



LOTUS *Fibre*

ISO 9001-2008 CERTIFIED
D & B RATED

**GRP (FRP) Products
FOR ELECTRICAL & INSTRUMENTATION USE :**

- SMC HOT MOULDED
- PULTRUSION
- HAND LAYUP

www.lotusfibre.com

“ India Looses ₹. 2 Lakh Crores on Account of Corrosion of Material & Metal in Infrastructure, Vehicles, Pipelines and Water Facilities etc. _____Media report.

Corrosion has been termed as The Unseen Destroyer. It is all Pervasive in the atmosphere and start-attacking concrete, steel etc. It damages not just homes but bridges dams, Industrial Plants with catastrophic results, deadly combination of Saline Breeze, Splashing of sea water subsoil saline water and gaseous emissions in Industrial regions leads to corrosion.

FRP (GRP) is being increasingly used for corrosion Resistant application as it offers better corrosion resistance to specific environment and temperature .

FRP (GRP) is a Composite material i.e. Glass fibre & Resin is combined to form the new material. The Glass fibre is the load bearing constituent. It has the benefit of Strength of glass fibre and the Corrosion Resistant Properties of Plastics i.e. resin matrix It has filler material also which enhances the functional properties of the composites e.g. Gloss, Wear resistance, Fire retardancy, Improvement in electrical Insulation etc.

The resin matrix provides a rigid shape required for the reinforcement to take external load, which otherwise cannot be taken by the reinforcements alone. Depending upon the application, the matrix material (resin) have to provide the required properties.

The choice of proper resin is vital in ensuring good weathering corrosion resistance. If the resin matrix is not able to withstand the corrosion, the mechanical properties of the composites are affected and with the on-set of time the mechanical properties are drastically reduced.

It is generally completely elastic up to the failure and exhibit no yield point, the mechanical properties depend upon:

- Fibre & Resin Properties
- Fibre Volume Fraction
- Geometry/Form of Fibre
- Cyclic Loading
- Temperature
- Stress Rupture

PROCESSING

The main technique to Mould / Fabricate FRP(GRP) are :

- Contact Molding
- Compression Moulding
- Pultrusion
- Resin injection
- Filament winding etc...

The choice of Process depends upon the end Product to be Moulded /Fabricated

PRODUCT RANGE in FRP

CANOPIES	<ul style="list-style-type: none"> » ELECTRICAL MOTORS » INSTRUMENTATION EQUIPMENT » P.A. SYSTEM » C.C.T.V. CAMERAS » LOCAL CONTROL STATION » JUNCTION BOXES » FIRE CALL STATION 	HAND LAY UP
CONTROL & DISTRIBUTION PANELS	<ul style="list-style-type: none"> » LV SWITCH GEAR » POWER JUNCTION BOX 	HAND LAY UP
INSTRUMENTATION ENCLOSURE	» CROCODILE MOUTH OPENING TYPE ENCLOSURE FOR INSTRUMENTATION EQUIPMENT (TRANSMITTER ENCLOSURE)	S M C (HOT MOULDED)
	» NECK MOUNTING (CLOSE COUPLE TYPE) ENCLOSURE	
	» SOLENOID VALVE BOX	HAND LAY UP
JN BOXES & LOCAL CONTROL STATION	<ul style="list-style-type: none"> » PUSH BUTTON STATION » SOCKET OUT LET » POLE BOX » CONTROL JUNCTION BOX 	S M C (HOT MOULDED)
CABLE TRAYS	<ul style="list-style-type: none"> » LADDER TYPE » PERFORATED TYPE 	PULTRUSION
LADDERS	<ul style="list-style-type: none"> » STEP LADDER » STEP STAND » WALK THROUGH CAGE FOR CHEMICAL TANKS 	PULTRUSION
FAN COVERS	» FAN COVERS HORIZONTAL / VERTICAL MOTORS	HAND LAY UP

MAIN CLIENTS

- | | |
|--|---|
| 1) Reliance Industries Ltd. | 13) National Fertilizers Ltd. |
| 2) Essar Oil Ltd. | 14) Rashtrya Chemicals & Fertilizers Ltd. |
| 3) Hindustan Petroleum Corporation Ltd. | 15) Coromandal Fertilizers. |
| 4) Bharat Oman Refinery Ltd. | 16) Chambal Fertilizers. |
| 5) Indian Oil Corporation Ltd | 17) Burpup Fertilizers. |
| 6) Numaligarh Refinery Ltd. | 18) Jindal Steel. |
| 7) Manglore Refinery And Petrochemicals Ltd. | 19) Vizag Steel Plant. |
| 8) Paradeep Phosphates Ltd. | 20) Jubilant Life Sciences. |
| 9) Vedanta Aluminium. | 21) Tata Chemicals Ltd. |
| 10) Hindustan Zinc Ltd. | 22) GHCL Ltd. |
| 11) Cipla Ltd. | 23) Apollo Tyres. |
| 12) Rainbow Parer Ltd. | 24) DCW Ltd. |

PROJECT	CONT RACTOR	CONSULTANT
1) HMEL - PUNJAB	HINDUSTAN DOOR OLIVER ABB TECHNIP PETRON	EIL EIL EIL EIL
2) RCF	MIRAJ INSTRUMENTATION	PDIL
3) GSFC	MIRAJ INSTRUMENTATION	PDIL
4) MANGLORE REFINERY	LARSEN AND TOUBRO LTD TOYO ENGINEERING ICB TECHNIMONT ROHINI TECHNIP	EIL EIL EIL JACOBS EIL/JACOBS.
5) BORL	ELEMATICS PUNJLYODS TECHNIP PETRON DRIPLEX	EIL EIL EIL/JACOBS. EIL EIL
6) IOCL GUWAHATI	PACE PROCESS	UHDE
7) IOCL DIGBOI	ELEMATICS	UHDE
8) IOCL BONGAIGAON	ELEMATICS MIRAJ	EIL EIL
9) IOCL MATHURA	ANACON	EIL
10) HPCL - MUMBAI	L & T	JACOBS.

PROTECT THE WORK HORSES
OF INDUSTRY

From :

- Water, Rain, Mist
- Acid & Chemicals
- Dust
- Heat
- Impact



MOTOR PROTECTION SHELL

The necessity to protect the equipment, needs no emphasis. The daily failures due to one reason or the other is reminding us always.

A little money extra spent on the protective means, is worth, than facing the breakdown and failures i.e. PRODUCTION LOSS.

The motor are invariably subjected to abnormal circumstances (other than the designed parameters) such as

NATURE OF WORK

- Installed Directly Under Sun/rain
- Installed In Dusty Atmosphere
- Installed In The Vicinity Of Flying Objects
(e.g. waste paper, clothes, leaves etc.)

ACCIDENTAL CONDITIONS

- Hit by falling object
- Excessive heating due to fire or heat in the vicinity.
- Splash of oil/acid/corrosive substances

The motors should be protected from abnormal eventualities and should be guarded to minimize the risk of damages.

PRODUCTS

To protect the equipment PROTECTION SHELL is suggested, which is a cover made of FRP (hand lapping process)

WHY FRP ?

Because.....

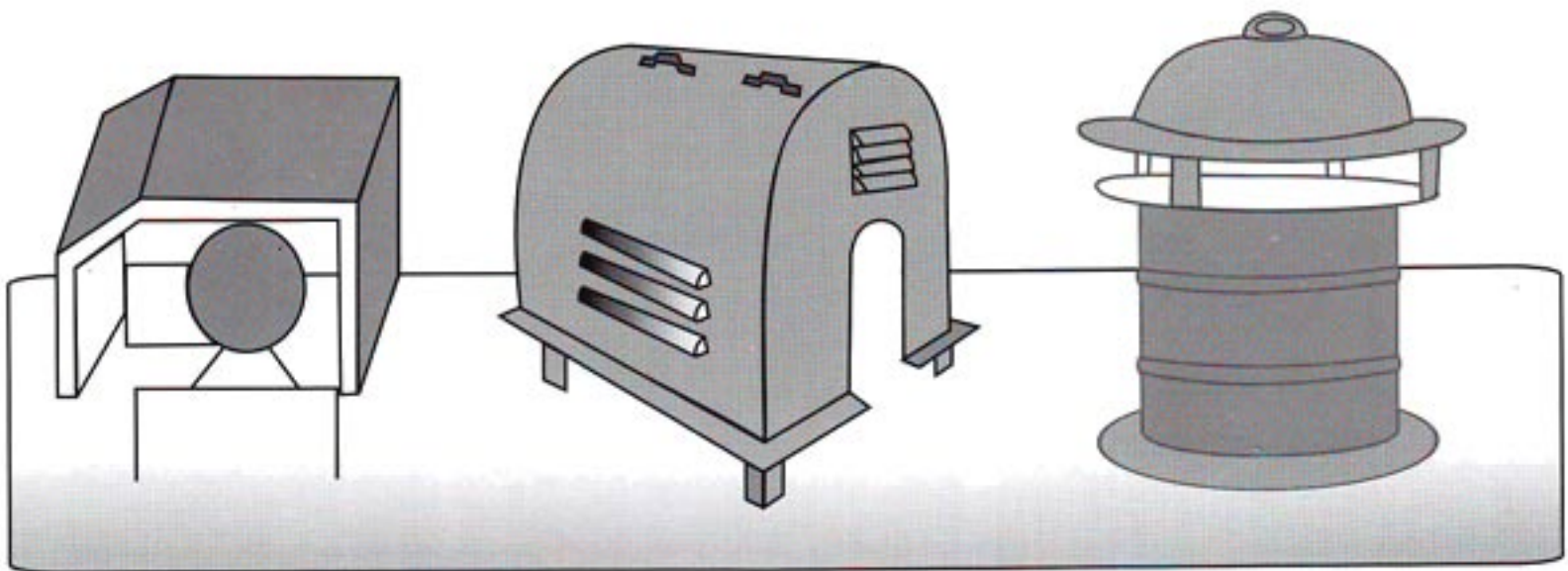
FRP is

- RESISTANT TO CORROSIVE ENVIRONMENT
- MECHANICALLY STRONG
- NO WATER ABSORPTION
- HIGHLY INSULATING MATERIAL
- U. V. STABILISED
- AESTHETIC LOOKS
- MAINTENANCE FREE
- LIGHT WEIGHT
- EXCELLENT WEATHERABILITY

MOTOR PROTECTION SHELL (MOTOR CANOPIES)

The salient feature are:

1. One piece moulding giving a monolithic construction
2. LOUVERS are FRP Moulded and provided all around the protection shell (due care has been taken towards the cooling requirement of the motor under full load conditions). The main advantage of FRP MOULDED LOUVERS IS THE LIFE, these louvers will last up to the life of shell
3. Have appropriate fixing arrangement for the ease of installation at site.
4. MECHANICALLY STRONG. Extra thickness is given at appropriate places. enabling this to withstand the Stresses and Shocks to which it is normally subjected to at site during its life span.
5. Lifting handle is provided.



SHAPE AND SIZE :

The size of the MOTOR PROTECTION SHELL is based on the physical dimensions of the motor It is so selected that a uniform clearance of at least 50mm is maintained on all sides with respect to the motor body for the purpose of:

1. PROPER CIRCULATION OF AIR ALONG WITH THE LOUVERS
2. FOR THE EASE OF INSTALLATION / LIFTING

It Should Cover The Motor Fully To Protect From

- Rain water
- Chemical or water spillages
- Accidental fall of some material or the hit of Some flying object under abnormal circumstances

SPECIFICATION

PARAMETERS	SPECIFICATION
1) MATERIAL OF CONSTRUCTION	FRP
2) TYPE OF RESIN	ISO-PHTHALIC/GEN PURPOSE
3) GLASS FIBRE	CSM OF 450GMS
4) SHAPE & SIZE	As per Motor Size
5) COLOUR	D. A. Grey
6) THICKNESS	3 to 5 MM
7) LOUVERS	Yes
8) HANDLES	Yes
9) FINISH	Outside Smooth Finish
10) STIFFNERS	Yes (in strip form by changing material Orientation).
11) SUPPORTING	As required at site by FRP ANGLES / CHANNELS
12) CORROSION RESISTIVITY	Yes
13) STABILITY From U. V. RAYS	Yes
14) MOULDING PROCESS	Hand Lay -up
15) FLAMABILITY	Low Flammability as per IS-6746
16) GLASS CONTENTS	30 to 33%
17) OXYGEN INDEX	30+
18) FLAME SPREAD INDEX	14 to 15
19) ANTI STATIC	Yes (If required)

INSTALLATION :

NO SPECIAL SKILL IS REQUIRED, JUST KEEP SHELL OVER THE MOTER.

The motor protection shell is specially designed by considering the general site conditions

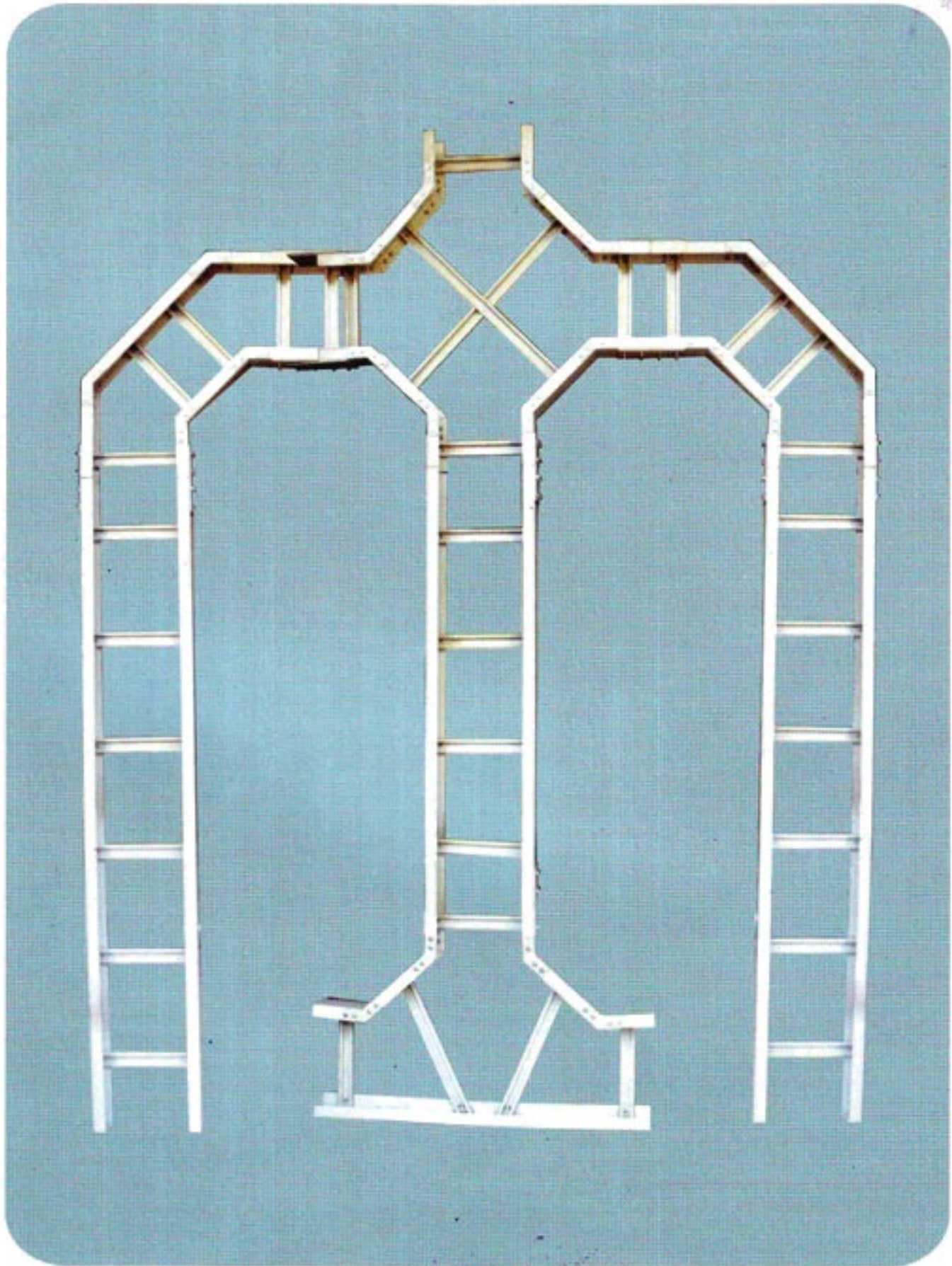
The height of FRP Angles is adjusted according to the required parameters such as height of the motor above the foundation, rail mounted, flange mounted, resting directly over the foundation etc.

PRECAUTION

The Motor Protection Shell Should Not Significantly Restrict Air (ventilation) Passage as such condition will lead to the burning of the motor.

(IT IN NOT SUPPOSED TO HAVE BOX LIKE SITUATION)

FRP CABLE TRAYS



The FRP Cable Support Systems is most suitable where the metallic Systems gets Corroded (Iron gets rusted and Alluminium develops White or Silver grey Patina)

THE CAUSES OF CORROSIVE ATTACK ARE

SIMPLE CHEMICAL ATTACK

When the environment is loaded with chemical vapours, the attack is severe.

SIMPLE CHEMICAL CORROSION

CHLORINE CONTENTS

in atmospheric air (Coastel / Sea)

in any event the METALLIC SYSTEM HAS LIMITED SERVICE LIFE/EXPECTANCY (Regardless of how the end point is defined)

FRP CABLE TRAYS

- designed to withstand corrosion and stresses

THE MAIN FEATURES ARE:

- Corrosion Resistant (Excellent Environmental Resistant)
- Rigid & Structurally Strong
- High Impact strength
- Light Weight
- Non Conductive (Electrical & Thermal)
- Non Sparking
- Chemical Resistant
- Non Magnetic
- Resistant to Chipping and Cracking
- U.V. Stabilized
- No Water Absorption

MATERIAL OF CONSTRUCTION

Main Ingredients :

- Glass Fibre (Roving)
- Glass Mat
- Surface veil
- Resin (ISO PHATHALIC OF VINYLESTER)
- Additives

PROCESS

PULTRUSION

Pultrusion is a manufacturing process for producing continuous length of reinforced plastic structural shapes.

The process involves pulling of Continuous Glass Fibres, Continuous Glass Fibre Mat, Plastic fibre veil through a liquid resin bath. The glass fibre gets impregnated by the resin mixture and this impregnated fibre is pulled through a heated steel shaping die, where the resin gets **GEL** and the **SOLID CONTINUOUS PROFILE** comes out of the die.

The continuous Glass Roving give the strength in the longitudinal direction, whereas Glass mat gives the strength in the transverse direction.

The type of Resin to be used depends upon the environment where the cable support System is used:

- * For General Environment
- * For Sever Corrosive Environment
(CAUSTIC AND STRONG ACIDIC)

**ISO PHATHALIC GRADE
VINYLESTER**

The Resin is FIRE RETARDANT & U. V. STABILISED)

TYPES OF CABLE TRAYS

LADDER TYPE

It is a structure Consisting of two **LONGITUDINAL SIDE MEMBERS** Connected by individual transverse members **CALLED RUNG**.

The Longitudinal Members are C-Channel.



THE RUNG ARE SPECIALLY DESIGNED TO

- Withstand the load
- Allow the cable to dropout without contacting a sharp edge.
- Double inside fold is used to anchor the fastner head for clamping the cables.



JOINING OF TRANSVERSE & LONGITUDINAL MEMBERS

To Get The Shape Of The Ladder _____ Transverse & Longitudinal Members Are Joined Together.
The strongest connections are made by using : Mechanical Fastners (S.S. Rivets or Nut / Bolts)

PERFORATED TYPE

It is a structure consisting of bottom (ventilated or solid) with the longitudinal siderails.
(Perforations are made by drilling holes)

MATCHING ACCESSORIES

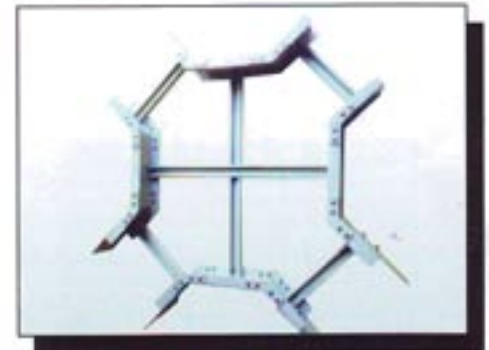
The Following accessories are generally used to complete the system:

- Bends
- Tees
- Cross
- Reducers etc

TEES



CROSSES



HORIZONATAL BENDS



VERTICAL BENDS



Note : All CUT or Machined Edges, Holes & Abrasions Must be Sealed with Resin

INSTALLATION

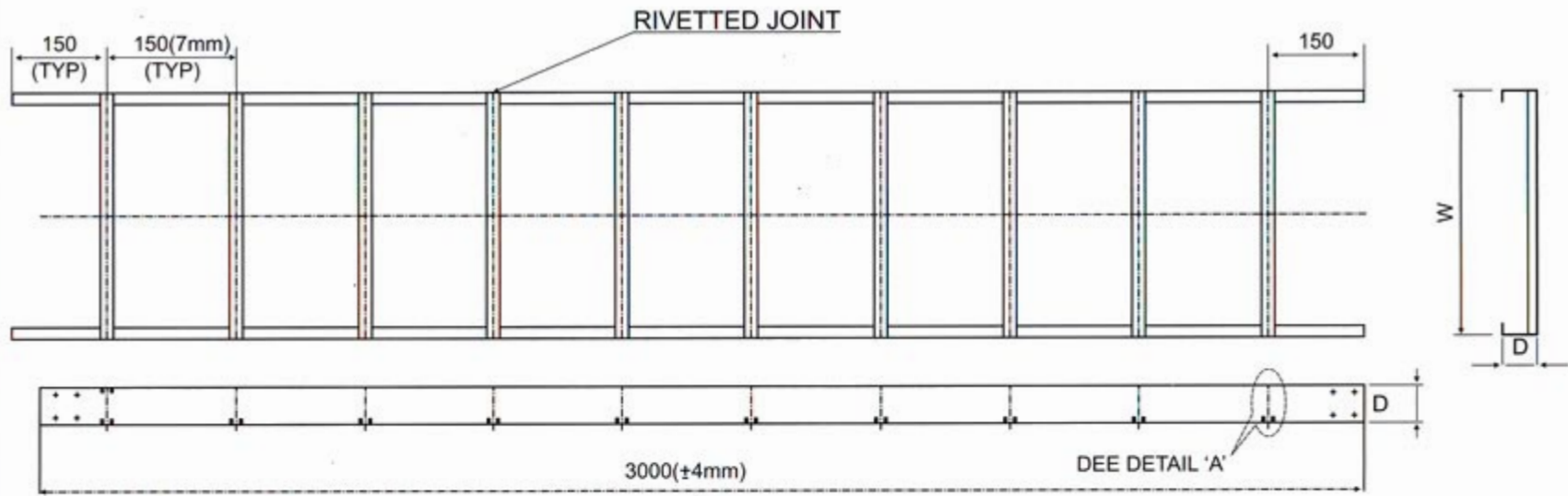
- General** The cable Trays and Accessories are bolted together and fixed to Supporting member. For the purpose of bolting together the side rails and all accessories have holes on each end for fixing Connector plates.
- Support Span** Recommended Support Span at installation site must not exceed 2000
- Cable Fill** Recommended cable fill should not normally be more than 80% of the inside area of the cable tray.

LOADING CAPACITY

The Working load capacity represents the ability of a cable tray to support the weight of the cable and the following guidelines should be Considered for loading the trays.

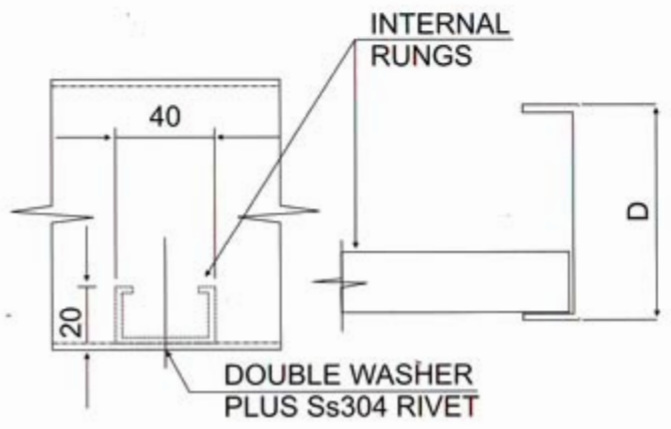
With the Support span not exceeding 2000 mm, the maximum designed loading is UDL + 70 kg. Concentrated Load at the Centre of the Span:

U. D. L. (CABLE LOAD)	WIDTH
30 kg/linear mtr.	150 mm
60 kg/linear mtr.	300 mm
90 kg/linear mtr.	600 mm
120 kg/linear mtr.	750 mm



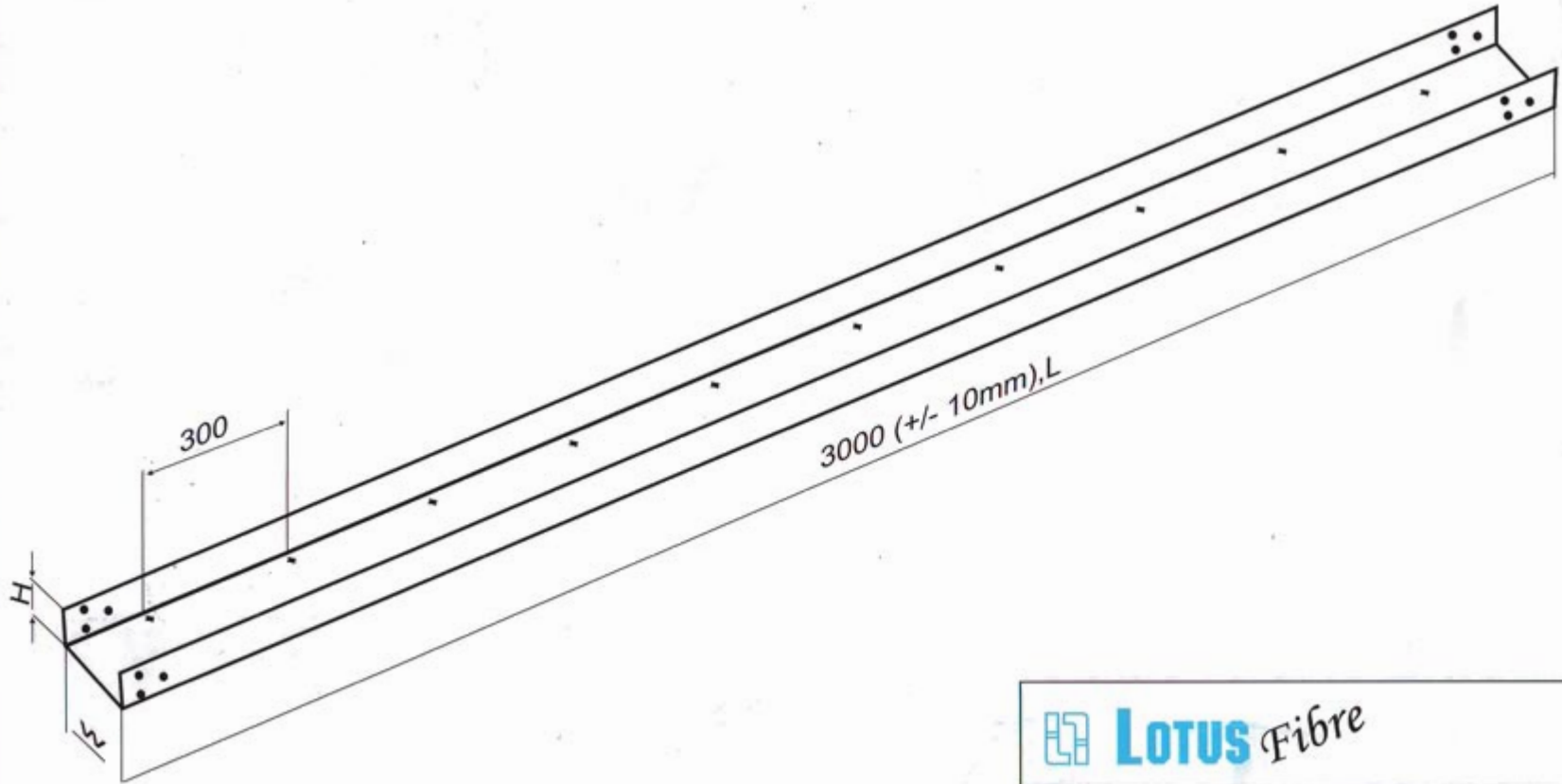
L


LADDER TYPE



DETAIL 'A'

CLIENT :		
CONSULTANT : -		
CONTRACTOR : -		
PROJECT : -		
TITLE : FRP CABLE TRAY LADDER TYPE		
DATE	DRG . NO.:	REV. No :0



		
CLIENT :-		
CONSULTANT :-		
CONTRACTOR :-		
PROJECT :-		
TITLE : FRP CABLE TRAY PERFORATED TYPE		
DATE	DRG. NO.:	REV. No.0

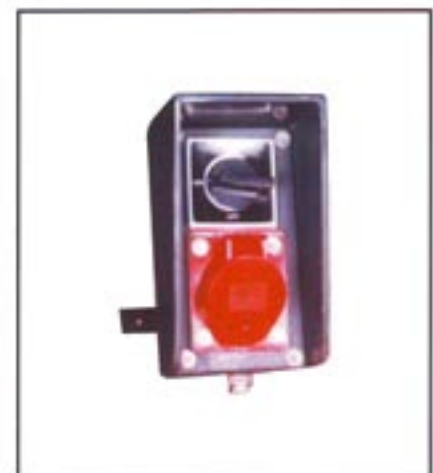
**ELECTRICAL CONTROL STATION
IN FRP
FOR OUT DOOR USE (for Non Flame Proof Area)**



- LOCAL CONTROL STATION
- RECEPTACLES
- CRANE PENDENT



- U. V. Stabalized
- Fire Retardant
- Corrosion Free
- Impact resistant
- IP 65



1. LOCAL CONTROL STATION:

- EMERGENCY STOP
- START / STOP
- FORWARD / REVERSE / STOP
- START / STOP WITH AMMETER
- START/STOP WITH SELECTOR SWITCH
- STRAT/STOP WITH AMMETER & SELECTOR SWITCH
- CRANE PENDENT
- VFD PANEL

2. RECEPTACLES

: 16 / 32 / 63 AMPERES

FEATURES :

Built In Canopy (Extra Deep)

Degree of Protection IP-65

Suitable Cable entries

Terminal Blocks Fixed on G.I. Gird plate with earthing arrangement

Front cover fixed with S.S. Screws along with Neoprene rubber gasket

SS mounting lugs.

Actuators / Elements / Accessories of reputed make (recommended by user)

CONTROL CONFIGURATION as required

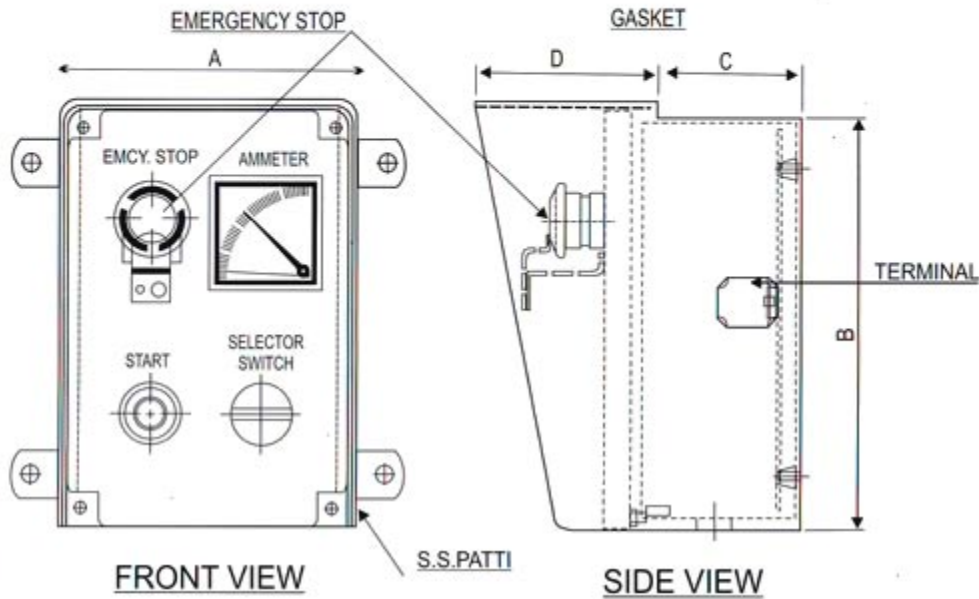
FRP LOCAL CONTROL STATION

Industrial Type Dust / Vermin / Weather Proof with Built in extradeep (integral) conopy

SPECIFICATION

Non FLP type FRP ENCLOSURE

• MATERIAL OF CONSTRUCTION	FRP (SMC-hot Moulded)
• CANOPY	Yes (Extra Deep)
• COLOUR	Grey (RAL -7032)
• CABLE ENTRY	From Bottom
• CABLE GLAND	Yes - 2 Nos (if required)
• THICKENSS	4 to 5mm
• EARTHING POINT	Provided at Both sides of the box through mounting Lugs(Grid Plate is connected to mounting lugs and the earthing connection is to be made through earthing screws on it, Gland Earthing Tag is also Provided.)
• INSTALLATION	SS mounoing lugs provided
• MOUNTING OF COMPONENTS	Operating components are provided on front cover
• MAKE OF THE COMPONENTS	As Required
• TERMINALS	Elmex / Brown / Connect well
• WIRING	Fully Wired By 1.5 / 2.5 sq mm Copper wire



NOTES :

TYPE

SIZE

	A	B	C	D	
PB-01	105	105	70	50	
PB-02	135	165	95	85	
PB-03	140	220	95	85	
PB-04	225	300	120	85	
PB-05 a	450	525	225	125	Under Development
PB-05 b	525	450	450	125	Under Development

10				
9.				
8				
7.	Earthing Tag		Brass	
6.	Cable Gland		Brass	
5.	Mounting Lugs		S.S.	
4.	Terminal Block			
3.	Grid Plate		G.I.	
2.	Rubber Gasket		Neoprene	
1.	Enclosure with cover	LOTUS	FRP-SMC	
Sr. NO.	ITEM	MAKE	MAT	QTY

LOTUS Fibre

CLIENT :

CONSULTANT : -

CONTRACTOR : -

PROJECT : -

SCALE

1:3

SIZE : A4

TITLE : LOCAL CONTROL

DRN

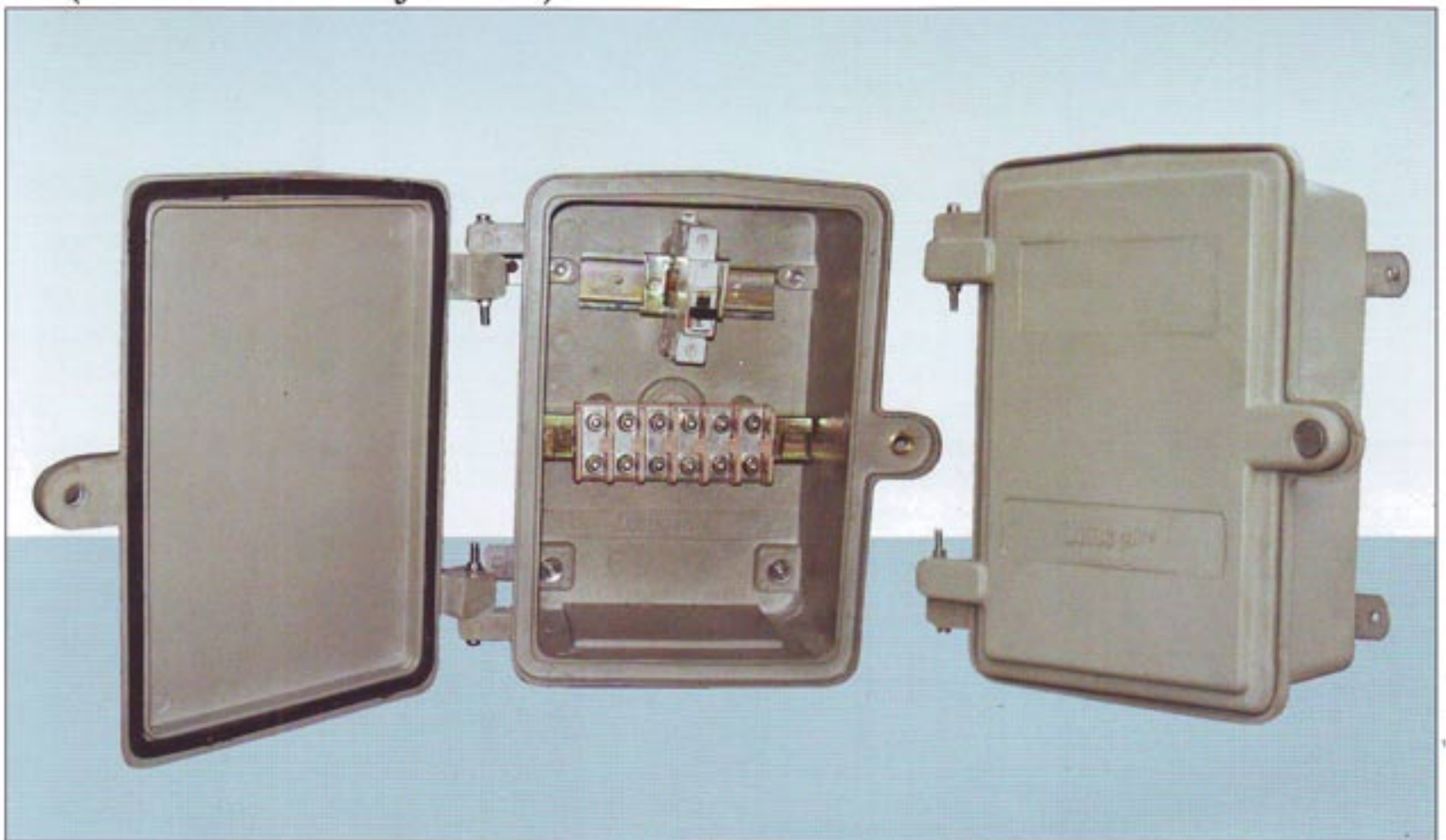
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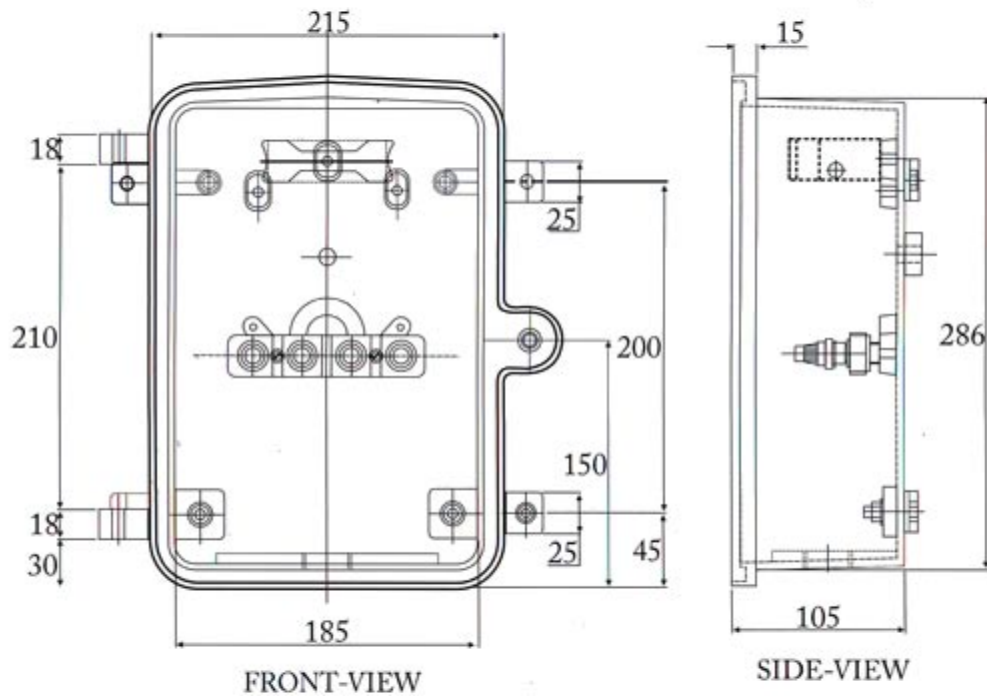
26/04/2011

DRG. NO.:

REV. No :0

**FRP POLE BOX
(STREET LIGHT JN BOX)**





S.NO.	ITEMS	MAKE	M.O.C.	QTY.
10				
9	COLOUR		GREY (RAL-7032)	
8	MOUNTING ARRANG.		Clamp	2 Nos
7	CABLE GLAND		If Required	
6	HARDWARE		S. S.	
5	TERMINAL BLOCK		As Required	
4				
3	RUBBER GASKET		Neoprene	
2	FUSE / M.C.B.		As Required	
1	Enclosure with Cover	Lotus	FRP-SMC	

LOTUS FIBRE
 102, SWAGAT, SAGAR PLAZA
 IND. ESTATE, SATIVLI, VASAI (East) Thane - 401 208
 E-mail : lotusfibre@yahoo.com

POLE BOX

HOT MOULDED WEATHER PROOF JN BOX WITH EXTRADEEP INTEGRAL CANOPY

Rust Proof

Maintenance Free

IP 65

Fire Retardant

U.V. Stabilised

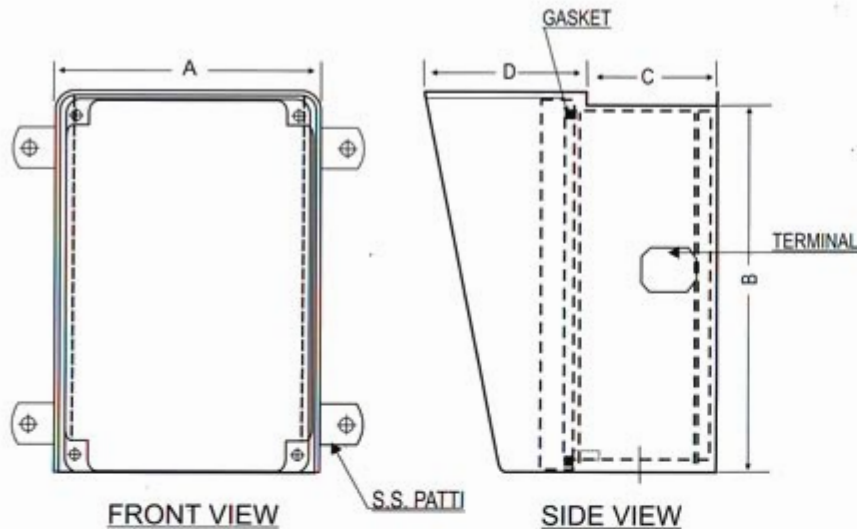
Corrosion Free

No Moisture Absorption

Aesthetic Looks

Shock Proof





SPECIFICATIONS

Non FLP type FRP ENCLOSURE

MATERIAL OF CONSTRUCTION	FRP (SMC-Hot Moulded)
CANOPY	Yes (Extra Deep)
COLOUR	Grey
CABLE ENTRY	From Bottom
CABLE GLAND	As required
THICKNESS	4 to 5 mm
EARTHING POINT	Provided at both sides of the box
INSTALLATION	SS mounting lugs provided
MOUNTING OF TERMINALS	G.I. Grid Plate Provide
TERMINALS	Elmex / Brown / Connect well

TYPE **A** **B** **C** **D**

JB - 01	105	105	70	50	
JB - 02	135	165	95	85	
JB - 03	140	220	95	85	
JB - 04	225	300	120	85	
JB - 05a	450	525	225	125	Under development
JB - 05b	525	450	225	125	Under development



CLIENT :			
CONSULTANT :-			
CONTRACTOR :-			
PROJECT :			
SCALE		TITLE : JN Box	
DRN	k2drafters@gmail.com		
DATE	26/04/2011	DRG . NO. : LF-011-2011	REV. No : 0

Product Improvement is a continuous Process hence SPECIFICATIONS are Subject to change without Intimation

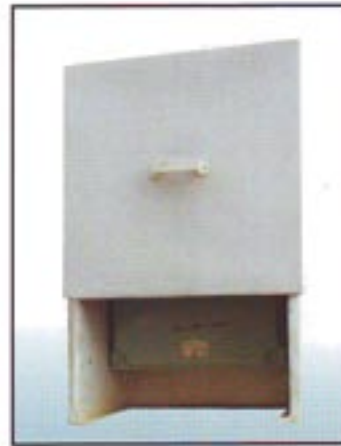
FRP FAN COVER FOR ELECTRICAL MOTORS



**ORDERING DETAILS : FRAME SIZE
MAKE OF MOTOR
MOUNTING
FLP / NFLP TYPE**

- * LOCAL CONTROL STN.
- * P.A. SYSTEM
- * INSTRUMENTS
- * JUNCTION BOXES
- * RECEPTACLES
- * FIRE CALL STATION
& OTHER EQUIPMENT

CANOPIES





Sensitive Electronic / Instrumentation Equipment is to be protected from:

- Sun Light
- Rain (Direct or Splash) / Water Leakage
- Dirt & Dust Accumulation
- Hit of Falling Objects
- Environmental Corrosion

ADVANTAGES

- Reduces the Sun face Temperature of Instruments
- Minimize Instrument Drift.
- Environmental / Weather Protection

TECHNICAL DETAILS:

1. MATERIAL OF CONSTRUCTIONS:	FRP (Fibre Reinforced Polyester) With UV Stabilised, Fire Retardant and anti static (If Req'd.) Properties. AS REQUIRED (Normally RAL7032)
2. COLOUR	3mm to 5mm
3. THICKNESS	Resistant to Chemicals prevailing in Refineries / Chemical Plants and Coastal Areas.
4. CORROSION	LOW as per IS-6746
5. FLAMMABILITY	30 +
6. OXYGEN INDEX	14 to 15
7. FLAME SPREAD INDEX	

A) MOUNTING ARRANGEMENT & ACCESSORIES

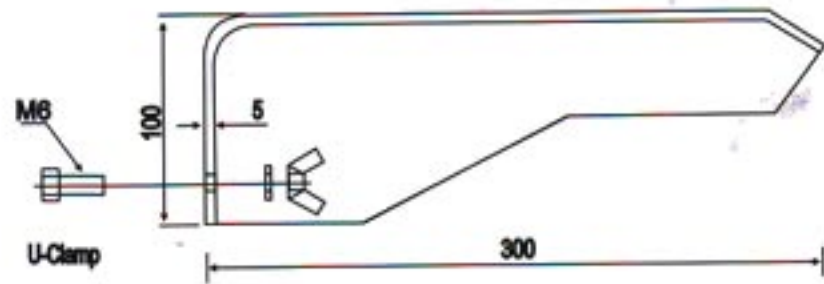
1 MOUNTING OF BOX	S. S. Pipe 63.5 NB x 100 with Base Plate
2 Mounting of Transmitter	S.S. Pipe 50 NB x 200 with Base Plate
3 Gasket	Neoprene / Soft Rubber
4 View Glass	Yes (If required)
5 Breather	Yes (if required)
6 Hardware	S. S.
7 Stand Bar	Yes (S. S.)

B) MOUNTING OF CANOPIES

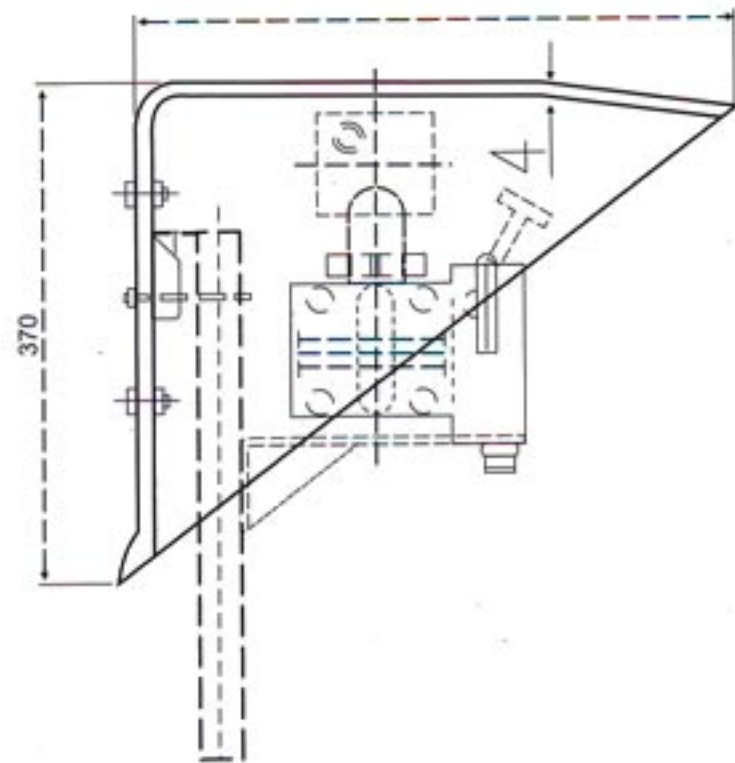
- Canopies are mounted with
- 2 Nos of SS/ Cadmium Coated U Clamps Suitable for 2 " Pipe
 - or
 - 70 O.D Pipe socket with 130 mm base plate.

PRODUCT RANGE

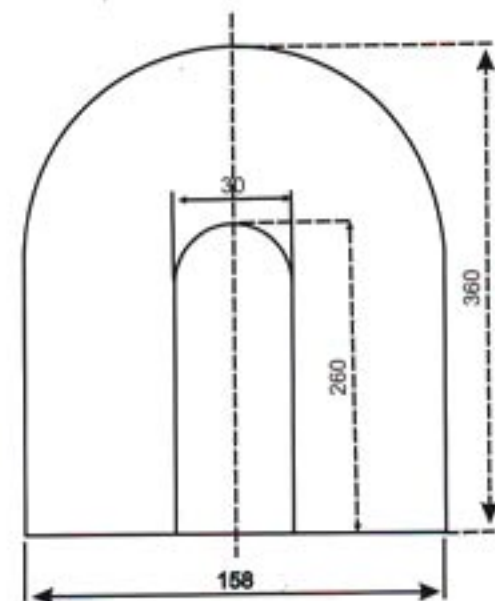
1) Sunshade



2) Standard Transmitter Canopy

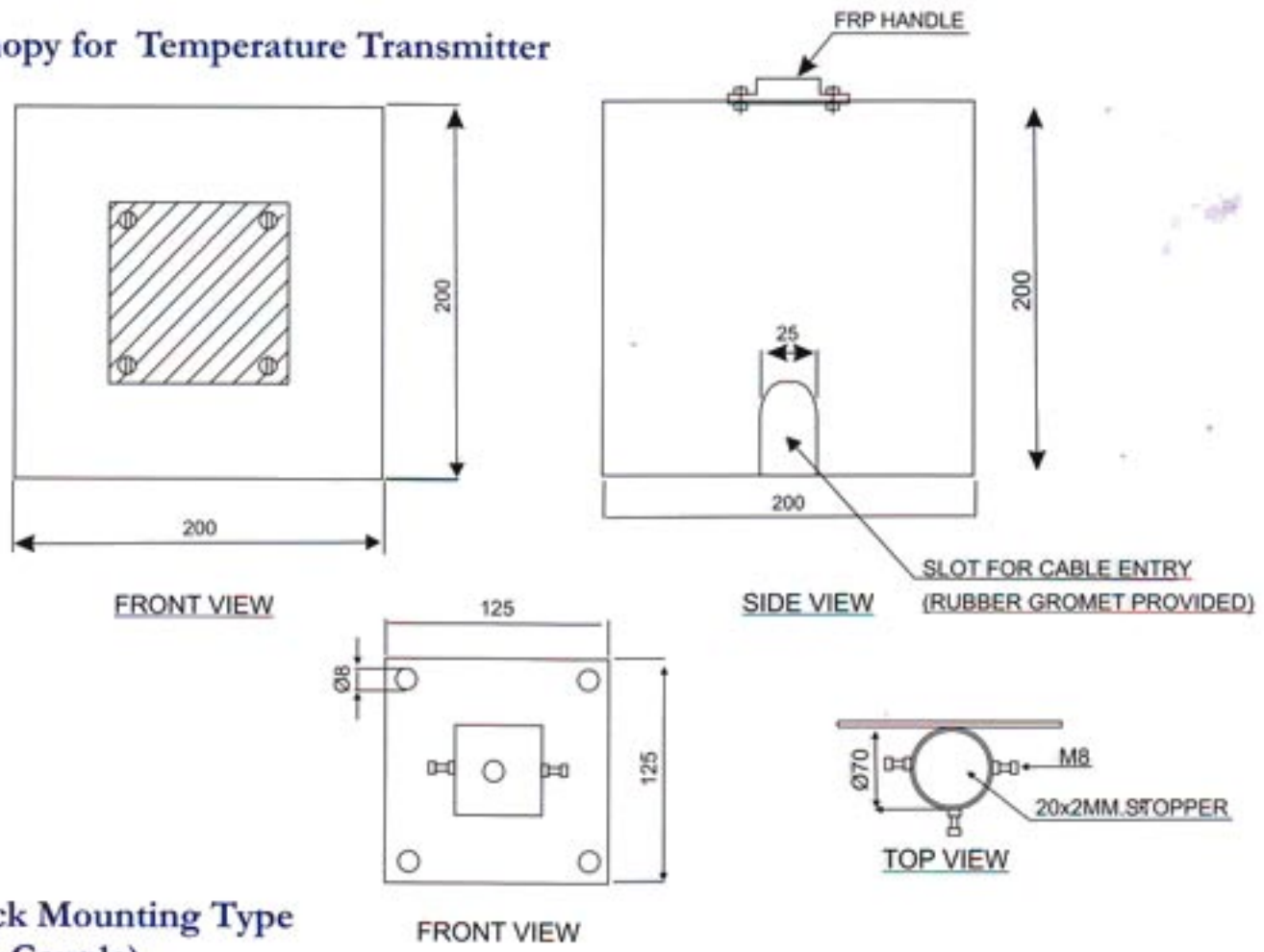


3) RTD Protection

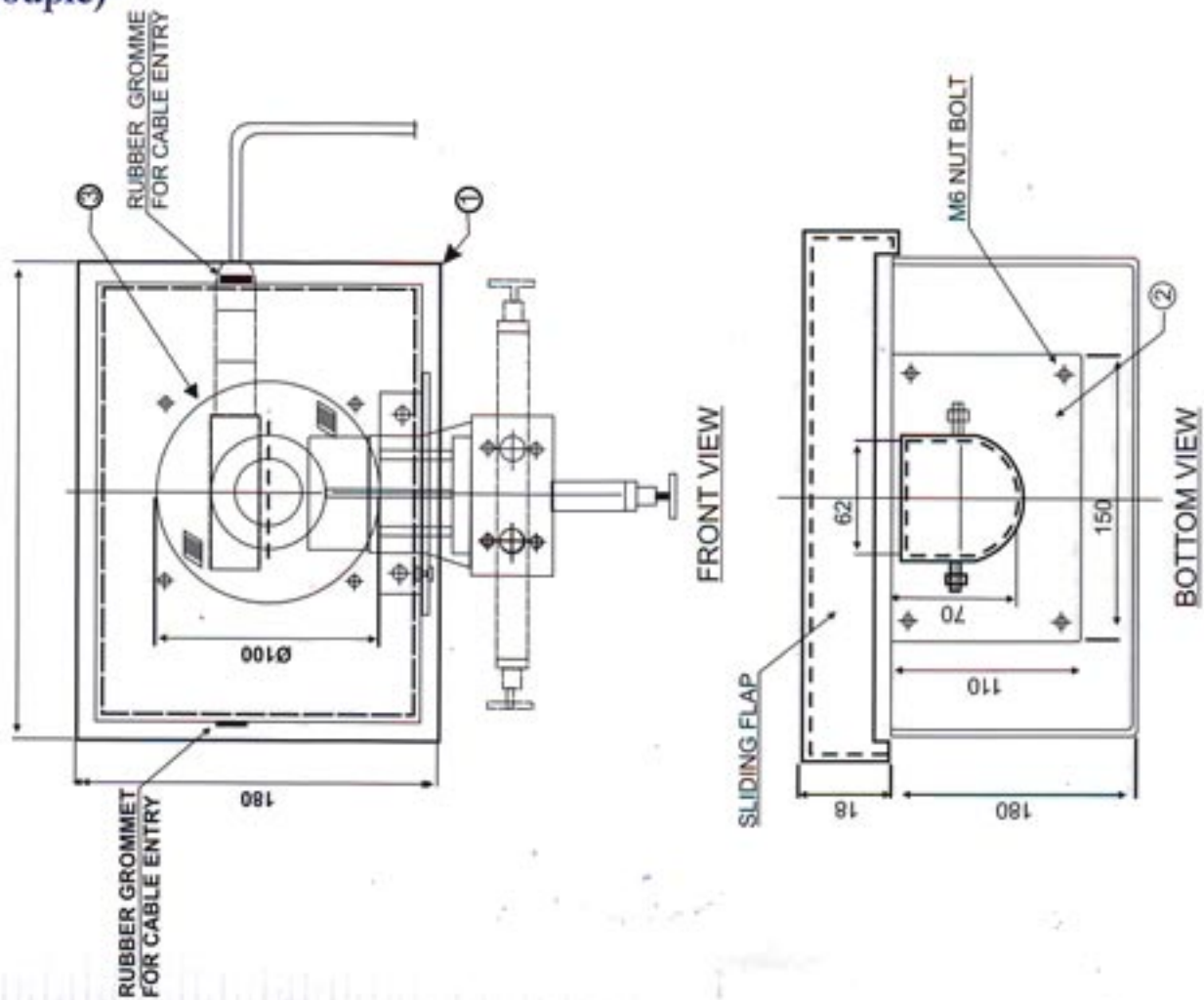


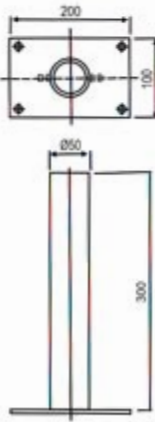
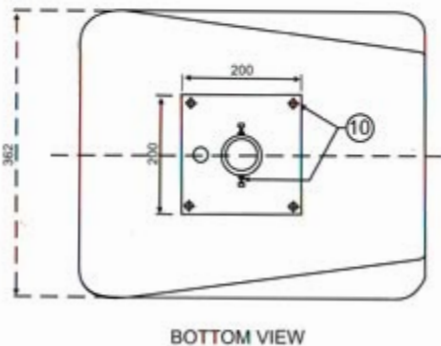
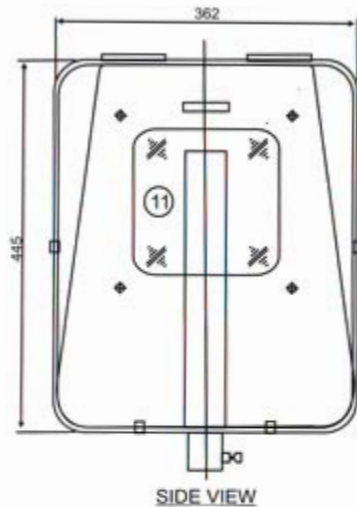
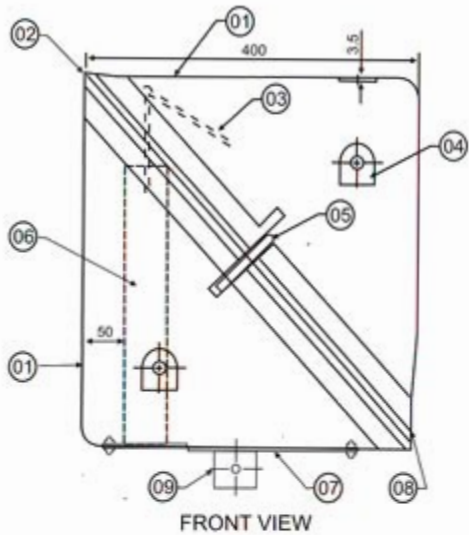
FRONT VIEW
NOTE : RUBBER GROMET IS PROVIDED.

4) Canopy for Temperature Transmitter



5) Neck Mounting Type (Close Couple)





Notes :

- COLOUR : SIEMENS GREY (RAL-7032)
- ALL DIMENSION ARE IN MM UNLESS SPECIFIED.
- UV STABILISED
- RESISTANCE TO MOST OF THE SCIDS AND ALKAUES.

Sr. No.	DESCRIPTION	MATERIAL	QTY.
1	GRP ENCLOSURE FOR TRANSMITTER	SMC	
2	HINGES	S.S 304	2
3	STAND BAR FOR HOLDING TOP PORTION	S.S 304	1
4	P.P. BREATHER (FOR AIR VENTILATION)	P.P	2
5	LOCKS	S.S. 304	2
6	50 dia PIPE WITH PLATE (2 MM THICK)	S.S 304	1
7	MOUNTING BRACKET PLATE	S.S. 304	1
8	RUBBER GASKET	SPONGE	1
9	73 dia SS PIPE	S.S. 304	1
10	8 MM NUT AND BOLT	S.S. 304	5
11	ACRYLIC WINDOW (IF REQUIRED)	ACRYLIC	1



CLIENT :	
CONSULTANT : -	
CONTRACTOR : -	
PROJECT : -	
TITLE : GRP ENCLOSURE FOR TRANSMITTER	
DATE	DRG. NO. TR-02/LOTUS/ENCLOSURE. REV. No :0

PRESS ESCAPE TO END



ISO 9001-2008 CERTIFIED
D&B RATED

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