BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS ENGINEERING MANAGEMENT

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TYPE OF DOC.	**TECHNICAL SPECIFICATION**			SIGN			
TITLE				NAME	**TDT**	**SKS**	**NSR**
FIRE DETECTION SYSTEM FOR SWITCHYARD				DATE	**07.01.17**	**07.01.17**	**07.01.17**
				GROUP	**TBEM**	W.O. No	**80001**

CUSTOMER	**RAICHUR POWER CORPORATION LIMITED**
CONSULTANT	**STEAG ENERGY SERVICES (INDIA) PVT. LTD.**
PROJECT	**2X800 MW YERMARUS TPS – 400 KV SWITCHYARD**

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SECTION 1

INTENT, SYSTEM REQUIREMENT, DESIGN CRITERIA AND SCOPE

1.0 INTENT OF SPECIFICATION

1.0.0 This specification is intended to cover the following balance/pending supply and services activities in respect of all the equipments of the **Fire detection System to be provided for 400 kV Substation of 2x800 MW Yeramarus Thermal Power Station** of **Raichur Power Corporation Limited (RPCL):**

i) Balance material supply & inspection as per Cl. No. 9.0 of this section.

ii) Packing and transportation from the manufacturer's works to the site including customs clearance/port clearance, if required.

iii) Fabrication, pre-assembly, if any, erection testing and putting into satisfactory operation all the equipment including successful completion of trial operation.

iv) Performance and Guarantee tests after successful completion of trial operation.

1.0.1 The requirements specified under SECTION 2, SECTION 3, SECTION 4 & SECTION 5 of the specification shall be considered as part of this section. In the event of any conflict between the various sections/sub-sections of this specification, Section 1 shall prevail.

1.0.2 It is not the intent to specify herein all the details of design and manufacture. However, the equipment and the system shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to Purchaser/ Owner, who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgment is not in full accordance herewith.

1.0.3 The contract shall be on Unit Rate Basis for the package. In case of change in the input after placement of order the additions / deletions to the scope shall be settled on the basis of unit rates agreed between the Purchaser and Contractor. The Bidder shall be responsible for providing all material, equipment and services, specified or otherwise which are required to fulfill the intent of ensuring operability, maintainability and the reliability of the complete work covered under this specification.

1.0.4 During contract stage, quantities of various items of BOQ may vary to any extent and same rates will be applicable.

1.0.5 The Bidder shall deem to have understood completely all the tender drawings and documents and quoted accordingly.

1.0.6 **Deviation:** There shall preferably be no deviation on technical specification. The bidder shall sign and stamp the "Certificate for No Deviation" enclosed in Schedule-2, Section-5 towards confirmation. Except for these deviations/variations covered under Deviation Schedules which are accepted by the Purchaser before the award of the Contract, it will be the responsibility of the Bidder to fully meet the intent and the requirements of the specification within the quoted price. *Deviations in any other form including clarifications/ assumptions/ etc will not be considered and it will be construed that the bid conforms strictly to the specification*.

1.0.7 The Bidder to note carefully that the parameters, estimated capacities of equipment indicated and the tender drawings in the specification are only for the guidance of the Bidder. The system shall be designed as per relevant standards/ codes and exact capacities and quantities are to be estimated by the Bidder. All such estimations and design calculations shall be submitted for Purchaser's approval.

1.0.8 It is the responsibility of the successful Bidder to obtain necessary approval/ clearance from statutory organizations wherever applicable for the equipment/ systems under the scope specified.

1.0.9 The term '**Owner**' appearing in this specification shall refer to **Raichur Power Corporation Limited (RPCL)**, the term '**Purchaser'** shall refer to **BHEL** and the term '**Contractor**' shall refer to the **successful Bidder**.

2.0 FIRE FIGHTING REQUIREMENTS FOR VARIOUS AREAS

The makes/models and technical features offered for various firefighting system components/ equipment shall comply with the standards of TAC/ BIS/ UL/ VDs and FM / NFPA/ LPCB as applicable The key elements of fire protection cum detection scheme and the related areas are presented as under:

System	Areas Protected	Scope of Work
Addressable Fire Detection & Alarm System	Switchyard Control Building (including Cable Vault) & Outdoor Switchyard	Supply & ETC of FDA System

- ❖ All works of Fire detection and alarm system shall be done as per respective drawings enclosed with section-5 of this specification. This requirement shall be adhered to by the contractor in strict manner.

3.0 SYSTEM REQUIREMENT & DESIGN PHILOSOPHY

This system shall be designed to provide fire detection and protection services for Switchyard and its control Building. Design criterion shall be based on "**Ordinary Hazard Occupancies**" classification as described in Tariff Advisory Committee's (TAC) guidelines. All equipment or systems in the designed fire detection cum protection arrangement shall be completely in compliance with the regulations of Tariff Advisory Committee (TAC) of India/ Loss Prevention Association (LPA) / National Fire Protection Association (NFPA)/LPCB/ VDs.

3.1 DETECTION SYSTEM

a) The system shall consist of addressable manual call points, addressable intelligent automatic detectors of various types, addressable interface units, microprocessor based fire alarm panel of "**Shrack"** make as required for the complete system with associated cabling and cabling accessories, fire sirens, etc.

b) All detection and sensing devices forming an integral part of the microprocessor based, addressable, intelligent fire detection and alarm system shall be approved by UL/ FOC/ Any other internationally recognized body acceptable to the Owner.

c) The number of detectors, spacing and their locations shall comply with NFPA 72E/BS 5839, Part 1/ IS 2189/ Rules for fire alarm system.

d) Addressable multi-sensor type and photo-electric smoke detectors shall be provided in all areas of Control Building except for the Battery rooms, AHU room & Pantry where Addressable corrosion proof rate of rise of heat detector with fixed temperature element shall be provided.

e) Areas such as Control/ Protection/ PLCC room, office room, shift manager room, conference room, maintenance engineer room and electronic test lab will have false ceiling.

f) In air conditioned areas of control room where false ceiling is present, the detectors shall be installed both above and below false ceiling. Photoelectric type smoke detectors shall be used for above false ceiling area of AC rooms. For above false ceiling detectors a response indicator shall be provided below

false ceiling for the purpose of detector's alarm status indication. Multisensor type smoke detectors shall be used for below false ceiling areas of AC rooms and other areas of control.

g) Cable Vault shall be provided with addressable multi-sensor smoke detector & temperature sensitive insulated wire (digital) linear heat sensor cables. The complete area shall be covered by cross zoning method. LHS cables shall be provided in top tray, bottom tray & in alternative trays. Suitable supports to clamp this cable shall be provided.

h) Manual call points with flame proof enclosure shall be located at each floor of control building such that no person needs to travel more than 30 meters from any point within the premises, in order to give an alarm. Manual call points shall be located on the exit routes and in particular on floor landings of stair cases and near exits from the building / area. Pedestal mounted flame proof enclosure manual call points shall be provided for the outdoor switchyard.

i) In case the operating voltage of the system is greater than 24V, all detector junction boxes, manual call points and cable marshalling boxes shall be earthed with 8 SWG GI wire. This earthing wire shall be connected to the earthing grid at the nearest point available.

j) All the detectors in the switchyard control building shall be looped into a Fire Alarm Panel situated in the switchyard control building.

k) Fire Alarm Panel of analogue addressable type shall be dedicated to Switchyard control building which shall evaluate the signals received from the detectors, transmit the fire or trouble alarms (audio-visual) to prearranged points, supervise and monitor the complete fire detection circuits and initiate the shutdown of air-conditioning equipment. One no. spare loop card shall be provided in the FAP as hot standby.

l) The fire alarm panel shall be designed to include all the standard features and shall also accommodate programmed activation of various interlocks with fire protection system and other associated systems and programmed activation of sequence of events to be carried out in case of fire in any particular protective area.

m) All the circuits from the detectors to the panels and the circuits from the panels to the actuating devices shall be closed loop type and shall be supervised for open and short circuiting.

n) Facilities shall be provided on the fire alarm panel for simulating fire conditions, sensitivity adjustment, isolation of detectors etc. from the panel.

o) Fire alarm control panel shall have filters to ignore false alarm and increase sensitivity to real fire from sensors and provision for automatic re-calibration of sensitivity levels of over / under sensitive detectors. The sensitivity of each detector should be automatically raised if detectors are gradually polluted due to dust and dirt entering inside the detector. If detectors are more polluted the control panel shall give a warning. The trouble report shall indicate the location of device requiring service.

p) All devices shall be individually identifiable for its type, its zone location, and alarm set value, alarm and trouble indication by a unique alpha numerical label.

q) The detectors shall be self-compensating for ambient temperature and humidity.

r) The detectors shall display a steady LED when in the alarm state. The LED shall flash when in standby or normal mode.

s) Each floor shall be provided with one electronic hooter besides the staircase.

t) All detectors and interface units for detectors which do not have response indicators (eg. LHS cables) shall be provided with local LED response indicators which will light up steadily when the detectors sense a fire and operates.

u) However other factors like beam depth and area separation criterion shall also be implemented in deciding coverage of each of the detectors.

v) Incipient fires sensed by these detectors shall trigger an alarm at the FAP.

w) The Batteries shall be of maintenance free sealed lead-acid type. The battery shall supply the normal power requirements for a period of 48 hours from the instant of charger AC supply failure, after which sufficient capacity would still be available to provide full load operation for at least 30 minutes.

a) The detector cable and other control cable shall be armored, screened and twisted pair FRLS type which shall be cleated to roof/wall surface.

b) Fire detection & alarm system will have various interfaces. Details for these interfaces are mentioned in Cl. No. 4.11 B of this section.

c) Cable Vault shall be equipped with suitable numbers of photoelectric type smoke detectors. Also each of the cable trays shall have Linear heat sensing cables suitably laid to sense fire in cables. Cross zoning odd detectors and LHS cable shall be done to avoid any false alarm.

4.0 SCOPE OF SUPPLY & SERVICES

4.1. Table-1 under Annexure-A to Section - 1 clearly indicates supply status of material i.e. available quantity & required balance quantity of various items at site. Also this table indicates erection status i.e. ETC work executed and ETC work required to be executed at site of the various firefighting system items.

4.2. Bidder is required to quote in his offer for the supply of balance items required and for balance ETC of various items listed in this table.

4.3. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications, and Drawings.

4.4. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Purchaser and valued at the rates and prices bid in the priced Bill of Quantities.

4.5. A rate or price shall be entered against each item in the priced Bill of Quantities. Cost of items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.

4.6. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.

4.7. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.

4.8. Miscellaneous items like hardware, fixtures etc. shall be deemed to be included under the relevant BOQ items and bidders shall consider the same while quoting for BOQ items.

4.9. Contractor shall supply items inline with the data sheets of various items enclosed in Sec-5 of this specification. No deviation from these data sheets shall be permitted for supply of the items.

4.10. Bidder shall also consider the following while quoting for the system:

i) Power & Control cables for fire protection system (except for cable for detection and alarm system) will be supplied on free issue basis to contractor. BHEL shall procure various sizes of cables (as per Annexure 'B' of this section) for the complete requirement of sub-station. Contractor shall have to choose their cables from the available sizes only and necessary modifications in their equipment for termination of these cables shall be made by contractor.

ii) Since laying & termination of all power & control cables is in contractor's scope, supply of cable accessories such as lugs, glands, cable tags & markers etc. shall be included by the bidders in their offers alongwith supply of cable (2 X 1.5 sq.mm, FRLS, twisted pair, armoured Cu cable) for fire detection and alarm system.

iii) Necessary cable trays will be supplied on free issue basis to the contractor, however necessary hardware for fixing the same on walls or elsewhere shall be included by the bidders in their offers.

iv) Earthing material viz. GS flat & wire will also be supplied on free issue basis to contractor; however requirement shall be given by the bidders in their respective bids.

v) Bidder shall ensure that sufficient quantities of commissioning spares are made available for timely completion of commissioning of the system. The bidder shall furnish a list of Commissioning spares that will be brought by him. The unused commissioning spares shall be returnable to the Bidder.

vi) Miscellaneous items like hardware, fixtures etc. required for installation of both free issue item and contractor supply items shall be in contractor's scope

vii) Conducting performance guarantee tests as per approved procedure to the satisfaction of Owner / Purchaser and handing over an operational system to the owner. Procedure for performance guarantee test shall be submitted by contractor for customer review and approval.

4.11. Scope of services

A. <u>Erection, Testing & Commissioning (ETC) requirements</u>

i) The scope of ETC shall include handling of equipment/ material at site, erection of equipment /material at site including fabrication, equipment and system testing, commissioning of the entire system, conducting performance guarantee tests to the satisfaction of Owner / Purchaser and final handing over to the owner of the entire system.

B. <u>Interfacing</u>

i) Interface with Main fire alarm panel in the power plant main control room.

ii) Interconnecting solenoid operated fire dampers to close in case of fire.

iii) Interlocking AC and Ventilation system with FF system such that these systems trip upon detection of fire.

Necessary network cards to interface main plant fire alarm panel with switchyard fire alarm panel shall be provided to ensure interface between the two panels.

C. With Other Electrical System

i) Preparations of cable interconnection diagram for equipment supplied under this contract and accordingly offer guidance to the purchaser for laying necessary cables. Termination details shall also be furnished in the said interconnection table.

ii) Laying & Termination of Power and Control cables for the equipment under the scope of this specification. Bidders shall include all cable accessories like lugs, glands, cable tags, markers etc in their respective bids.

iii) Earthing of all installations (to the nearest earth mat/ earthing pad) supplied under the scope of this specification.

D. With Civil System

E. All machinery tools & tackles and consumables required for erection/testing / commissioning of the system shall be arranged by the Bidder.

F. Minor modifications, alterations in system installation as per customer's specific requirements shall be done without any extra cost to purchaser.

G. Bidders to ensure that sufficient quantity of spares are made available for timely completion of commissioning of the system. The bidder shall furnish a list of commissioning spares that will be brought by him. The unused commissioning spares shall be returnable to the bidder.

i) Obtaining, "As Built" certification from purchaser or owner on applicable drawings. Completing documentation as per specification requirement.

ii) Obtaining customer's written acceptance of satisfactory completion of job. (Acceptance of PG + handing over of plant.

iii) Any other service not explicitly illustrated herein but which may be required to complete the system with its desired functionality or in the spirit of contract shall also deemed to be under the scope of bidder.

H. Civil Works

Civil Works Major civil works such as foundations, cut outs etc., shall be in Purchaser's scope. The Bidder shall however supply foundation bolts & hardware and undertake minor civil works such as grouting, filling up of crevices/ cut outs etc. Any damage caused to civil works during ETC work of the equipment/system shall have to be made good to the original finish by the Contractor at no extra cost to the Purchaser.

5.0 Exclusions

a) Supply of power & control cables except for detection cable. However laying and termination of these cables shall be in contractor's scope. ***The bidder shall furnish quantity and type of cables required complete system in their respective bids. Laying & termination is in contractor scope.***

b) Supply of necessary cable trays for laying power and control cables, however hardware for fixing the same on wall trenches or elsewhere shall be included by the bidder in his bid.

c) Supply of GI flat for earthing of equipments.

d) Unloading & storage of firefighting items at site.

6.0 UTILITIES AVAILABLE

Construction water and electricity shall be available at one point each. Contractor shall be required to make own arrangement for taking supplies from there.

7.0 OPERATION & MAINTENANCE (O&M) MANUAL

Operation and Maintenance manuals shall be specifically complied for the project by the bidders. The draft O&M manual shall be submitted within 20 weeks after award of contract. The O&M manual shall contain the following information:

a. Description of the system and equipment with design particulars.
b. Instruction for erection.
c. Instruction for operation, maintenance and repair.
d. Recommended inspection practices and inspection schedule.
e. Ordering information for all replaceable parts.
f. Recommendation for type of lubricants and frequency of lubrication.

8.0 Handing & Taking Over

It is the responsibility of the contractor to maintain the plant till it is handed over. Any defect noted during the period shall be rectified by the contractor. Also suitable PG tests shall be conducted by the contractor to show the achievement of guaranteed parameters in line with the requirements of specification/ standards/ codes and to the satisfaction of Purchaser/ Owner.

9.0 BOQ FOR SCOPE OF SUPPLY & ETC WORKS

9.1.1 Based on the above input it is recommended that the bidders shall submit their unit rate offers as per the Table – 1 furnished as Annexure-A to section – 1 of this specification.

10.0 Inspection & Testing

All the equipments shall be inspected prior to dispatch in line with relevant IS, approved GTP/ drawing, technical specification and approved QAP.

TABLE – 1 **Annexure - A**

SR NO.	ITEM	SIZE (MM)	UNIT	DESIGN QTY	AVAILABLE QTY AT SITE	BALANCE QTY REQUIRED AT SITE	ETC WORK EXECUTED AT SITE	ETC WORK REQUIRED AT SITE
A	**FIRE ALARM SYSTEM**							
1.1	Photoelectric Smoke detector	—	No.	11	11	--	--	11
1.2	Multisensor Smoke detector	—	No.	22	--	22	--	22
1.3	Heat detector	—	No.	5	--	5	--	5
1.4.1	Manual call Point for flame proof enclosure.	—	No.	18	--	18	--	18
1.4.2	Manual call Point	—	No.	2	--	2	--	2
1.5	Hooter	—	No.	2	--	2	--	2
1.6	Relay Module	—	No.	2	--	2	--	2
1.7	INPUT / OUTPUT Monitor Module	—	No.	1	--	1	--	1
1.8	Zone Monitor Module	—	No.	1	--	1	--	1
1.9	Response Indicator	—	No.	11	11	--	--	11
2	Digital LHS Cable	—	No.	500	--	500	--	500
3	Addressable Type Fire alarm control Panel	—	No.	1	--	1	--	1
4	Loop Cable (Armoured FRLS Cu.)	2C X 1.5 SQ.MM	Mtr	2025	1575	450	--	2025

ANNEXURE- 'B'

Cable Sizes being procured by BHEL for Sub-Station

2C x 2.5 sq mm PVC/Copper, Armoured
5C x 4 sq mm PVC/Copper, Armoured
5C x 2.5 sq mm PVC/Copper, Armoured
7C x 2.5 sq mm PVC/Copper, Armoured
10C x 2.5sqmm PVC/Copper, Armoured
14C x 2.5 sq mm PVC/Copper, Armoured
19C x 2.5 sq mm PVC/Copper, Armoured
2C x 10 sqmm XLPE/Aluminium, Armoured
4C x 10 sqmm XLPE/Aluminium, Armoured
4C x 16 sqmm XLPE/Aluminium, Armoured
3.5C x 35 sqmm XLPE/Aluminium, Armoured
3.5C x 70 sqmm XLPE/Aluminium, Armoured

SECTION - 2

EQUIPMENT SPECIFICATION

2.0 CODES AND STANDARDS

The design, manufacture, inspection and testing of complete system shall comply with the latest applicable Indian/British/American standards. The equipment shall conform to the latest edition to the following standards:

a. "Fire Protection Manual" - Issued by the Regional Committees of Tariff Advisory Committee (TAC).
b. Underwriters Laboratories of USA
c. LPCB – United Kingdom
d. National Fire Codes of National Fire Protection Association (NFPA) of USA.

2.1 GENERAL DESIGN AND CONSTRUCTIONAL REQUIREMENT

i. All the items shall be provided as per the data sheets provided as enclosure to section – 5 of this specification. Contractor shall strictly adhere to make & parameters indicated in these data sheets for supply of the items.

2.5 SHOP & SITE TESTS

2.5.1 SHOP TESTS

All acceptance and routine tests in accordance with relevant IS codes/standards shall be carried out by the contractor/ manufacturer. Charges for all these routine and acceptance tests for all the equipment & components shall be deemed to be included in the bid price.

Contractor shall submit the QP for all such equipment calling inspection/ testing for purchaser's approval in the prescribed format enclosed as Schedule-5 in Section 5 of the technical specification.

2.5.2 SITE TESTS

The Contractor shall prepare and submit detailed field quality plans in the format prescribed, setting out the quality practice and procedures to be adopted by him for assuring quality of each equipment/material from the receipt of material at site, during erection, pre-commissioning to final commissioning of the system. These procedures shall necessarily include all checks/tests conducted at site for preservation, assembly, alignment, positioning of equipment, foundation preparation, welding/bolting heat treatment, non-destructive examination, hydraulic test, running test, performance test etc.

Performance test and guarantee

After erection at site, the Fire Protection system shall be subjected to tests to show achievement of guaranteed parameters in line with the requirements of specification/ standards/ codes and to the satisfaction of Purchaser/ Owner.

The Contractor shall take full responsibility for the safe and efficient operation of each of the equipment as well as the whole system. If the shop/ site tests indicate failure of the equipment or if

the system does not meet the guarantee in any respect, the Contractor may be required to make alterations in the system/ equipment. Such alterations shall be carried out after purchaser's/ Owner's approval at no extra cost to purchaser. Additional tests required to show the effect of such alterations should also be performed at no extra cost to Purchaser. Above mentioned tests shall be carried out separately for each sub-system. All the testing instruments shall be tested/ calibrated in accordance with the applicable codes & standards. Under PG testing, interlocks, protections, vibrations & noise levels shall also be checked. Detailed procedure for PG test shall be submitted by the contractor in advance. The Contractor shall give guarantee of satisfactory and trouble free operation of the equipment/ systems for a duration described in Section-3 of this specification.

The following codes and standards shall be applicable for conducting test unless otherwise modified or supplemented by the enclosed procedure and mutually agreed to between the purchaser and contractor.

1. NFPA – 72 E3: Standard on Automatic Fire Detectors.
2. Fire Protection manual of TAC (Latest edition) IS 3034: Fire safety

SECTION - 3

PROJECT DETAILS GENERAL TECHNICAL REQUIREMENTS

GENERAL TECHNICAL REQUIREMENTS

1.1 PROJECT DETAILS

Customer	:	M/s Raichur Power Corporation Limited
Project Title	:	2x800MW Yermarus Thermal Power Station at Raichur.
Project Location	:	Near Wadloor village 5 kms. from Raichur TPS Raichur Distric
Nearest Railway station	:	Yermarus railway station at a distance of 2 kms.
Nearest Airport	:	
Nearest Access Roads	:	State Highway No. 13 at a distance of 0.5 kms.
Postal Address	:	Chief Engineer Yermarus Thermal Power Station Raichur Power Corporation Ltd. Raichur, Karnataka

1.2 SITE CONDITIONS (FOR DESIGN PURPOSES)

SITE CONDITIONS

a).	Average rainfall per year	:	621 mm
b).	Altitude	:	1000 m

DESIGN AMBIENT

a).	Minimum Temperature	:	17.7°C
b).	Maximum Temperature	:	45°C
c).	Design Ambient Temperature	:	50 °C

RELATIVE HUMIDITY

a).	Maximum	::	75%

WIND PRESSURE (AS PER IS: 875-1987)

a).	Design wind speed	:	39 m/sec.

SEISMIC FACTORS

a).	Horizontal Seismic Coefficient	:	As per latest IS : 1893	} ***Zone – III***
b).	Vertical Seismic Coefficient	:	As per latest IS : 1893	

1.3 INSTRUCTION TO BIDDERS

The bidders shall submit the technical requirements, data and information as per the technical data sheets, provided in Section-4.

The bidders shall furnish catalogues, engineering data, technical information, design documents, drawings etc fully in conformity with the technical specification. It is recognised that the Manufacturer may have standardised on the use of certain components, materials, processes or procedures different than those specified herein. Alternate proposals offering similar equipment based on the manufacturer's standard practice will also be considered provided such proposals meet the specified designs, standard and performance requirements and are acceptable to the Purchaser. Unless brought out clearly, the Bidder shall be deemed to conform to this specification scrupulously.

1.4 STANDARDS

The works covered by the specification shall be designed, engineered, manufactured, built, tested and commissioned in accordance with the Acts, Rules, Laws and Regulations of India.

The equipment to be furnished under this specification shall conform to latest issue (with all amendments) of specified standards.

In addition to meeting the specific requirement called for in Sections 1 and 2 of the Technical Specification, the equipment shall also conform to the general requirement of the applicable standards, which shall form an integral part of the specification. The Bidder shall note that standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to complement each other. When the specific requirements stipulated in the specifications exceed or differ from those required by the applicable standards, the stipulation of the specification shall take precedence.

Other internationally accepted standards, which ensure equivalent or better performance than that specified in the standards referred, shall also be accepted. The bidder shall submit copies of such standards.

In case governing standard for the equipment is different from IS or IEC, the salient points of difference shall be clearly brought out in the offer along with English language version of standard or relevant extract of the same. The equipment conforming to standards other than IS/IEC shall be subject to Purchaser's / owner’s approval. The bidder shall clearly indicate in his bid the specific standards in accordance with which the works will be carried out.

1.5 TYPE TESTING, INSPECTION, TESTING & INSPECTION CERTIFICATE

All equipment being supplied shall conform to type tests and shall be subject to routine and acceptance tests in accordance with requirements stipulated under respective sections. Purchaser reserves the right to witness any or all the tests. The Manufacturer shall intimate the Purchaser the detailed programme about the tests at least three (3) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies. Purchaser reserves the option for getting any or all the type tests repeated on the equipment. The Manufacturer shall also submit type test procedure for approval of the Purchaser.
In the event of any discrepancy in the test reports i.e. any test report not acceptable due to any

design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the technical specification or any/all additional type tests not carried out without any additional cost implication to the Purchaser.

The price of conducting all tests and additional type tests is deemed to be included in Bid price. In case any bidder indicates that he shall not carry out a particular test, his offer shall be considered incomplete and shall be liable to be rejected.

The purchaser intends to repeat the type tests and additional type tests on cables for which test charges shall be payable as per provision of contract.

The Purchaser, his duly authorised representative and/or outside inspection agency acting on behalf of the Purchaser shall have at all reasonable times free access to the Contractors premises or Works and shall have the power, at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if pert of the Works is being manufactured or assembled at other premises or works, the Manufacturer shall obtain for the Engineer and for his duly authorized representative permission to inspect as if the works were manufactured or assembled on the Manufacturer's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the Purchaser and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.

The Manufacturer shall give the Purchaser/inspector thirty (30) days written notice of any material being ready for testing. Such tests shall be to the Manufacturer's account except for the expenses of the inspector. Unless witnessing of the tests is virtually waived, the Purchaser/ inspector will attend such tests within thirty (30) days of the date of which the equipment is notified as being ready for test/ inspection, failing which the Manufacturer may proceed with the test which shall be deemed to have been made in the Inspector's presence and the Manufacturer shall forthwith forward duly certified copies of test reports in triplicate to the Inspector.

The Purchaser or Inspector shall, within fifteen (15) days from the date of inspection as defined herein, give notice in writing to the Manufacturer, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Manufacturer shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Purchaser/ inspector giving reasons therein, that no modifications are necessary to comply with the Contract.

When the factory tests have been completed at the Manufacturer's works, the Purchaser/ inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Purchaser/inspector, the certificate shall be issued within fifteen (15) days of receipt of the Manufacturer's Test certificate by the Engineer/ Inspector. Failure of the Purchaser/inspector to issue such a certificate shall not prevent the Manufacturer from proceeding with the Works. The completion of this test or the issue of the certificate shall not bind the Purchaser to accept the equipment should it, on further tests/ after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of MICC by the Purchaser.

In all cases where the Contract provides for tests whether at the premises or at the works of the Manufacturer or of any Sub-Contractor, the Manufacturer except where otherwise specified shall

provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Purchaser /Inspector or his authorized representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Purchaser Inspector or to his authorized representative to accomplish testing.

The inspection by Purchaser and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Manufacturer in respect of the agreed quality assurance programme forming a part of the Contract.

The Purchaser will have the right of having at his own expenses any other test(s) of reasonable nature carded out at Manufacturer's premises or at site or in any other place in addition of aforesaid type and routine tests, to satisfy that the material comply with the specification.

The Purchaser reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipment for these tests shall be provided by the Purchaser.

1.6 AUXILIARY POWER SUPPLY

1.13.1 A.C power supply for auxiliaries will be available at 240 V, 50 C/s 1-phase, 2 wire and 415V, 50 C/s, 3-phase, 4 wire, neutral solidly earthed with variation in frequency of +/-5% and variation in voltage +/-10%

1.13.2 D.C. power supply at 220 V, 2-wire ungrounded will be available 187 V to 242 V.

1.7 INSPECTION AND TESTING

All tests and inspection of the equipment specified shall be performed to the extent and in the manner as stipulated in the relevant standards and in this specification. All type tests/routine tests/acceptance tests as specified shall be conducted in the presence of purchaser. Wherever equipment similar to the one being offered has already been type tested within 5 years from the date of opening the bid. Type tests done in an independent government laboratory or in the presence of representative of State Electricity Board or other reputed public undertakings, the type test reports of the same shall be submitted for scrutiny /approval. If these are found suitable and technically acceptable, conducting of type tests shall be waived off. Otherwise the subcontractor will have to carry out the type tests without any extra cost and without any delivery implications.

1.8 PACKAGING

Aluminium Tube shall be partially packed with Hessians cloths. Similar items shall be grouped and tied with steel wires/strip for convenient handling during transits.

MARKINGS

The following details are to be clearly indicated in the material forwarding documents:

a) Name and address of the consignee.
b) Purchase order number.
c) Name of supplier/s.
d) Description of equipment / material.
e) Tare weight.

f) Gross weight.

All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and at Site till the time of erection. On request of the purchaser, the Contractor shall also submit packing details/associated drawing for any equipment material under his scope of supply, to facilitate the purchaser to repack any equipment/ material at a later date, in case the need arises, while packing all the materials, the limitation from the point of view of availability of Railway wagon sizes in India should be taken account of. The Contractor shall be responsible for any loss or damage during transportation, handling due to improper packing. Any demurrage wagons and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor. Purchaser takes no responsibility of the availability of the wagons.

1.9 HANDLING AND INSTALLATION

In accordance with the specific installation instructions as shown on manufacturer's drawings or as directed by the purchaser or his representative, the Contractor shall erect, install, wire, test and place into commercial use all the equipment included in the contract. Equipment shall be installed in a neat, workmanlike manner so that it is level, plumb, square and properly aligned and oriented. Commercial use of switchyard equipment means completion of all site tests specified and energisation at rated voltage.

Contractor may engage manufacturer's Engineers to supervise the unloading, transportation to site, storing, testing and commissioning of the various equipment being procured by them separately. Contractor shall transport, test and commission the equipment as per instructions of the manufacturer's supervisory Engineer(s) and shall extend full cooperation to them.

In case of any doubt/misunderstanding as to the correct interpretation of manufacturer's drawings or instructions, necessary clarifications shall be obtained from the purchaser.

Contractor shall be held responsible for any damage to the equipment consequent to not following manufacturer's drawings/instructions correctly.

Where assemblies are supplied in more than one section, contractor shall make all necessary mechanical and electrical connections between sections including the connection between buses. Contractor shall also do necessary adjustments/alignments necessary for proper operation of circuit breakers, isolators and their operating mechanisms. All components shall be protected against damage during transportation installation, testing and commissioning. Any equipment damaged due to negligence or carelessness or otherwise shall be replaced by the contractor at his own expenses.

Contractor shall be responsible for examining all the shipment immediately of any damage, shortage, discrepancy etc. for the purpose of Purchaser’s information only. The Contractor shall submit to the purchaser every week a report detailing all the receipts during the weeks. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in erection of the equipment at Site. Any demurrage, pilferage and other such charges claimed by the transporters, railways etc. shall be to the Contractor' account.

The Contractor shall be fully responsible, for the equipment/material until the same is handed over

to the purchaser in an operating condition after commissioning. Contractor shall be responsible for the maintenance to the equipment/material while after erection until taken over by Purchaser, as well as protection of the same against theft, element of such nature, corrosion, damages etc.

The words erection and installation used in the specification are synonymous. Exposed live parts shall be placed high enough above ground to meet the requirements of electrical and other statutory safety codes.

The minimum phase to earth, phase to phase and section clearance along-with other technical parameters for the various switchyard voltage levels to be maintained shall be strictly as per the approved drawings.

The design and workmanship shall be in accordance with the best engineering practices to ensure satisfactory performance throughout the service life. If at any stage during the execution of the Contract, it is observed that the erected equipment(s) do not meet the above minimum clearances, the Contractor shall immediately proceed to correct the discrepancy at his risks and costs.

1.10 TOOLS AND TACKLES

The Contractor shall supply with the equipment one complete set of all special tools and tackles for the erection, assembly, dis-assembly and maintenance of the equipment. However, these tools and tackles shall be separately, packed and brought on to Site.

1.11 EQUIPMENT BASES

A cast iron or welded steel base-plate shall be provided for all rotating equipment, which is to be installed on a concrete base unless otherwise agreed to by the Purchaser. Each base-plate shall support the unit and its drive assembly, shall be of a neat design with pads for anchoring the units shall have a raised lip all around, and shall have threaded drain connections.

1.12 QUALITY

BHEL quality plan to be followed subject to TBEM / customer's approval.

1.13 DOCUMENTATION

1.13.1 DRAWINGS

All drawings shall be prepared in AutoCAD and ultimate documentation would include drawings/documents on CDs. All dimensions and data shall be in SI metric units.

All items of the equipment should be clearly identified by proper part nos. in the contract drawings. Such parts, which are to be dispatched to site from works in dispatchable units and are reassembled at site, should be marked by proper identification marks at works and indicated in the drawings and quantified. The shipping list should be sent along with the general arrangement drawings for engineer's approval. All the items of the shipping list should be identified in the drawing.

The drawing submitted by the supplier shall be reviewed by the purchaser as far as practicable within two weeks of receipt of drawings and shall be modified by the sub-contractor if any modifications and/or corrections are required by the purchaser. The sub-contractor shall incorporate such modifications and / or corrections and submit the final drawings for approval. Any delay arising out of failure of the subcontractor to rectify the drawings shall not alter the contract completion date.

Further work by the subcontractor shall be in strict accordance with these drawings and no deviation shall be allowed without the written approval of the purchaser.

All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at supplier's risk.

Approval of drawing or work by the purchaser/consultant shall not relieve the subcontractor of any of his responsibilities and liabilities under the contract.

In case of any modifications that may be necessary during erection or commissioning of the equipment, the subcontractor shall carry out modifications in the original drawing & submit 'As Built drawings' and required no. of prints thereof.

1.13.2 Instruction manuals

The supplier shall submit to the purchaser, draft instruction manuals for approval within 30 days of placement of order. The final instruction manuals complete in all respects shall be submitted 60 days before the first shipment of the equipment. The instruction manuals shall contain full details and drawings of all the equipment furnished, the erection procedures, testing, operation & maintenance procedures of the equipment.

If after the commissioning and initial operation of the plant, the instruction manuals require any modification/ addition / changes, the same shall be incorporated and the up- dated final instruction manuals shall be submitted as required.

1.13.3 DOCUMENTATION SCHEDULE AT CONTRACT STAGE

As Built Drawings

i)	Hard copies of Drawings	15
ii)	CDs	3

NOTE:

1. Any revision of drawings / documents shall be submitted in the same no. of copies submitted first time for approval

   Final drawings / documents shall be submitted in bound volume with customer and project details etc. written on the top.

SECTION 4

GUARANTEED AND TECHNICAL PARTICULARS

1.0 LIST OF TECHNICAL DATASHEETS

All the items shall be provided as per the data sheets provided as enclosure to section – 5 of this specification. Contractor shall strictly adhere to make & parameters indicated in these data sheets for supply of the items.

SECTION- 5

ENCLOSURES TO SPECIFICATION

SCHEDULES TO BE FILLED UP BY THE BIDDER

Schedule 1 **Schedule of makes of Equipments**

Schedule 2 **Schedule of Deviations**

Schedule 3 **Schedule of past experience and qualifying requirements**

Schedule 4 **Schedule of performance certificates**

Schedule 5 **Schedule of type test and special tests**

Schedule 6 **Details of contact persons (technical & commercial)**

Schedule 7 **Enclosures to Specification**

ANNEXURE-A Drawings

SCHEDULE-1

MAKES OF IMPORTANT ITEMS / COMPONENTS OF EQUIPMENTS AND THEIR DETAILS

ITEM NAME	NAME OF MANUFACTURER	PLACE OF MANUFACTURE OF ITEM	PLACE OF TESTING AND INSPECTION

Place

Date

Signature of the authorized representative of Bidder

Name ----------

Designation----------

Company seal----------

SCHEDULE-2

SCHEDULE OF TECHNICAL DEVIATION

The following are the deviations / variations / exceptions from the specification:

Section	Clause No. / Page No.	Statement of deviation/ Variations/Exceptions

1) In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract are deemed to be in compliance with the specification.

2) If there is NIL deviation, even then the format to be filled as **NIL DEVIATION**

3) Continuation sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

Place Signature of the authorized representative of Bidder

Name ----------

Date Designation----------

Company seal----------

SCHEDULE – 3

SCHEDULE OF PAST EXPERIENCE AND QUALIFYING REQUIREMENT

Following is the list of earlier orders executed by us for supply of equipment / material of similar nature over the last past five years:

S.No.	Item	Brief rating	Qty	customer	Date Of order	Date of supply	Order value

Place

Date

Signature of the authorized representative of Bidder

Name----------

Designation----------

Company seal ----------

Note: Continuation sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

SCHEDULE – 4

SCHEDULE OF PERFORMANCE CERTIFICATE

Bidder shall furnish the performance certificate of the similar equipment having
The following details:

S.No.	Item	Brief rating	Qty	Customer	Date Of supply

Place

Date

Signature of the authorized representative of Bidder

Name----------

Designation----------

Company seal ----------

Note: Continuation sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

SCHEDULE-5

SCHEDULE OF TYPE TESTS AND SPECIAL TESTS

The following type tests and special tests as called for in the Specification shall be conducted (all type tests / special tests as mentioned in the relevant clauses of the Specification shall be listed here):

Sl no.	Clause no/ page no of Specification	Details of test	Lab in which to be conducted	Whether test to conducted free or chargeable basis. Mention 'FREE' 'CHARGEABLE'	If charges per test have been quoted for in the price bid. YES / NO
		A. Type Tests			
		1.			
		2.			
		B. Routine Tests			**DO NOT**
		1.			**MENTION**
		2.			**ANY PRICE**
		C. Site Tests			**IN THIS**
		1.			**COLUMN**
		2.			
		D. Special Tests (specified)			
		1.			
		2.			
		E. Other tests at works / site recommended by the Bidder			
		1.			
		2.			

NOTE:

1) Details have to be furnished on cables as well as accessories, each separately.

2) NO PRICE SHALL BE FURNISHED IN THIS FORMAT.

Place

Date

Signature of the authorized representative of Bidder

Name----------

Designation----------

Company seal----------

SCHEDULE-6

DETAILS OF CONTACT PERSON BOTH TECHNICAL AND COMMERCIAL

Name

Address for correspondence

Phone No.

Fax No.

Email

Place

Date

Signature of the authorized representative of Bidder

Name----------

Designation----------

Company seal ----------

Note: Continuation sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

SCHEDULE –7

ENCLOSURES TO SPECIFICATION

DRAWINGS (ANNEXURE-D)

Fire Alarm & Detection system inside control room	TB/DWG/332/552/004
LCPDV Drawing	TB/DWG/332/552/005A
LHS Layout for Cable vault area	TB/DWG/332/552/007
MCP for outdoor switchyard area	TB/DWG/332/552/008

DATA SHEETS (ANNEXURE-E)

D.S. For Twisted Pair Control Cable	TB/DS/332/552/040
D.S. For Main Fire Alarm Panel	TB/DS/332/552/041
D.S. For Addressable Multisensor Smoke Detector	TB/DS/332/552/042
D.S. For Addressable Manual Call Point	TB/DS/332/552/043
D.S. For Hooters	TB/DS/332/552/044
D.S. For LHS Cable	TB/DS/332/552/051
D.S. For Addressable Heat Detector.	TB/DS/332/552/056
D.S. For Relay Module	TB/DS/332/552/058
D.S. For Monitor cum Control Module	TB/DS/332/552/059
D.S. For Zone Monitor Module	TB/DS/332/552/060

F-DD-04
Rev no.00

	MEHTA & ASSOCIATES **FIRE PROTECTION SYSTEMS PVT. LTD.**	Date:10.07.2013 DOC No. TB/DS/332/552/041 Rev : 1

PROJECT :	**Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station**
PURCHASER :	**M/s BHEL - Transmission Buisness Group - New Delhi.**
CUSTOMER :	**M/s Raichur Power Corporation Limited**
CONSULTANT :	**M/s Steag Energy Services Pvt. Ltd. ; Delhi**
CONTRACTOR :	**M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.**
P.O. No. & DATE :	**312P385 dt. 12.03.13**

	DATA SHEET FOR MAIN FIRE ALARM CONTROL PANEL		**REVISION MARK**
1	Type	Microprocessor Based Addressable Fire Alarm Panel	
2	Make	Schrack Seconet	
3	Model No.	Integral IP MXF	R1
4	Approval	Vds, CPD, As per EN54	
5	Supply Voltage	26,3 VDC (50°C) to 28,3 VDC (0°C)	
6	Power Supply	230 VAC	
7	Emergency Supply	Batteries/24V DC through DC-DC converter (seperetly provided by MASS)	R1
8	Output Current	7.5 A	
9	Alarm Current	7.5 A	
10	Interfaces	Potential free contact provided inbuilt in panel	R1
11	Display	4 line X 40 i.e. 240 character LC display	
12	Outputs	Through loop modules as per requirement.	
13	Inputs	Through loop modules as per requirement.	
14	Ambient Temperature	-5°C to +50°C	
15	Humidity	5 to 95%, without condensation	
16	Protection Class	IP 30 (acc. to DIN 40050)	R1
17	Colour	red RAL 3000	
18	Material	sheet steel	
19	Dimensions	600 x 445 x 225 mm (HxWxD)	
20	Application	Fire Detection Panel	
21	Is Catalogue Enclosed?	Yes	

REVISION HISTORY

Date	Prepared By	Checked By	Approved By	Rev.
25.04.2013	ABHISHEK	HIREN	BHAVIN	0
01.07.2013	ABHISHEK	HIREN	BHAVIN	1

Abhatnagar

BHEL	**CAT-1**
A P P R O V E D **This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.**	
SIGNED TDT	**DATE** 30.09.13
Transmission Business Engineering Management	

E072-BHEL_TBG-3-O-13-5136

Integral IP MX.

Manual.

FIRE ALARM

www.schrack-seconet.com

SCHRACK SECONET

1 General

This document describes the standard functions of the Integral IP MX fire alarm system manufactured by Schrack, with the currently valid hardware and software versions correct at the time that this document is released. We reserve the right to make alterations, particularly where they are the result of technical improvements. Please consult Schrack Seconet staff members about functions and processes which are not described in this document.

The planning of fire alarm systems as well as the installation, commissioning and maintenance of products and the systems which they form required specialist expert knowledge, and therefore may only be undertaken by specially trained experts. The product-specific training of staff members must be carried out by Schrack Seconet or by people who have been specifically authorised to carry out this duty by Schrack Seconet. In addition to this, the currently applicable country-specific regulations and guidelines for the planning, construction of and use of the products must be observed and complied with without fail. Damage and consequential damage which have been caused due to interference or modifications made to our products or by improper handling of them are excluded from liability. The same is also true for inappropriate storage of items or other detrimental external factors.

We would explicitly like to point out that the fire alarm system must be periodically serviced by people who are qualified and certified to carry out these duties, in accordance with the respective relevant standards (e.g. ÖNORM F3070, DIN 14675, EN 54-2 etc.), in order to also ensure that the system's range of functions and range through which it offers protection is also maintained in the long term.

Particularly important notes in this document are denoted using the exclamation mark symbol shown beside this text. Failure to observe these points can lead to system faults or to damage to property!

2 System Overview

Integral IP MXF

The Integral IP MX system is a modular, decentrally constructed fire alarm system, comprising of individual components, and which in programmed and configured according to the requirements of the individual system in question. A maximum of 4000 devices can be connected to 16 loop circuits (loops) in its basic installation.

Integral IP MXE

The Integral IP MXE is an automatic electronic control and delay unit for controlling multiple zone extinguishing systems, which can either be used as a combined fire alarm control panel/controller unit or exclusively as a controller unit for up to 32 extinguishing zones. The Integral IP MXE can be integrated into an Integral LAN and can be networked.

Control Panel and Integral LAN

The fire alarm control panel comprises of 1 to 16 Subcontrol Units (SCUs), which are spread around the building as required. The system is operated in a clear manner from a single location, with the system operating, despite its decentralized construction, exactly like a traditional "centralized" fire alarm control panel. The interconnection of several SCUs to a single fire alarm control panel is known as an "Integral LAN".

SecoNET Network

Every Integral LAN is suitable for connection building management systems and field buses. If more than 16 control panels are required, then Integral LANs are connected to the SecoNET Fire Alarm Network. In the SecoNET, all connected fire alarm control panels (Integral, Integral IP MX, Integral IP CX, Integral LAN, etc.) are configured separately from one another, and furthermore, in every SecoNET device, there is an interface set aside for SecoNET. For configuration of SecoNET interfaces, Integral software including the SecoNET Dongle is required. A standardised interface protocol is used for connecting control systems produced by different manufacturers with one another, which allows the connection to occur with the device functioning fully.

IP Interface

Every Integral IP MX control panel can be fitted with an Ethernet interface, which permits a wide array of additional applications. Remote access to the control panel is also possible, as well as the automatic forwarding of messages to mobile terminals, sending of e-mails and integration into management systems.

External Operating Panels & Devices Bus

External operating panels and devices and connected to the control panel via the MMI BUS. Up to 15 devices can be connected to this serial data bus - without using any additional devices e.g. repeaters etc. and can be located up to 1200 metres away from the control panel. Data communication uses redundant digital communication circuits, with the devices being able to be used in any possible combination regardless of the devices' locations. For safety reasons both the data circuit as well as the power supply circuit are fully redundant, and each of these circuits should be installed separately away from one another.

NOTE

In particular, it should be noted that MMI-BUS devices can only be addressed with an address within the address range of 1-8 up until version 7.1 of the Integral software!

Moreover the Integral MAP and Integral PIP have an EPI-BUS interface. Up to 3 non-redundant indication and operating devices can be connected per EPI-BUS capable operating panel and can be located up to 1 metre away from the control panel or the external operating panel (MAP, PIP). This means that the additional indicating and operating devices must be integrated in the case of the control panel or the external operating panel (MAP, PIP) or immediately next to it.

Length of wires

The distance between two Integral IP MX units may be up to 1,200 metres. Neither repeaters nor other additional devices such as modems are required, and only the types of cable used and the environmental factors must be observed. In special cases – where the distance has to be greater than 1,200 metres – then external transmission equipment which have been cleared for use by Schrack Seconet's competence centre can also be used.

Overvoltage protection:

The Integral IP MX system is fitted with a comprehensive integrated overvoltage protection concept, which protects all peripheral inputs, including the power supply in accordance with EN50130-4 (EMC) and EN61000-06-02 (interference in industrial use). The EMC protection concept involves the deployment of measures such as a zonal concept, tranzorp diodes, filters and broadband decoupling of the power supply to protect the electronic devices. As a result, no additional measures, e.g. an overvoltage arrester etc. are required for operation within building where heavy- and medium-duty protection is installed (protection against lightning strikes, supply side overvoltage arrester).

Earthing Concept

The earthing concept used in the Integral IP MX, with a central protective earth serving to protect electronics and people, whereby all components that conduct electricity, which are connected to the GND cable of the Integral IP MX control panel, may only be installed in areas and buildings, which have potential equalisation conforming to directives (ÖVE and TAEV) with this subcontrol unit.

CAUTION

Non-observance can lead to faults occurring or damage to the control panel and even to human life being endangered!

Software

The microprocessor-controlled Integral IP MX system is fitted with a real time operating system that is capable of multitasking. In this system a basic program is loaded to allow the system to function, which is then customized with customer-specific configuration for the building which is to be protected, whilst conforming to the applicable standards.

CAUTION

This documentation is only valid in its entirety for the Integral IP Software pack V7.3, as well as for the valid versions of the hardware for the documented modules and systems at the time of issue. For systems with older versions of the hardware and/or software, the valid documentation for those versions of the hardware and software must be consulted.

For new installations, on the whole the current version of the Integral IP software must be used. In all other instances we would strongly recommend consulting the section "Measures and Recommendations for Upgrades" of the service information document B-SI 242 and adhering to its guidelines.

2.1 Important Features

- Microprocessor-controlled and monitored system topology.
- Fully redundant system composition to ensure that the system remains fully operational, even in the event of a fault or in the event that one half of the processor unit fails.
- Constant automatic test routines for all system components and programs.
- Modules are simple to connect using flat cable connectors
- Up to 8 remote display panels and operating panels per control unit with a alphanumeric full text descriptions and a 40 characters per line, 6 line display, for which the language can also be selected.
- Integrated log printer with UPS power supply, with an event memory and message filter.
- Suitable for connection to the fire brigade's public alarm notification system
- Can be connected to hierarchically superior computer systems or fire alarm control systems via a serial interface protocol with full level of functions (message and command modes).
- Fully-redundant interconnection of up to 16 control panels with a superordinated control computer.
- Superordinated networking of an almost infinite number of fire alarm control panels (can also be done retrospectively)
- Local TCP/IP-based mesh network.
- Up to 250 devices per loop and with a loop length of up to 3,500m.
- Display panels and operating panels, log printers, parallel panels and other system components are connection via digital communication circuits, with the devices being able to be used in any possible combination regardless of the types of control panels.
- As a result of the special redundancy concept, according to VdS, the Integral IP MX is suitable for controlling more than one sprinkler zone.
- Corresponds to, or exceeds the following relevant standards and guidelines: European Standard EN 54, DIN, ÖNORM, ÖVE, VDE and many more.
- VdS devices and system approval (G298029, S298029, G204087) with additional approvals in more than 20 countries.

2.2 Technical Specifications

Mains supply voltage:	230 V AC
Operating voltage:	Typically 27V, dependent on ambient temperature and charge level
Rechargeable cells that can be used:	2 pcs. 12V / 38...40 Ah in series
Emergency power supply with rechargeable cells:	72 hours normal operation + 0.5 hours alarm
Alarm Current:	max. 7A
Ambient temperature:	-5° C to +50° C, measured with natural convection conditions
Heat dissipation:	typ. 20W max. 40W (with full load)
Colour:	red RAL3000
Relative air humidity:	5 to 95% without condensation
Air pressure:	<= 80 kPa, up to 2,000 m above sea level
Protection class:	IP 30
Electrical Protection:	EMC by means of zone concept, tranzorp diodes, filters and broadband decoupling of the power supply in order to protect electronics' protective earthing to protect personnel and also electronic components
Dimensions:	
Control unit:	445 x 600 x 225 mm
External operating panel:	445 x 230 x 35 mm
External operating panel with printer:	445 x 360 x 45 mm
Weight: (Basic construction without rechargeable cells):	15 kg

2.3 Overview of System limits

Element/Function	per control unit	per Integral LAN
Detector zone	max. 768 (from SW 8.0 max. 600)	max. 4096
Input		max. 4096
Output		max. 4096
External	max. 256	
Printer or SPP	max. 3	max. 16 x 3
Integral operating panel (incl. virtual operating panels)	max. 16	max. 16 x 16
Delay level	max. 16	
Fire Brigade Control Panel	max. 8	max. 16 x 8
Intervention	max. 1	
Indicator	max. 256	max. 16 x 256
Remote access	max. 1	max. 16 x 1
Maintenance request	max. 1	
Extinguishing zone	max. 32	
Master control unit (Seconet)	max. 32	
Slave control unit (Seconet)	max. 254	
Alarm Zone	max. 256	
Management system or external system	dependent on the protocol used	max. 32

2.4 Overview of X-LINE limits

	X-LINE High Power	X-LINE Long Range	DAI Mode
X-LINE Devices per loop	max. 250	max. 250	max. 128
Devices per stub	max. 64	max. 64	max. 64
BX-SOL, BX-SBL per Loop	max. 62 LOW, max. 31 HIGH	max. 62 LOW, max. 31 HIGH	max. 31 LOW, max. 15 HIGH
BX-FOL per loop:	max. 23	max. 23	max. 23
Loop length	1500m max.	3500m max.	2000m max.
Max. line resistance	106 Ω	248 Ω	142 Ω

2.5 Integral IP MXF


B5-SCU-CP


B5-SCU-C


B5-SCU

The Integral IP MXF is available in three different versions, which differ from one another only by the layout of their doors. The back wall, main processor unit, power supply unit and case are identical in all types of Integral IP MXF control panels.

Every Integral IP MXF control panel consists of:

- wall-mounted cabinet with doors (with/without operating panel, with/without printer)
- B5-MCU main processor unit
  - 16 loop circuits (max. 4,000 elements)
  - 1 main detector output (transmission equipment)
  - 1 monitored output (alarm system)
  - 5 relay outputs (230V/3A)
  - Connection for fire alarm control panel in accordance with DIN 14661
  - MMI-BUS connection
- B5-PSU 27V/7A power supply unit
- 2 pcs. emergency power supply rechargeable cells 12V/38...44Ah in series
- Power clips and battery lead
- Build-in operating panel (built into the doors in the relevant language)
- Built-in printer (dependent on type)

Article Numbers

Integral IP MXF cabinet B5-SCU with full door	FG052100
Integral IP MXF B5-SCU-C cabinet with cutaway for operating panel	FG052101
Integral IP MXF B5-SCU-CP cabinet with cutaway for operating panel and printer	FG052102
B5-CII-DE built-in operating panel (German)	FG91600-9
B5-MCU main processor unit (replacement)	EG072939
B5-PSU power supply unit (replacement)	EG072918
rechargeable cell	HG691017
B5 battery holder set	FG74108
B5 distance piece set	FG74110
3m USB cable for service PC	FG022051
4.5 m USB cable for service PC	FG022052
SD card	FG020325
IDC connector for MMI BUS	FG74085
Solder lug terminal connector for MMI BUS	FG74086
Connector plug for DIN fire brigade control panel (replacement part)	YK130459
Connector plugs for monitored outputs (spare part)	YK130293
Connector plug for relay contacts (replacement part)	FG74115
Connector plug for loop circuits (replacement part)	YK130295

2.6 Integral IP MXE


B5-SCU-CP4L

The Integral IP MXE can be networked and can be connected to management systems.

The Integral IP MXE is available as the following version and consists of:

- Wall-mounted cabinet with door (with built-in LED indicator panel for 4 extinguishing zones)
- B5-MCU main processor unit
  - 16 loop circuits (max. 4,000 elements)
  - 1 main detector output (transmission equipment)
  - 1 monitored output (alarm system)
  - 5 relay outputs (230V/3A)
  - Connection for fire alarm control panel in accordance with DIN 14661
  - MMI-BUS connection
- B5-PSU 27V/7A power supply unit
- 2 pcs. emergency power supply rechargeable cells 12V/38...44Ah in series
- Power clips and battery lead
- Build-in operating panel (built into the doors in the relevant language)
- Built-in printer (dependent on type)

Article Numbers

Integral IP MXE B6-SCU-CP4L cabinet with cutaway for operating panel, log printer and LED indicator panel for 4 extinguishing zones	FG052103
B5-CII-DE built-in operating panel (German)	FG91600-9
B5-MCU main processor unit (replacement)	EG072939
B5-PSU power supply unit (replacement)	EG072918
rechargeable cell	HG691017
B5 battery holder set	FG74108
B5 distance piece set	FG74110
3m USB cable for service PC	FG022051
4.5 m USB cable for service PC	FG022052
SD card	FG020325
Solder lug terminal connector for MMI BUS	FG74086
IDC connector for MMI BUS	FG74085
Connector plugs for monitored outputs (spare part)	YK130293
Connector plug for DIN fire brigade control panel (replacement part)	YK130459
Connector plug for loop circuits (replacement part)	YK130295
Connector plug for relay contacts (replacement part)	FG74115

2.7 Integral IP Floor Standing Cabinet

The Integral IP floor standing cabinet is a compact unit for fitting up to 5 Integral IP MX fire alarm control panels. This type of control panel case is used when modernising existing old systems or to accommodated several control panels or a subcontrol unit loop in a single case. An Integral IP floor standing cabinet consists of a cabinet case with mounting plate and lockable full-length glass door, as well as a tipping frame with 40 height units for 19" front panels and battery holders. All Integral IP floor standing cabinets can be shipped with a complete installation and prewired.

B5-STS-RT1-R

Planning steps to be taken

- Selection of types of floor standing cabinets (opening on left or right side)
- Selection of quantity of module racks and fitting of modules
- if being networked, selection of the relevant connection cable (old SC loop, Integral LAN, SecoNET)
- Selection of front panels with respective connection cables
- Selection of the terminal block for the supply voltage

B5-STS-RT1-L

Full fitting of the Integral IP MX floor standing cabinet

- 5 module racks
- In total 8 front panels each 5 height units high, consisting of:
  - up to 1 front panel with an external operating panel
  - up to 1 front panel with a printer
  - up to 4 front panels with external indicator panel for 8 extinguishing zones or 4 front panels with external indicator panel for 64 detector zones
  - up to 8 blanking plates

B5-STS-CIP

B5-STS-PR

Article Numbers

Integral IP MX floor standing cabinet - glass door with hinges on right side	20-1060030-01-01
Integral IP MX floor standing cabinet - glass door with hinges on left side	20-1060030-02-01
Integral IP MX floor standing cabinet - sheet metal door with hinges on right side	20-1060031-01-01
Front panel for MAP and HE-BF	20-1060000-01-01
Front panel with MAP operating panel (German)	20-1060009-01-01
Front panel with MAP operating panel (English)	20-1060009-02-01
Front panel with MAP operating panel (Dutch)	20-1060009-03-01
Front panel with high-end operating panel	20-1060010-01-01
Front panel with EAT64	20-1060011-01-01
Front panel with IPEL	20-1060012-01-01
Front panel with printer	20-1060001-01-01
Front panel with printer for high-end operating panel	20-1060002-01-01
Front panel without cutaway (5 height units)	20-1060003-01-01
BGT Integral, incl. B5-PSU, B5-BUS, B5-MCU, battery compartment	20-1060006-01-01
Front panel without cutaway (1 height unit)	20-1060008-01-01
Rechargeable cell compartment to hold additional rechargeable cells	20-1060007-01-01
MMI-BUS cable with connector for connecting the BAF/PSU with the 1st MMI-BUS device	20-1060040-01-01
MMI-BUS cable with connector for connection between MMI-BUS devices	20-1060041-01-01
Networking cable with connector, for B3-LPI or B3-USI4	20-1060042-01-01
Cat5 cable with connector for B5-NETx	20-1060043-01-01
Networking cable with connector, for B3-USI4	20-1060044-01-01
Terminal block for connection to supply voltage	20-1060045-01-01

3 Integral IP MX control panels

All the various types of Integral IP MX control panels differ from one another in physical terms solely in terms of the construction of their doors. The back wall, module rack, case etc. are identical in all types of Integral IP MX control panels.

3.1 Case construction and dimensions

all dimensions are in mm

1. Main processor unit
2. Power supply
3. Rechargeable cells

The back wall of the Integral IP MX control panels acts as a holding unit for the electronic modules, power supply and batteries and is installed in situ. The cable inlet for connections to peripheral devices is via the cut-out section in the back wall, which is laid out in a concave fashion to the back panel, allowing cables to enter the box from above, below or behind. All cables are connected using clamp terminals.

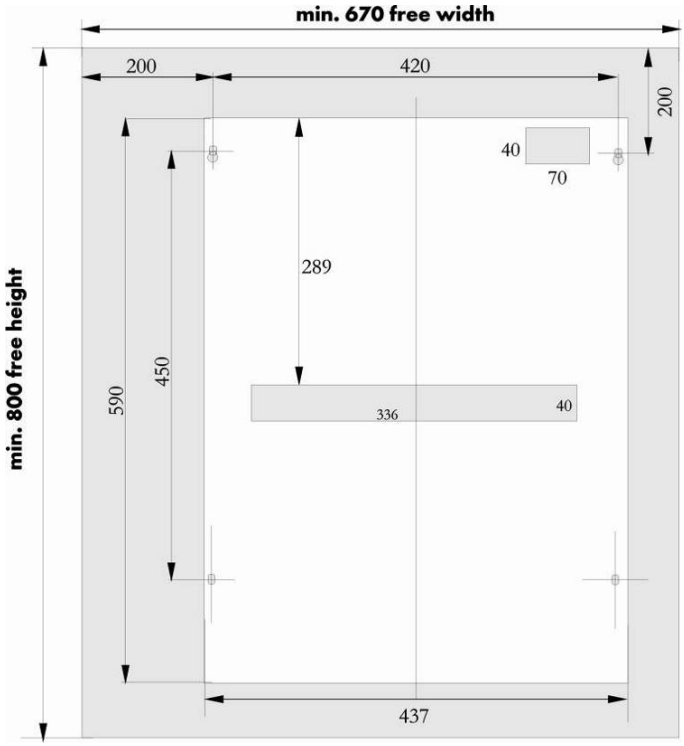
During the commissioning of the system, the batteries are set up on the rack on the back wall, and the plug clamps connected to the electronics and the power supply. The cabinet is then fitted, along with its door, as well as the operating panel, if one is being used, and collected to the electronics. Even when the case has been fitted, there is still good accessibility to all important components via the door.

3.2 Built-in operating panel

The B5-CII operating panel is available in many different language versions and can be fitted into the doors of all Integral IP MX cabinets with a cut away for an operating panel.

It is connected to the B5-MCU main processor unit by means of a ribbon cable and also controls the log printer.

3.3 Installation of a Control Panel



Drilling plan for all types of Integral IP MX cabinet (all dimensions in mm)

1. Affix back wall as per the drilling plan with 4
   5x40 round headed screws and 4 S 8 rawl plugs. When installing the back wall on plasterboard, then suitable rawl plugs and also possible reinforcement is required.
   Weight incl. batteries: ca. 50 kg!
2. Feed in cable and relieve the strain using cable ties.
3. Insert and connect batteries
4. Insert module rack and fit with modules
5. Wire up the power supply connection and connectors on the modules
6. Lift on case and attach it with two screws
7. Connect the operating panel's ribbon cable to the B5-MCU
8. Connect the door's earthing cable to the case.

Distance Piece Set

Optional distance piece rails are available for all Integral IP MX cabinets, to allow the control panel to be fitted an extra 2cm away from the wall. The drill holes required for attaching them to the cabinets have already been drilled. Furthermore, screws that are accordingly longer (at least 5 x 60 mm) must be used.

Battery fastening Set

To attached batteries in the cabinet in conformance with VdS and EN 54-2 criteria, a battery clip is available which can be ordered as an optional extra if required. The drill holes required for attaching the clip have already been drilled into the cabinets.

Nameplates

NOTE

Every Integral IP MX case is supplied with two nameplates, one of which is already mounted above the batteries on the right hand side in the case during manufacturing. The second name-plate is shipped with the control panel and must be fitted prior to commissioning in access level 1 (on the outside of the case) in a visible location!

4 External operating panels

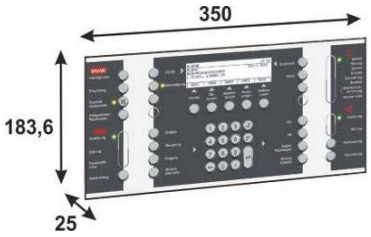
4.1 Dimensions for external operating panels

The external Integral IP operating panels are connected to the Integral IP MX control panels using the MMI-BUS, and are also available in a large number of different language versions.

Dimensions

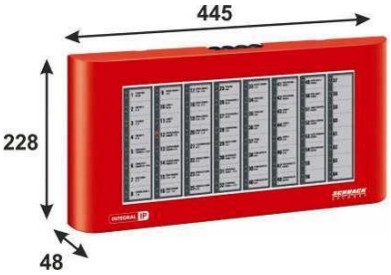
B5-MMI-CIP
External operating panel

B5-MMI-CPP
External operating panel with log printer



B5-MMI-CII
External operating panel without case

B3-MMI-IPEL
External Indicator Panel for 8 extinguishing zones



B3-MMI-EAT64
External indicator panel for 64 detector zones

B3-MMI-HCIP
High End Operating Panel

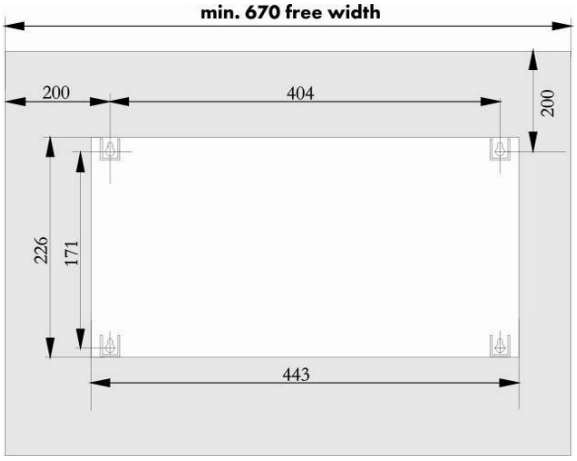
B5-MMI-PIP
External indicator panel

B3-MMI-FPA and B5-EPI-FPA
Fire Brigade Control Panel Austria

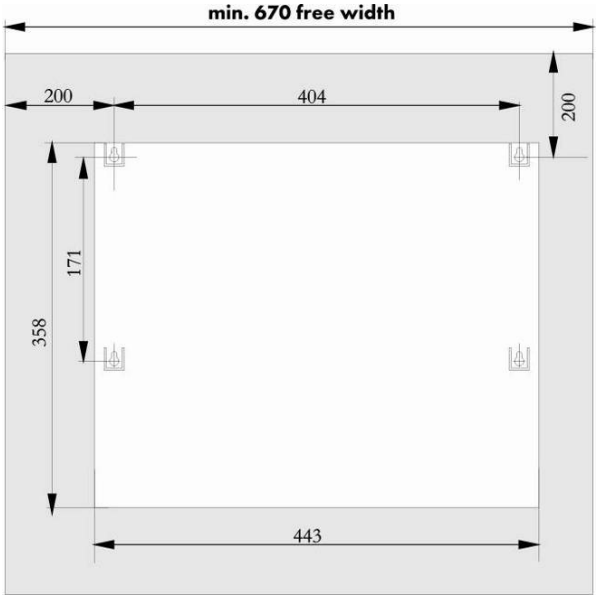
B3-MMI-FAT and B5-EPI-FAT
Fire brigade indicator panel

all dimensions are in mm

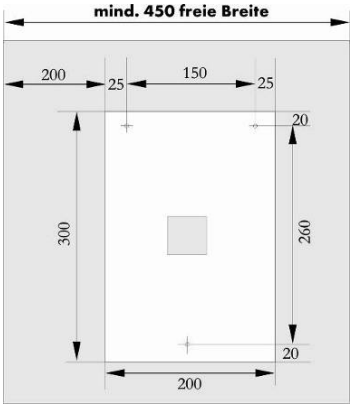
4.2 Drilling Plans for External Operating Panels



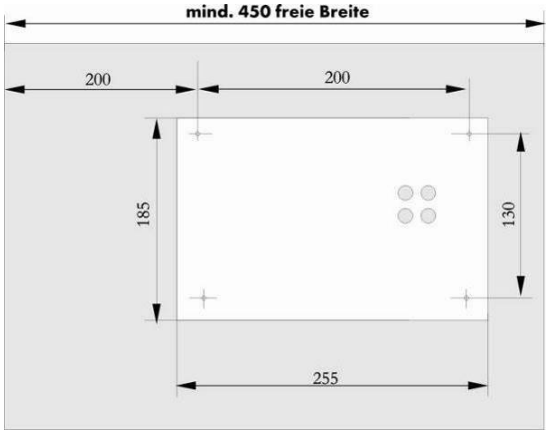
B5-MMI-CIP
B5-MMI-HCIP
B3-MMI-IPEL
B3-MMI-EAT64



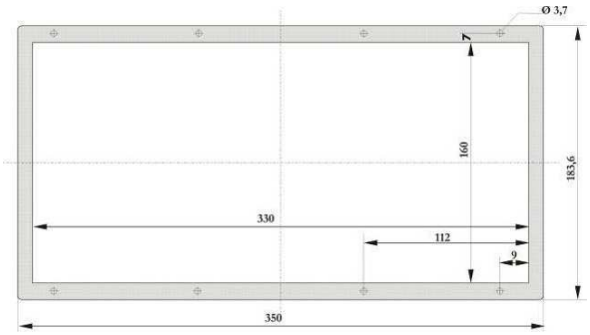
B5-MMI-CPP and B5-MMI-HCPP



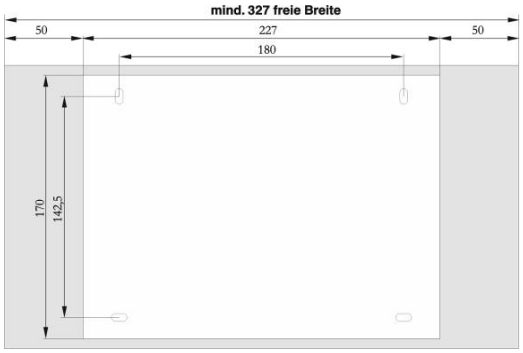
B3-MMI-FPA



B3-MMI-FAT



B5-MMI-CII



B5-MMI-PIP

all dimensions are in mm

5 Integral IP MX platform

5.1 B5-MCU main processor unit

The B5-MCU main processor unit processes all data generated by other modules, undertakes the processes necessary for the system's logical behaviour and manages configuration data and system time.
The system states are indicated by LEDs, with all programming and configuration processes by carried out over the USB interface (X7) using a Service PC and version 7.1 or higher of the Integral software pack.

Interfaces

X1 System bus interface to B5-BUS
X2 Connection socket for built-in operating panel
V5 Status LEDs for master processors A and B
X6 Reset pin for system reset
X7 USB 1.1 Device interface (e.g.: Service PC)
X8 USB 1.1 Host interface (currently not yet supported)
X9 SD card interface for extending the event log memory

Technical Specifications

Power supply:	internally over the system bus
Quiescent current uptake:	typically 35 mA (battery current)
Operating voltage:	Battery voltage VL+22V .. 30 V Logical voltage VCC+5.0 V ± 5% Logical voltage VCC+3.3V ± 5%
Ambient temperature:	-5° to +50°C
Rel. air humidity:	5 to 95 % without condensation

Article Numbers

B5-MCU main processor unit	EG072939
3m USB cable for service PC	FG022051
4.5 m USB cable for service PC	FG022052
SD card	FG020325

Notes about compatibility

Possible connection slot in the module rack:	1
Compatible power supply unit:	B5-PSU from issue state EG072918--
Integral software version:	From version 6.0

5.2 B5-PSU power supply unit

The internal 7A power supply unit delivers the required voltages in every Integral IP MX of 3.3 V, 5 V and 27 V. The connection to the system is made using a socket connection on the back side of the unit via the bus circuit boards (B5-BUS) which are fixed on the module rack. There is a 10 pin connectable screw clip terminal on the front panel of the power supply unit, to which external devices can be connected using five separately fused outputs.

Interfaces

X1	mains power connection
X3	socket for rechargeable cell current measurement
X4	Output voltage for internal consumers
X5	Output voltage for external consumers
X13	Rechargeable cell connection VBAT
X14	Rechargeable cell connection GNDBAT
S1	On/Off switch (mains switch)
V45	LED indicators
A10	Output fuses F1 to F5

Technical Specifications

Mains supply voltage / frequency:	230 VAC +15%/-20% 47-63 Hz
Power consumption:	max. 350 VA
Mains fuse:	with 10A current surge-resistant
Mains fuses in power supply:	2 x 2.0A slow
Outputs for internal devices:	3.3V/3A, 5V/1A, 27V/7A
Outputs for external devices:	5 x 27 V, 2.5 A FF
Alarm Current:	max. 7 A
Replacement fuses F1 to F5:	2.5A superfast, glass tube 5x20 mm

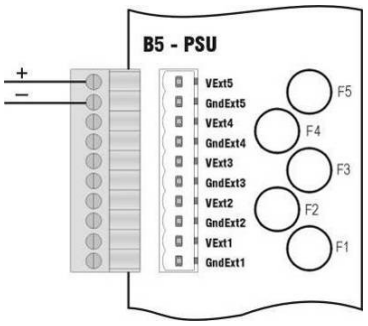
Article Numbers

B5-PSU power supply unit	EG072918
Replacement connection plug for external devices	FG74090
Replacement fuses F1 to F5:	IS625228

Notes about compatibility

Possible connection slot in the module rack:	10
Compatible main processor units:	B5-MCU from issue state EG072939-- B5-MCU-P from issue state EG072901--
System bus compatible:	B3 or B5-BUS (all issues)
Integral software version:	Backward compatible to version 1.0 From version 6.0 full range of functions together with the B5-MCU (recognition of failure of voltage and fuses etc.)

Connecting external devices



The B5-PSU power supply unit, has five outputs (each 2.5A fast fused) (connector X5), to which external devices, e.g. MMI Bus devices, sirens, flashing lights, fire brigade key safes, interface converters, holding magnets etc. can be connected.

Only the named 2.5A superfast, 5x20 glass tube fuses may be used, as otherwise, in the event of a short circuit, it cannot be guaranteed that the circuit will be broken.

CAUTION

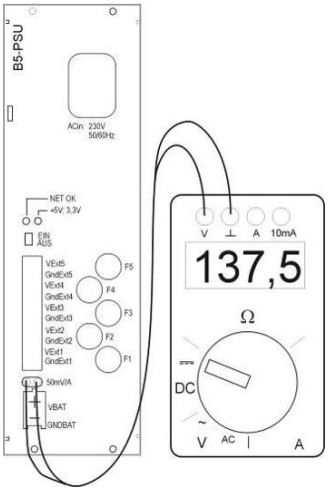
All national regulations must be observed when connecting external devices!

Neither the rechargeable cells nor the power supply unit may be connected to to devices which do not belong to the system!

The total output current (external devices and own consumption) must not exceed the nominal current of 7A of the power supply under any circumstance, since this leads to the power supply device being overloaded when there is purely power supply based operation of the system (i.e. with no battery operation), thus meaning that the fire alarm control panel cannot be guaranteed to function properly.

For reasons pertaining to security in the event of a failure, sirens may not be connected to a single output with other devices, as the possible occurrence of a short circuit in another device could mean that acoustic alarms are no longer possible.

Battery Current Measurement



During normal operation, remove the power line connector to B5-PSU power supply unit; in which instance neither alarms nor disablements must be present in the system and the rechargeable batteries must be connected
and charged.

A power supply fault is indicated: The BMZ's power supply will now come from the rechargeable batteries.

Switch on the measuring device (multimeter or voltmeter) and select "DC" on the measuring scale. The expected value should be between 10-350 mV DC.

Connect the battery current measuring cable to the battery current measuring socket on the B5-PSU power supply and connect it with the measuring device.

Read the value off the measuring device and make a note of it (Quiescent Current)

Trigger a hard alarm, during which as many as possible of the fire alarm devices
which are supplied with power by the fire alarm control panel are activated.

Read the value off the measuring device and make a note of it (alarm current)

Convert the values: measured value [mV]/50 = Battery current [A].

80 % charging of the battery's total capacity within 24 hours is guaranteed, if the quiescent current is lower than 5 A (=250 mV).

A supply interruption period of 72 hours with a battery capacity of 40 Ah is guaranteed, if the quiescent current is less than 0.48 A (=24 mV) – (in the event that the alarm current is the maximum permissible 7 A, then the power supply is guaranteed for half an hour). If the quiescent current is greater than 0.48 A, then the following

calculation must be done:

(Quiescent Current x Supply interruption period)+(Alarm current x Supply interruption period) < effective battery capacity (38Ah)

If the result of the battery current measurement does not match that of the power consumption calculation (+/- 10%), contact the Support Department for Security Systems in Vienna immediately.
A separate 230V/50Hz power circuit is required for the supplying of power from the mains networks (e.g. in accordance with TRVB S 123), which must be protected with an automatic circuit breaker, marked in red (minimum 10A surge resistant) and with its own residual current circuit breaker (U characteristic).

CAUTION

The installation of Integral IP MX system components, as well as their connection to the mains may only be carried out by a trained specialist, and in any case in accordance with valid regulations and rules that apply for the land in which the installation is taking place (e.g. DIN, ÖNORM, VDE, etc.)!

The fire alarm system must be operated using its own power supply network, with all work to be carried out with the system in a currentless state (mains and batteries) and with no external voltages present.

When adjusting individual modules, the regulations and preventative measures against static charges (ESD safety measures) must be observed!

5.3 Emergency power supply (Batteries)

In order to ensure the continuous operation of the fire alarm system even in the event of a short interruption to the power supply, two rechargeable batteries connected in series are installed in every Integral IP MX control panel, which supply the unit with power in the event of a power outage. The batteries are installed in the bottom part of the case of every Integral IP MX cabinet.

The accumulator capacity must be calculated that the function of the fire alarm system, inclusive all periphery components switched on, is protected at a mains failure. The respective national norms and guidelines have to be checked, furthermore a current calculation must be carried out in every case.

Only the following type of rechargeable cells, which are VdS tested and released for use by Schrack Seconet (article no.: HG691017), may be used, as otherwise the fault-free functioning of the system cannot be ensured:

Rechargeable cell types	VdS Approval No.
WP 45-12	G105087
CTM CT38-12i	G103053
Excide Powerfit S312/40G5	G102109
Genesis NP38-12R	G106045
Sauseng SB 40-12I	G105017
CTM CT 24-12	G103052

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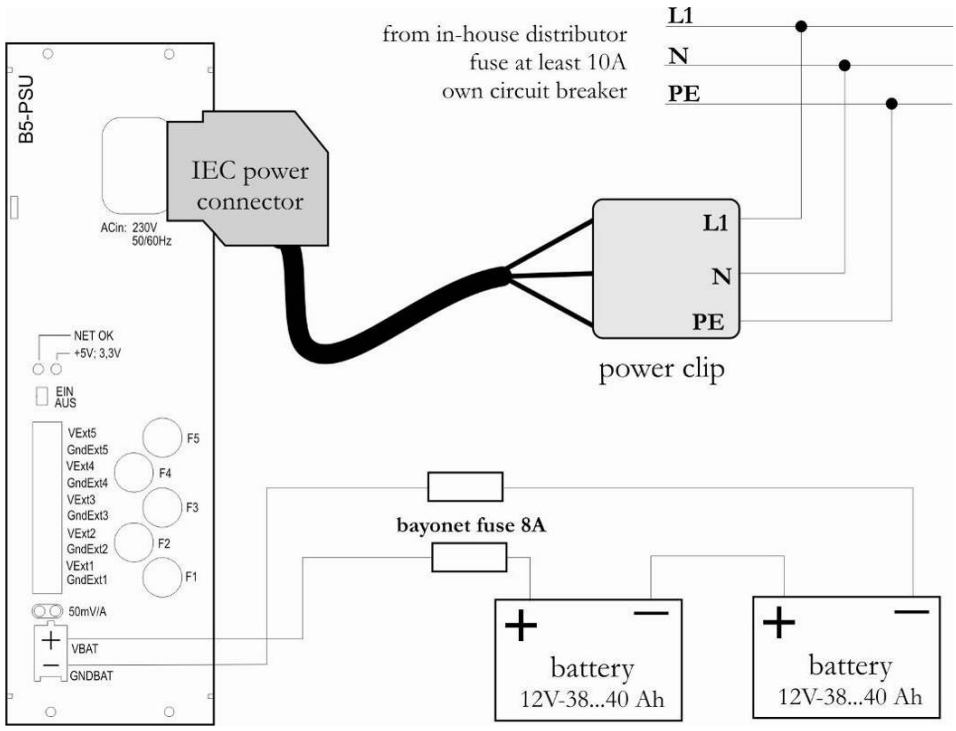
Transmission Business Engineering Management	

NOTE

Batteries and rechargeable cells must not be disposed of in household rubbish, but should be returned free of charge after use to the vendor or to the designated places for returning them (e.g. communal collection points or in shops).

5.4 Mains power and rechargeable cell connection

On the back wall of each Integral IP MX cabinet, there is an aperture in the upper right corner for allowing the power cable to fed through. The edges of the aperture contain drilled holes that allow fastenings to be made using cable ties.
The power supply cable should be connected to the clip that has been assigned for this purpose, while the protective earth conductor (PE) should furthermore be connected to the earthing screw marked accordingly next to the cable aperture. The battery cable set is supplied with the unit and is connected to the power supply and rechargeable batteries.



Article Numbers

B5-PSU power supply unit	EG072918
Replacement connection plug for external devices	FG74090
Replacement fuses F1 to F5:	IS625228
Battery cable set (replacement):	FG29910
Fuses for cable set (replacements):	IS625040
Rechargeable batteries:	HG691017

6 Line & Control Modules

6.1 B5-DXI2 module for X-LINE

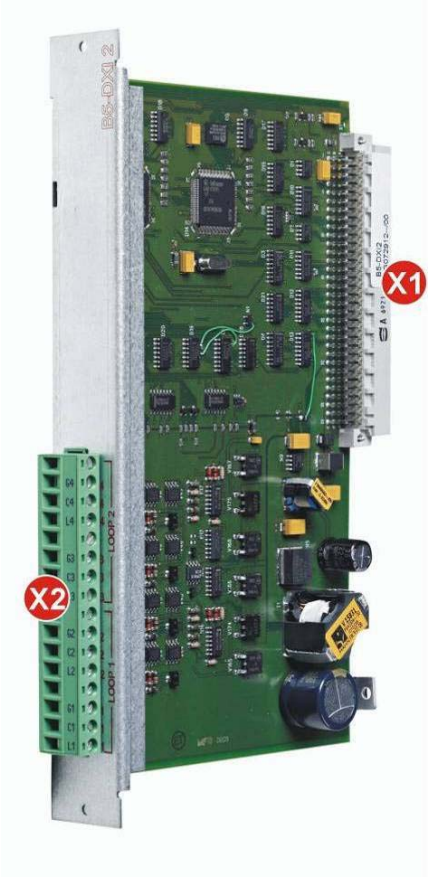
For connecting two loop circuits (loops) to the relevant detectors and Integral X-LINE technology modules. Alternatively one loop circuit and two stub lines or four stub lines can be connected. Further information can be found in the Integral X-LINE manual.

Interfaces

X1 System bus connection socket

X2 Connection socket for 2 loop circuits or 4 stub lines

Loop No.	Description	Function
2	V4	n. a.
	G4	Shield
	C4	GND Loop end
	L4	+24V Loop End
	V3	n. a.
	G3	Shield
	C3	GND Loop start
	L3	+24V Loop start
1	V2	n. a.
	G2	Shield
	C2	GND Loop end
	L2	+24V Loop End
	V1	n. a.
	G1	Shield
	C1	GND Loop start
	L1	+24V Loop start



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SIGNED TDT DATE 30.09.13
Transmission Business Engineering Management

Technical Specifications

Supply voltage:	internally over the system bus
Current draw:	35 mA
Ambient temperature:	-5° to +50°C
Connection:	2 loop circuits, each with max. 250 devices or 4 stub lines
Short circuit isolator:	integrated into detectors and controller modules
Individual detector identification:	integrated as standard
Loop/stub line length:	3,500 m max.

Article Numbers

B5-DXI2 module for X-LINE	EG072912
Connector plug for loop circuits	YY970138
Cable for loop circuit (shielded)	L198200804

NO COMMENTS

	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD.	Date: 01.07.2013 DOC No. TB/DS/332/552/042 Rev : 1
PROJECT :	Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station	
PURCHASER :	M/s BHEL - Transmission Bulsness Group - New Delhi.	
CUSTOMER :	M/s Raichur Power Corporation Limited	
CONSULTANT :	M/s Steag Energy Services Pvt. Ltd. ; Delhi	
CONTRACTOR :	M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.	
P.O. No. & DATE :	312P385 dt. 12.03.13	

	TECHNICAL DATASHEET OF MULTI SENSOR DETECTOR WITH BASE		REVISION MARK
1	Type Of Detector	Multi sensor detector - can be used as a smoke detector, as a heat detector or as a combined smoke/ heat detector as well. Having integrated short circuit isolator.	
2	Make	Schrack Seconet	
3	Model No .	MTD 533X+ US8501-6	
4	On Board Micro Processor	Yes	
5	Approval	VDS approved, CE certified, EN 54	
6	Operation Voltage	12- 30VDC (without modulation deviation)	
7	Quiescent Current	120 µ A	
8	Alarm Current	min 0-5 mA,max. 10 mA	
9	Short Circuit Isolator	Integrated (Inbuilt)	
10	Sensitivity	smoke acc. to EN 54-7, heat acc. to EN 54-5; (classes A1, A2 and B (Index S and R)	
11	Ambient Temperature	—25° C to + 60 ° C	
12	Humidity	permanent, without condensation: 10 to 95% rel/F	
13	Colour Housing	White (Similar to RAL 9003)	
14	Material	ABS/ PC	
15	Dimensions (H X Φ)	Ø 118 mm, Height: 68 mm (incl. base)	
16	Inbuilt indicating lamp to indicate operation of detector to be provided ?	Yes. LED alarm indicator 360° Visible.	
17	Approximately quantity as per approved drawings	As per BOQ	R1
18	Is Catalogue Enclosed ?	Yes	

REVISION HISTORY

Date	Prepared By	Checked By	Approved By	Rev. Remark
20.04.2013	ABHISHEK	HIREN	BHAVIN	0
01.07.2013	ABHISHEK	HIREN	BHAVIN	1

APPROVED AS SUBMITTED
steag

Digitally signed by Sudeep M Sekhar
DN: cn=Sudeep M Sekhar, o=STEAG Energy Services (India) Pvt. Ltd., ou, email=sm.sekhar@steag.in, c=IN
Date: 2013.07.18 17:09:42 +05'30'

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APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED DATE 05/08/13
Transmission Projects
Engineering Management

Mehrfachsensormelder MTD 533X.
Multiple Sensor Detector MTD 533X.

• ein Melder für alle Anwendungen • Branderkennung immer mittels Rauch- und Temperaturauswertung • optimierte Rauchkammer • Rauchvoralarm bei 30 % und bei 75 % der Alarmschwelle • Speicherung aller Melderdaten und Ereignisse • dynamische Anpassung an Umgebungsbedienungen • 2-stufige Verschmutzungserkennung • parametrierbare Wärmeklassen gemäß EN 54 • LED Alarmanzeige 360° sichtbar • integrierter Kurzschlussisolator • VdS-Zulassung

• one detector for all applications • fire detection always carried out by means of smoke and temperature evaluation • optimized smoke chamber • Smoke pre-alarm at 30 % and at 75 % of the alarm threshold • all detector data and events are stored • adapts dynamically to surrounding conditions • 2 stage pollution detection • adjustable temperature classes acc. to EN 54 • LED alarm indicator 360° visible • integrated short circuit isolator • VdS-approval

Beschreibung

Der Mehrfachsensormelder MTD 533X kann je nach Bedarf und Anwendung als Rauch-, als Temperatur-, oder als kombinierter Melder eingesetzt werden und wird jeweils entsprechend seinem Einsatzgebiet anlagenspezifisch programmiert und eingestellt. Er erkennt frühzeitig Schwelbrände und offene Brände, indem er sowohl die Brandkenngröße Rauch (mittels Tyndall-Prinzip) als auch Wärme (NTC-Sensor-Prinzip) detektieren und auswerten kann. Die Empfindlichkeit kann über Software im Rahmen der EN 54 angepasst werden.

Der Melder verfügt über einen integrierten Kurzschlussisolator, der es im Kurzschlussfall auf einer Ringleitung ermöglicht, das schadhafte Leitungselement zu isolieren und den Betrieb aller Melder aufrecht zu erhalten.

Ein dynamischer Alarmfilter dient zum Erkennen und Ausfiltern von Täuschungsgrößen, darüber hinaus kann bei Bedarf ein Voralarm ausgewertet und an die Zentrale weitergeleitet werden. Wechselnde Umwelteinflüsse werden kompensiert, indem sich der Melder in regelmäßigen Abständen automatisch an seine Umgebung anpasst.

Die Montage und Installation des MTD 533X erfolgt mittels der Montagesockel-Serie USB 501.

Für die Projektierung gelten die länderspezifischen Richtlinien für Planung und Einbau von automatischen Brandmeldeanlagen. Für kombinierte Brandmelder können zusätzliche Richtlinien gelten, sofern dauernd oder zeitweise eine der Detektionseigenschaften abgeschaltet wird.

Description

The MTD 533 multiple sensor detector can be used as a smoke detector, as a heat detector or as a combined smoke/heat detector upon demand and is programmed and set-up specifically for the environmental conditions that it is part of. It detects smouldering and open fires at an early stage by being able to detect and evaluate the characteristics of fire and smoke (Tyndall principle) as well as heat (NTC sensor principle). The sensitivity of the detector can be adjusted using software within the scope of EN 54.

The detector provides an integrated short circuit isolator that, in case of a short circuit on the loop, enables the isolation of the faulty element while maintaining the operation of all other detectors.

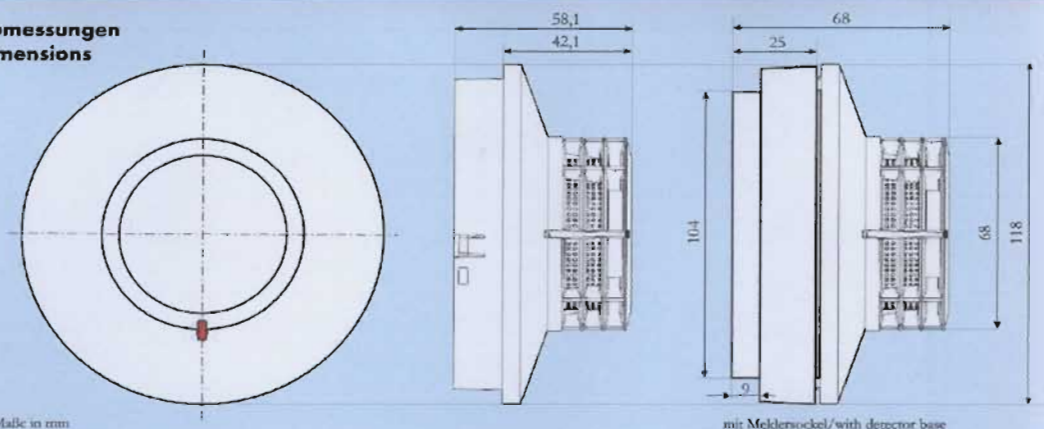
A dynamic alarm filter is used to detect and filter out deceptive alarms, furthermore a pre-alarm can be evaluated and forwarded to the control panel, if required. To compensate changing environmental influences, the detector adjusts itself at periodic intervals to its surroundings.

The assembly and installation is done by means of the mounting base series USB 501.

For planning and installation, the country-specific guidelines for planning and installation of automatic fire alarm systems apply. It could be possible, that additional guidelines and regulations for combined fire detectors must be taken into account, if continuously or temporarily one of the detection principles is switched off.

Mehrfachsensormelder MTD 533X.
Multiple Sensor Detector MTD 533X.

Abmessungen
Dimensions



Alle Maße in mm
All dimensions in mm

mit Meldersockel/with detector base
USB 501-1 oder/or USB 501-6

Technische Daten

Betriebsspannung:	12 bis 30 VDC (ohne Modulationshub)
Ruhestrom:	120 µA typ.
Alarmausgang:	3 Stufen programmierbar 0,1 mA/1 mA/5 mA
Alarm-LED aktiv:	1,6 mA
Alarmstrom:	min. 0,5 mA, max. 10 mA
Ausgangsspannung:	programmierbar
X-LINE:	5 V
Ringleitung:	6,3 V
Meldersockel:	USB 501-x
Funktionsprinzip:	Kombinierter Rauch/Wärmemelder (Tyndall-Effekt/NTC Sensor)
Signalübertragung:	serielle Biphase Datenübertragung, 2-Leiter-Technik
Empfindlichkeit:	Rauch nach EN 54-7
Empfindlichkeit:	Wärme nach EN 54-5; Klassen A1, A2, B (Index S und R)
Schutzart:	IP 44 (mit Sockel USB 501-1)
Umgebungstemperatur:	-25° bis +60°C
Rel. Luftfeuchtigkeit:	dauernd, ohne Betauung:
bei ≤ 34 °C:	10 ... 95 % rel/F
bei > 34 °C:	max. 35 g/m³ min. 10 % rel/F
Luftgeschwindigkeit:	max. 20 m/s
Abmessungen:	siehe Maßzeichnung oben
Gehäuse Farbe:	weiß ähnlich RAL 9003 alle RAL Farben auf Anfrage
Gehäuse Material:	ABS/PC
Gewicht:	125 g
CE-Zertifikat:	0786-CPD-20993
VdS-Zulassung:	G210115

Technical data

Operating voltage:	12 to 30 VDC (without modulation amplitude)
Quiescent current:	120 µA typ
Alarm output:	3 levels programmable 0,1 mA/1 mA/5 mA
Alarm-LED active:	1,6 mA
Alarm current:	min. 0,5 mA, max. 10 mA
Output current:	programmable
X-LINE:	5 V
Loop technology:	6,3 V
Detector base:	USB 501-x
Principle of function:	Combined smoke/heat detector (Tyndall effect and/or NTC sensor)
Signal transmission:	serial biphase data transmission, 2-wire -technology
Sensitivity:	smoke acc. to EN 54-7
	heat acc. to EN 54-5; (classes A1, A2 and B (Index S and R)
Protection class:	IP 44 (with base USB 501-1)
Ambient temperature:	-25° to +60°C
Rel. humidity:	permanent, without condensation:
at ≤ 34 °C:	10 ... 95 % rel/F
at > 34 °C:	max. 35 g/m³ min. 10 % rel/F
Air velocity:	max. 20 m/s
Dimensions:	see drawing above
Case colour:	white similar to RAL 9003 all RAL colours upon request
Case material:	ABS/PC
Weight:	125 g
CE-Certificate:	0786-CPD-20993
VdS-Approval:	G210115

Weitere Informationen sind der Technischen Dokumentation zu entnehmen.
Further informations can be obtained from the technical documentation.

SCHRACK SECONET AG
A-1122 Wien, Eibesbrunnergasse 18 • Tel.: +43-1-81157-0 • office@schrack-seconet.com

FIRE ALARM

www.schrack-seconet.com

SCHRACK SECONET

NO COMMENTS

	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD.	Date: 01.07.2013 DOC No. TB/DS/332/552/056 Rev : 1
PROJECT :	Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station	
PURCHASER :	M/s BHEL - Transmission Buisness Group - New Delhi.	
CUSTOMER :	M/s Raichur Power Corporation Limited	
CONSULTANT :	M/s Steag Energy Services Pvt. Ltd. ; Delhi	
CONTRACTOR :	M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.	
P.O. No. & DATE :	312P385 dt. 12.03.13	

	TECHNICAL DATASHEET OF HEAT DETECTOR WITH BASE		REVISION MARK
1	Type Of Detector	Heat detector can be used as a heat detector as well. Having integrated short circuit isolator.	
2	Make	Schrack Seconet	
3	Model No .	MTD 533X+ USB501-6	
4	On Board Micro Processor	Yes	
5	Approval	VDS approved, CE certified, EN 54	
6	Operation Voltage	12- 30VDC (without modulation deviation)	
7	Quiescent Current	120 µ A	
8	Alarm Current	min 0-5 mA,max. 10 mA	
9	Short Circuit Isolator	Integrated (Inbuilt)	
10	Sensitivity	smoke acc. to EN 54-7, heat acc. to EN 54-5; (classes A1, A2 and B (Index S and R)	
11	Ambient Temperature	—25° C to + 60 ° C	
12	Humidity	permanent, without condensation: 10 to 95% rel/F	
13	Colour Housing	White (Similar to RAL 9003)	
14	Material	ABS/ PC	
15	Dimensions (H X Φ)	Ø 118 mm, Height: 68 mm (incl. base)	
16	Inbuilt indicating lamp to indicate operation of detector to be provided ?	Yes. LED alarm indicator 360° Visible.	
17	Approximately quantity as per approved drawings	As per BOQ	R1
18	Is Catalogue Enclosed ?	Yes	

REVISION HISTORY

Date	Prepared By	Checked By	Approved By	Rev. Remark
20.04.2013	ABHISHEK	HIREN	BHAVIN	0
01.07.2013	ABHISHEK	HIREN	BHAVIN	1

APPROVED AS SUBMITTED

steag

Digitally signed by Sudeep M Sekhar
DN: cn=Sudeep M Sekhar, o=STEAG Energy Services (India) Pvt. Ltd., ou, email=sm.sekhar@steag.in, c=IN
Date: 2013.07.18 17:12:06 +05'30'

E072-BHEL_TBG-3-M-13-4439

BHEL CAT-1
APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED DATE 05/08/13
Transmission Projects
Engineering Management

Mehrfachsensormelder MTD 533X.
Multiple Sensor Detector MTD 533X.

• ein Melder für alle Anwendungen • Branderkennung immer mittels Rauch- und Temperaturauswertung • optimierte Rauchkammer • Rauchvoralarm bei 30 % und bei 75 % der Alarmschwelle • Speicherung aller Melderdaten und Ereignisse • dynamische Anpassung an Umgebungsbedienungen • 2-stufige Verschmutzungserkennung • parametrierbare Wärmeklassen gemäß EN 54 • LED Alarmanzeige 360° sichtbar • integrierter Kurzschlussisolator • VdS-Zulassung

• one detector for all applications • fire detection always carried out by means of smoke and temperature evaluation • optimized smoke chamber • Smoke pre-alarm at 30 % and at 75 % of the alarm threshold • all detector data and events are stored • adapts dynamically to surrounding conditions • 2 stage pollution detection • adjustable temperature classes acc. to EN 54 • LED alarm indicator 360° visible • integrated short circuit isolator • VdS-approval

Beschreibung

Der Mehrfachsensormelder MTD 533X kann je nach Bedarf und Anwendung als Rauch-, als Temperatur-, oder als kombinierter Melder eingesetzt werden und wird jeweils entsprechend seinem Einsatzgebiet anlagenspezifisch programmiert und eingestellt. Er erkennt frühzeitig Schwelbrände und offene Brände, indem er sowohl die Brandkenngröße Rauch (mittels Tyndall-Prinzip) als auch Wärme (NTC-Sensor-Prinzip) detektieren und auswerten kann. Die Empfindlichkeit kann über Software im Rahmen der EN 54 angepasst werden.

Der Melder verfügt über einen integrierten Kurzschlussisolator, der es im Kurzschlussfall auf einer Ringleitung ermöglicht, das schadhafte Leitungselement zu isolieren und den Betrieb aller Melder aufrecht zu erhalten.

Ein dynamischer Alarmfilter dient zum Erkennen und Ausfiltern von Täuschungsgrößen, darüber hinaus kann bei Bedarf ein Voralarm ausgewertet und an die Zentrale weitergeleitet werden. Wechselnde Umwelteinflüsse werden kompensiert, indem sich der Melder in regelmäßigen Abständen automatisch an seine Umgebung anpasst.

Die Montage und Installation des MTD 533X erfolgt mittels der Montagesockel-Serie USB 501.

Für die Projektierung gelten die länderspezifischen Richtlinien für Planung und Einbau von automatischen Brandmeldeanlagen. Für kombinierte Brandmelder können zusätzliche Richtlinien gelten, sofern dauernd oder zeitweise eine der Detektionseigenschaften abgeschaltet wird.

Description

The MTD 533 multiple sensor detector can be used as a smoke detector, as a heat detector or as a combined smoke/heat detector upon demand and is programmed and set-up specifically for the environmental conditions that it is part of. It detects smouldering and open fires at an early stage by being able to detect and evaluate the characteristics of fire and smoke (Tyndall principle) as well as heat (NTC sensor principle). The sensitivity of the detector can be adjusted using software within the scope of EN 54.

The detector provides an integrated short circuit isolator that, in case of a short circuit on the loop, enables the isolation of the faulty element while maintaining the operation of all other detectors.

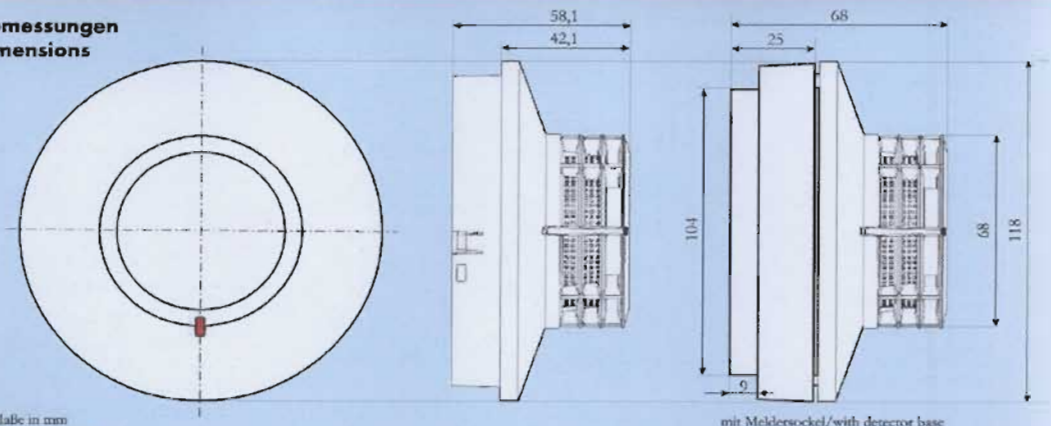
A dynamic alarm filter is used to detect and filter out deceptive alarms, furthermore a pre-alarm can be evaluated and forwarded to the control panel, if required. To compensate changing environmental influences, the detector adjusts itself at periodic intervals to its surroundings.

The assembly and installation is done by means of the mounting base series USB 501.

For planning and installation, the country-specific guidelines for planning and installation of automatic fire alarm systems apply. It could be possible, that additional guidelines and regulations for combined fire detectors must be taken into account, if continuously or temporarily one of the detection principles is switched off.

Mehrfachsensormelder MTD 533X.
Multiple Sensor Detector MTD 533X.

Abmessungen
Dimensions



Alle Maße in mm
All dimensions in mm

mit Meldersockel/with detector base
USB 501-1 oder/or USB 501-6

Technische Daten

Betriebsspannung:	12 bis 30 VDC (ohne Modulationshub)
Ruhestrom:	120 µA typ.
Alarmausgang:	3 Stufen programmierbar 0,1 mA/1 mA/5 mA
Alarm-LED aktiv:	1,6 mA
Alarmstrom:	min. 0,5 mA, max. 10 mA
Ausgangsspannung:	programmierbar
X-LINE:	5 V
Ringleitung:	6,3 V
Meldersockel:	USB 501-x
Funktionsprinzip:	Kombinierter Rauch/Wärmemelder (Tyndall-Effekt/NTC Sensor)
Signalübertragung:	serielle Biphase Datenübertragung, 2-Leiter-Technik
Empfindlichkeit:	Rauch nach EN 54-7
Empfindlichkeit:	Wärme nach EN 54-5; Klassen A1, A2, B (Index S und R)
Schutzart:	IP 44 (mit Sockel USB 501-1)
Umgebungstemperatur:	-25° bis +60°C
Rel. Luftfeuchtigkeit:	dauernd, ohne Betauung:
bei ≤ 34 °C:	10 ... 95 % rel/F
bei > 34 °C:	max. 35 g/m³ min. 10 % rel/F
Luftgeschwindigkeit:	max. 20 m/s
Abmessungen:	siehe Maßzeichnung oben
Gehäuse Farbe:	weiß ähnlich RAL 9003 alle RAL Farben auf Anfrage
Gehäuse Material:	ABS/PC
Gewicht:	125 g
CE-Zertifikat:	0786-CPD-20993
VdS-Zulassung:	G210115

Technical data

Operating voltage:	12 to 30 VDC (without modulation amplitude)
Quiescent current:	120 µA typ
Alarm output:	3 levels programmable 0,1 mA/1 mA/5 mA
Alarm-LED active:	1,6 mA
Alarm current:	min. 0,5 mA, max. 10 mA
Output current:	programmable
X-LINE:	5 V
Loop technology:	6,3 V
Detector base:	USB 501-x
Principle of function:	Combined smoke/heat detector (Tyndall effect and/or NTC sensor)
Signal transmission:	serial bipbase data transmission, 2-wire -technology
Sensitivity:	smoke acc. to EN 54-7
	heat acc. to EN 54-5; (classes A1, A2 and B (Index S and R)
Protection class:	IP 44 (with base USB 501-1)
Ambient temperature:	-25° to +60°C
Rel. humidity:	permanent, without condensation:
at ≤ 34 °C:	10 ... 95 % rel/F
at > 34 °C:	max. 35 g/m³ min. 10 % rel/F
Air velocity:	max. 20 m/s
Dimensions:	see drawing above
Case colour:	white similar to RAL 9003 all RAL colours upon request
Case material:	ABS/PC
Weight:	125 g
CE-Certificate:	0786-CPD-20993
VdS-Approval:	G210115

Weitere Informationen sind der Technischen Dokumentation zu entnehmen.
Further informations can be obtained from the technical documentation.

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FIRE ALARM

www.schrack-seconet.com

SCHRACK SECONET

NO COMMENTS

	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD.	Date: 01.07.2013 DOC No. TB/DS/332/552/043 Rev : 1

PROJECT :	Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station
PURCHASER :	M/s BHEL - Transmission Buisness Group - New Delhi.
CUSTOMER :	M/s Raichur Power Corporation Limited
CONSULTANT :	M/s Steag Energy Services Pvt. Ltd. ; Delhi
CONTRACTOR :	M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.
P.O. No. & DATE :	312P385 dt. 12.03.13

	TECHNICAL DATASHEET OF ADDRESSABLE MANUAL CALL POINT		REVISION MARK
1	Type	Addressable Glass Break type with integrated short circuit fault isolator	
2	Make	Schrack Seconet	
3	Approval	VDS	R1
4	Model No.	MCP545X-2R	
5	Mounting	Flush Type	
6	Operation Volatage	7 to 31 VDC	
7	Quiescent Current	max. 120 µA at 30 VDC	
8	Alarm Current	2.5 mA	
9	Ambient Temperature	–20° C to + 50 ° C	
10	Humidity	5 to 95% without condensation	
11	Protection Class	IP 52	
12	Colour Housing	Red, (RAL 3001)	
13	Material	Plastic, Glass fibere-reinforced	
14	Dimensions (H X W X D)	89 x 93 x 27.5 in mm (HxWxD)	
15	Approximately quantity as per approved drawings	As per BOQ	R1
16	Is Catalogue Enclosed ?	Yes	

REVISION HISTORY

Date	Prepared By	Checked By	Approved By	Rev. Remark
20.04.2013	ABHISHEK	HIREN	BHAVIN	0
01.07.2013	ABHISHEK	HIREN	BHAVIN	1

APPROVED AS SUBMITTED
steag
Digitally signed by Sudeep M Sekhar
DN: cn=Sudeep M Sekhar, o=STEAG Energy Services (India) Pvt. Ltd., ou, email=sm.sekhar@steag.in, c=IN
Date: 2013.07.18 17:10:28 +05'30'

BHEL CAT-1
APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED DATE 05/08/13
Transmission Projects
Engineering Management

E072-BHEL_TBG-3-M-13-4439

Handfeuermelder MCP 545X.
Manual callpoint MCP 545X.

• einfache Installation • Gehäuse in rot, blau oder gelb • Schutzart IP 24 bis IP 67 • Alarmanzeige mittels LED • Störungsmeldung bei Bauteilausfall • Melder einzeln abschaltbar • integrierter Kurzschlussisolator • geprüft nach EN 54-11 & EN 54-17.

• easy installation • case available in red, blue or yellow • IP protection class from IP 24 up to IP 67 • alarm indication by LED • fault message in the event of a component failure • detectors can be individually disabled • integrated short circuit isolator • approved according to EN 54-11 & EN 54-17.

Beschreibung

Die Handfeuermelder MCP 545X sind geeignet zum Anschluss an die Integral X-LINE.

Die drei verschiedenen Ausführungen unterscheiden sich lediglich durch ihre Gehäuseform (IP-Schutzart), Elektronik, Anschaltung und Funktion ist bei allen Typen ident.

Die Melder enthalten einen Kurzschlussisolator und eine rote Alarm-LED. Die Alarmauslösung erfolgt durch Eindrücken der Glasscheibe bzw. Drücken des Kunststoff-Plättchens. Der Alarm bleibt bis zum Wiedereinsetzen einer neuen Glasscheibe bestehen bzw. resetieren des Kunststoff Plättchen bestehen. Ein Prüfschlüssel dient zur Funktionsprüfung.

Der MCP 545X-1 ist geeignet für Innenanwendungen und wird Aufputz montiert. Die Dose wird mit zwei Schrauben an der Wand befestigt, dabei müssen die Befestigungspunkte für den Tasterteil waagrecht sein. Eventuell nötige Kabeleinführungen für AP-Installationen müssen aufgebohrt werden.

Der MCP 545X-2 ist geeignet für Innenanwendungen und wird direkt in eine handelsübliche Unterputzdose Größe 1 (rund od. viereckig) eingebaut. Der Befestigungsloch-Abstand beträgt 60 mm waagrecht.

Der MCP 545X-3 ist auch für Außenanwendungen geeignet und wird Aufputz montiert. Der Melder verfügt über Schutzart IP 67 (wasserfest); die Kabeleinführung erfolgt mittels Kabelverschraubung M 20 von unten oder oben. Die Dose des Melders wird mit drei Schrauben an der Wand befestigt.

Description

The manual call points MCP 545X are suitable for the connection to the Integral X-LINE.

The three different versions differ only from the shape of the housing (IP protection category).
Electronics, connection and function are the same for all types.

The detectors contain a short circuit isolator and a red alarm LED. An alarm is released directly when the glass pane is broken or the plastic pane is pressed.
The alarm condition remains active, until the glass pane is replaced by a new one or the plastic pane is reset.
A test key is available for function test.

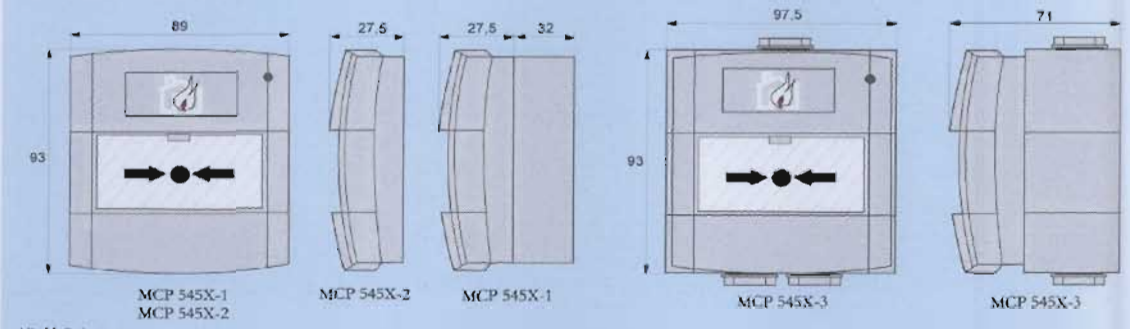
The MCP 545X-1 is suitable for indoor applications and surface-mounting. The surface-mounted box is fastened to the wall with two screws. The fastening points for the switch part must be horizontal.
Any necessary cable entries for surface-mounted installations must be drilled.

The MCP 545X-2 is suitable for indoor applications and is mounted in a commercial flush-mounted box (size 1; round or square). The horizontal distance between the mounting holes is 60 mm.

The MCP 545X-3 is also suitable for outdoor applications and surface-mounting. The detector has protection category IP 67 (waterproof); the cable entry is carried out by means of cable gland M20 from the bottom. The mounting box is attached to the wall with three screws.

Handfeuermelder MCP 545X.
Manual callpoint MCP 545X.

Abmessungen
Dimensions



Alle Maße in mm
All dimensions in mm

Technische Daten

Betriebsspannung:	7 bis 31 VDC
Ruhestrom:	max. 120 µA bei 30 VDC
Alarmstrom:	2,5 mA
Anschaltung:	Integral X-LINE
Schraubanschlüsse:	max. 2,5 mm²
Signalübertragung:	seriell, 2-Leiter-Technik
Schutzart	
MCP 545X-1/2:	IP 24
MCP 545X-3:	IP 67
Umgebungstemperatur:	-20° bis +50°C
Gehäuse Farbe:	rot, RAL 3001 gelb, RAL 1006 blau, RAL 5002
Gehäuse Material:	Kunststoff, glasfaserverstärkt
Gewicht	
MCP 545X-1/2:	160 g/110 g
MCP 545X-3:	240 g
Zulassung:	rot, G210092 (EN 54-11: 2001, EN 54-17: 2005) gelb, entsprechend (EN 54-11: 2001, EN 54-17: 2005) blau, entsprechend (EN 54-11: 2001, EN 54-17: 2005)
CPD-Zertifikat:	rot, 0786-CPD-20998

Technical data

Operating voltage:	7 to 31 VDC
Quiescent current:	max. 120 µA at 30 VDC
Alarm current:	2,5 mA
Connection:	Integral X-LINE
Screw terminals:	max. 2,5 mm²
Signal transmission:	serial, 2-wire
Protection class	
MCP 545X-1/2:	IP 24
MCP 545X-3:	IP 67
Ambient temperature:	-20° to +50°C
Housing colour:	red, RAL 3001 yellow, RAL 1006 blue, RAL 5002
Housing material:	plastic, glass fibre-reinforced
Weight	
MCP 545X-1/2:	160 g/110 g
MCP 545X-3:	240 g
Approval:	red, G210092 (EN 54-11: 2001, EN 54-17: 2005) yellow, according (EN 54-11: 2001, EN 54-17: 2005) blue, according (EN 54-11: 2001, EN 54-17: 2005)
CPD-Certificate:	red, 0786-CPD-20998

Weitere Informationen sind der Technischen Dokumentation zu entnehmen.
Further informations can be obtained from the technical documentation.

Schrack Seconet AG
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FIRE ALARM

www.schrack-seconet.com

SCHRACK SECONET

BHEL	CAT-1
A P P R O V E D This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.	
SIGNED TDT	DATE 15.11.13
Transmission Business Engineering Management	

NO COMMENTS

E072-BHEL_TBG-3-O-13-5466

	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD.	Date: 30.08.2013 DOC No. TB/DS/332/552/044 Rev :1
PROJECT :	Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station	
PURCHASER :	M/s BHEL - Transmission Buisness Group - New Delhi.	
CUSTOMER :	M/s Raichur Power Corporation Limited	
CONSULTANT :	M/s Steag Energy Services Pvt. Ltd. ; Delhi	
CONTRACTOR :	M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.	
P.O. No. & DATE :	312P385 dt. 12.03.13	

	TECHNICALDATASHEET OF ADDRESSABLE HOOTER		REVISION MARK
1	Make	Schrack Seconet: BX-SOL-R	
2	Type	Loop Powered Addressable Hooter with integrated short circuit isolator	
3	Approval	VDS	R1
4	Operating Voltage	12 to 30 VDC	
5	Alarm Current	in idle mode: 500 µA with volume LOW: 2.3 mA at 24 VDC with volume HIGH: 4.7 mA at 24 VDC	
6	**Enclosure Details**		
6.1	Dimensions	Diameter: max. 108 mm Construction height: 91 mm	
6.2	Weight	230 g	
6.3	Color	red (similar to RAL 3001)	
7	Volume / audible range	LOW: 89 dB± 3 dB @ 1 m @ 24 VDC HIGH 99 dB ±3 dB @ 1 m @ 24 VDC	R1
8	Sounder Tone	4 different tone	
9	Separate datasheet provide for interface module ?	Not required since hooter is self addressable & loop powered.	
10	Material & Thickness	ABS plastic	
11	Approximately quantity as per approved drawings	2 Nos.	R1
12	Is Drawing of hooter Enclosed?	Yes	

REVISION HISTORY

Date	Prepared By	Checked By	Approved By	Rev. Remark
20.04.2013	ABHISHEK	HIREN	BHAVIN	0
30.08.2013	ABHISHEK	HIREN	BHAVIN	1

Loop Sirene BX-SOL.
Loop Sounder BX-SOL.

• direkt auf der X-LINE anschaltbar • einstellbare Lautstärke • 4 einstellbare Warntöne • geringer Stromverbrauch • einzeln abschaltbar • integrierter Kurzschlussisolator • Gehäusefarben weiß oder rot • robustes Kunststoffgehäuse • Umweltkategorie Typ A gemäß EN 54-3.

• can be connected directly to the X-LINE • configurable volume • 4 warning tones can be set • low power consumption • can be individually disabled • integrated short circuit isolator • white or red case colours • robust plastic case • type A environment category according to EN 54-3.

Beschreibung

Die Loop Sirene BX-SOL dient zur akustischen Signalisierung eines Brandalarms in Innenräumen und entspricht Umweltkategorie Typ A gemäß EN 54-3.

Das Gerät ist in den Farben rot oder weiß lieferbar und wird über eine 6-polig Schraubklemme direkt an die Integral X-LINE angeschlossen.

Bis zu 32 Stk. BX-SOL können auf einer Integral X-LINE aufgeschalten werden, die Anzahl richtet sich nach der eingestellten Lautstärke, nach dem Mischverhältnis mit anderen Teilnehmern sowie dem Kabeldurchmesser.

Die Einstellung der Tonarten „Slow Whoop“, „DIN-Ton“, „Dauerton“ und „Schwedenton“ erfolgt, auch während des laufenden Betriebes, direkt an der Brandmelderzentrale, die Lautstärke kann mittels Software oder DIP-Schalter eingestellt werden.

Besonders beim Einsatz in Bereichen, wo EMV-Störgrößen vorhanden sind, oder solche bedingt durch Arbeitsprozesse periodisch auftreten können, empfehlen wir die Verwendung eines geschirmten Brandmeldekabels.

Wie jedes Element der Integral X-LINE verfügt auch die Loop Sirene BX-SOL über einen Kurzschlussisolator, welcher im Fall von Drahtbruch oder Kurzschluss dafür sorgt, dass der Fehler lokalisiert und gleichzeitig der Betrieb der Ringleitung in vollem Funktionsumfang erhalten bleibt.

Für die Projektierung gelten die landesspezifischen Richtlinien für Planung und Einbau von automatischen Brandmeldeanlagen.

Description

The loop sounder BX-SOL is used to signal a fire alarm in interior rooms and conforms to environmental category type A according to EN 54-3.

The device is available in red or white and is connected directly to Integral X-LINE by means of a 6 pin screw clip.

Up to 32 BX-SOL devices can be connected to an Integral X-LINE, with the quantity being determined by the volume that has been configured, the combination of other devices as well as the cable diameter.

The tone types “Slow Whoop”, “DIN tone”, “Swedish Tone”or “permanent tone” are set directly at the fire alarm control panel, even during ongoing operation, whilst the required volume can be set by using software or setting DIP switches.

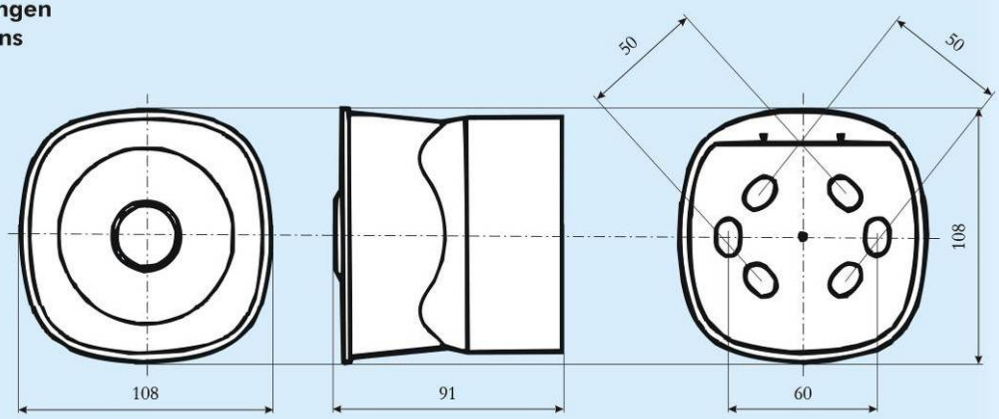
In particular when deployed in areas where there are EMC disturbances, or where such disturbances can occur periodically as a result of working processes, we recommend that a shielded fire alarm cable is used.

Like every element of Integral X-LINE, the loop sounder BX-SOL also contains a short circuit isolator, which ensures in the event of a wire break or a short circuit that the fault is localised and that the loop circuit’s operation is simultaneously maintained in its entirety.

The country-specific guidelines for planning and installation of automatic fire alarm systems are applicable.

Loop Sirene BX-SOL.
Loop Sounder BX-SOL.

Abmessungen
Dimensions



Alle Maße in mm
All dimensions in mm

Technische Daten

Betriebsspannung:	12 bis 30 VDC
Stromverbrauch:	
in Ruhe:	500 µA
Lautstärke LOW:	2,3 mA @ 24 VDC
Lautstärke HIGH:	4,7 mA @ 24 VDC
Anschluss:	Schraubklemmen, max. 2,5 mm²
Lautstärken:	
LOW:	89 dB ± 3 dB @ 1 m @ 24 VCD
HIGH:	99 dB ± 3 dB @ 1 m @ 24VDC
Tonarten:	
DIN:	1200 ~ 500 Hz (DIN 33404-3)
Slow Whoop:	500 ~ 1200 Hz (EN 2575)
Dauerton:	990 Hz (Pulsverhältnis in der Zentrale frei projektierbar)
Schweden Ton:	60Hz (150ms on, 150ms off)
Schutzart:	IP 21c
Umgebungstemperatur:	-10° bis +55°C
Durchmesser:	max. 108 mm
Bauhöhe:	91 mm
Gehäuse Farbe:	weiß (RAL 9003) rot (ähnlich RAL 3001)
Gehäuse Material:	ABS
Gewicht:	ca. 230 g
CPD-Zertifikat:	beantragt
VdS-Zulassung:	beantragt

Technical data

Operating voltage:	12 to 30 VDC
Power consumption:	
in idle mode:	500 µA
with volume LOW:	2.3 mA at 24 VDC
with volume HIGH:	4.7 mA at 24 VDC
Connection:	Screw clips, maximum 2.5 mm²
Volume settings:	
LOW:	89 dB ± 3 dB @ 1 m @ 24 VDC
HIGH	99 dB ± 3 dB @ 1 m @ 24 VDC
Types of tone:	
DIN:	1200 ~ 500 Hz (DIN 33404-3)
Slow Whoop:	500 ~ 1200 Hz (EN 2575)
Continuous tone:	990 Hz (pulse behaviour can be freely set on the control panel)
Swedish Tone:	60 Hz (150ms on, 150ms off)
Protection class:	IP 21c
Ambient temperature:	-10° to +55°C
Diameter:	max. 108 mm
Construction height:	91 mm
Case colour:	white (similar to RAL 9003) red (similar to RAL 3001)
Case material:	ABS plastic
Weight:	ca. 230 g
CPD-Certificate:	applied
VdS Approval:	applied

Weitere Informationen sind der Technischen Dokumentation zu entnehmen.
Further informations can be obtained from the technical documentation.

SCHRACK SECONET AG
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	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD.	Date: 25.04.2013 DOC No. TB/DS/332/552/059 Rev : 0
PROJECT :	Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station	
PURCHASER :	M/s BHEL - Transmission Buisness Group - New Delhi.	
CUSTOMER :	M/s Raichur Power Corporation Limited	
CONSULTANT :	M/s Steag Energy Services Pvt. Ltd. ; Delhi	
CONTRACTOR :	M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.	
P.O. No. & DATE :	312P385 dt. 12.03.13	

	TECHNICAL DATASHEET OF ADDRESSABLE MONITOR CUM CONTROL MODULE		REVISION MARK
1	Type	01 no. relay output with programmed fail-safe position , 2nos. monitored inputs and 1 optocoupler input	
2	Make	Schrack Seconet	
3	Model No .	BX-OI3	
4	Approval	VDS approved, as per EN54	
5	Short circuit isolator	Integrated (Inbuilt)	
6	Operation Voltage	12 - 30VDC (Loop Powered)	
7	Quiescent Current	typ. 550 µA Current consumption	
8	Alarm Current	typ. 550 µA Current consumption	
9	Ambient Temperature	—20° C to + 60 ° C	
10	Humidity	5 to 95% without condensation	
11	Colour Housing	Grey (Similar to RAL 7035)	
12	Material	ABS	
13	Dimensions (H X W X D)	67 mm X 67 mm X 20 mm	
14	Is Catalogue Enclosed ?	Yes	

REVISION HISTORY				
Date	Prepared By	Checked By	Approved By	Rev. Remark
25.04.2013	ABHISHEK	HIREN	BHAVIN	0

Approval Category:
'A' APPROVED AS SUBMITTED
Release distribution prints.
Transmittal No: E072-BHEL_TBG-3-O-13-4224
Date: 20-06-2013

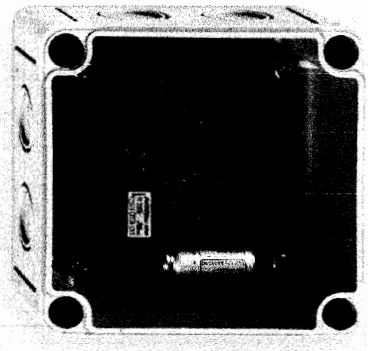
BHEL CAT-1
APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED DATE 20/6/13
Transmission Projects Engineering Management

STEAG Energy Services (India) Pvt. Ltd. steag
DRAWING/DOCUMENT REVIEW STATUS

APPROVED AS SUBMITTED Release distribution prints.	A	☑
APPROVED WITH COMMENTS Proceed with fabrication / manufacture / construction considering comments and resubmit for approval and stamping.	B	☐
NOT APPROVED correct the original drawing duly incorporating our comments and resubmit for approval / Information.	C	☐
INFORMATION NOTED Information furnished in the drawing is noted	H	☐

Transmittal No. E072-BHEL-TBG-3-O-13-4224
Date 20-06-2013 Name Sudeep Sekhar Signature
Kindly note approval of the drawing/documents does not absolve the contractor of any contractual obligations.

Ein-/Ausgangsmodul BX-OI3.
Input/Output Module BX-OI3.



• Relaisausgang mit programmierbarer Fail-Safe-Lage • 2 überwachte Eingänge • 1 Optokopplereingang • Einfache Einbindung von Sondermeldern • Geringer Stromverbrauch • Hohe Störfestigkeit durch spezielles Energiemanagement • Integrierter Kurzschlussisolator • Gehäuse erfüllt Schutzklasse IP 66.

• relay output with programmed fail-safe position • 2 monitored inputs • 1 optocoupler input • simple implementation of special detectors • low power consumption • high resistance against faults thanks to special energy management • integrated short circuit isolator • case satisfies IP 66 protection class.

Beschreibung

Das Ein-/Ausgangsmodul BX-OI3 ist geeignet zum Anschluss an die Integral X-LINE.
Es enthält einen Relaisausgang mit programmierbarer Fail-Safe-Lage, zwei Eingänge für die überwachte Abfrage von potentialfreien Kontakten und einen Optokopplereingang, welcher bei Bedarf zur Überwachung einer externen Spannung verwendet werden kann.

Das BX-OI3 ist besonders geeignet zur Einbindung von Sondermeldern (Flammen- und Linearmelder, Rauchansaugsysteme, etc.) in die Integral X-LINE. Sowohl die Adressierung des Moduls, als auch die Einstellung der Parameter für die angeschalteten Sondermelder (z.B. deren Verhalten bei Alarm und Störung) erfolgt mittels PC-Software über die Brandmelderzentrale.

Das BX-OI3 enthält einen Kurzschlussisolator, welcher im Fall von Drahtbruch oder Kurzschluss dafür sorgt, dass der Fehler lokalisiert wird und gleichzeitig der Betrieb der Ringleitung in vollem Funktionsumfang erhalten bleibt, zusätzlich wird die Spannung auf der Ringleitung intern auf Unterspannung überwacht.

Das BX-OI3 ist in ein Kunststoffgehäuse mit Schutzart IP 66 eingebaut, welches je nach Bedarf mit verschiedenen Kabeleinführungen ausgestattet werden kann.

Die Verwendung eines geschirmten Brandmeldekabels wird empfohlen, besonders in Bereichen, wo EMV-Störgrößen vorhanden sind, oder solche bedingt durch Arbeitsprozesse periodisch auftreten können.

Für die Projektierung gelten die landesspezifischen Richtlinien für Planung und Einbau von automatischen Brandmeldeanlagen.

Description

The input/output module BX-OI3 is suitable for the connection to Integral X-LINE.
It contains a relay output with a programmable fail-safe position, two inputs for monitored querying of potential-free contacts and an optocoupler input which can be used, if required, for monitoring external voltages.

The BX-OI3 is particularly well-suited for connecting special detectors (flame and line detectors, smoke aspirating systems etc.) using Integral X-LINE. Addressing of the module as well as setting the parameters for connected special detectors (e.g. how they behave when there is an alarm or a fault) is carried out via the fire alarm control panel using PC software.

The BX-OI3 contains a short circuit isolator which guarantees, that a possible failure is located and that the loop stays in unrestricted function even in case of a wire break or a short circuit, in addition the voltage on the loop line is internally monitored on under voltage.

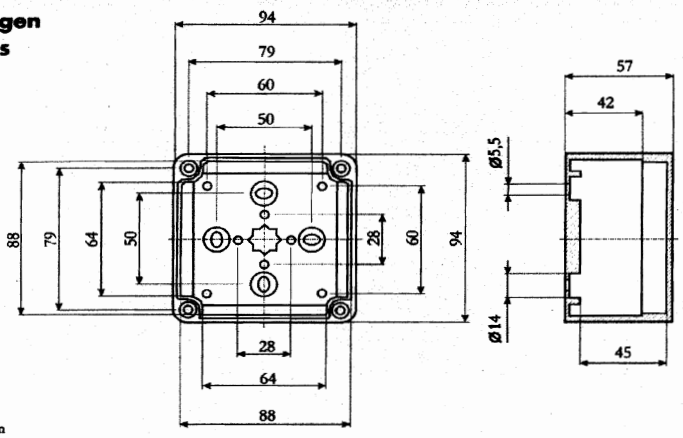
The BX-OI3 is installed in a IP 66 protection class plastic case, which can be fitted with different cable inlets depending on requirements.

A shielded cable installation is recommended, particularly in cases, where electromagnetic disturbances occur, or such could be caused periodically during working processes.

The country-specific guidelines for planning and installation of automatic fire alarm systems are applicable.

Ein-/Ausgangsmodul BX-OI3.
Input/Output Module BX-OI3.

Abmessungen
Dimensions



Alle Maße in mm
All dimensions in mm

Technische Daten

Betriebsspannung:	12 bis 30 VDC
Stromverbrauch:	typ. 550 µA
Signalübertragung:	seriell, 2-Leiter-Technik
Relaisausgang:	bistabiler Umschaltekontakt 230 V/2 A, (max. 60 W)
Überwachte Eingänge:	für potentialfreie Kontakte
Optokopplereingang:	Abfrage von potentialgebundenen Signalen, bzw. externen Spannungen von 0 bis 30 VDC
Anschluss:	Schraubklemmen, max. 1,5 mm²
Kurzschlussisolator:	integriert
Schutzart:	IP 66 mit Gehäuse
Umgebungstemperatur:	-20° bis +60°C
Rel. Luftfeuchtigkeit:	5 bis 95% ohne Kondensation
Abmessungen:	67 x 67 x 20 mm (mit Gehäuse 94 x 94 x 57 mm)
Gehäuse:	Polystyrol, halogenfrei
Farbe:	grau (RAL 7035)
VdS-Zulassung:	beantragt

Technical data

Operating voltage:	12 to 30 VDC
Current consumption:	typ. 550 µA
Signal transmission:	serial, 2 wire technology
Relay output:	bistable change-over contact 230 V/2 A, (max. 60 W)
Monitored inputs:	for potential-free contacts
Optocoupler input:	Querying potentially-charged signals, or external voltages of 0-30 VDC
Connection:	Screw clips, max. 1.5 mm²
Short circuit isolator:	integrated
Protection class:	IP 66 with case
Ambient temperature:	-20° to +60°C
Relative air humidity:	5 to 95% without condensation
Dimensions:	67 x 67 x 20 mm (with case 94 x 94 x 57 mm)
Case:	Polystyrol, halogen-free
Colour:	grey (RAL 7035)
VdS-Approval:	applied for

Weitere Informationen sind der Technischen Dokumentation zu entnehmen.
Further informations can be obtained from the technical documentation.

SCHRACK SECONET AG
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FIRE ALARM

www.schrack-seconet.com

SCHRACK SECONET

	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD.	Date: 20.04.2013 DOC No. TB/DS/332/552/058 Rev : 0

PROJECT :	**Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station**
PURCHASER :	**M/s BHEL - Transmission Buisness Group - New Delhi.**
CUSTOMER :	**M/s Raichur Power Corporation Limited**
CONSULTANT :	**M/s Steag Energy Services Pvt. Ltd. ; Delhi**
CONTRACTOR :	**M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.**
P.O. No. & DATE :	**312P385 dt. 12.03.13**

TECHNICAL DATASHEET OF ADDRESSABLE RELAY MODULE			**REVISION MARK**
1	Type	4 addressable potential-free double-throw contacts with integrated fault isolator and programmable fail safe position	
2	Make	Schrack Seconet	
3	Model No .	BX-REL4	
4	Approval	VDS approved, as per EN54	
5	Short Circuit Isolator	Integrated (Inbuilt)	
6	Operation Voltage	12 - 30VDC	
7	Current Consumption	typ. 510 µA Current consumption	
8	Ambient Temperature	—20° C to + 60 ° C	
9	Humidity	5 to 95% without condensetion	
10	Dimensions (H X W X D)	100 mm X 67 mm X 20 mm	
11	Is Catalogue Enclosed	Yes	

REVISION HISTORY				
Date	**Prepared By**	**Checked By**	**Approved By**	**Rev. Remark**
20.04.2013	ABHISHEK	HIREN	BHAVIN	0

BHEL CAT-1
APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED [signature] **DATE** 20/6/13
Transmission Projects Engineering Management

Approval Category:
'A' APPROVED AS SUBMITTED
Release distribution prints.
Transmittal No: E072-BHEL_TBG-3-O-13-4224
Date: 20-06-2013

STEAG Energy Services (India) Pvt. Ltd.
DRAWING/DOCUMENT REVIEW STATUS

APPROVED AS SUBMITTED Release distribution prints.	A	☑
APPROVED WITH COMMENTS Proceed with fabrication / manufacture / construction considering comments and resubmit for approval and stamping.	B	☐
NOT APPROVED correct the original drawing duly incorporating our comments and resubmit for approval / Information.	C	☐
INFORMATION NOTED Information furnished in the drawing is noted	H	☐

Transmittal No E072-BHEL-TBG-3-O-13-4224
Date 20-06-2013 Name Sudeep Nehar Signature
Kindly note that approval of the drawing/documents does not absolve the contractor / vendor from his contractual obligations.

No.: 20-2100004-01

Relay module BX-REL4

Contains 4 relays each with a potential-free double-throw contact with a switching capacity of up to 2 A and up to 230 V. The BX-REL 4 is also suitable for emitting switching impulses. The relay outputs can be switched to a fail-safe position in the event of voltage loss on the loop circuit, and the voltage on the loop circuit is also internally monitored for under voltage. Both the addressing of the module and the setting of its parameters, which are set separately for every input, are carried out using PC software via the fire alarm control panel. An IP 66 protection class plastic case is used for fitting the module, which can be fitted with various different cable inlets as required. The case must be ordered separately.

Operating voltage:	12 to 30 VDC
Power consumption:	typ. 510 µA
Signal transmission:	serial, 2 wire technology
Function:	4 potential-free relay outputs
Terminals:	Screw clips, max. 1.5 mm²
Relay output connection:	Screw clips, max. 2.5 mm²
Leitungslänge:	max. 100 m
Short circuit isolator:	integrated
Protection category:	IP 66 with case
Ambient temperature:	-20° to +60°C
Rel. air humidity:	5 to 95% without condensation
Relay output:	bistable change-over contact 230V/2 A
Switching power:	60 W (230 V, 0.25 A)
Switching frequency:	max. 3,125 Hz
Pulse emission:	200ms- 25 s in 100 ms intervals
Dimensions:	100 x 67 x 20 mm with case: 130 x 94 x 57 mm
Case:	Polystyrol, halogen-free
Colour:	grey RAL 7035
VdS-Approval:	G210134
CPD-Approval:	0786-CPD-21012

Description	Type	Art. No.
BX-REL4 Relay module	BX-REL4	20-2100004-01
Case for loop module	GEH MOD2 IP66	FG020235

	MEHTA & ASSOCIATES PROTECTION SYSTEMS PVT. LTD.	Date : 25.04.2013 Doc. No. : TB/DS/332/552/060 Rev. : 0

PROJECT :	**Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station**
PURCHASER :	**M/s BHEL - Transmission Buisness Group - New Delhi.**
CUSTOMER :	**M/s Raichur Power Corporation Limited**
CONSULTANT :	**M/s Steag Energy Services Pvt. Ltd. ; Delhi**
CONTRACTOR :	**M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.**
P.O. No. & DATE :	**312P385 dt. 12.03.13**

	TECHNICALDATASHEET OF ADDRESSABLE ZONE MONITOR MODULE		**REVISION MARK**
1	Type	Monitored Input	
2	Make	Schrack Seconet	
3	Model No .	BX-AIM	
4	Approval	VDS approved, as per EN54	
5	Short Circuit Isolator	Integrated (Inbuilt)	
6	Operation Voltage	12 to 30 VDC	
7	Quiscent Current	typ. 450 µA current consumption	
8	Alarm Current	typ. 450 µA current consumption	
9	Ambient Temperature	-20° C to +60° C	
10	Humidity	5 to 95% without condensation	
11	Dimensions (H X W X D)	67 x 67 x 20 mm	
12	Is Catalogue Enclosed	Yes	

REVISION HISTORY				
Date	**Prepared By**	**Checked By**	**Approved By**	**Rev. Remark**
25.04.2013	ABHISHEK	HIREN	BHAVIN	0

Approval Category:
'A' APPROVED AS SUBMITTED
Release distribution prints.
Transmittal No: E072-BHEL_TBG-3-O-13-4224
Date: 20-06-2013

BHEL CAT-1
APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED **DATE** 28/6/13
Transmission Projects Engineering Management

STEAG Energy Services (India) Pvt. Ltd. steag
DRAWING/DOCUMENT REVIEW STATUS

APPROVED AS SUBMITTED Release distribution prints.	A	☑
APPROVED WITH COMMENTS Proceed with fabrication / manufacture / construction considering comments and resubmit for approval and stamping.	B	☐
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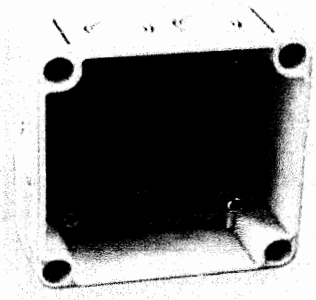
INFORMATION NOTED Information furnished in the drawing is noted	H	☐

Transmittal No. E072-BHEL-TBG-3-O-13-4224
Date 20-06-2013 Name Sudeep Selekar Signature
Kindly note that approval of the drawing/documents does not absolve the contractor / vendor from his contractual obligations.

Eingangsmodul BX-AIM.
Input Module BX-AIM.



• 1 überwachter Eingang • Überwachung von Ex-Bereichen • einfache Einbindung von Sondermeldern • geringer Stromverbrauch • hohe Störfestigkeit durch spezielles Energiemanagement • integrierter Kurzschlussisolator • lokale Kurzschlusserkennung • verbessertes Aufstartverhalten • Gehäuse erfüllt Schutzklasse IP 66.

• 1 monitored input • monitoring of intrinsically safe areas • simple implementation of special detectors • low power consumption • high resistance against faults thanks to special energy management • integrated short circuit isolator • local short circuit detection • reduced on-start time • case satisfies IP 66 protection class.

Beschreibung

Das Eingangsmodul BX-AIM ist geeignet zum Anschluss an die eXtended Line und kann entweder als überwachter Eingang zur Abfrage von potentialfreien Kontakten oder als kollektiv adressierbare Meldergruppe der Gleichstromtechnik projektiert werden.

Der überwachte Eingang kann bei Bedarf als "Standard-Schnittstelle Löschen" (nach VdS Richtlinien) projektiert werden, zusätzlich ist eine Abgleichfunktion der Störgrenzen an den Ruhestromwert (normenkonform nach EN 54-13 bzw. VdS 2489) möglich.

Mit Zwischenschaltung einer Zener-Barriere und Verwendung von eigensicheren Meldern (Gleichstromtechnik) können auch Ex-Bereiche überwacht werden.

Das BX-AIM enthält einen Kurzschlussisolator, welcher im Fall von Drahtbruch oder Kurzschluss dafür sorgt, dass der Fehler selbstständig autark isoliert wird und gleichzeitig der Betrieb der Ringleitung in vollem Funktionsumfang erhalten bleibt, dadurch verringert sich die Aufstartzeit, zusätzlich wird die Spannung auf der Ringleitung intern auf Unterspannung überwacht.

Das BX-AIM ist in ein Kunststoffgehäuse mit Schutzart IP 66 eingebaut, welches je nach Bedarf mit verschiedenen Kabeleinführungen ausgestattet wird.

Die Verwendung eines geschirmten Brandmeldekabels wird empfohlen, besonders in Bereichen, wo EMV-Störgrößen vorhanden sind, oder solche bedingt durch Arbeitsprozesse periodisch auftreten können.

Für die Projektierung gelten die landesspezifischen Richtlinien für Planung und Einbau von automatischen Brandmeldeanlagen.

Description

The input module BX-AIM is suitable for the connection to eXtended Line and can either be programmed as a monitored input for potential-free contacts or as a collectively addressable detector zone using DC technology.

The monitored input can, if required, be programmed as a "standard extinguishing interface" (in accordance with VdS directives). The primary input now contains a feature for comparing fault thresholds with the quiescent current levels (conformant to standards EN 54-13 and VdS 2489).

By interconnecting a zener barrier and by using intrinsically safe detectors (DC technology) it is also possible to monitor hazardous areas.

The BX-AIM contains a short circuit isolator which guarantees, that a possible failure is isolated independently self-sufficiently and that the loop stays in unrestricted function even in case of a wire break or a short circuit, the start on time is also reduced, in addition the voltage on the loop line is internally monitored on under voltage.

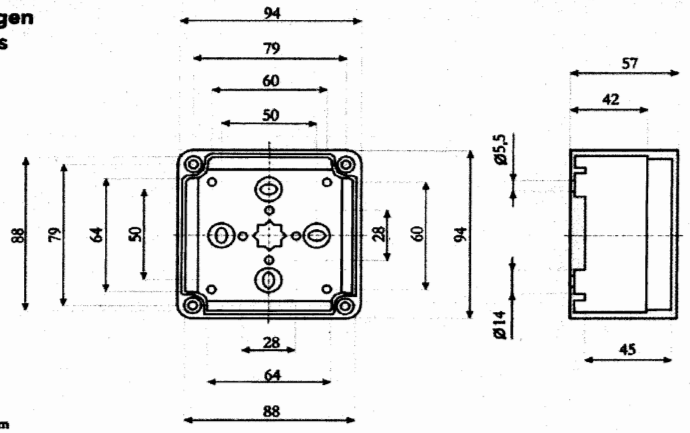
The BX-AIM is installed in a IP 66 protection class plastic case, which can be fitted with different cable inlets depending on requirements.

A shielded cable installation is recommended, particularly in cases, where electromagnetic disturbances occur, or such could be caused periodically during working processes.

The country-specific guidelines for planning and installation of automatic fire alarm systems are applicable.

Eingangsmodul BX-AIM.
Input Module BX-AIM.

Abmessungen
Dimensions



Alle Maße in mm
All dimensions in mm

Technische Daten

Betriebsspannung:	+10 bis +29 VDC
Stromverbrauch:	
ohne Gleichstromabzweig:	typ. 460 µA
mit Gleichstromabzweig:	typ. 1800 µA
Signalübertragung:	seriell, 2-Leiter-Technik
Funktion:	Gleichstromabzweig, überwachter Eingang
Anschluss:	Schraubklemmen, max. 1,5 mm²
Kurzschlussisolator:	integriert
Schutzart:	IP 66 mit Gehäuse
Umgebungstemperatur:	-20° bis +60°C
Rel. Luftfeuchtigkeit:	5 bis 95% ohne Kondensation
Abmessungen:	67 x 67 x 20 mm (mit Gehäuse 94 x 94 x 57 mm)
Gehäuse:	Polystyrol, halogenfrei
Farbe:	grau (RAL 7035)
VdS-Zulassung:	G208138
CE-Zertifikat:	0786-CPD-20601

Technical data

Operating voltage:	+10 to +29 VDC
Current consumption:	
without DC branch:	typ. 460 µA
with DC branch:	typ. 1800 µA
Signal transmission:	serial, 2 wire technology
Function:	DC branch module, monitored input
Connection:	Screw clips, max. 1.5 mm²
Short circuit isolator:	integrated
Protection class:	IP 66 with case
Ambient temperature:	-20° to +60°C
Relative air humidity:	5 to 95% without condensation
Dimensions:	67 x 67 x 20 mm (with case 94 x 94 x 57 mm)
Case:	Polystyrol, halogen-free
Colour:	grey (RAL 7035)
VdS-Approval:	G208138
CE-Certificate:	0786-CPD-20601

Weitere Informationen sind der Technischen Dokumentation zu entnehmen.
Further informations can be obtained from the technical documentation.

Schrack Seconet AG
A-1122 Wien/Vienna, Eibesbrunnergasse 18, Tel.:+43-1-81157-0, office@schrack-seconet.com

FIRE ALARM

www.schrack-seconet.com

SCHRACK SECONET

F-DD-04

Rev no.00

	MEHTA & ASSOCIATES PROTECTION SYSTEMS PVT. LTD.	Date : 25.04.13
		MASS Doc. No. : TB/DS/332/552/051
		Rev. : 0

PROJECT :	**Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station**
PURCHASER :	**M/s BHEL - Transmission Buisness Group - New Delhi.**
CUSTOMER :	**M/s Raichur Power Corporation Limited**
CONSULTANT :	**M/s Steag Energy Services Pvt. Ltd. ; Delhi**
CONTRACTOR :	**M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.**
P.O. No. & DATE :	**312P385 dt. 12.03.13**

DATASHEET FOR DIGITAL LHS CABLE

			REVISION MARK
1	Type	Digital type	
2	Make	Protectowire	
3	Model No .	**PHSC -155 - EPC**	
4	Approval	UL , FM	
5	Operation Volatage	6 VDC up to 28 VDC	
6	Current	1 Amp	
7	Max. Recommended Ambient Temprature	100 °F (38 °C)	
8	Alarm Temprature	155 °F (68 °C)	
9	M.O.C. of Conductor	Steel	
10	Number of Conductor	Two	
11	Application	Cable Trays	
12	Outer Jacket	Flame Reardant Vinyl Outer Jacket	
13	Resistance	0.2 Ohm /FEET	
14	Acessories	Fastenings, Sleeves, straps,staples, Clips (Mounting)rings,junction box, test terminals, fittings,Connector etc.	
15	Is Catalogue Enclosed ?	Yes	

REVISION HISTORY

Date	Prepared By	Checked By	Approved By	Rev Remark
25.04.13	Abhishek	Hiren	Bhavin	

Approval Category:
'A' APPROVED AS SUBMITTED
Release distribution prints.
Transmittal No: E072-BHEL_TBG-3-O-13-4216
Date: 20-06-2013

BHEL CAT-1
APPROVED
This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.
SIGNED DATE 28/6/13
Transmission Projects Engineering Management

STEAG Energy Services (India) Pvt. Ltd. steag
DRAWING/DOCUMENT REVIEW STATUS

APPROVED AS SUBMITTED Release distribution prints.	A	☑
APPROVED WITH COMMENTS Proceed with fabrication / manufacture / construction considering comments and resubmit for approval and stamping.	B	☐
NOT APPROVED correct the original drawing duly incorporating our comments and resubmit for approval / Information.	C	☐
INFORMATION NOTED Information furnished in the drawing is noted	H	☐

Transmittal No. E072-BHEL_TBG-3-O-13-4216
Date 20-06-2013 Name Sudeep Belekar Signature
Kindly note that approval of the drawing/documents does not absolve the contractor / vendor from his contractual obligations.

BHEL | CAT-1

A P P R O V E D

This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.

SIGNED TDT | DATE 15.01.14

Transmission Business Engineering Management

CAT A

F-DD-04

R

MEHTA & ASSOCIATES
FIRE PROTECTION SYSTEMS PVT. LTD.

Date :14.12.2013

DOC No. : TB/DS/332/552/040

Rev : 2

PROJECT :	**Fire Protection System for 2 * 800 MW Yeramarus TPS - 400 KV Sub Station**
PURCHASER :	**M/s BHEL - Transmission Buisness Group - New Delhi.**
CUSTOMER :	**M/s Raichur Power Corporation Limited**
CONSULTANT :	**M/s Steag Energy Services Pvt. Ltd. ; Delhi**
CONTRACTOR :	**M/s Mehta & Associates Fire Protection Sys. Pvt. Ltd.**
P.O. No. & DATE :	**312P385 dt. 12.03.13**

DATASHEET FOR 2C X 1.5 & 2C X 2.5 SQ. MM CONTROL/POWER CABLE

				REVISION MARK
1	Type	XLPE Insulated, PVC Sheathed,Armoured FRLS Type, 1.1 KV Grade Copper cable		
2	Make	POLYCAB/DELTON/PARAMOUNT/NICCO /RADIENT/TORRENT/HVPL		
3	Size	2C x 1.5 Sq. MM	2C x 2.5 Sq. MM	
4	Voltage Grade	1100 Volt		
5	Applicable Standard	As per IS : 7098 part - 1 - 1988		R2
6	**CONDUCTOR**			
6.1	Material and grade	7 Stranded Copper		
6.2	Nominal cross sectional area of Main (Sq.mm)	1.5	2.5	
6.3	Maximum D.C Resistance at 20˚C(ohm/km)(Approx.)	**12.1**	**7.41**	
7	**INSULATION**			
7.1	Material	XLPE		R2
7.2	Nominal thickness(mm)	0.7	0.7	R2
7.3	Core Identification	RED & BLACK		
10	**INNER SHEATH**			
10.1	Material	Extruded FRLS PVC-Type ST2		R1
10.2	Minimum Thickness(mm)	0.3		
10.3	Color	Black		
11	**ARMOUR**			
11.1	Material	Single Layer G.S Wire Armoured		
11.2	Minimum Thickness(mm)	1.4		
12	**OUTER SHEATH**			
12.1	Material	Extruded FRLS PVC-Type ST2		R1
12.2	Minimum Thickness(mm)	1.24		
12.3	Color	Black		
13	Overall Diameter (Approx.)-(mm)	13.2±2	14.0±2	
14	Test	To be conducted As per IS : 7098 part - 1 - 1988		R1
15	Embossing Details	As per manufacturer's standard		
16	Application	Loop Cable & Control Cable	External 24 V DC Power supply distribution	

REVISION HISTORY

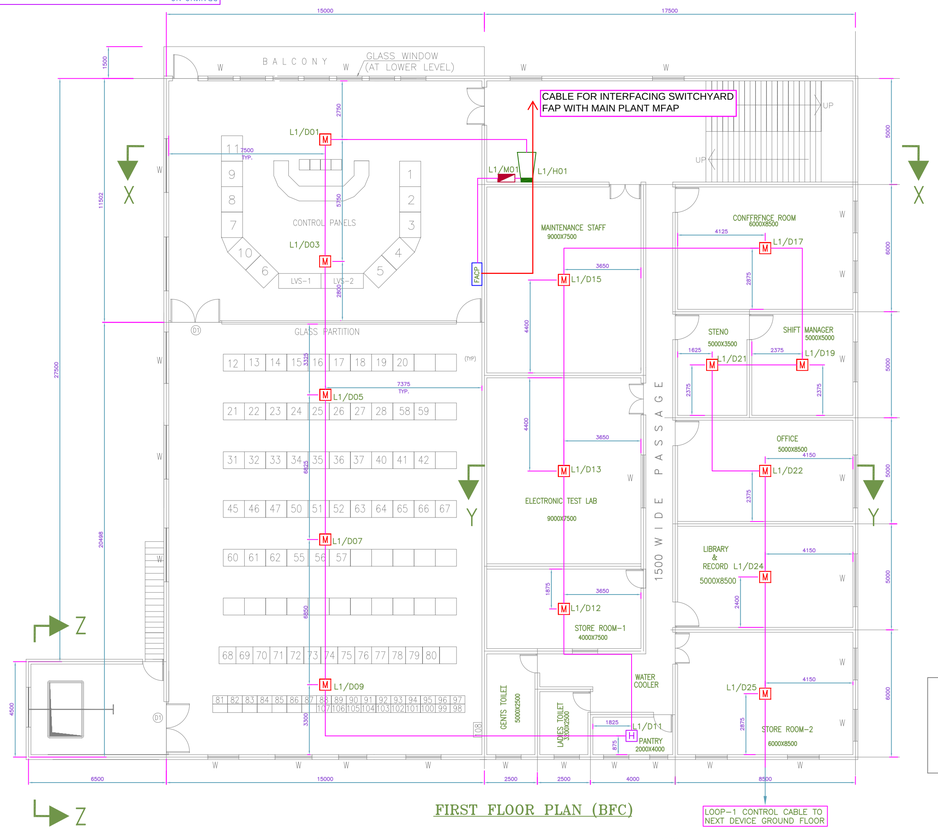
Date	Prepared By	Checked By	Approved By	Rev. Remark
20.04.2013	ABHISHEK	HIREN	BHAVIN	R0
01.07.2013	ABHISHEK	HIREN	BHAVIN	R1
14.12.2013	ABHISHEK	APEXA	APEXA	R2

E072-BHEL_TBG-3-O-14-6065

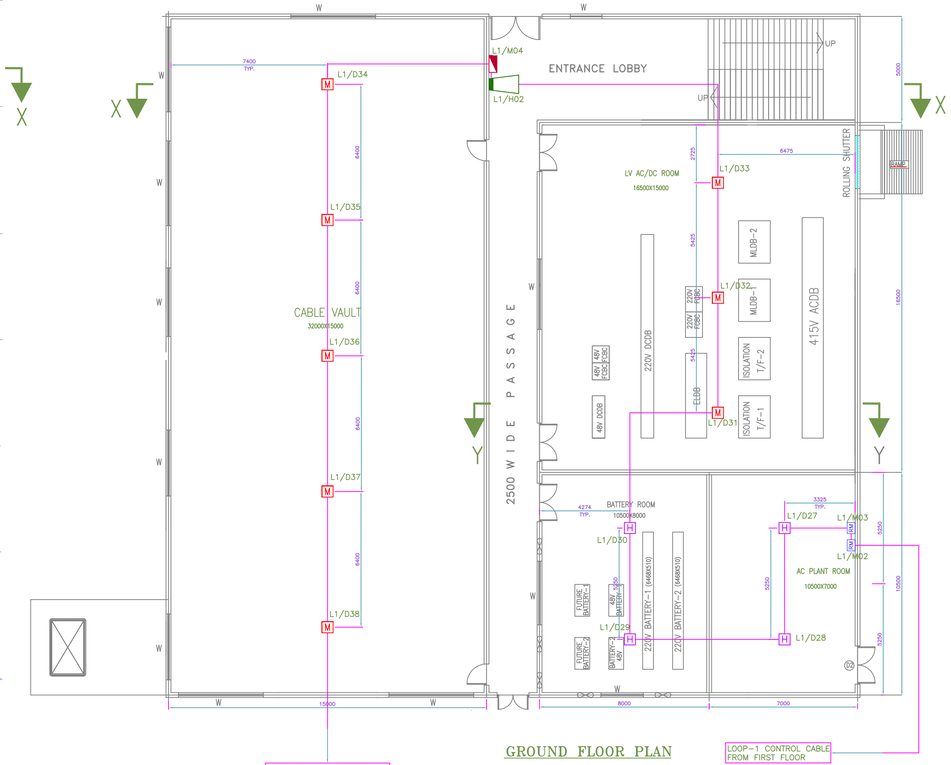
DO NOT SCALE. IF IN DOUBT, ASK.

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED

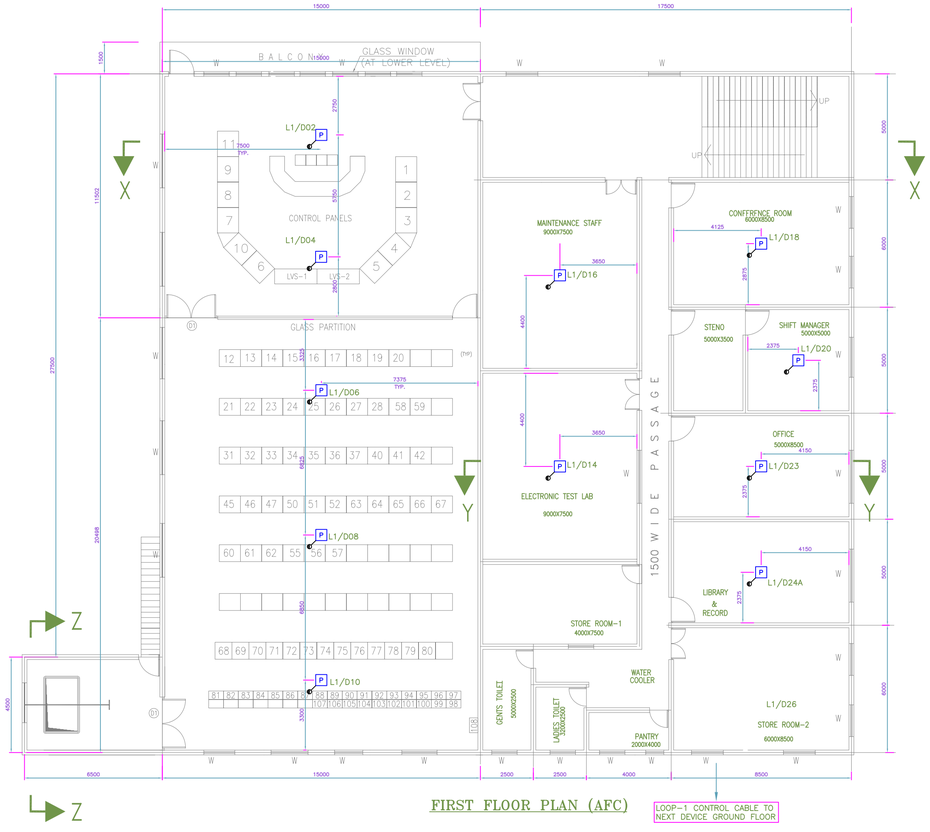
DRAWING NO. TB/DWG/332/552/003



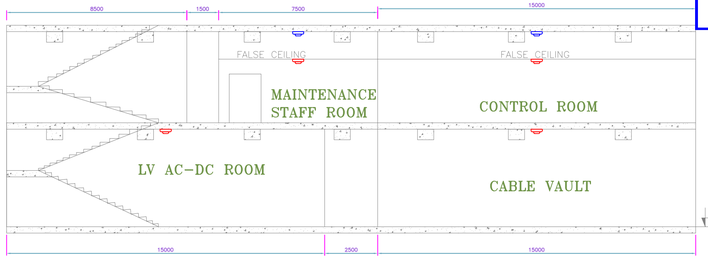
FIRST FLOOR PLAN (BFC)



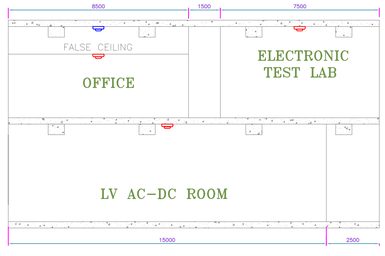
GROUND FLOOR PLAN



FIRST FLOOR PLAN (AFC)



SECTION OF X-X



SECTION OF Y-Y

LEGENDS

SR. NO.	SYMBOLS	DESCRIPTION	QTY.
1	H	HEAT DETECTOR	05
2	M	MULTI SENSOR SMOKE DETECTOR	22
3	P	PHOTOELECTRIC SMOKE DETECTOR	11
4		MANUAL CALL POINT	2
5		HOOTER	2
5	RM	RELAY MODULE	2
6		RESPONCE INDICATOR	11
7		2Cx1.5 SQ.MM.ARMOR,FRLS FIRE ALARM CONTROL CABLE	255 MTR

DESIGN CHART & BILL OF MATERIALS

SR. NO.	DESCRIPTION	Area Sq.Mt.	SPACING STANDARD	SPACING DESIGN	SPACING ACTUAL	HD	MSD (BFC)	OSD (AFC)	RI	MCP	HOOTER	RM	CABLE LENGTH IN (MTRS)
	FIRST FLOOR												
1	CONTROL ROOM (AFC)	180.0 M^2	100 M^2	100 M^2	90.0 M^2	0	0	2	2	0	0	0	10
2	CONTROL ROOM (BFC)	180.0 M^2	100 M^2	100 M^2	90.0 M^2	0	2	0	0	0	0	0	20
3	PLCC ROOM (AFC)	300 M^2	100 M^2	100 M^2	100 M^2	0	0	3	3	0	0	0	15
4	PLCC ROOM (BFC)	300 M^2	100 M^2	100 M^2	100 M^2	0	3	0	0	0	0	0	20
5	PANTRY	4.15 M^2	50 M^2	50 M^2	4.15 M^2	1	0	0	0	0	0	0	06
6	STORE ROOM-1	28.26 M^2	100 M^2	100 M^2	28.26 M^2	0	1	0	0	0	0	0	07
7	ELECTRICAL TEST LAB (AFC)	67.77 M^2	100 M^2	100 M^2	67.77 M^2	0	0	1	1	0	0	0	05
8	ELECTRICAL TEST LAB (BFC)	67.77 M^2	100 M^2	100 M^2	67.77 M^2	0	1	0	0	0	0	0	10
9	MAINTENANCE STAFF ROOM (AFC)	64.0 M^2	100 M^2	100 M^2	64.0 M^2	0	0	1	1	0	0	0	10
9	MAINTENANCE STAFF ROOM (BFC)	64.0 M^2	100 M^2	100 M^2	64.0 M^2	0	1	0	0	0	0	0	10
10	CONFERENCE ROOM (AFC)	52.42 M^2	100 M^2	100 M^2	52.42 M^2	0	0	1	1	0	0	0	05
11	CONFERENCE ROOM (BFC)	52.42 M^2	100 M^2	100 M^2	52.42 M^2	0	1	0	0	0	0	0	05
12	SHIFT MANAGER ROOM (AFC)	25.0 M^2	100 M^2	100 M^2	25.0 M^2	0	0	1	1	0	0	0	03
13	SHIFT MANAGER ROOM (BFC)	25.0 M^2	100 M^2	100 M^2	25.0 M^2	0	1	0	0	0	0	0	05
14	STENO ROOM	18.11 M^2	100 M^2	100 M^2	18.11 M^2	0	1	0	0	0	0	0	03
15	OFFICE ROOM (AFC)	42.5 M^2	100 M^2	100 M^2	42.5 M^2	0	0	1	1	0	0	0	06
15	OFFICE ROOM (BFC)	42.5 M^2	100 M^2	100 M^2	42.5 M^2	0	1	0	0	0	0	0	05
17	LIBRARY & RECORD ROOM (AFC)	42.5 M^2	100 M^2	100 M^2	42.5 M^2	0	0	1	1	0	0	0	03
18	LIBRARY & RECORD ROOM (BFC)	42.5 M^2	100 M^2	100 M^2	42.5 M^2	0	1	0	0	0	0	0	02
19	STORE ROOM-2	39.0 M^2	100 M^2	100 M^2	39.0 M^2	0	1	0	0	0	0	0	05
20	STAIR	---	---	---	---	0	0	0	0	1	1	2	15
	GROUND FLOOR												
1	CABLE VALT	480 M^2	100 M^2	100 M^2	96.0 M^2	0	5	0	0	0	0	0	25
2	AC PLANT ROOM	73.5 M^2	50 M^2	50 M^2	36.75 M^2	2	0	0	0	0	0	0	15
3	LT AC/DC ROOM	247.5 M^2	100 M^2	100 M^2	82.5 M^2	0	3	0	0	0	0	0	20
4	BATTERY ROOM	84 M^2	50 M^2	50 M^2	42 M^2	2	0	0	0	0	0	0	15
5	CORRIDOR	---	---	---	---	0	0	0	0	1	1	0	10
	TOTAL					5	22	11	11	2	2	2	255

NOTE:-

1) ALL THE DIMENSIONS ARE IN MM & ALL THE ELEVATIONS & COORDINATES ARE IN METER. UNLESS AND OTHERWISE SPECIFIED.
2) DESIGN OF FIRE ALARM SYSTEM IS AS PER TAC/ IS -2189 & TENDER SPECIFICATIONS.
3) THE DETECTOR LOCATIONS ARE SUBJECT TO MINOR CHANGE TO AVOID FOULING WITH EXISTING SUPPORT, STRUCTURE, LIGHTING FIXTURES, AC DIFFUSERS AS PER THE ACTUAL SITE CONDITION AFTER CONSULTATION WITH CONCERN SITE ENGINEERS
4) MCPS WILL BE MOUNTED AT A HEIGHT OF 1.4 METERS FROM FLOOR STANDING LEVEL.
5) HOOTERS WILL BE MOUNTED AT A HEIGHT OF 2.3 METERS FROM FLOOR STANDING LEVEL.
6) DETECTOR & DEVICES LOCATIONS ARE INDICATIVE; EXACT LOCATION SHALL BE DECIDED TO SUIT SITE CONDITION.
7) INDICATED CABLE ROUTING ARE TENTATIVE & LIKELY TO CHANGE AS PER SITE CONDITIONS.
8) MAIN FIRE ALARM PANEL WOULD BE LOCATED INSIDE SWITCHYARD CONTROL ROOM
9) ALL ADDRESSABLE DEVICE SHALL BE PROVIDED WITH INBUILT LINE ISOLATOR MODULE.
10) RELAY MODULE ARE PROVIDE POTENTIAL FREE CONTACT FOR TRIP AC SYSTEM AND ACTUATE FIRE DAMPER IN CASE OF FIRE.
11) POTENTIAL FREE CONTACT PROVIDED IN FIRE ALARM PANEL BY MASS FOR INTERFACING BETWEEN MAIN FIRE ALARM PANEL TO FIRE ALARM PANEL i.e. INTERFACE OF MFAP IN THE MAIN PLANT TO FAP OF SWITCHYARD.
12) LAYING AND TERMINATION OF POWER / CONTROL CABLE RELATED TO FIRE FIGHTING SYSTEM OF SUBSTATION SHALL BE IN MASS SCOPE.
13) REF.BASE DRAWING NO. TB 1 332 618 008 REV.NO.-04
14) REFER DRAWING NO REF TB/DWG/332/552/006 FOR TYPICAL CIRCUIT WIRING DIAGRAM .

BHEL | **CAT-1**

APPROVED

This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.

SIGNED TDT | **DATE** 17.07.13

Transmission Business Engineering Management

CUSTOMER : PROJECT :	RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION-(2x800MW) 400kV Switchyard
CONSULTANT :	CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.
PURCHASER :	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION
CONTRACTOR :	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402-403, 'SACHET', OPP. BALAJI GARDEN RESTAURANT ; PRERNATIRTH DERASAR ROAD, SATELLITE, AHMEDABAD - 380 015.

	NAME	SIGN.	DATE
DRAWN	ABHISHEK	ABHISHEK	24.04.13
CHECKED	HIREN	HIREN	24.04.13
APPROVED	BHAVIN	BHAVIN	24.04.13

P.O. Number - 312P385 Dated-12.03.13

REV.	DATE	
		ALTERED
		CHECKED
		APPROVED

ZONE | DEPT. | CODE | SCALE - 1:1100 | CARD CODE

PROJECT :- FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)

TITLE: Fire Alarm & Detection system inside control room

DRAWING NO. TB/DWG/332/552/003 | REV. 0

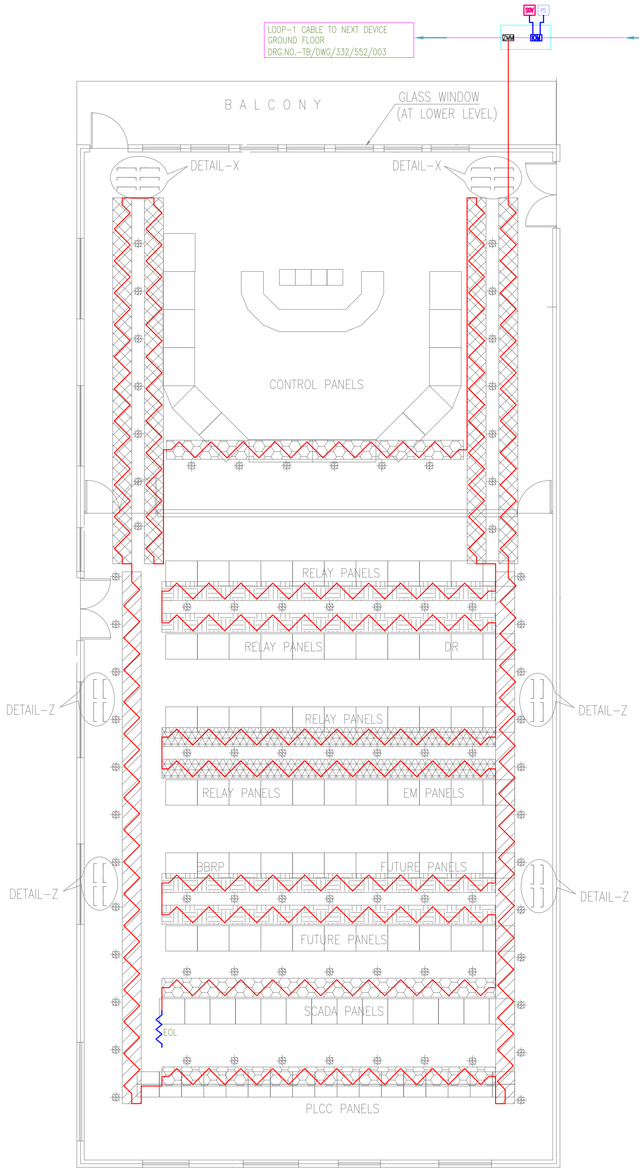
SHEET No. 1 OF 1 | NEXT SHEET -- --

SIZE-A1

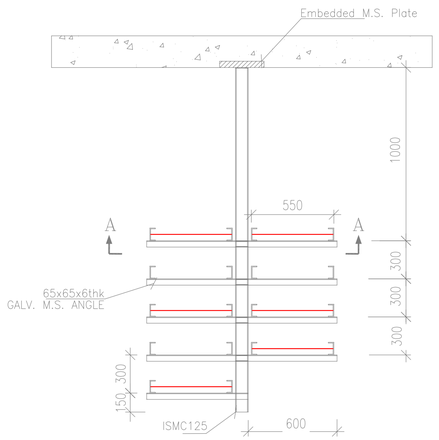
FILE PATH :-FILE : \\Server\engg\Projects\501-520\518 - BHEL_RPCL YERAMARUS TPS(Extn.)\Orga\Electrical\FDA Drawings\delhi visit FDA\revised 517 - MASS-MO1

DO NOT SCALE. IF IN DOUBT, ASK.

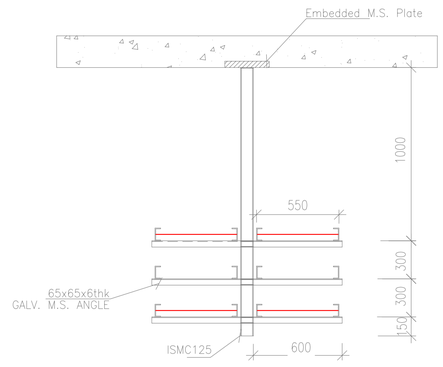
ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED



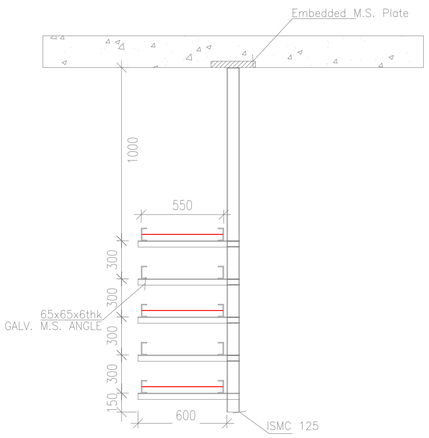
UNDERHUNG CABLE TRAY LAYOUT FOR CONTROL & RELAY ROOMS ON FIRST FLOOR



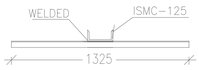
TYPICAL DETAIL OF UNDERHUNG CABLE TRAY (SECTION-1)



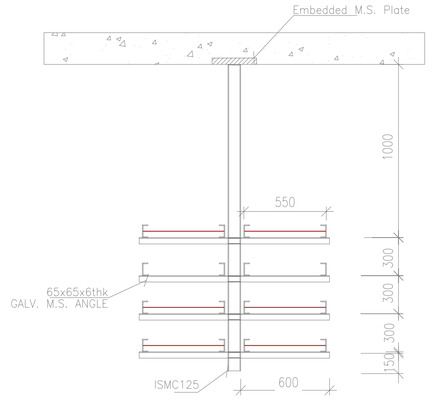
TYPICAL DETAIL OF UNDERHUNG CABLE TRAY (SECTION-3)



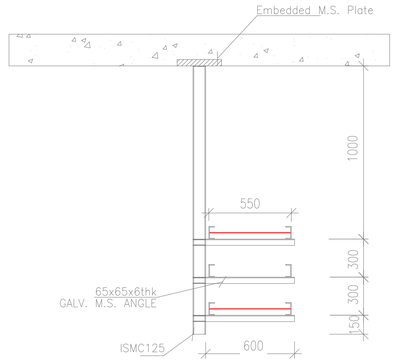
TYPICAL DETAIL OF UNDERHUNG CABLE TRAY (SECTION-2)



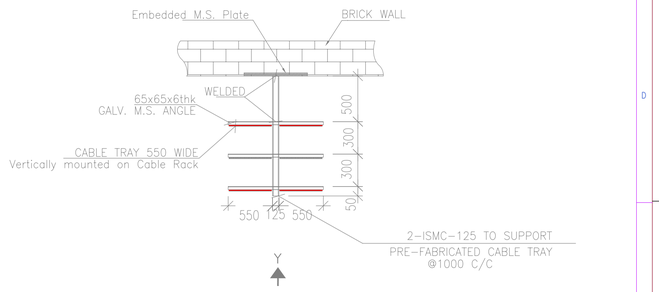
SECTION A-A



TYPICAL DETAIL OF UNDERHUNG CABLE TRAY (SECTION-4)



TYPICAL DETAIL OF UNDERHUNG CABLE TRAY (SECTION-5)



DETAIL X

VERTICAL WALL MOUNTED CABLE TRAY

BHEL	CAT-1
A P P R O V E D This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.	
SIGNED TDT	DATE 17.07.13
Transmission Business Engineering Management	

SCHEDULE OF QUANTITIES

SR. NO.	SYMBOLS	DESCRIPTION	MODEL NO.	QUANTITY
1	IOM	INPUT OUTPUT MODULE FOR MWS	BX - 013	01 NOS.
3	ZMM	ZONE MONITOR MODULE	BX - AIM	01 NOS.
4		2Cx1.5 SQ.MM.ARMOR,FRLS FIRE ALARM CONTROL CABLE	----	20 MTR.
5		24V POWER CABLE	----	----
6		LHS CABLE	----	500 MTR.
7	PS	PRESSURE SWITCH FOR MVW SPRAY SYSTEM	----	01 NOS.
8	SOV	SOLENOID VALVE FOR MVW SPRAY SYSTEM	----	01 NOS.
9		END OF LINE RESISTOR	----	01 NOS.

NOTE:-

1) ALL THE DIMENSIONS ARE IN MM & ALL THE ELEVATIONS & COORDINATES ARE IN METER. UNLESS AND OTHERWISE SPECIFIED.
2) DESIGN OF FIRE ALARM SYSTEM IS AS PER TAC/ IS -2189 & TENDER SPECIFICATIONS.
3) INDICATED CABLE ROUTING ARE TENTATIVE & LIKELY TO CHANGE AS PER SITE CONDITIONS.
4) IOM MODULE PROVIDE FOR MVWS SYSTEM.
5) LOOP CABLE WILL BE USED IN THE AREA AS MENTIONED IN TENDER TECHNICAL SPECIFICATIONS.
6) SUITABLE ARRANGEMENTS SHALL BE PROVIDED TO HOLD LHS CABLE PROPERLY. LHS SENSORS SHALL BE LAID IN THE CABLE TRAY IN ZIG-ZAG FASHION.
7) LHS SENSORS SHALL BE SUPPORTED AT EVERY 0.85M. INTERVAL (APPROXIMATELY) AND SHALL RUN ON ALL BOTTOM, TOP AND ALTERNATE TRAYS.
8) LHS DETECTION SYSTEM ZONE LENGTH SHALL BE SAME AS THAT OF MVW SPRAY SYSTEM ZONE AND ONE NUMBER OF ADDRESSABLE UNIT SHALL BE PROVIDED FOR LHS SYSTEM IN EVERY ZONE.
9) MAIN FIRE ALARM PANEL WOULD BE LOCATED INSIDE SWITCHYARD CONTROL ROOM
10) ALL ADDRESSABLE DEVICE SHALL BE PROVIDED WITH INBUILT LINE ISOLATOR MODULE.
11) FIXING OF SUPPORTS FOR LHS CABLE ARE INDICATIVE EXACT ARRANGEMENTS SHALL BE DECIDED TO SUIT SITE CONDITION.
12) EXISTING CABLE TRAYS MAY BE USED FOR LAYING OF CABLE WHEREVER POSSIBLE.
13) QUANTITY OF ITEM MAY CHANGE AS PER CHANGE IN LAYOUT.
14) CROSS ZONING OF LHS CABLE WITH SMOKE DETECTORS IN CABLE VAULT ROOM SHALL BE DONE AS PER TECHNICAL SPECIFICATION.
15) POTENTIAL FREE CONTACT PROVIDED IN FIRE ALARM PANEL BY MASS FOR INTERFACING BETWEEN MAIN FIRE ALARM PANEL TO FIRE ALARM PANEL .
16) LAYING AND TERMINATION OF POWER / CONTROL CABLE RELATED TO FIRE FIGHTING SYSTEM OF SUBSTATION SHALL BE IN MASS SCOPE..
17) REFER BASE DRAWING NO :-TB 1 332 618 011 REV.-0

CUSTOMER : PROJECT :	RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION-(2x800MW) 400kV Switchyard
CONSULTANT :	CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.
PURCHASER :	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION
CONTRACTOR :	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402-403, SAGNET, OPP. BALAJI GARDEN RESTAURANT, PRERNATIRTH DERASAR ROAD, SATELLITE, AHMEDABAD - 380 015.
P.O. Number - 312P385 Dated-12.03.13	

	NAME	SIGN.	DATE
DRAWN	ABHISHEK	ABHISHEK	27.04.13
CHECKED	HIREN	HIREN	27.04.13
APPROVED	BHAVIN	BHAVIN	27.04.13

REV.	DATE	ALTERED / CHECKED / APPROVED

DEPT. | SCALE - 1:1100 | CARD CODE | CODE | ZONE

PROJECT :- FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)

TITLE: LAYOUT OF LHS CABLE FOR CONTROL ROOM CABLE VAULT AREA

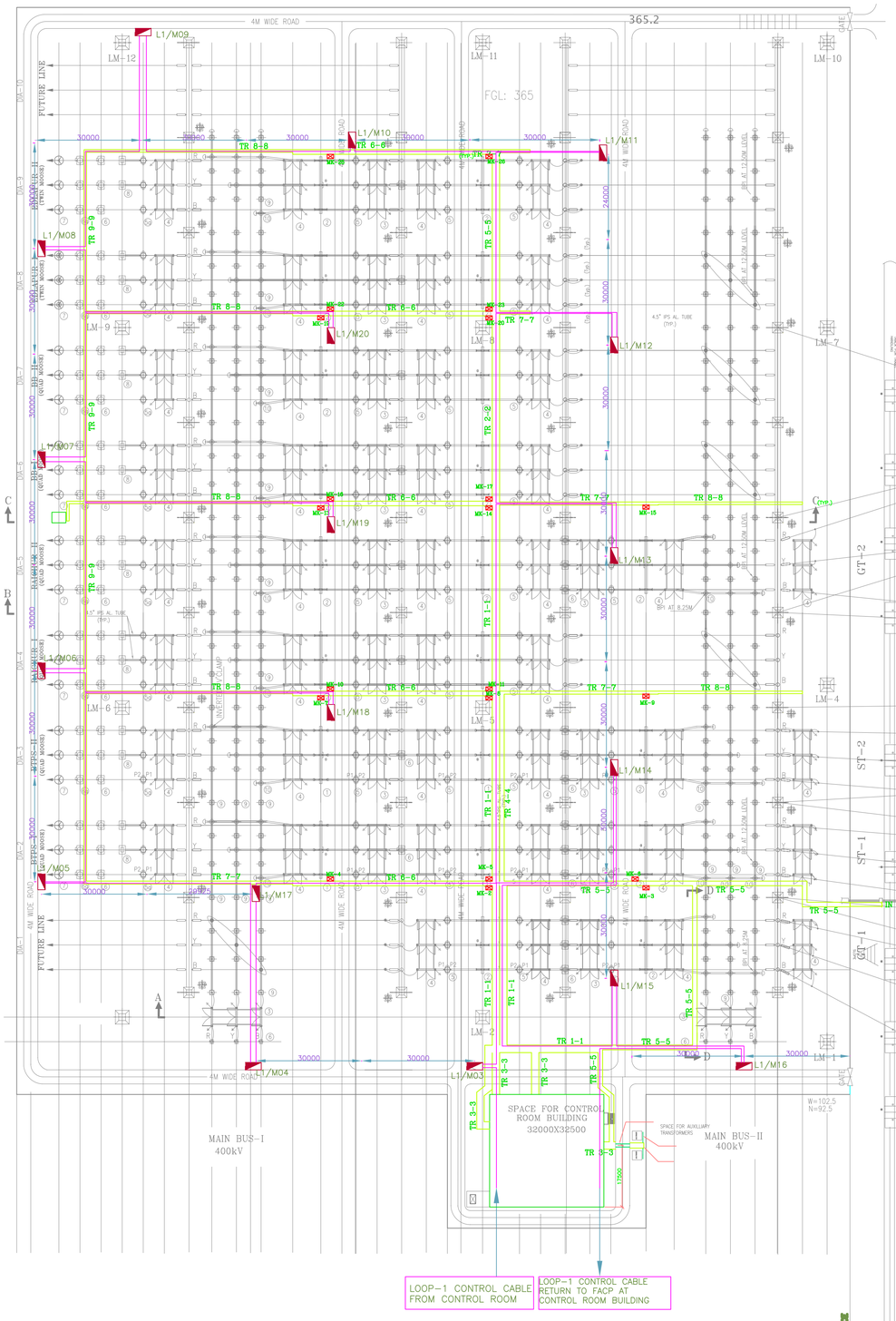
DRAWING NO. TB/DWG/332/552/007 | REV. 0

SHEET No. 1 OF 1 | NEXT SHEET - -

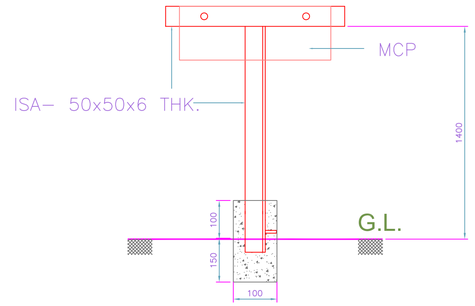
SIZE-A1

NO COMMENTS

E072-BHEL_TBG-3-M-14-6016



TYP. MOUNTING ARRANGEMENT FOR MANUAL CALL POINT



FRONT VIEW

NOTE:–

1) ALL THE DIMENSIONS ARE IN MM & ALL THE ELEVATIONS & COORDINATES ARE IN METER. UNLESS AND OTHERWISE SPECIFIED.
2) DESIGN OF FIRE ALARM SYSTEM IS AS PER TAC/ IS –2189 & TENDER SPECIFICATIONS.
3) DEVICES LOCATIONS ARE INDICATIVE; EXACT LOCATION SHALL BE DECIDED TO SUIT SITE CONDITION.
4) INDICATED CABLE ROUTING ARE TENTATIVE & LIKELY TO CHANGE AS PER SITE CONDITIONS.
5) CABLES RUNNING FOR MCP IN SWITCHYARD SHALL BE LAID ON CABLE TRAYS WHEREVER APPLICABLE. THESE CABLE TRAYS ARE SUPPLY BY M/S BHEL AND LAYING & ERECTED BY M/S MASS. HOWEVER NECESSARY REQUIREMENT OF PVC CONDUITS FOR MCP (ALONG ROAD SIDE) PROVIDED BY M/S MASS.
6) MAIN FIRE ALARM PANEL WOULD BE LOCATED INSIDE SWITCHYARD CONTROL ROOM
7) ALL ADDRESSABLE DEVICE SHALL BE PROVIDED WITH INBUILT LINE ISOLATOR MODULE.
8) LAYING AND TERMINATION OF POWER / CONTROL CABLE RELATED TO FIRE DETECTION SYSTEM OF SUBSTATION SHALL BE IN MASS SCOPE.
9) REF.BASE DRAWING NO. TB 0 332 316 002 REV.NO.–03, TB 0 332 316 004 REV.NO.–02
10) PAINT DETAIL FOR A.G. MCP SUPPORT:– TWO COAT OF RED PRIMER + TWO COATS OF SYNTHETIC ENAMEL PO–RED.

LEGENDS

SR. NO.	SYMBOLS	DESCRIPTION	QTY.
1		MANUAL CALL POINT WITH FLAME PROOF ENCLOSURE	18
2		2Cx1.5 SQ.MM.ARMOR,FRLS FIRE ALARM CONTROL CABLE	1750MTR

REV.	DATE	DISCRIPTION	DRAWN	CHECKED	APPROVED
2	04.12.13	REVISED IN LINE WITH COMMENTED BY M/S STEAG ON DATED:–02.12.2013	VISHAL	APEKA	BHAVIN
1	11.11.13	REVISED IN LINE WITH COMMENTED BY M/S STEAG ON DATED:–31.10.2013	ABHISHEK	HIREN	BHAVIN

CUSTOMER : PROJECT :	RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION–(2x800MW) 400kV Switchyard
CONSULTANT :	CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.
PURCHASER :	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION
CONTRACTOR :	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402–403, SACHET, OPP. BALAJI GARDEN RESTAURANT ; PRERNATIRTH DERASAR ROAD, SATELLITE, AHEMDABAD – 380 015.

P.O. Number – 312P385 Dated–12.03.13

	NAME	SIGN.	DATE
DRAWN	ABHISHEK	ABHISHEK	19.07.13
CHECKED	HIREN	HIREN	19.07.13
APPROVED	BHAVIN	BHAVIN	19.07.13

REV.	DATE	
		ALTERED
		CHECKED
		APPROVED

ZONE

DEPT. CODE SCALE – 1:1100 CARD CODE

PROJECT – FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)

TITLE: MCP For Outdoor Switchyard Area

DRAWING NO. TB/DWG/332/552/008 REV. 2

SHEET No. 1 OF 1 NEXT SHEET – –

SIZE–A1

BHEL | CAT-1

A P P R O V E D

This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.

SIGNED TDT **DATE** 09.01.14

Transmission Business Engineering Management

Approval Category:
'A' APPROVED AS SUBMITTED
Release distribution prints.
Transmittal No: E072-BHEL_TBG-3-O-13-4223
Date: 20-06-2013

(A) CONSTRUCTION:

1.	TITLE:	DELUGE VALVE LCP
2.	INSTALLATION:	OUTDOOR
3.	DIMENSION:	450mm(H) X 375mm(W) X 150mm(D)
4.	PROTECTION:	IP-42
5.	FABRICATION:	TYPE: WELDED WALL MOUNTED
		SHEET SIZE(FRONT & SIDE): 2.0mm THK. CRCA SHEET
		SHEET SIZE REAR: 2.0mm THK. CRCA SHEET
		SHEET SIZE(TOP): 2.0mm THK. CRCA SHEET
		GLAND PLATE: 3.0mm THK. CRCA SHEET, REMOVABLE (BOTTOM)
		MOUNTING PLATE: N/R
		GLASS WINDOW: REQUIRED
		CANOPY: 2.0mm THK. CRCA SHEET
		ANTI VIBRATION PAD: N/R
		BASE FRAME: N/R
		CABLE ENTRY: BOTTOM
6.	FRONT DOOR:	SINGLE LEAF
	TYPE:	PROJECTED TYPE
	LOCK:	IP-LOCK
7.	REAR DOOR:	N/R
	TYPE:	N/R
	LOCK:	N/R
8.	PAINT METHOD:	PAINTING :- 1ST EPOXY COAT, 2ND PU COAT STRUCTURE FINISH
		THICKNESS 60 MICRONS MIN
		INTERNAL: IS :5 538 PO RED
		EXTERNAL: IS :5 538 PO RED
		MOUNTING PLATE: N/R.
9.	LABELS:	EXTERNAL TAGS: TRAFOLITE SHEET WITH WHITE LETTER ENGRAVED ON BLACK BACKGROUND
		INTERNAL TAGS: METALISED POLYSTER STICKER SHEET.
10.	GASKET:	NEOPRENE GASKET/ EPDM
11.	BUSBAR:	25 X 3 mm TINNED Cu FOR EARTHING
12.	EARTH BOLT:	M8 X 25 MS HEX BOLT, 2 NOS. AT BOTH SIDES
13	QUANTITY:	104 NOS

BHEL	CAT-1
A P P R O V E D This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.	
SIGNED TDT	DATE 17.07.13
Transmission Business Engineering Management	

CUSTOMER : PROJECT :	RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION-(2x800MW) 400kV Switchyard
CONSULTANT :	CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.
PURCHASER :	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION
CONTRACTOR :	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402-403, SACHET, OPP. BALAJI GARDEN RESTAURANT, PRERNATIRTH DERASAR ROAD, SATELLITE, AHMEDABAD - 380 015.
P.O. Number - 312P385 Dated-12.03.13	
REV. DATE ALTERED CHECKED APPROVED	DEPT. CODE SCALE - 1:1100 CARD CODE
ZONE	TITLE: LOCAL CONTROL PANEL FOR DELUGE VALVE (MVWS)

	NAME	SIGN.	DATE
DRAWN	ABHISHEK	ABHISHEK	26.04.13
CHECKED	HIREN	HIREN	26.04.13
APPROVED	BHAVIN	BHAVIN	26.04.13

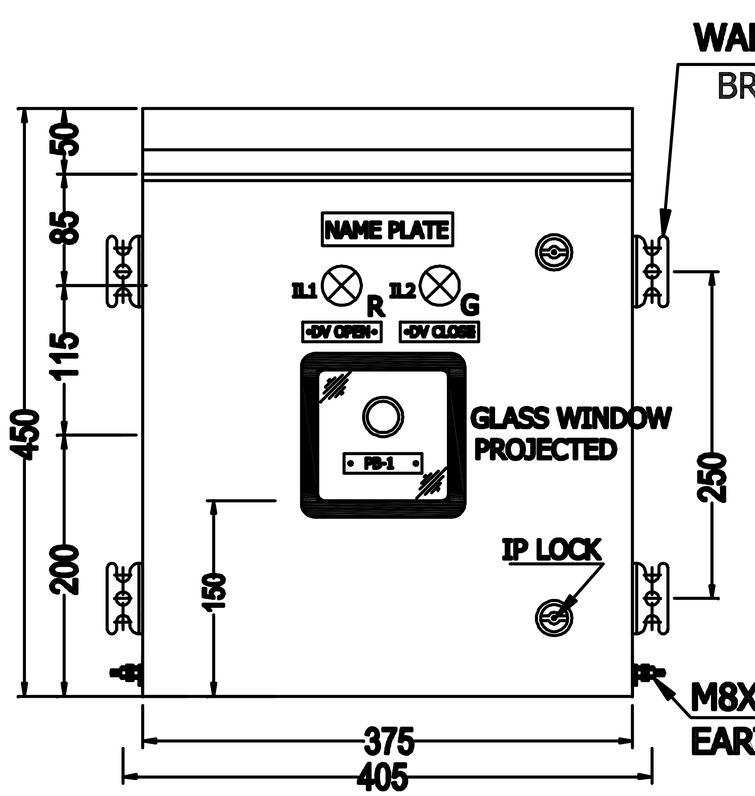
PROJECT :- FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)

DRAWING NO. TB/DWG/332/552/005 REV. 0

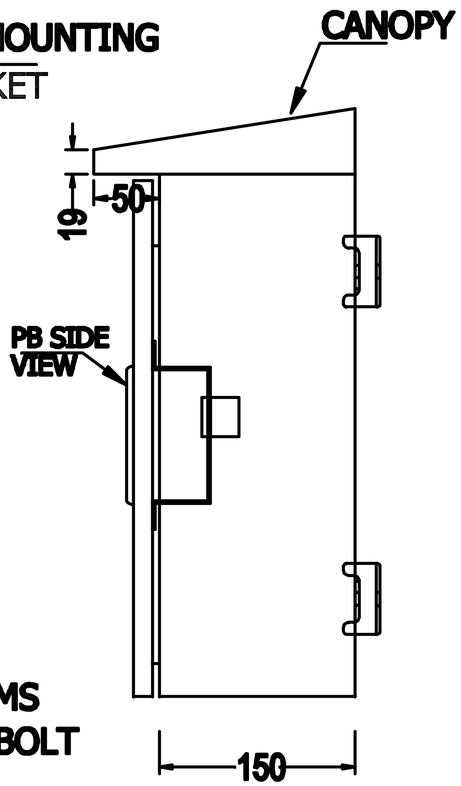
SHEET No. 1 OF 4

SIZE-A4

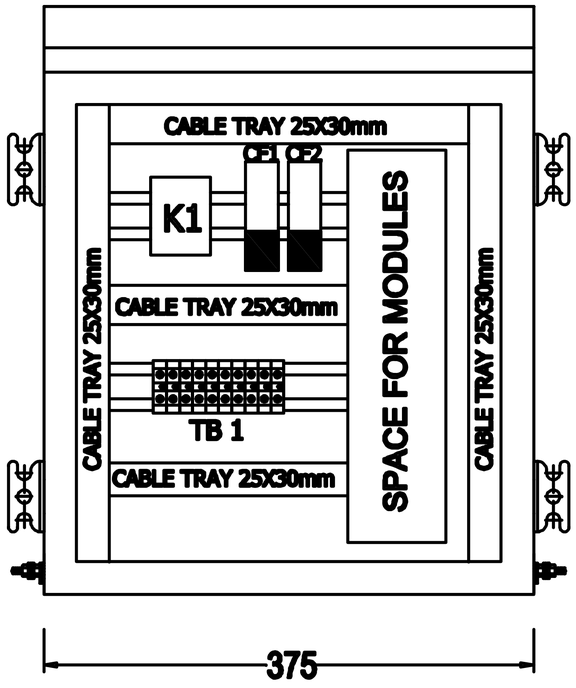
FILE PATH :- FILE : C:\Documents and Settings\Administrator\Desktop\518 YERMARUS\Drgs\Electrical\Panel Drawings\Local Control Panel for Deluge Valve for MVWS system



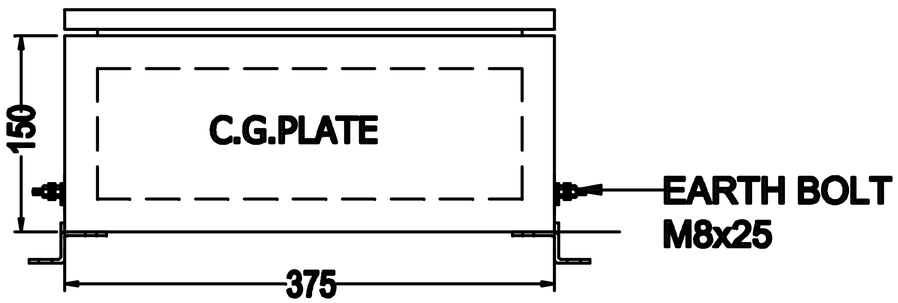
FRONT VIEW



INTERNAL SIDE VIEW



INTERNAL FRONT VIEW



BOTTOM VIEW

BHEL	CAT-1
A P P R O V E D This Approval does not relieve the Sub-Contractor of his responsibilities under the contract.	
SIGNED TDT	DATE 17.07.13
Transmission Business Engineering Management	

NOS. OF LCPDV:- 01

CUSTOMER : PROJECT :	RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION-(2x800MW) 400kV Switchyard				
CONSULTANT :	CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.				
PURCHASER :	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION				
CONTRACTOR :	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402-403, 'SACHET', OPP. BALAJI GARDEN RESTAURANT, PRERNATIRTH DERASAR ROAD, SATELLITE, AHEMDABAD - 380 015.		NAME	SIGN.	DATE
		DRAWN	ABHISHEK	ABHISHEK	26.04.13
		CHECKED	HIREN	HIREN	26.04.13
	P.O. Number - 312P385 Dated-12.03.13	APPROVED	BHAVIN	BHAVIN	26.04.13
DATE ALTERED / CHECKED / APPROVED	DEPT. SCALE -1:1100 CARD CODE	PROJECT :- FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)			
ZONE	CODE TITLE: LOCAL CONTROL PANEL FOR DELUGE VALVE (MVWS)	DRAWING NO. TB/DWG/332/552/005			REV. 0
		SHEET No. 2 OF 4			

SIZE-A4

DO NOT SCALE. IF IN DOUBT, ASK.

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED

DRAWING NO. TB/DWG/332/552/005

SCHEDULE OF QUANTITIES

SR. NO.	DESCRIPTION	MAKE	QUANTITY
1	UN SHROUDED PUSH BUTTON	TEKNIC	01 NO.
2	INDICATION LAMP WITH LED, 230V AC	TEKNIC	02 NOS.
3	FUSE LINK	C&S	02 NOS.
4	FUSE BASE	C&S	02 NOS.
5	AUX.CONTACTOR(CONTACTOR RELAY) 230V AC	C&S	01 NO.
6	TERMINAL SUITABLE FOR 2.5 SQ MM WIRE	ELMEX (KUT4)	20 NO.
7	WIRE 1/1.5 SQ. MM PVC INSULATION WITH LUGS AND FERRULES.	REPUTED	20 POINTS.

BHEL | **CAT-1**

A P P R O V E D

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SIGNED TDT | **DATE 17.07.13**

Transmission Business Engineering Management

CUSTOMER : RAICHUR POWER CORPORATION LIMITED
PROJECT : YERAMARUS THERMAL POWER STATION-(2x800MW) 400kV Switchyard

CONSULTANT :
CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.

PURCHASER : BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION

CONTRACTOR : MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402-403, SACHET, OPP. BALAJI GARDEN RESTAURANT PRERNATIRTH DERASAR ROAD, SATELLITE, AHEMDABAD - 380 015.

P.O. Number - 312P385 Dated-12.03.13

	NAME	SIGN.	DATE
DRAWN	ABHISHEK	ABHISHEK	26.04.13
CHECKED	HIREN	HIREN	26.04.13
APPROVED	BHAVIN	BHAVIN	26.04.13

DATE | ALTERED | CHECKED | APPROVED

ZONE | DEPT. | CODE | SCALE -1:1100 | CARD CODE

PROJECT :- FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)

TITLE: LOCAL CONTROL PANEL FOR DELUGE VALVE (MVWS)

DRAWING NO. TB/DWG/332/552/005 REV. 0

SHEET No. 3 OF 4

SIZE-A4

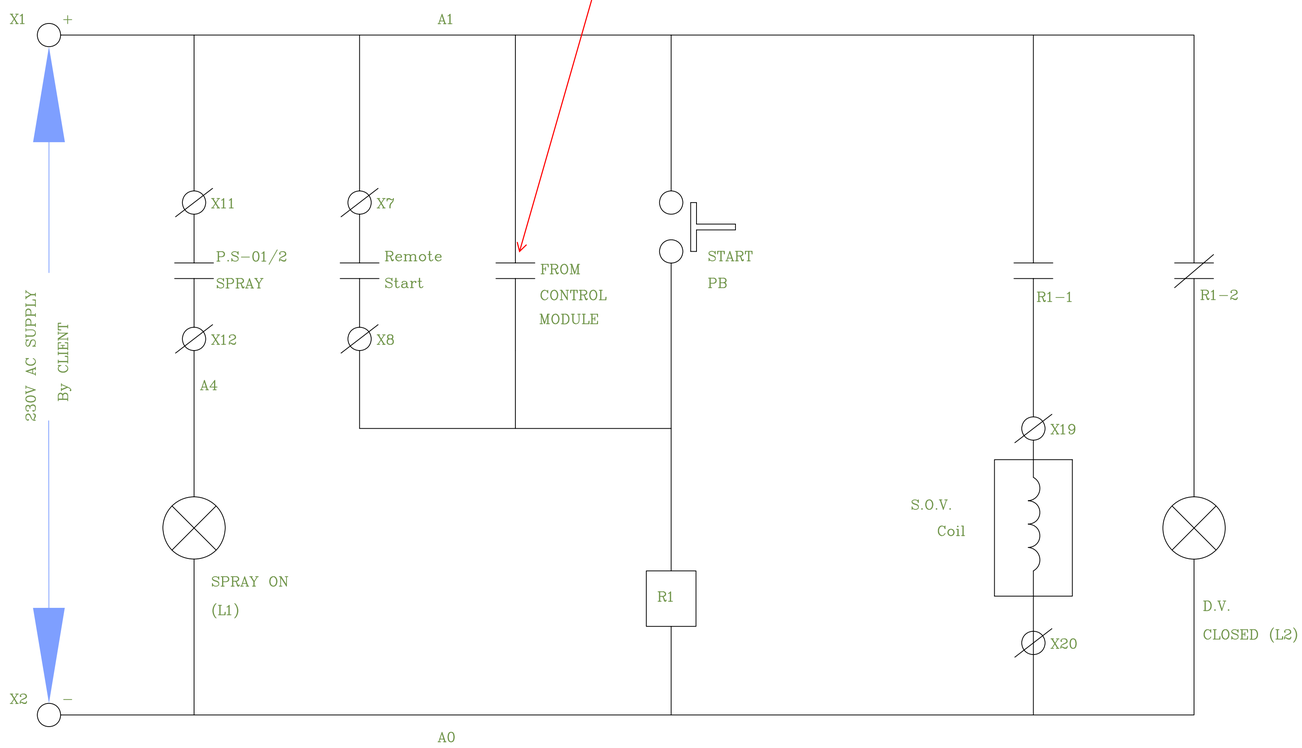
FILE PATH :- FILE : C:\Documents and Settings\Administrator\Desktop\Local Control Panel for Deluge Valve for MVWS system

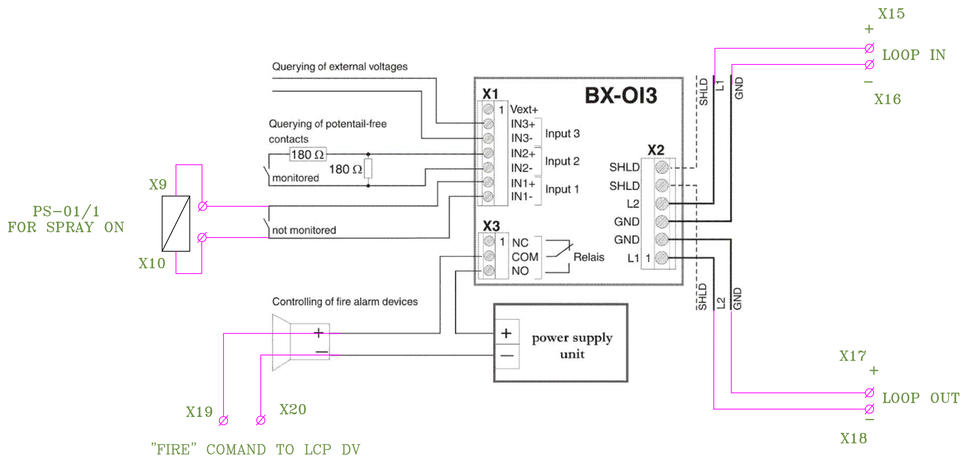
DO NOT SCALE. IF IN DOUBT, ASK.

ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED

DRAWING NO. TB/DWG/332/552/005

Ensure that this CM is interfaced with LHS cable in cable vault, to enable automatic actuation of DV in case of fire in cable vault





TB1

X1	230V AC INCOMING SUPPLY
X2	
X3	230V AC OUTGOING SUPPLY
X4	
X5	SPARE
X6	
X7	REMOTE START
X8	
X9	PS-01/1 CONTACT - 01 FOR SPRAY ON TO MONITOR MODULE
X10	
X11	PS-01/2 CONTACT - 02 FOR SPRAY ON INDICATION
X12	
X13	SPARE
X14	
X15	LOOP IN
X16	
X17	LOOP OUT
X18	
X19	TO SOLENOID VALVE
X20	

BHEL	CAT-1
A P P R O V E D	
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SIGNED TDT	DATE 17.07.13
Transmission Business Engineering Management	

CUSTOMER : PROJECT :	RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION-(2x800MW) 400kV Switchyard
CONSULTANT :	CONSULATANT : STEAG ENERGY SERVICES (INDIA) PVT. LTD.
PURCHASER :	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION
CONTRACTOR :	MEHTA & ASSOCIATES FIRE PROTECTION SYSTEMS PVT. LTD. 402-403, SACHET, OPP. BALAJI GARDEN RESTAURANT PRERNATIRTH DERASAR ROAD, SATELLITE, AHEMDABAD - 380 015.
P.O. Number - 312P385 Dated-12.03.13	

	NAME	SIGN.	DATE
DRAWN	ABHISHEK	ABHISHEK	26.04.13
CHECKED	HIREN	HIREN	26.04.13
APPROVED	BHAVIN	BHAVIN	26.04.13

DATE | ALTERED | CHECKED | APPROVED

ZONE | DEPT. | CODE | SCALE - 1:1100 | CARD CODE

PROJECT :- FIRE PROTECTION SYSTEM FOR RAICHUR POWER CORPORATION LIMITED YERAMARUS THERMAL POWER STATION (2 * 800 MW)

TITLE: LOCAL CONTROL PANEL FOR DELUGE VALVE (MVWS)

DRAWING NO. TB/DWG/332/552/005 REV. 0

SHEET No. 4 OF 4

SIZE-A4

FILE PATH :- FILE : C:\Documents and Settings\Administrator\Desktop\Local Control Panel for Deluge Valve for MVWS system