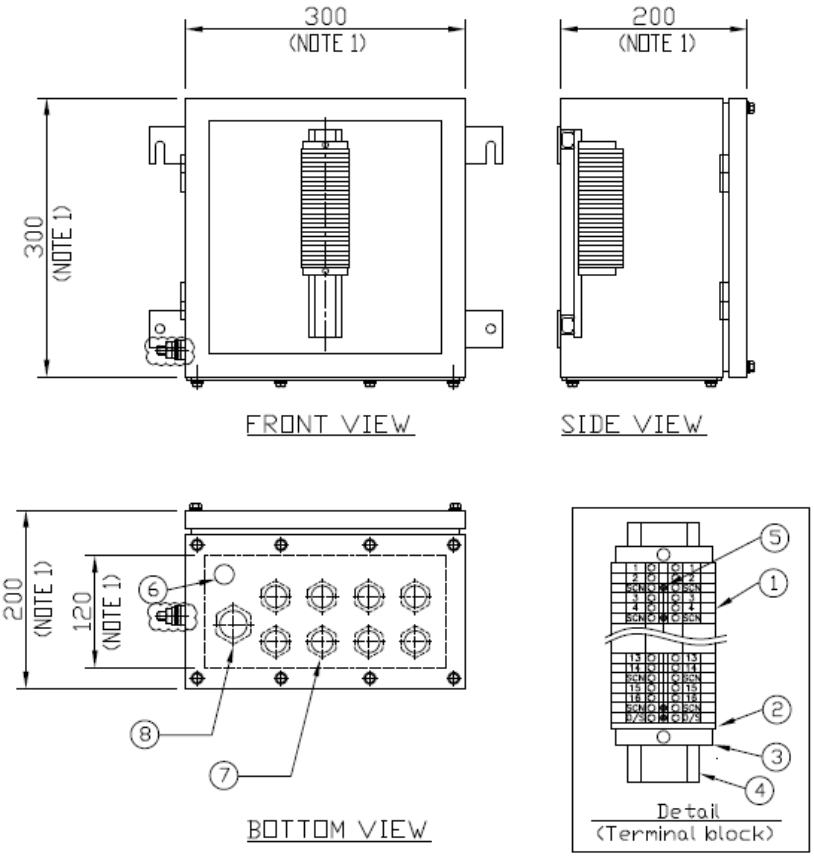
(*2) :Arrangement of terminal block shall be provided by JB vendor

6 TERMINAL BLOCK ARRANGEMENT



7 TYPICAL JUNCTION BOX ARRANGEMENT

7.1 For 4 or 8 pair multi cable

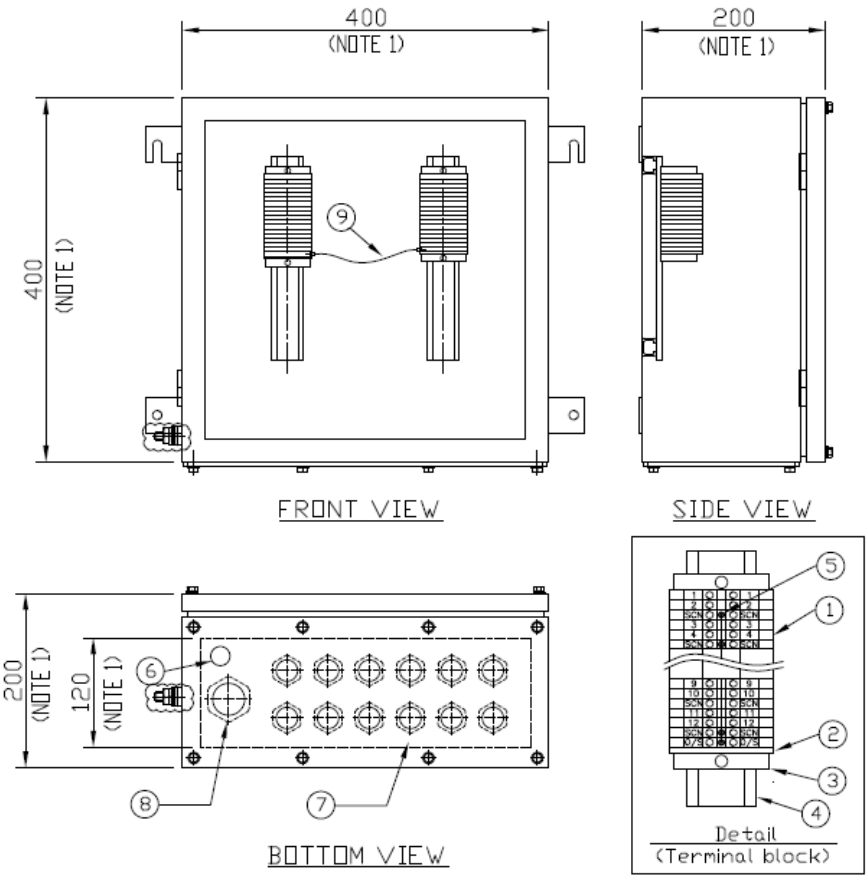


Notes.

1. Dimension of Junction box is for reference only. Vendor shall propose standard size according to actual number of terminal and cable entry.
2. Cable entry hole of gland plate to be decided after cable and cable gland selection
3. Terminals shall be identified by means of pre-printed plastic insert markers, black characters on white background, these shall be fitted to both sides of terminals.

No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2

7.2 For 12 pair multi cable



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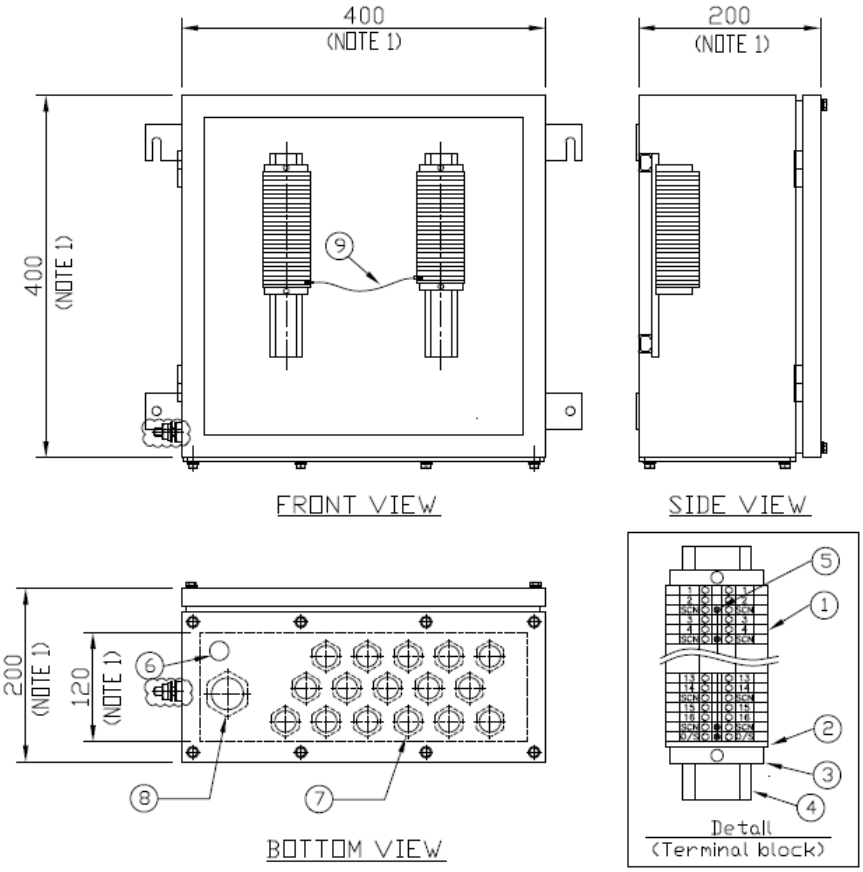
No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2
9	Jumper wire	2.5mm2 Green	

7.3 For 16 pair multi cable



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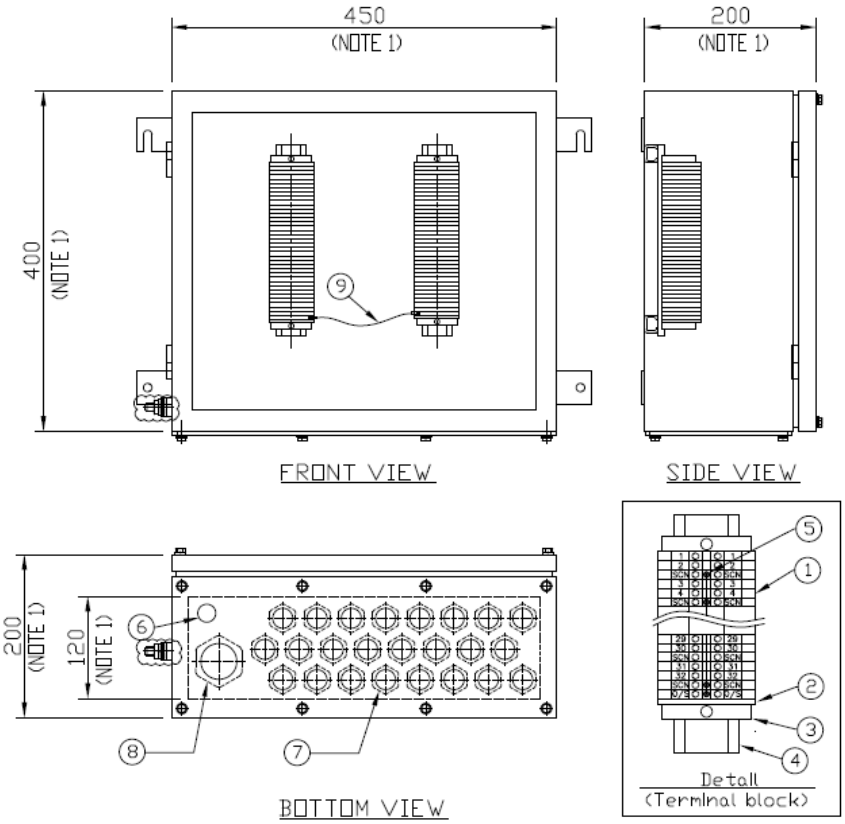
No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2
9	Jumper wire	2.5mm2 Green	

7.4 For 24 pair multi cable



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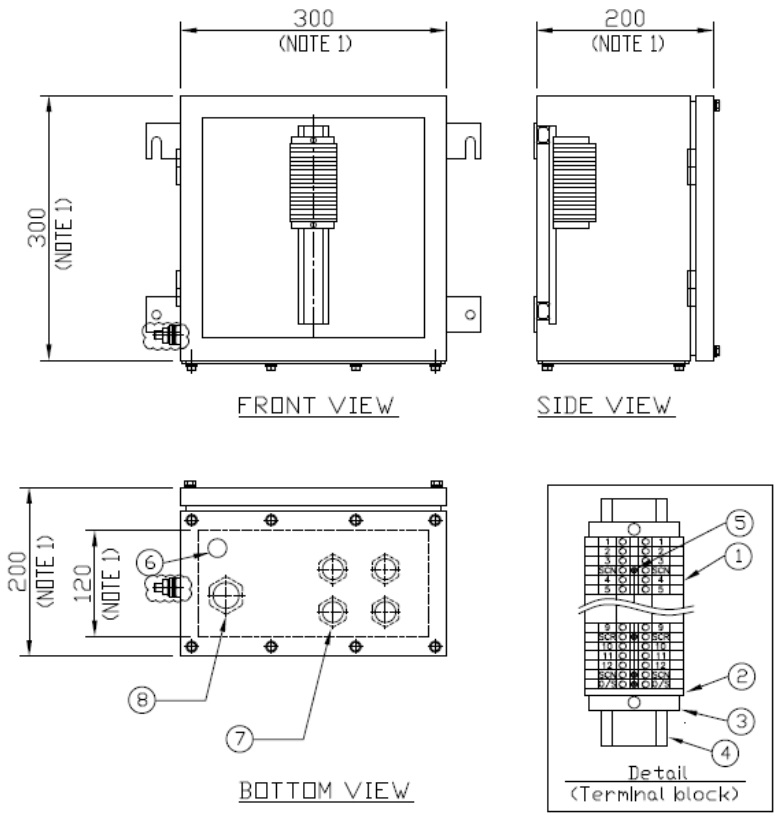
2. Cable entry hole of gland plate to be decided after cable and cable gland selection
3. Terminals shall be identified by means of pre-printed plastic insert markers, black characters on white background, these shall be fitted to both sides of terminals.

No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2
9	Jumper wire	2.5mm2 Green	

7.5 For 4 Triad multi cable



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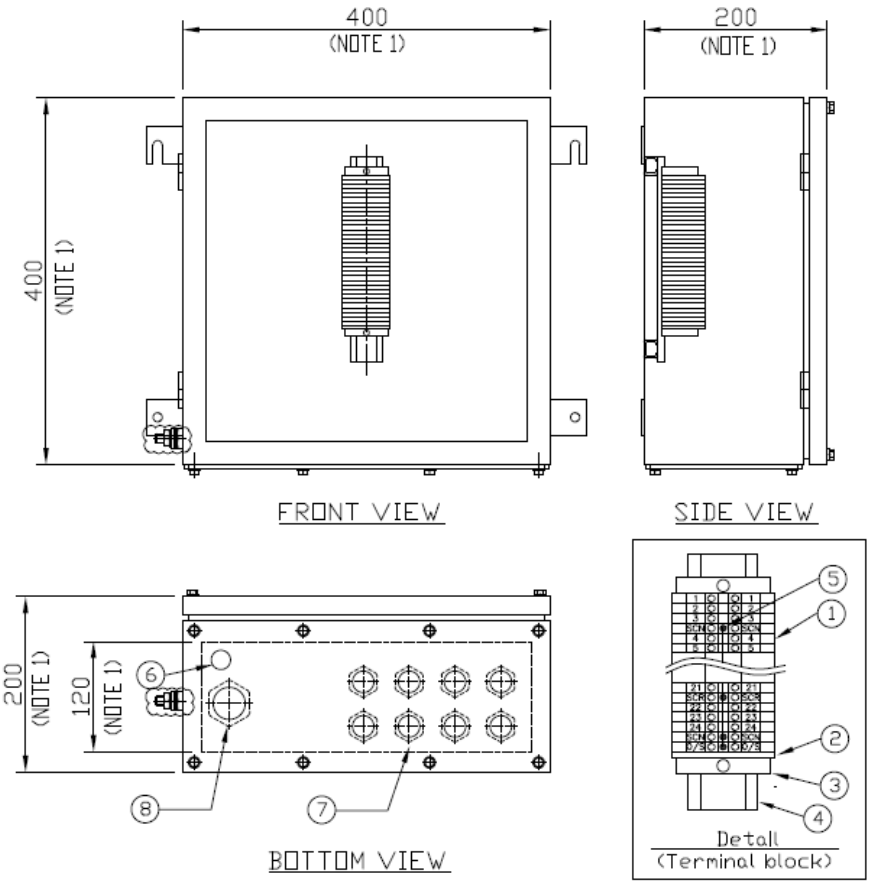
2. Cable entry hole of gland plate to be decided after cable and cable gland selection
3. Terminals shall be identified by means of pre-printed plastic insert markers, black characters on white background, these shall be fitted to both sides of terminals.

No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2

7.6 For 8 Triad multi cable



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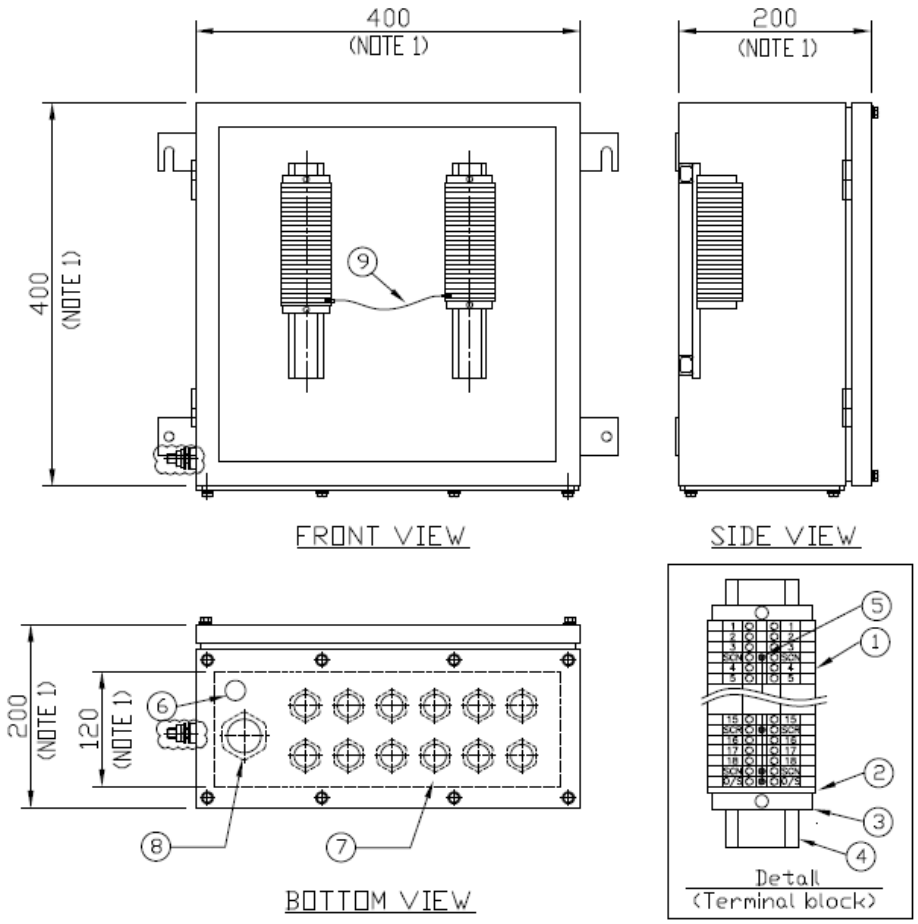
2. Cable entry hole of gland plate to be decided after cable and cable gland selection
3. Terminals shall be identified by means of pre-printed plastic insert markers, black characters on white background, these shall be fitted to both sides of terminals.

No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2

7.7 For 12 Triad multi cable



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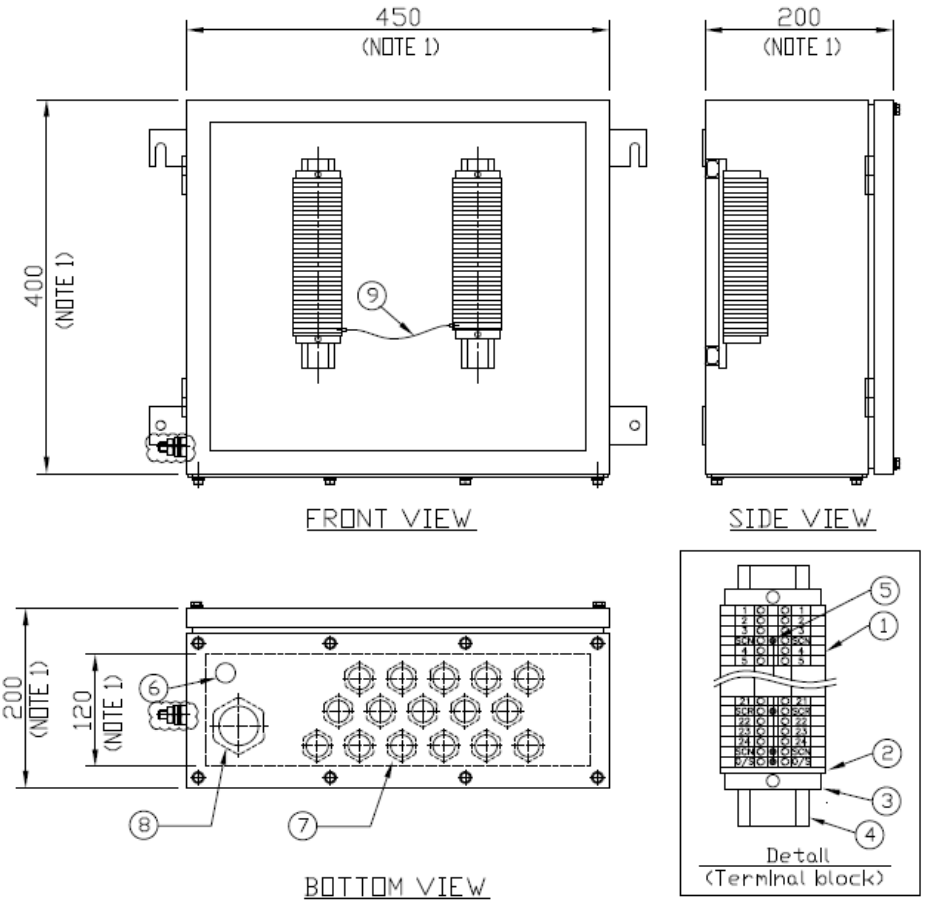
3. Terminals shall be identified by means of pre-printed plastic insert markers, black characters on white background, these shall be fitted to both sides of terminals.

No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2
9	Jumper wire	2.5mm2 Green	

7.8 For 16 Triad multi cable



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No.	Name	Description	Remarks
1	Terminal Block	Screw clamp type SAK or eq.	Non-IS: Beige or Vendor Std / IS: Light Blue
2	End Plate	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
3	End Bracket	Vendor standard	Non-IS: Beige or Vendor Std / IS: Light Blue
4	Din Rail	TS35	
5	Jumper Bar	Vendor standard	Where required
6	Breather / Drain Plug	IEC Exe IP66	Mfr's standard material
7	Plug and Lock nut	IEC Exe IP66 (Branch)	Note 2
8	Plug and Lock nut	IEC Exe IP66 (Main)	Note 2
9	Jumper wire	2.5mm2 Green	

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