BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

WESTERN ZONE BENCH

ORIGINAL APPLICATION NO.77 OF 2024

Mamta Samir Shirali & Anr ...Applicant

Versus

The Authorities of New Crematorium,
Borivali & Ors. ....Respondents

AFFIDAVIT IN REPLY

I, Jayant D. Shirsath Age: Adult, Occupation – Service as Executive Engineer (M&E) WS of Brihanmumbai Municipal Corporation, having office at Bandar Pakhadi Road, Off Link Road, Kandivali (West) Mumbai 400067; do state on solemn affirmation as under:

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

1. I say that; I have made myself conversant with the facts of the case and am able to depose on behalf of the Respondent No 1 and 2. I am filing this affidavit in reply thereto.

2. This Original Application has been filed by applicant no.1, on a complaint dated 04.03.2024 made by Dr. Mamta Samir Shirali, R/o 1, Manav Classic, Opp. Shanti Dham Prarthanalaya, Shimpoli Road No.5, Boriwali (W), Mumbai, alleging therein that the authorities responsible for running new crematorium at Boriwali (West), Babhai/Vazira Naka as well as Municipal Corporation of Greater Mumbai - MCGM have not taken cognizance of the fact that the said crematorium is located in the middle of the residential area though the same is electric/PNG crematorium, huge gas is emanating out of it in the surrounding. Also, lot of obnoxious gases is also released from the same affecting the health of the nearby residents.

3. At the outset, I deny each and every contention, averment, submission which is contrary to what is stated herein below and the averments, contentions, submissions which are not specifically denied shall not be deemed to be admitted by reason of non-traverse.

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Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
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4. With reference to the above subject matter, in compliance of Hon'ble National Green Tribunal western zone, Bench, Pune order dated 06/05/2024 in 0. A. No. 77 of 2024 (WZ) visit carried out to crematorium located at plot bearing 277, TPS at Ram mandir Road, Bhabhai, Borivali (W) in R/Central ward on dated 03/06/2024 with BMC officers. The official of MPCB has carried out Ambient Air Quality Monitoring for 24 hours through mobile van on 03/06/2024 in the premises of crematorium. The results of Ambient Air Quality Monitoring was given in the report dated 24.06.2024 - Hereto annexed and marked as **Exhibit "A"** is the copy of Report Dated 24.06.2024 of MPCB -

   - The report further says that; the PM10 and PM2.5 pollutions are marginally higher than prescribed limits. The Respondent submits that:

     After examining the report it is found that the pollution levels do not change much during 24 hrs. The highest levels are around 5 pm which a high traffic hours is leading to increase in pollution due to traffic jams.

   - Further the report states about the levels of Benzene, Xylenes and Ethyl Benzene -

The Respondent States that the cremation flue gases do not emit these gases and therefore the local pollution must have other pollution sources near cemetery such as vehicular traffic jams, new constructions, painting jobs of buildings etc.

- The Report also shows the observations levels of Toluene, Oxylene; however there are no readings to support these levels and hence it is not possible to comment on it. The Respondent further submits that crematorium flue gas Toluene is natural hydrocarbons and same is not poisonous.

5. **In the Notice dated 10.06.2024 the MPCB has directed to the certain conditions. The Mitigation measures suggested by MPCB as under –**

Hereto annexed and marked as **Exhibit "B"** Notice dated 10.06.2024

a. The report recommends to upgrade existing scrubbing system provided to furnace with three column Scrubber & scrubbing media as acidic type, alkaline type, finally with water -

- *The Chemical Scrubbers is used to remove the hazardous chemicals and gases exhaust streams before*

they are released into the atmosphere. However the present cremation flue gases emit gases such as Sulphur Dioxide (SO2), Carbon Monoxide (CO), which is within the permissible limit as mentioned the Ambient Air Quality Monitoring Report on 03.06.2024 by the MPCB; hence the question of introducing chemical scrubber does not arise.

b. The technically redesign the Crematorium so as to achieve burning temperature between 1000°C to 1100°C. -

- *The cremations start at around 500°C and due to exothermic burning the furnace temperature rises to 600°C to 800°C. The cremations get completed in around 90 minutes. If the furnace temperature is increased upto 1000°C, the cremation still will require 90 minutes for completion; however due to 1000+ °C temperature the Nitrogen (N2) in air will start oxidizing leading to unnecessary increase in Nitric Oxide and Nitrogen Dioxide (NOx).*

c. The report recommends to revamp existing crematorium by designing through the Institutes like IIT/NEERI by considering various factors like residential time, design of

burning chamber, details of Air / water pollution control equipment's to mitigate air pollution problems & associated nuisance.

- *The MCGM already has condition to get Furnace design vetted by IIT or VJTI. The Babhai PNG crematorium design is also vetted by VJTI which include Air pollution control system.*

6. The Respondent state that; the per norms of MPCB, more environment friendly PNG cremation system was installed at Babhai Cemetery on 15.05.2021. The said PNG cremation system is having 2 number of P.N.G. operated furnaces for cremation of human bodies. The design of said PNG cremation system is vetted at Veermata Jijabai Technological Institute (V.J.T.I.), Mumbai. Hereto annexed and marked as **Exhibit "C"** is Copy of final Report of Vetting furnace Design and its APC for PNG Cremations.

7. The Respondent further state that, an air pollution control systems are installed at PNG operated furnaces at this cemetery and same is operated and Maintained by appointed contractors. The regular maintenance of air pollution control system is carried out by contractor appointed for these systems and same is working satisfactorily. The Black Smoke generated during cremation of

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
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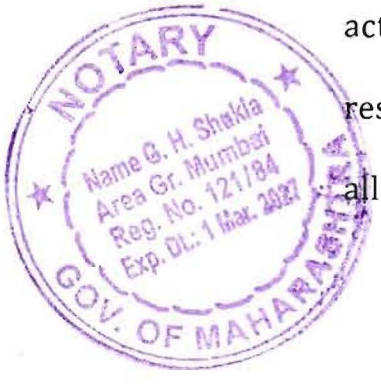
human body is collected in scrubber to scrub/clean the gases and remaining gases is passed in air through chimney. Hereto annexed and marked as **Exhibit "D"** is Copy of Monthly Maintenance Report till Aug 2024.

8. The Respondent further state that; to check pollutants in smoke generated during cremation of human body; the Stack Emission Test is conducted periodically by MPCB approved agency at both cremation systems. Recently such test was conducted on 26.09.2024 and it was observed that pollutants in air are within permissible limits as specified by MPCB. Hereto annexed and marked as **Exhibit "E"** is the copy of Test Report dated 26.09.2024.

9. The Respondent further state that; same type of P.N.G. cremation systems are installed at different locations all over Mumbai City and all systems are working satisfactorily. Hence there is no scope that PNG cemetery creates air pollution at Babhai Cemetery at Borivali, Mumbai.

10. In view of above, the Respondent submits that there is no cause of action against this Respondent. In these circumstances, it is respectfully submitted that the application is misconceived, the allegations of huge gas is emanating out of it in the surrounding,



lot of obnoxious gases is released in the environment are vague and baseless and applicant not supported with substantial proof and therefore this Respondent prays that application be dismissed forthwith

11. The Respondent submits that the present respondent will abide by any directions of this Hon'ble Tribunal.

12. This Respondent craves leave to add, alter or amend the aforesaid averments as and when necessary.

Date: 10.12.2024

Mumbai

Respondent No. No. 1 and 2

VERIFICATION

Jayant D. Shirsath Age: Adult, Occupation – Service as Executive Engineer (M&E) WS of Brihanmumbai Municipal Corporation, having office at Bandar Pakhadi Road, Off Link Road, Kandivali (West) Mumbai 400067; do hereby state on solemn affirmation on behalf of

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
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Respondent No. 1 and 2 - Brihanmumbai Municipal Corporation (BMC) that, the contents of this Affidavit in Reply are true and correct and explained it to me in vernacular language and same is true and correct to the best of my own knowledge and belief.

Solemnly affirmed at Mumbai)

This 13th day of Dec 2024)

10 DEC 2024

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

Deponent

Identified & Explained By

Advocate

BEFORE ME

G. H. SHUKLA
NOTARY GREATER MUMBAI
Jagdamba Bhavan, Ground Floor,
Ganpatrao Kadam Marg, Lower Parel,
MUMBAI - 400 013

10 DEC 2024

NOTED & REGISTERED
Sr. No. 22703 Page No. 38
Book No. 28 Date 10 DEC 2024

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.
1 Mar 2027
GOV. OF MAHARASHTRA

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
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Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
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EXHIBIT - A

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

WESTERN ZONE BENCH, PUNE

Original Application No.77/2024(WZ)

[Earlier Letter Petition No.40/2024(WZ)]

Report on behalf of the Maharashtra Pollution Control Board(MPCB) in compliance of the Order dated 6/5/2024 passed by this Hon'ble NGT

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1. The Applicant Dr.Mamta Samir Shirali, Manav Classic, Opp. Shanti Dham Pranthanalaya, Shimpoli Road No. 5, Borivali (W), Mumbai has submitted a complaint dated 4/3/2024 before this Hon'ble NGT, which is registered as Original Application bearing No. 77/2024 (WZ) alleging that the authorities responsible for running new crematorium at Borivali (West), Babhai/Vazira Naka as well as Municipal Corporation of Greater Mumbai (MCGM) have not taken cognizance of the fact that the said crematorium is located in the middle of the residential area though the same is electric/PNG crematorium, huge gas is emanating out of it in the surrounding area. Also, lot of obnoxious gases are released from the same affecting the health of the nearby residents.

2. In the said matter, the Hon'ble NGT vide order dated 06/05/2024 directed the Maharashtra Pollution Control Board (MPCB) to submit a report with respect to the truthfulness of the contents of the aforesaid complaint and the action taken at their end, if any.

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
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3. In compliance of the order dated 06/05/2024 passed by this Hon'ble NGT, the Officials of the Maharashtra Pollution Control Board (MPCB) at Mumbai alongwith MCGM visited to the Crematorium site located at plot bearing No.277, 7ps at Ram Mandir Road, Bhabhai, Borivali (W), Mumbai in R/C ward on 03/06/2024 and observed as follows :

i) The said crematorium is PNG gas fired crematorium.

ii) MCGM officials reported that, the said crematorium started its operations from 16/05/2021. MCGM has outsourced construction, operation & maintenance of the said crematorium to M/s.Ador Welding Ltd, Pune.

iii) During visit it was observed that, the said crematorium have two numbers of cremation furnaces. The said cremation furnace have single chamber with refractories, heat exchanger and further connected to wet scrubber & stack having height 30.5 meter.

iv) PNG is supplied by Mahanagar Gas Ltd.

v) The cremation furnace is provided two nozzles of PNG gas. It was reported that, they have maintained temperature of furnace @ 700^0C during burning of the body and time period upto 2 hrs or period depends upon size of the body. Emission is observed from the stack connected to Cremation furnace.

vi) ETP is provided for effluent generation from scrubber.

vii) Residential building , one garden and one Shanti Dham Prarthanalay was found near the compound wall of the said Crematorium.

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
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It reveals from the Ambient Air quality Monitoring results that the ambient levels are marginally exceeding for parameter PM_{10} compared with National Ambient Air Quality Standards, 2009. Further, there are considerable amount of VOCs like Tolune, Ethyl Benzene, Xylenes & Benzene present in the ambient air. The presence of VOCs, marginally exceeded PM_{10} in ambient air could be due to various reasons like vehicular pollution, road & associated infrastructure pollution, traffic congestion, burning of dead bodies in Crematorium. A copy of the visit report dated 03/06/2024 is enclosed herewith and marked as an **Annexure-'I'**.

4. As per Schedule-II of the Bio-medical Waste Management Rules, 2016, the temperature of the incinerator primary chamber shall be a minimum of 800^0C and the secondary chamber shall be minimum of 1050^0C + or - 50^0C. MCGM is burning dead bodies in a single chamber crematorium with temperature set at about 700^0C, which leads to incomplete burning. Further, there is use of ghee as per rituals of Hindu traditions, which may emit VOCs in the said premises. MCGM have installed single chamber wet scrubber with water as scrubbing media to limit emissions / off gases generating after burning of dead bodies.

5. In view of the above non-compliances, MPCB vide letter dated 10/6/2024 directed MCGM to upgrade existing scrubbing system provided to furnace with three column scrubber and scrubbing media as acidic type, alkaline type.

NOTARY
Name S. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
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viii) Existing wood fired crematorium was found not in operation . It was reported that the said crematorium is under major civil repair work.

The official of MPCB has carried Ambient Air Quality Monitoring for 24 hours through mobile van on 03/06/2024 in the premises of crematorium. The results of Ambient Air Quality Monitoring are as as below:

Date	Time	PM10 ug/m3	PM2.5 ug/m3	SO2 ug/m3	NO2 ug/m3	CO ug/m3	Benzene ug/m3
03/06/2024 to 04/06/2024	13.00 hrs to 12.00 hrs	**133.16**	53.10	10.93	8.87	0.46	2.68
National Ambient Air Quality Standards 2009		100	60	80	80	04	05

Date	Time	OZONE ug/m3	Toluene ug/m3	Ethylbenzene ug/m3	M+P Xylene ug/m3	OXylene ug/m3
03/06/2024 to 04/06/2024	13.00 hrs to 12.00 hrs	31.55	13.65	7	8.87	0.46
National Ambient Air Quality Standards 2009		100	–	–	–	–

NOTARY Name S. H. Shukla Area Gr. Mumbai Reg. No. 121/84 Exp. Dt.: 1 Mar. 2027 GOV. OF MAHARASHTRA

finally with water, to redesign crematorium technically so as to achieve burning temperature between 1000^{0}C to 1100^{0}C, to revamp existing crematorium by designing through the institutes like IIT /NEERI by considering various factors like residential time, design of burning chamber, details of air / water pollution control equipments to mitigate air pollution problems and associated nuisance. A copy of the MPCB's letter dated 10/6/2024 addressed to MCGM is enclosed herewith and marked as an **Annexure-'II'**.

For and on behalf of
Maharashtra Pollution
Control Board,

Place : Mumbai
Date : 24/06/2024

(A. S. Nandvate)
Sub-Regional Officer, Mumbai-IV

NOTARY
Name S. H. Shukla
Area Gr. Mumbai
Reg. No. 121/24
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

EXHIBIT - B Annexure 2

Maharashtra Pollution Control Board
Sub-Regional Office, Mumbai-IV

Phone No. 24015269 / 24016239
Visit us at : http://mpcb.gov.in
Email : sromumbai4@mpcb.gov.in

"Your Service is our Duty"

Kalptaru Point 1st floor,
Sion Matunga Scheme Road No. 8,
Infant of Sion Cercal, Sion (E),
Mumbai – 400 022.

No./MPCB/SROM-IV/ 1517 Date 10 /06 / 2024

To,
Assistant Commissioner - R/C ward
Municipal Corporation of Greater Mumbai
F.P.No.-44, TPS No-1, Chandawarkar Road,
Borivali (W), Mumbai-400092
Ac.rc@mcgm.gov.in

Sub : Compliance of order dated 06/05/2024 passed by the Hon'ble NGT, WZ, Pune in Original Application No.77/2024(WZ).

.....

Sir,

Dr.Mamta Samir Shirali, R/o 1, Manav Classic, Opp.Shanti Dham Prarthanalaya, Shimpoli Road No. 5, Borivali (W), Mumbai has made a complaint dated 04/03/2024 to the Hon'ble National Green Tribunal, Western Zone, Pune, which is registered as Original Application bearing No.77/2024(WZ), wherein it is alleged that, "the authorities responsible for running new crematorium at Boriwali (West), Babhai/Vazira Naka as well as Municipal Corporation of Greater Mumbai (MCGM) have not taken cognizance of the fact that the said crematorium is located in the middle of the residential area though the same is electric/PNG crematorium, huge gas is emanating out of it in the surrounding area. Also, lot of obnoxious gases are also released from the same affecting the health of the nearby residents."

In the said matter, the Hon'ble NGT vide Order dtd. 06/05/2024 directed Maharashtra Pollution Control Board and Municipal Corporation of Greater Mumbai (MCGM) to submit report regarding truthfulness of the contents of the aforesaid complaint and the action taken at their end, if any.

In compliance of the Hon'ble NGT Order dated 06/05/2024, the officials of MPCB & MCGM visited the aforesaid site of crematorium at Boriwali (West), Babhai/Vazira Naka on 03/06/2024 and observed as follows :-

i. The crematorium is PNG gas fired crematorium & MCGM officials informed that, the crematorium started its operations from 16/05/2021 and the construction, operation & maintenance of the said PNG crematorium is outsourced to M/s. Ador welding Ltd, Pune

ii. Residential building, one Municipal Garden & Shanti Dham Prarthanalay is found near the compound wall of the vicinity of said Crematorium.

iii. The PNG gas for crematorium is being supplied by Mahanagar Gas Ltd.

iv. Existing wood fired crematorium found not in operation due to major civil & repair work etc.

NOTARY Name G. H. Shaikh Area Gr. Mumbai Reg. No. 121/24 Exp. Dt.: 1 Mar. 2029 GOVT. OF MAHARASHTRA

v. The said crematorium having two numbers of cremation furnaces with single chamber constructed with refractories. The off gaseous generated after burning of dead bodies are passed through heat exchanger followed by wet scrubber & finally vented through stack having height 30.5 meter. MCGM have provided Effluent treatment plant consisting of primary & tertiary units for treatment of waste water generated from scrubbing operations.

vi. The cremation furnace is fitted with two nozzles for firing of PNG gas. It was reported that, temperature of furnace (burning chamber) is being maintained @ 700°C for period up to 2 hrs or period depends upon size of the body. During visit, one of the crematorium furnace was operational & observed emitting white smoke through stack.

The official of MPCB has also carried out Ambient Air Quality Monitoring for 24 hours through mobile van on 03/06/2024 in the premises of crematorium.. It reveals from the Ambient Air quality monitoring reports that the ambient levels are marginally exceeding National Ambient Air Quality Standards 2009 for parameter PM_{10} and considerable amount of VOCs like Toluene, Ethyl Benzene, Xylenes & Benzene are present in the Ambient Air. The Ambient Air quality Monitoring Results are enclosed for kind perusal.

As per Schedule II of the Bio-medical Waste Management Rules, 2016 "The temperature of incinerator of the primary chamber shall be a minimum of 800°C and the secondary chamber shall be minimum of 1050°C + or - 50°C." MCGM is burning dead bodies in a single chamber crematorium with temperature set at about 700°C, which leads to incomplete burning and use of ghee as per rituals of Hindu traditions, causing smell nuisance in the surrounding area.

In view of the above, you are hereby directed to comply with the following conditions :

1. You shall upgrade existing scrubbing system provided to furnace with three column scrubber & scrubbing media as acidic type, alkaline type , finally with water.
2. You shall technically redesign the Crematorium so as as to achieve burning temperature between 1000°C to 1100°C. Further, you shall define proper residential time for burning of body & off gases emitted thereof.
3 You shall revamp existing crematorium by designing through the Institutes like IIT /NEERI by considering various factors like residential time, design of burning chamber, details of Air / water pollution control equipment's to mitigate air pollution problems & associated nuisance.

Being a planning Authority, you are hereby requested to comply with the aforesaid conditions in order to mitigate the air pollution caused due to the above Crematorium. The Action Taken Report (ATR) along with time bound proposals shall be submitted to MPCB on priority.

DA: Ambient Air Quality Monitoring Reports

(A. S. Nandvate)
Sub- Regional Officer, Mumbai-IV

NOTARY Name G. H. Shukla Area Gr. Mumbai Reg. No. 121/84 Exp. 31.12.2027 GOV. OF MAHARASHTRA

Copy Submitted to:-
1) Joint Director (APC Div) MPC Board, Sion, Mumbai
2) Regional Officer (BMW Div) , MPC Board, Sion, Mumbai
3) Regional Officer, MPCB, Mumbai.

EXHIBIT - C

VJTI
Veermata Jijabai Technological Institute
(Central Technological Institute, Maharashtra State, INDIA)
H. R. Mahajani Marg, Matunga, Mumbai 400019
Tel.No. +91 22 24198101-02 Fax: +91 22 24102874
www.vjti.ac.in

1887-2016
129 Years of Technical Excellence

VJTI/ CEED /CON/ 2816 25.07.2016

CEED /CON/vetting of furnaces/09/2016/84 dated 09 June 2016

To,
Business Head,
ADOR Welding Limited
142/2B/3, Near Khandoba Mandir
Akurdi Chowk, Chinchwad, Pune 411019

Ref.: MCGM letter No. ChE/M&E/7436 of 12/01/2016

Subject: 'Vetting of Furnace design and its allied APC for PNG cremations'

Dear Sir,

With reference to the above mentioned subject, please find herewith the final Report of 'Vetting of Furnace design and its allied APC for PNG cremations'.

Thanking you,

Yours sincerely,

Prof.N.P.Gulhane
Coordinator
Asso.Professor, Mechanical Engineering Department

Dr.Prashant.P.Bhave
Asso.Professor & Head
Civil & Env.Engg. Dept.

Dean, Research & Development

Director
V.J.T.I

Encl.: as above

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

VJTI
Veermata Jijabai Technological Institute
(Central Technological Institute, Maharashtra State, INDIA)
H. R. Mahajani Marg, Matunga, Mumbai 400019
Tel.No. +91 22 24198101-02 Fax: +91 22 24102874
www.vjti.ac.in

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VJTI/ CEED /CON/ 2816 25.07.2016

CEED /CON/vetting of furnaces/09/2016/84 dated 09 June 2016

Report on vetting of the 'design of Piped Natural Gas (PNG) based Cremation furnace & its allied Air Pollution Control system' for MCGM.

Ref:

i. MCGM letter ChE/M&E/7436 of 12/01/2016
ii. VJTI offer letter no VJTI/CEED/CON/5137 dated 9 June'2016
iii. Design data of furnace and its allied APS systems, as provided by the ADOR WELDING LIMITED, Akurdi Chowk, Chinchwad, Pune 411019
iv. Clarifications to the queries related to the design raised vide mails dated June'2016 & July'2016
v. Tender documents as submitted by MCGM / ADOR:
   1) 'e-Tender - Proposed Construction of PNG based Gas Crematorium on plot bearing 277,TPS at Ram Mandir Road, Borivali (W),R/C ward, Mumbai'
   2) 'e-Tender - Proposed repairs to structure of electric Crematorium and conversion in to PNG fired furnaces situated at Sion, Mumbai in F/North ward'

M/s ADOR WELDING LIMITED, Akurdi Chowk, Chinchwad, Pune 411019 has been entrusted the above Project to be carried out for MCGM.

The scope of VJTI was 'Vetting of furnace Design and its allied APC for PNG Cremations'. VJTI has vetted the prototype design of the furnace system and ETP and is applicable to MCGM's Tenders for the furnace system/s at Six places namely Bhabhai-Borivali, Sion, Daulatnagar, Dahanukarwadi, Charai, Underai-Malad.

Our comments are as follows:

1. Design of Piped Natural Gas (PNG) based Cremation furnace system (furnace along with its Air Pollution Control system) and the related drawings were checked and verified against the specification provided. The same is found to be satisfactory. The furnace system is designed, to provide the fuel consumption not more than 12 SCM, time of one cycle, temperatures, Air quality of emissions, etc as mentioned in tender Specifications, So as to keep the air emission, within the norms of MPCB /Local air monitoring authority.

2. The Design and Drawings of Effluent Treatment Plant for the scrubbed liquid is found to be satisfactory so as to achieve the required treatment efficiency of the ETP.
The drawings with respect to S.N. 1 & 2 above, submitted by ADOR WELDING LIMITED are duly signed stamped by VJTI, Mumbai.

Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

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VJTI
Veermata Jijabai Technological Institute
(Central Technological Institute, Maharashtra State, INDIA)
H. R. Mahajani Marg, Matunga, Mumbai 400019
Tel.No. +91 22 24198101-02 Fax: +91 22 24102874
www.vjti.ac.in

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129
Years of
Technical Excellence

3. The furnace system and the ETP have to deliver as per the specification. In case of deviation from their required performance, the manufacturer/supplier will have to bring it back to the required level at their cost.

4. The operation of Furnace system and ETP needs to be strictly as per the manufacturers / suppliers operation manual for the desired efficiency.

5. At any given time of the operation the exhaust gases coming out of stack, treated effluent from ETP should be within the norms of the pollution control authorities / any other authority dealing with this.

Prof.N.P.Gulhane
Coordinator
Asso.Professor,
Mechanical Engineering Department

Dr.Prashant.P.Bhave
Asso.Professor & Head
Civil & Env.Engg. Dept.

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

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PROJECTS NAME :- PNG FIRED CREMATORIUM

CLIENT :- MCGM-MUMBAI

MANUFACTURER : ADOR WELDING LIMITED, PUNE

SR. NO	DESCRIPTION	REF.DRG/DOC.NO.	DRG.SIZE	REV
	MECHANICAL			
1	DESIGN CALCULATION FOR FUEL FIRED CREMATORIUM	NA	A4	0
2	STRUCTURAL ASSEMBLY & DETAILS	CRM-FF1-16-001-04	A1	0
3	BURNER MOUNTING FLANGE FOR PRIMERY & SECONDARY BURNER	CRM-FF1-16-STD-01/5	A3	0
4	DOOR ASSEMBLY	CRM-FF1-16-STD-02	A2	0
5	DOOR DETAILS	CRM-FF1-16-STD-02/1	A1	0
6	DOOR INSULATION DETAILS	CRM-FF1-16-STD-02/2	A2	0
7	VIEW PORT DETAILS	CRM-FF1-16-STD-02/7	A3	0
8	REFRACTORY ASSEMBLY	CRM-FF1-16-STD-03	A2	0
9	SHAPE REFRACTORY DETAILS	CRM-FF1-16-STD-03/1	A2	0
10	ASSEMBLY & DETAILS OF VANE SCRUBBER	CRM-FF1-16-STD-04	A1	0
11	MIST ELEMINATOR ASSEMBLY	CRM-FF1-16-STD-04/1	A3	0
12	SUPPORT FOR SCRUBBER SYSTEM	CRM-FF1-16-STD-04/3	A3	0
13	DAMPER DETAILS FOR FLUE DUCT (300 DIA.)	CRM-FF1-16-STD-04/4	A3	0
14	ASSLY. & DETAILS FOR ASH DOOR	CRM-FF1-16-STD-06/3	A3	0
15	HEAT EXCHANGER ASSLY. & DETAILS	CRM-FF1-16-STD-07	A1	0
16	GA DRAWING OF EXHAUST BLOWER WITH DATASHEET (SHEET-1)	CRM-FF1-16-STD-08	A3	0
17	GA DRAWING OF FRESH AIR BLOWER WITH DATASHEET (SHEET-2)	CRM-FF1-16-STD-08	A3	0
18	SCHEMATIC FOR VACCUME GAUGE LINE	CRM-FF1-16-STD-09	A4	0
19	COMBUSTION AIR ASSEMBLY & DETAILS	CRM-FF1-16-STD-10	A1	0
20	DAMPER DETAILS FOR 4" NB SIZE.	CRM-FF1-16-STD-10/1	A3	0
21	FOUNDATION BOLT DETAILS FOR PUMP AND SCRUBBER SUPPORT	CRM-FF1-16-STD-12/2	A3	0
22	ASSLY.& DETAILS OF SELF SUPPORTING CHIMNEY (500 I.D X 30 MTR HEIGHT)	CRM-FF1-16-STD1-01	A1	0
23	TEMPLATE & FOUNDATION BOLTS FOR 500 ID CHIMNEY	CRM-FF1-16-STD1-01/1	A3	0
24	ELLUENT TREATMENT PANT DETAILS	NA	A4	0
	ELECTRICAL			
25	SPEC FOR DOOR MOTOR (M 102)	CRM-FF1-16-STD-104	A4	0
26	SPECS FOR WATER PUMP MOTOR (M 101)	CRM-FF1-16-STD-105	A4	0
27	DG SET	CRM-FF1-16-STD-106	A4	0
	INSTRUMENTATION			
28	SPECS FOR THERMOCOUPLE (TE101, TE102)	CRM-FF1-16-STD-201	A4	0
29	SPEC FOR VACUUM GAUGE (VG 101)	CRM-FF1-16-STD-202	A4	0
30	SPEC FOR LIMIT SWITCH	CRM-FF1-16-STD-203	A4	0

NOTE : NA- NOT APPLICABLE

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

ADOR WELDING LTD

DESIGN CALCULATION FOR FUEL FIRED CREMATORIUM FURNACE

Municipal Corporation of Greater mumbai

PROJECT:- FUEL FIRED CREMATORIUM FURNACE

CUSTOMER:- MUNICIPAL CORPORATION
OF GREATER MUMBAI (MCGM)

SUBJECT :- DESIGN CALCULATION FOR FUEL
FIRED CREMATORIUM FURNACE

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE, MUMBAI
Civil & Env Engg Dept

(Dr. P. P. Bhave)

Dr. N P Gulhane

Dr. Nitin P. Gulhare
Ph.D., IIT B
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

0	APPROVAL		A.K.	S.P.	R.J.
Revision	Issued for	Date	Prepared by	Checked by	Approved by

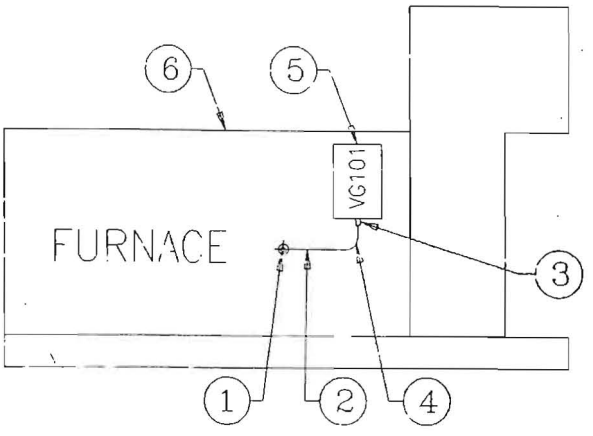
NOTARY
Name B. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

19

1	2	3	4
BURR FREE	ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE		IF IN DOUBT ASK
REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES		DO NOT SCALE DRG.

NOTES:–

1) ALL DIMNESIONS ARE IN mm.
2) QTY.– MENTIONED IN BILL OF MATERIAL.



Dr. Nitin P. Gulhane
Ph.D., IITB
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

SR.NO.	DESCRIPTION	DRG.NO./MATL./STD.	SIZE	QTY	WT/PC	TTLWT	REMARK
04	ELBOW 90°	G.I.	1/2" BSP.	6	–	–	
03	COUPLING	G.I.	1/2' BSP.(F) THREAD, 800#	2	–	–	
02	BARREL NIPPLE	G.I.	1/2"BSP.x50 LG. BOTH END	2	–	–	
01	HEX. NIPPLE	G.I.	1/2" BSP.	2	–	–	

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM
▽ ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT FFC STD
MODEL FF1

2016	DATE	SIGN.
DRN. BY	08.01.16	Chalke
CKD. BY	08.01.16	P.G.K.
APD. BY	08.01.16	R.J.
SCALE 1:1		

FILE NAME
CRM-FF1-16-STD-09

DSGN 4031/I3/R1

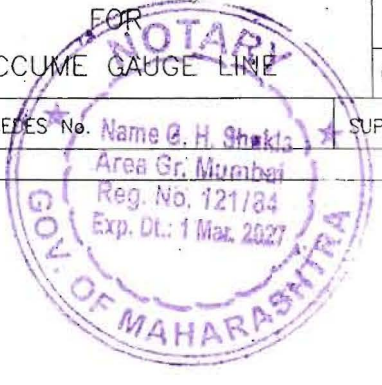
ADOR WELDING LIMITED
PUNE - 411019

SCHEMATIC DIAGRAM
FOR
VACCUME GAUGE LINE

CRM–FF1–16–STD–09 | 0

SUPERSEDES No.

SUPERSEDED BY No.



21

Municipal Corporation of Greater Mumbai	**DATASHEET OF LIMIT SWITCH**	ador WELDING ADOR WELDING LTD.

CLIENT NAME : **MUNICIPAL CORPORATION OF GREATER MUMBAI.**

PROJECT NAME : **FUEL FIRED CREMATORIUM FURNACE**

SUBJECT : **DATASHEET OF LIMIT SWITCH**

DOCUMENT NO : **CRM-FF1-16-STD-203**

Dr. Nitin P. Gulhane
Ph.D., IITB
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

0	APPROVAL		SR	MS	RJ
Revision	Issued for	Date	Prepared by	Checked by	Approved by

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

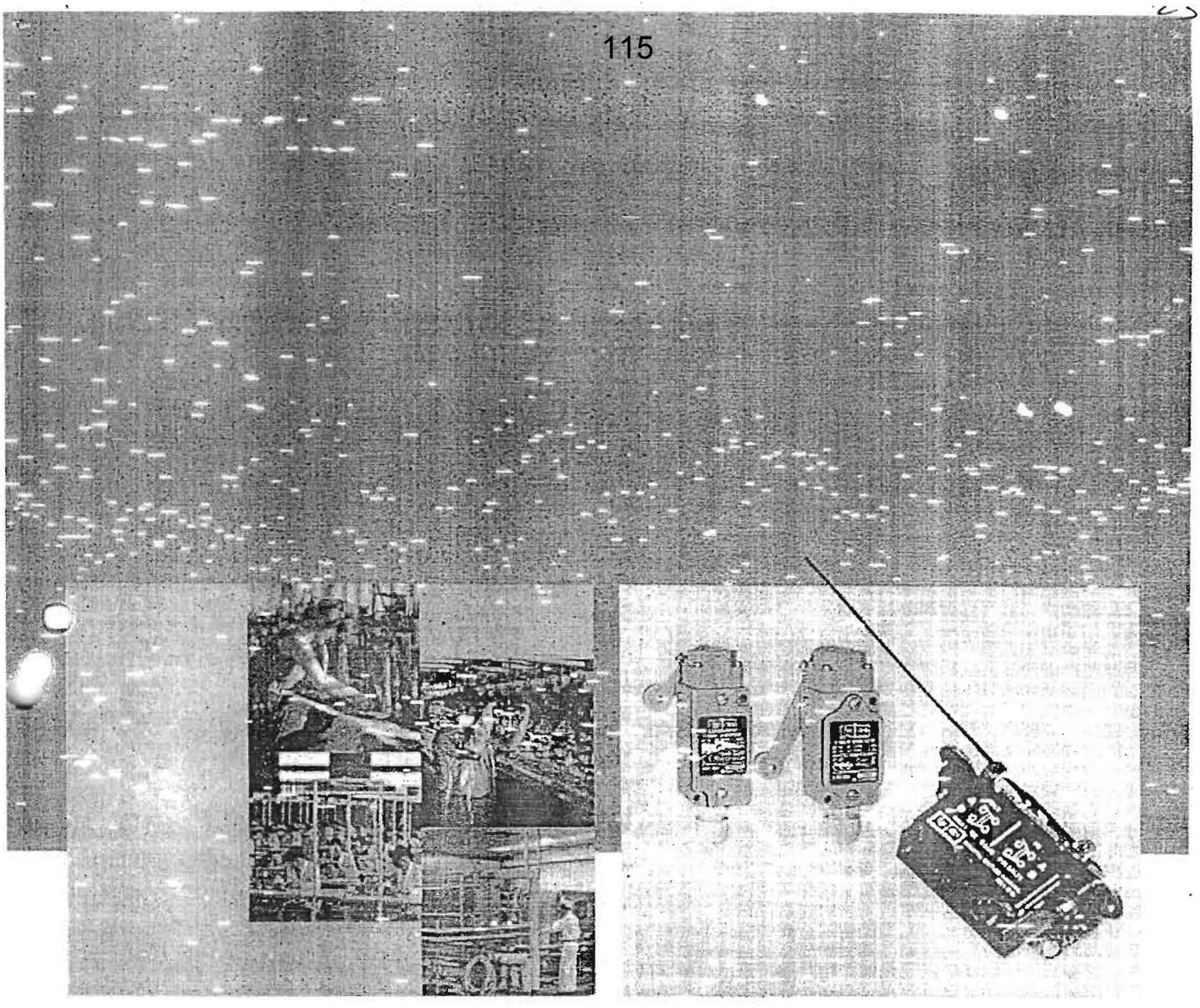
SPECIFICATIONS FOR LIMIT SWITCH			
CLIENT :	Muncipal Corporation of Greater Mumbai (MCGM)		
PROJECT :	FTC Crematorium Furnace		
1	Tag No.	ZSC101	ZSO101
2	Type	Oil tight, Roller lever type	Oil tight, Roller lever type
3	Make	BCH	BCH
4	Model No.	NLL2	NLL2
5	Location	On the furnace body	On the furnace body
6	Service	To limit the extreme close position of door	To limit the extreme open position of door
7	Ambient temperature	60°C	60°C
8	Electrical supply	24 V, 50 Hz , DC supply	24 V, 50 Hz , DC supply
9	Insulation voltage	600 V, AC	600 V, AC
10	Contact combination	1 NO + 1 NC, SPDT switch change over contacts.	1 NO + 1 NC, SPDT switch change over contacts.
11	Contact rating	1 Amps	1 Amps
12	Enclosure	Zinc die cast enclosure to IP65 as per IS 2147	Zinc die cast enclosure to IP65 as per IS 2147
13	Terminal capacity	2.5 sq.mm solid or stranded.	2.5 sq.mm solid or stranded.
14	Cable entry	3/4 " NPT (F)	3/4 " NPT (F)
15	Cable gland	3/4 " NPT (M), single compr.	3/4 " NPT (M), single compr.
16	Cable gland material	Nickel plated brass.	Nickel plated brass.
17	Frequency of operation	2500 operations per hour.	2500 operations per hour.
18	Mechanical life	20 x 10exp(6) operations	20 x 10exp(6) operations
17	Mounting dimensions	29.4mm (W) x 59.5mm (H)	29.4mm (W) x 59.5mm (H)
18	Overall dimensions	46mm (W) x 97.5mm (H)	46mm (W) x 97.5mm (H)
19	Quantity	1 No.	1 No.

NOTE:		
	1	VTS -Vendor to specify
	2	Vendor to enclose catalouge / Diamensional drawing for selected
	3	Visual,Diamensional,functional test shall be carried out.

DOC No - CRM-FF1-16-STD-203

ador WELDING	TITLE : Crematorium Project MCGM	REV	0
	DATASHEET FOR LIMIT SWITCH	DATE	13.05.2016
		BY	SR
		CHKD	MS
		APPD	RJ

NOTARY Name G. H. Shukla Area Gr. Mumbai Reg. No. 121/84 Exp. DL: 1 Mar. 2027 GOV. OF MAHARASHTRA



PRECISION & HEAVY DUTY LIMIT SWITCHES

BHARTIA CUTLER-HAMMER

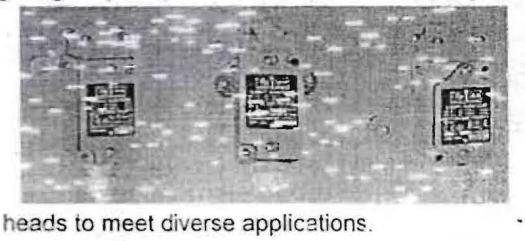
IP67 CE

BCH ELECTRIC LIMITED

we care for you

Heavy Duty Limit Switches

BCH Limit Switches are designed with one aim only to help you produce better...faster... with less production down time. These limit switches will keep operating in highly contaminated atmospheres and extremely high shock and vibration conditions. Every limit switch that comes off the Bhartia Cutler-Hammer assembly line passes through rigid quality tests before it reaches you ...



Versions

▪1NO + 1NC ▪ 2NC + 2NC ▪ Screw Terminal ▪ Pre-cabled

Operating Head

Type NL Limit Switches are available with a variety of operating heads to meet diverse applications.

Rotary lever operating heads

These heads, which are of the spring return variety, with rotary shafts, can be readily changed on the job to operate clockwise, counter clockwise or in both directions. Operating levers may be rotated and locked on the rotary shaft in any one position, through 360°. The operating head is adjustable in four 90° apart positions. The levers are provided with 19mm dia. metal rollers. Two types of roller lever operators, with a fixed length of 38mm and 76.2mm, are available. A third type had an adjustable length between 32mm and 82.5mm.

Top push operating heads

These are available in two designs. One has an adjustable push button, the length of which can be adjusted up to 8 mm. The second type has a metal roller of 11.1mm diameter.

Side push operating head

The head is also available with an adjustable push button alternatively a metal roller of 11.1mm dia. These are designed for small space and low travel application where the actuator travel is perpendicular to the switch.

Cat whisker operating head (Nylon & Steel Rod)

This head has been designed for applications where extremely low operating force is available. The operator consists of a nylon covered wire/steel rod, which is a spring return switch moving the extension in any direction from the centre operates the contacts.

Contact block

The contact mechanism is enclosed in a phenolic moulding with a transparent thermoplastic front cover. The complete unit can be removed and released without the risk of changing the operating characteristic of the limit switch.

The single pole double throw, twin break silver contacts (normally open / normally closed change over) provide quick make, quick break action and full contact pressure at all times. There is no point of zero contact pressure - no matter how slowly the switch is operated.

Both the normally open and normally closed contacts can be used simultaneously, provided they are connected on the same polarity.

The IP 67 degree conformity makes it more suitable for all adverse applications.

Operating Data

Type	NLL1, NLL2 NLLA, NLJW	LTPR LTPBA (mm)	LSPR LSPRH LSPBA (mm)	LCW	LLGS (mm)	LPGS (mm)
Travel to Trip A	7-12°	1.3	2.0	20°	4.5	3.5
Travel to reset from trip point B	6°	1.1▪	1.7▪	18°▪	2.5▪	2.0▪
Over Travel C	34	5.5	5.1	5°▪	2.5▪	1.0▪
Total Travel D	45 ▪	6.8	7.0	25°•	7.0▪	4.5
Force to Trip (max.) Kg.	1.0▪	2.0	2.0	0.285•	1.5	1.5
Force to be applied at a radius of (mm)	28	-	-	25.5	-	-

▪ Max. • Min.

25

Electrical and Mechanical Ratings

Utilisation Category : AC15 & DC13 as per IEC947-5 IS 13947-5
Thermal Current (Ith) : 10A
Insulation Voltage (Ui) : 600 V AC
240 V DC

Operational Current and Voltage

AC15 rating

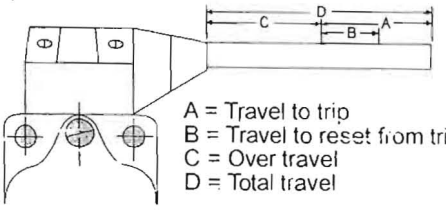
Voltage	110V	220V	440V	550V
Rating	6.0A	3.0A	1.5A	1.2A

DC13 rating

Voltage	24V	60V	110V	220V
Rating	1.0A	0.5A	0.2A	0.1A

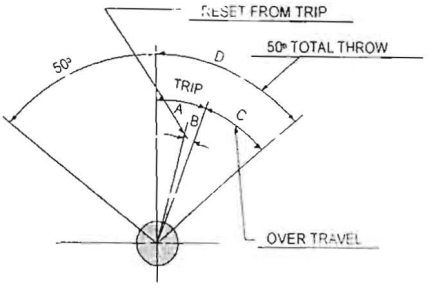
Contact Combination : 1NO + 1NC, 2NO + 2NC
Frequency of Operation : 2500 operations per hour
Mechanical Life : 20 x 10^6 operations
Enclosed Category : Zinc die cast enclosure to IP67
Terminal Capacity : 2.5 mm^2 solid or stranded

Linear Motion



A = Travel to trip
B = Travel to reset from trip point
C = Over travel
D = Total travel

Angular Motion



Pilot Devices & Limit Switches

Heavy Duty Limit Switch - Snap Action Type NL

TYPE	DESCRIPTION	CAT. NO SCREW TERMINAL (1NO+1NC)	CAT. NO. PRECABLED (1NO+1NC)	SCREW TERMINAL CAT NO. (2NO+2NC)	PRECABLED CAT NO. (2NO+2NC)
Roller Lever	Standard-38mm	NLL1	NLL1C	NLL1-22	NLL1-22C
	Standard-76.2mm	NLL2	NLL2C	NLL2-22	NLL2-22C
	Adjustable	NLLA	NLL4C	NLLA-22	NLLA-22C
	Maintained Type LL1	NLL1M	NLL1MC	NLL1M-22	NLL1M-22C
	Maintained Type LL2	NLL2M	NLL2MC	NLL2M-22	NLL2M-22C
	Maintained Type LLA	NLLAM	NLL4MC	NLLAM-22	NLLAM-22C
Push Roller	Top	NLTPR	NLTPRC	NLTPR-22	NLTPR-22C
	Side	NLSPR	NLSPRC	NLSPR-22	NLSPR-22C
Push Button	Top Adjustable	NLTPBA	NLTPBAC	NLTPBA-22	NLTPBA-22C
	Side Adjustable	NLSPBA	NLSPBAC	NLSPBA-22	NLSPBA-22C
Cat Whisker	Nylon Rod	NLCW	NLCWC	NLCW-22	NLCW-22C
	Steel Rod	NLJW	NLJWC	NLJW-22	NLJW-22C
Fork Type	Roller in same Line	NLLF	NLLFC	NLLF-22	NLLF-22C
	Offset Rollers	NLLFO	NLLFOC	NLLFO-22	NLLFO-22C
	Rolleer in same line	NLLFM	NLLFMC	NLLFOM-22	NLLFOM-22C
	Maintained Offset Rollers	NLLFOM	NLLFOMC	NLLFM-22	NLLFM-22C
General Purpose	Angular Roller	LLGS	-	-	-
	Top Plunger	LPGS			

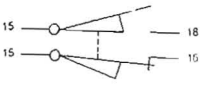
Spares

DESCRIPTION	CATALOGUE
38 mm Lever	SP40L1
76.2 mm Lever	SP40L2
Adjustable Lever	SP40LA
Operating Head	SP40HLG
Operating Head	SP40HL
Operating Head	SP40HTP B or R
Operating Head	SP40HSP B or R
Operating Head with Lever	SP40CW
Limit Switch Assembly	SP40SA
Operating Head in Line	SP40LF
Operatng Head Offset	SP40LFO
Operating Head Maintained	SP40HLM

B - Button R - Roller

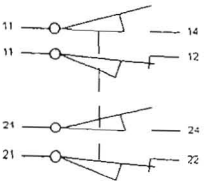
Wiring Diagram

1NO + 1NC



Must be same polarity

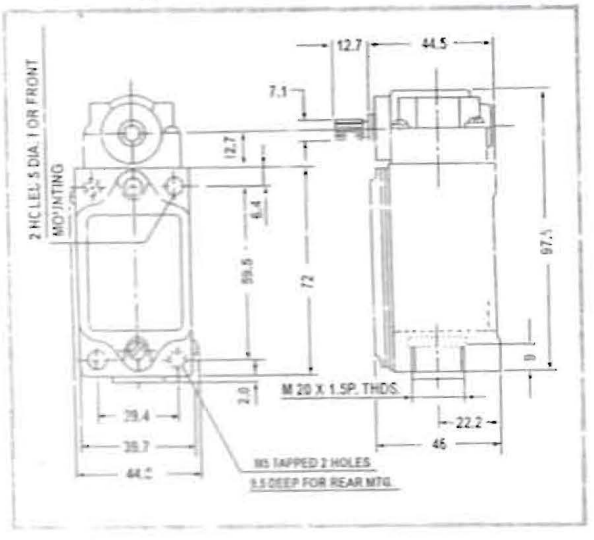
2NO + 2NC



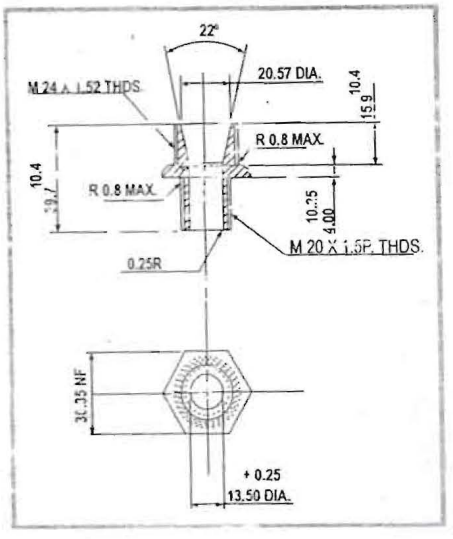
Must be same polarity

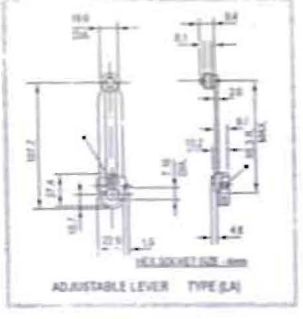
Dimensions

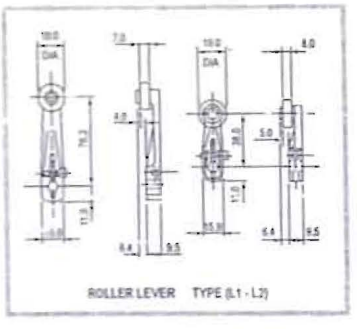
Conduit Entry

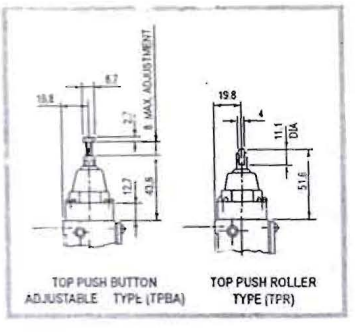


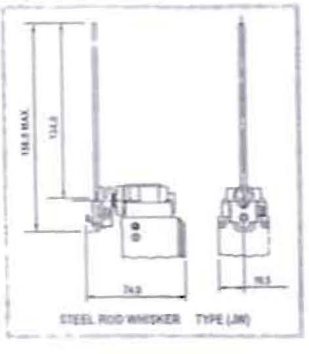
Surface Mounted Side Operated

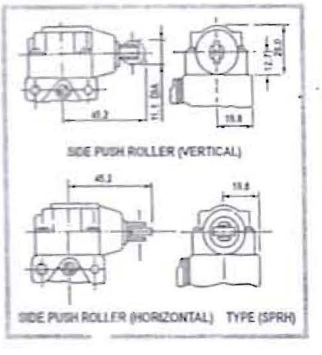


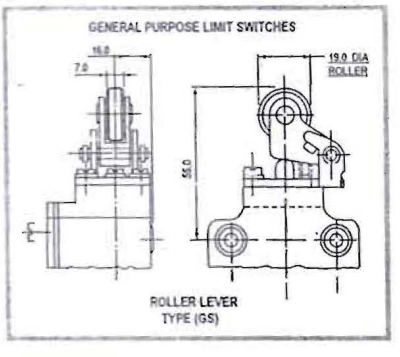


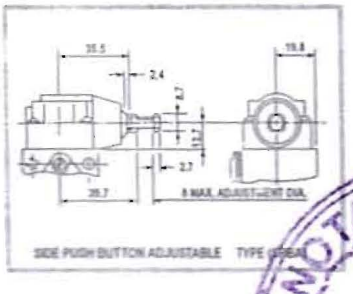


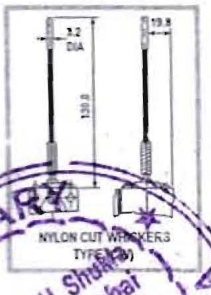


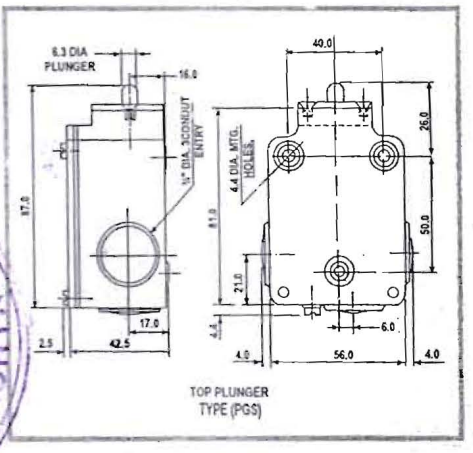










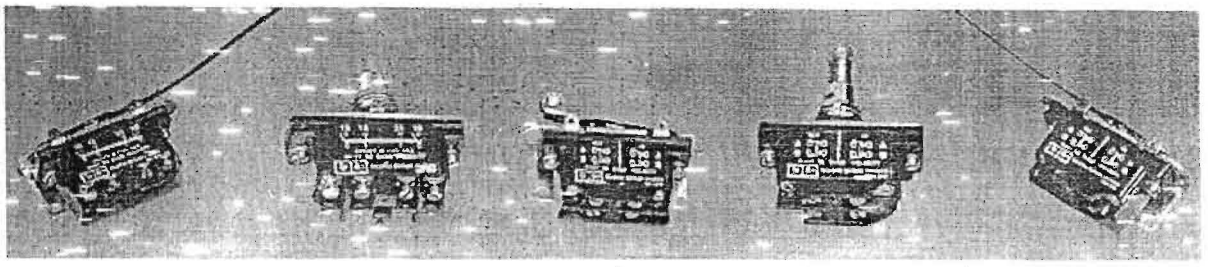


Weights :

Oil Tight Limit Switches (except type LLG) : 500 gms.

General Purpose Limit Switch (LLG) : 300 gms.

Precision Limit Switches



Precision Limit Switches are designed for industrial applications. These are small in size, reliable in operation, have exceptionally long life and are accurate. The wide variety of switch operating mechanisms coupled with the choice of either single pole 1NO + 1NC or double pole 2NO + 2NC changeover contacts permit easy selection and application for many needs.

Contact Mechanism

- Quick make & quick break action.
- Low bounce mechanisms.
- Long life on high load applications.
- Serrated-silver stationary contacts, definite wiping action and high contact pressure assure reliability on dry circuit applications.
- Semi dust-tight moulded, phenolic case of great physical strength and high arc-resisting capacity.

Versatile

A wide variety of operators are available for use in combination with the basic switch. These operators with individual mounting variations afford a high degree of versatility.

Electrical and Mechanical ratings

Utilisation category	: AC 15 and DC 13 as per
IEC 337-1 and IS	: 6875
Thermal current (Ith)	: 15 A
Insulation voltage (Ui)	: 600 V AC

Operational current and voltage

AC15 RATING	SINGLE POLE (1NO + 1NC CHANGEOVER CONTACTS)	DOUBLE POLE (2NO + 2 NC CHANGEOVER CONTACTS)
110V	4.0A	3.0A
240V	2.0A	1.5A
440V	1.0A	0.8A
600V	0.6A	0.6A

DC13 RATING	SINGLE THROW	DOUBLE THROW	SINGLE THROW	DOUBLE THROW
115V	2.0A	0.50A	1.0A	0.2A
230V	0.5A	0.20A	0.3A	0.1A
600V	0.1A	0.02A	0.1A	-

Mechanical & electrical life	: 20x10⁶ operations without operator 10x10⁶ operations with operator
Terminal capacity	: 2.5mm² solid or stranded conductors
Frequency of operation	: 2500 operations per hour (max.)

Types Of Operators

Push Button Plunger

These are designed for one hole panel mounting. The plunger mechanism is of oil-tight construction and prevents any ingress of oil, including coolant. These operations are designed for an in-line actuating motion with controlled over-travel.

Top Push Roller Plunger

Operators are designed for one hole mounting and are of oil-tight construction. The roller plunger comes assembled either in line with the length of the contact block or at right angles to it. This allows the roller to accept cam or slide operation from any of the four directions.

Six Inch (150 mm) Lever

These operators provide either top and right hand mounting or top and left hand mounting. with this do-it-yourself operator, the lever may be formed by the user to satisfy unusual requirements and can be cut or bent to any desired length or shape.

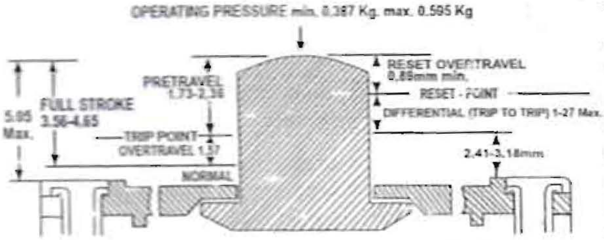
Roller Lever

These operators are available with either top and right hand mounting or top and left hand mounting and are equipped with a steel roller which may be operated by a cam or some similar actuating device. Operation is provided in both directions.

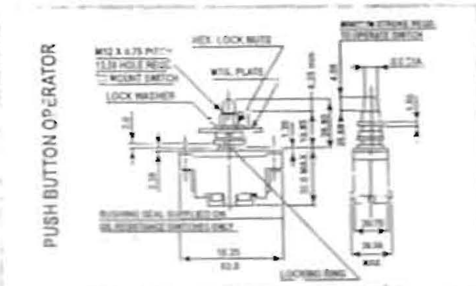
Selection Chart

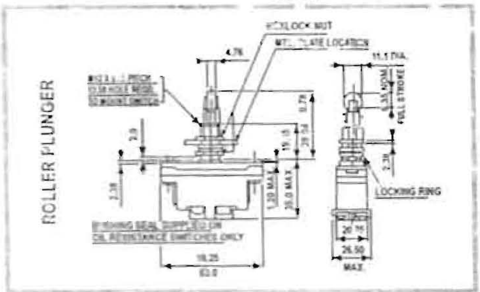
DESCRIPTION	CATALOGUE CODE 1NO + 1NC	2NO + 2NC
With Top Push Button Operator	PSTPB	PSTPB2
With Top Push Roller Operator assembled in line with contact block	PSTPRA	PSTPR2A
With Top Push Roller Operator assembled at right angles to contact block	PSTPRB	PSTPR2B
With Six Inch Lever Operator (right hand mounting)	PSSILR	PSSIL2R
With Six Inch Lever Operator (left hand mounting)	PSSILL	PSSIL2L
With Roller Lever Operator (right hand mounting)	PSRLR	PSRL2R
With Roller Lever Operator (left hand mounting)	PSRLL	PSRL2L
Without Operator	SP20S1	SP20S2

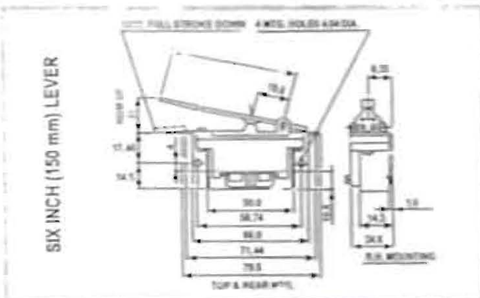
The Repeat Accuracy Of Individual

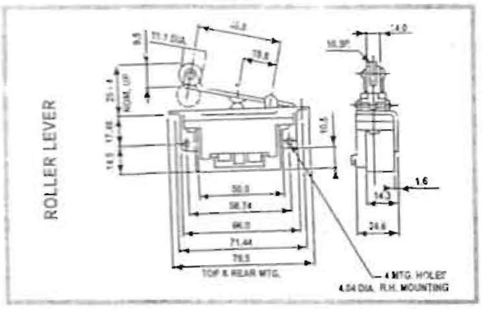


The repeat accuracy of individual switch trip points is such that after millions of operations they do not drift more than two or three thousands of an inch.









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Kanpur	98397-34539	Salem	94433-19533	[illegible]	[illegible]	Siliguri	98320-11433		
Muzaffarnagar	98370-73741	Udaipur	98292-44085	[illegible]	[illegible]	Bhilai	98266-12907		
Renukoot	98399-55117	Bhopal	98266-64093	[illegible]	[illegible]	Gwalior	98268-03658		
Ambala	93541-[illegible]	[illegible]	[illegible]	Gorakhpur	98392-24985	Jodhpur	98292-16518		
Durgapur	97320-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Rajkot	98256-04709		

Since product improvement is a continuous process, the data furnished in this brochure may undergo revision without prior notice.

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Municipal Corporation of Greater Mumbai	DATASHEET OF THERMOCOUPLE	ador WELDING ADOR WELDING LTD.

CLIENT NAME : MUNICIPAL CORPORATION OF GREATER MUMBAI.

PROJECT NAME : FUEL FIRED CREMATORIUM FURNACE

SUBJECT : DATASHEET OF THERMOCOUPLE

DOCUMENT NO : CRM-FF1-16-STD-201

Dr. Nitin P. Gulhane
Ph.D., IITB
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

0	APPROVAL		SR	MS	RJ
Revision	Issued for	Date	Prepared by	Checked by	Approved by

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/24
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

DATASHEET FOR THERMOCOUPLE

CLIENT	Muncipal Corporation of Greater Mumbai (MCGM)
PROJECT	FFC Crematorium Furnace

1	Tag No.	TE 101	TE 102
2	Make	EUREKA, 02	EUREKA, 01
3	Service	To sense Flue gas temperature at Primary chamber	To sense Flue gas temperature at Secondary Chamber
4	Scale range	0 - 1000 °C	0 - 1000 °C
5	Maximum Temperature	1100 °C	1100 °C
6	Type / ELEMENT	CR-AL / DUPLEX	CR-AL / DUPLEX
7	Design standard	DIN 43710	DIN 43710
8	Wire gauge	16 SWG	16 SWG
9	Head	Die Cast Al	Die Cast Al
10	Protection class	IP 55	IP 55
11	Sheath material	SS 310	SS 310
12	Sheath outer dia	19 mm	19 mm
13	Insert length	150 mm (Min)	150 mm (Min)
14	Total length	700 mm	500 mm
15	Hot end grounding	N.A	N.A
16	Cold end termination	At terminal in Head	At terminal in Head
17	Insulation	Ceramic	Ceramic
18	Process connection	Flanged on Furnace	Flanged on Furnace
19	Instrument connection	Al Flange as per Catalogue	Al Flange as per Catalogue
20	Cable Entry	1/2 " NPT (F)	1/2 " NPT (F)
21	Cable gland	Nickel Plated Brass	Nickel Plated Brass
22	Thermowell: Yes / No	- / NO	- / NO
	a) Material	N. A.	N. A.
	b) Construction	N. A.	N. A.
	c) Dimension, mm	N. A.	N. A.
	d) Conn. with Thermocouple	N. A.	N. A.
	e) Flange size	N. A.	N. A.
	f) Flange material	N. A.	N. A.
	Quantity	1 NO.	1 NO.

NOTE:-

1. VTS-Vendor to specify.
2. Vendor to Enclose catalouge/Diamensional drawing for selected model.
3. Vendor shall submit G.A drawing of thermocouple for approval
4. **Inspection:** Vendor shall carry out following tests and submit T.C. (2 copies)
   - a. Vendors normal testing.
   - b. Functional Test
   - c. Environment protection test
   - d. Performance / calibration report
   - e. Material test cirtificate.
   - f. Guarantee certificate
5. **Final Document Submission: (2 copies)**
   - a. Final as built Drg
   - b. Installation & Operation Maintainence Manual
   - c. Spare part List for 2 year trouble free operation

DOC No - CRM-FF1-16-STD-201

ador WELDING	Title : Crematorium Project MCGM	REV - 0
	Datasheet for Thermocouple (TE101, TE102)	DATE - 16-05-2016
		BY - SR
		CHKD - MS
		APPD - RJ

NOTARY Name G. H. Shukla Area Gr. Mumbai Reg. No. 121/84 Exp. Dt.: 1 Mar. 2017 GOV. OF MAHARASHTRA

31

Municipal Corporation of Greater mumbai	DATASHEET OF VACCUME GAUGE	ador WELDING ADOR WELDING LTD.

CLIENT NAME : MUNICIPAL CORPORATION OF GREATER MUMBAI.

PROJECT NAME : FUEL FIRED CREMATORIUM FURNACE

SUBJECT : DATASHEET OF VACCUME GAUGE

DOCUMENT NO : CRM-FF1-16-STD-202

Dr. Nitin P. Gulhane
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Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

0	APPROVAL		SR	MS	RJ
Revision	Issued for	Date	Prepared by	Checked by	Approved by

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Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

DATASHEET FOR VACCUME GAUGE		
CLIENT :	Muncipal Corporation Of Greater Mumbai (MCGM)	
PROJECT :	FFC Crematorium Furnace	
1	Tag No.	VG101
2	Type	Direct measurement type
3	Make	SWITZER Instrumeras
4	Model No.	501-0-1-3-3-S
5	Location of instrument	Control Panel
6	Service	To indicate draft in crematorium furnace
7	Ambient temperature	60°C
8	Range limits	-25 mmWC To +25 mmWC
9	Range type	Compound range
10	Pressure suction/differential	Suction pressure (Operating)
11	Scale	Linear, 5" (127 mm)
12	Case material	Pressed sheet steel for Indoor Mounting
13	Max. over pressure	100 % over max range
14	Design	Hays-Republic Style 501
15	Sensing element	Silicon elastomer diaphragm
16	Movement	Electro-polished 304SS pivot.
17	Accuracy	+/- 2 % full scale range
18	Hysteresis	+/- 2 %
19	Process conn on instr.	1/2" NPT(F) Through 304 SS Adaptor - Bottom
20	Mounting	Flush panel mounting
21	Accessories	As required for flush mounting
22	Case painting	Stove enamalled gray.
23	Dimensions :	
24	Cut out : (W) x (H) mm	52 x 167
25	Bezel : (W) x (H) mm	60 x 175
26	Depth : mm	290 mm inside panel.
27	Quantity	1 No.

NOTE:-		
1	VTS-Vendor to specify	
2	Vendor to Enclose catalouge/Diamensional drawing for selected model.	
3	Process connection on instrument shall made 1/2" NPT(F) using coupling of size 1/4"NPT (M) x 1/2" NPT(F),MOC-SS304	
4	Inspection: Vendor shall carry out following tests and submit T.C. (2 copies)	
	a	Vendors normal testing.
	b	Functional Test
	c	Environment protection test
	d	Performance / calibration report
	f	Guarantee certificate
5	Final Document Submission: (2 copies)	
	a	Final as built Drg
	b	Installation & Operation Maintainence Manual
	c	Spare part List for 2 year trouble free operation

DOC No - CRM-FF1-16-STD-202

ador WELDING	Title - Crematorium Project MCGM DATASHEET FOR VACCUME GAUGE (VG 101)	REV - 0 DATE - 18-06-2016 BY - SR CHKD - MS APPD - RJ

NOTARY Name G. H. Shukla Area Cr. Mumbai Reg. No. 12/1/14 Exp. DL: 1 Mar. 2021 GOV. OF MAHARASHTRA

33

Municipal Corporation of Greater mumbai	DATASHEET OF DG SET	ador WELDING ADOR WELDING LTD.

CLIENT NAME : MUNICIPAL CORPORATION OF GREATER MUMBAI.

PROJECT NAME : FUEL FIRED CREMATORIUM FURNACE

SUBJECT : DATASHEET OF DG SET

DOCUMENT NO : CRM-FF1-16-STD-106

Dr N P Gulhane

0	APPROVAL		SR	MS	RJ
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NOTARY
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Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

MCGM	DATA SHEET OF DG SET	ADOR WELDING

PROJECT - FFC CREMATORIUM

1	**Generator Set Specification**	
	a) Model	C15D5P
	b) Duty	Prime
	c) Power Rating	15 KVA
	d) No. of Phases	3 Phase
	e) Output Voltage	415 V
	f) Power Factor	0.8 (lagging)
	g) Current	21 A
	h) Frequency	50 Hz
	i) RPM	1500
	j) Total weight of DG Set	600 Kg (approx)
	k) Overall Dimensions	1460(L) x 940(W) x 920(H)
	l) Enclosure	Accoustic Enclosure
2	**Specification of Engine:**	
	a) Make	Cummins
	b) Model	X13TAA-G1
	c) No. of Cylinders	2, In-line
	d) Bore x Stroke (mm)	95 x 91
	g) Cooling	Liquid Cooled (EG compleat 50:50)
	h) Operating Condition	50 Deg.C
	i) Type of Injection	Direct
	j) Recommended Fuel Oil	High speed Diesel
	k) Lubricaiuon oil consumption at full load	0.01 lt./hr
	l) Lube oil sump capacity	4 - 3
	m) Lube oil specification	CH4 15W40
	n) Method of Starting	12 V DC Electrical
	o) Total coolant capacity	5.5 litre
	p) Fuel tank capacity & size	Sufficient for 12 hours continuous run
	q) Fuel consumption @ 75% load with radiator & fan	2.2 litre/hr
	r) Fuel consumption @ 100% load with radiator & fan	2.64 litre/hr
	s) Combustion air intake @ 100% load	61 cfm
	t) Exhaust Temperature	346 deg.C
	u) Weight of Engine (Engine + Radiator)	180 Kg
	v) Noise, Level & Smoke Limits	As per latest Amendment of Environment (Protection) Act 1986
3	**Alternator:**	
	a) Make	Stamford (CGT)
	b) Rating	15 KVA
	c) Frame	PI044D
	d) Voltage Regulation	+/- 1%
	e) Winding pitch	2/3
	f) Stator Winding	Double Layer Lap
	g) Class of Insulation	H
	i) Degree of Protection	IP23
	l) Rotor	Dynamically Balanced
	m) Max Unbalanced Load across phases	less than or equal to 25%

Notes	
1	Two Nos. Earthing studs shall be provided.
2	Catalogue, operation & maintenance manual shall be provided.
3	Test certificates shall be provided including load test, engine test, alternater test, fuel consumption test.
4	DG set overload capacity is 10% on rated current.

Date: 16.05.2016	ISSUED FOR APPROVAL	Prepared By : SR	Checked By: MS	Approved By: RJ
		ador WELDING		Rev. 00
ADOR DOC. NO - CRM-FF1-16-STD-106				PAGE NO. 01 OF 01

NOTARY Name G. H. Shukla Area Gr. Mumbai Reg. No. 121/84 Exp. Dt.: 1 Mar. 2027 GOV. OF MAHARASHTRA

Effluent Treatment Plant (12 m3/day)

INTRODUCTION

The system is envisaged for treatment of effluent mainly containing turbidity and suspended solids. Service water effluent from Scrubber is collected in common collection tank and then pumped to the Reaction cum settling tank. The effluent is dosed for the coagulate and flocculate the suspended / colloidal matter.

Effluent Treat plants help in solving environmental pollution issues without exposing same to open environment.

ETP is known for saving energy and removing pollution effluent with economical operations and also meet stringent pollution control norms.

Effluent Collection Tank

The effluent coming from Water scrubber tank has their own characters which are not uniform. But here they are going to treat the combined effluent. So the effluent of each unit has to be well mixed so as to get on effluent with uniform characters this is main purpose of providing collection / equalization tank. The waste water pH varies with respect to time and process discharge which is Equalization and Neutralization in this tank by adding calcium hydroxide solution and homogenized by operating floating operator.

Effluent Transfer Pump

Collected effluent is transferred from underground tank by these transfer pumps into next treatment plant which is installed above the ground i.e. Reaction cum settling tank.

Reaction cum Settling Tank

In settling tank effluent/solid particles separates from the water and it found in the lower level of the tank and accumulate into the Sludge Drying Bed.

Filter Feed Tank

The filtrate from the Reaction cum Settling Tank will be collected in the intermediate treated water tank (filtered).

Filtered Feed Transfer Pump

Filter feed pumps are used to take the water from Filter Feed Tank and pass it through the pressure sand filter and activated carbon filter installed in series.

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OPERATION & MAINTENANCE FOR ETP (12m3/day)

Operation Aspect:

- Cleaning of chemical dosing system
- Maintaining effluent removal intervals
- Checking of position of valves provided in the system
- Checking of level in scrubber water tank.
- Monitoring of effluent characteristic

Maintenance Aspect:

- Attend the rotating unit where noise is found different than normal.
- Check regularly the gland, bearing of each rotating unit.
- Any leakage point from piping/unit must be identified and taken for rectification at the earliest to avoid further mishap.

General House Keeping:

- Good housekeeping for any treatment plant is mandatory for obtaining the satisfactory performance. It calls for the establishment of systematic approach. A single individual should be responsible for conducting various functions.
- The plant operators should be regular appointees, well versed and experiences to handle the sophisticated electrical and mechanical equipment.

Start Up Procedure:

- ✓ Start pump to feed effluent stored in any one of the holding tanks to overhead Reaction-cum-Settling Tank when Equalization tank at ground floor holds sufficient quantity of effluent to be treated.
- Ensure that reaction-cum-settling tank is not filled beyond 2-3 inches below the outlet.
- ✓ Switch the agitator motor ON.
- ✓ Add specified/pre-calculated amount of Polyelectrolyte jelly for better Flocculation and after 5 minutes switch the agitator motor OFF.
- ✓ Allow the water in the tank to settle for about ½ hr. Sludge will settle down at the bottom of the tank.
- ✓ Using the side outlets, transfer the clear supernant from reaction tank out to Filter feed Tank.
- ✓ From filter feed tank through pump effluent goes into Sand filter and then in to Carbon filter and final treated effluent is collected in the final treated water Collection tank.

Suspended Solids [Sludge] coming from Backwash will accumulate into the Sludge Drying Bed.

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Dr. Vitin P. Gulhane Ph.D., IITB Associate Professor, Mech. Engg. VJTI, Mumbai-19 (India)

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	Technical Specification for Effluent Treatment Plant (Capacity 12 m3/Day)		
1	SCRUBBER WATER TANK CAPACITY	4000	Litre
	Generally, We drained all water of scrubber water tank after three cremations.Considering 7-8 cremation per day the Effluent generated in one day is 12,000 liter.		
	So, Effluent Treatment plant capacity is	12	m3/day
	Opration of ETP	Batch Type (3 Batches/Day)	
2	**Effluent Collection Tank**		
	Retention time in Effluent Collection Tank	20	Hrs
	Plant Capacity	12	m3/day
	Volume of the tank per hour	0.5	m3
	Total Volume of the tank	10	m3
	Size of the tank	1.7 M Length X 2.0 M Width X 3.0 M Height	
	Material of Construction of tank	Civil	
3	**Effluent Transfer Pump**		
	Effluent Transfer Pump	2	m3/hr
	Head	8-10	M
	Motor	1	HP
	MOC	PP (Polypropylene)	
4	**Reaction cum Settling Tank**		
	Reaction Cum Settling Tank	4	m3
	Material of Construction	MS-FRP	
5	**Filtered Feed Tank**		
	Retention time in Filtered Feed Tank	8 Hrs/ Batch	
	No. of Batches per day	3	Nos.
	Volume	4	m3
	Dimension	1.5M Length X1.0M Width X3M Height	
	MOC	CIVIL	
6	**Filtered Feed Transfer Pump**		
	Filtered Feed Pump	2	m3/hr
	Head	25-30	Meter
	Motor	1	HP
	MOC	CI	
7	**Pressure Sand Filter**		
	Pressure Sand Filter	2	m3/hr
	Pressure Sand Filter	2	m3/hr
	Vessel Size	14" Dia. X 65" Height	
	Filtration Media	Sand, Silex and supproting pebbles	
	MOC	FRP	
8	**Activated Carbon Filter**		
	Activated Carbon Filter	2	m3/hr
	Activated Carbon Filter	2	m3/hr
	Vessel Size	14" Dia. X 65" Height	
	Filtration Media	Activated Charcol	
	MOC	FRP	
9	**Final Collection Tank**		
	Retention time in Final Collection Tank	10	Hrs
	Volume	5	m3
	Dimension	1.5m Length X1.2m Width X3m Height	
	MOC	CIVIL	
10	**Sludge Drying Bed**		
	Quantity	3 Nos.	
	Volume	1.5 m3 each	
	Dimension	1.5m Length X 1.0m Width X 1.0m Height	
	MOC	CIVIL	
11	**Chemical Dosing System**		
	Quantity	1 No.	
	Capacity	About 6 LPH	

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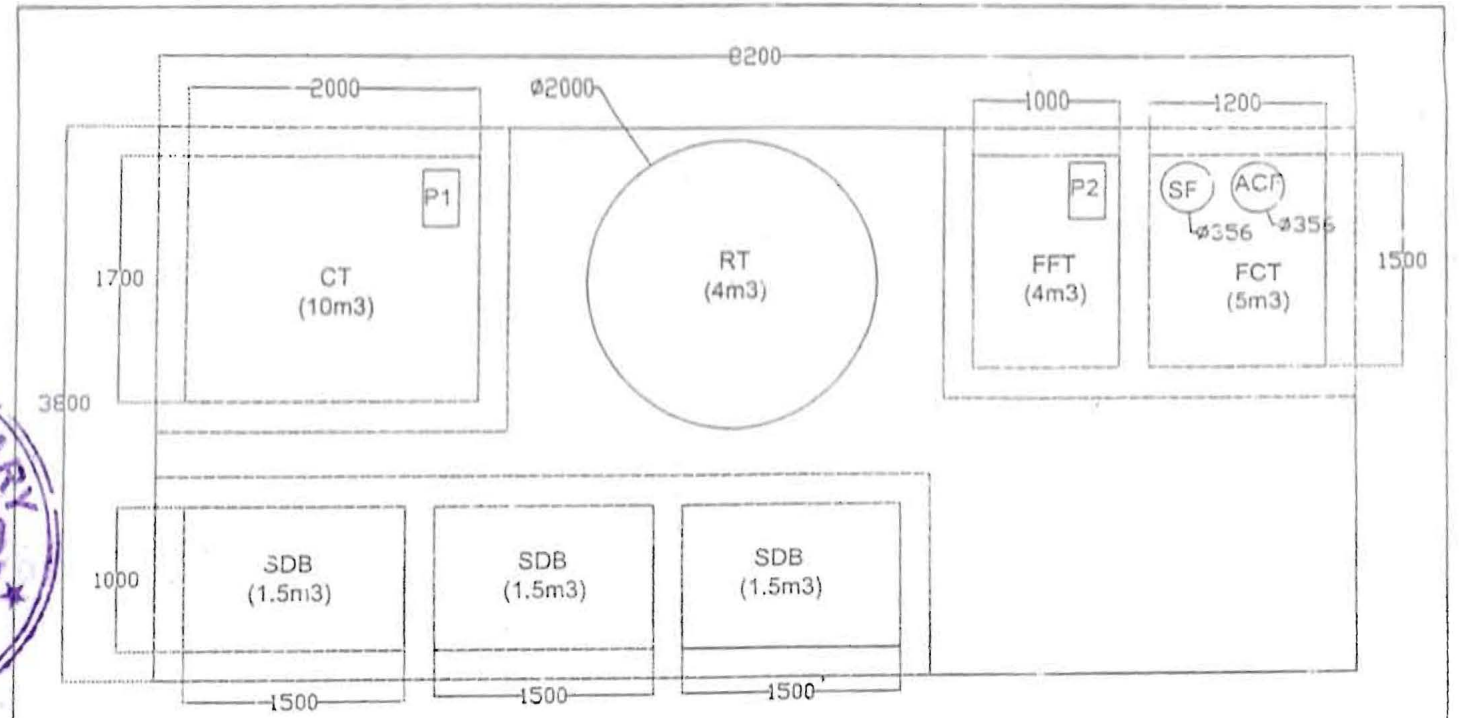

TANKS	
LEGENDS	SPECIFICATIONS
CT	Collection Tank
RT	Reaction Cum Setting Tank
FFT	Filter Feed Tank
FCT	Final Collection Tank
SDB	Sludge Drying Bed

ELECTROMECHANICAL EQUIPMENTS	
LEGENDS	SPECIFICATIONS
P1	Effluent Transfer Pump
P2	Filter Feed Pump
SF	Sand Filter
ACF	Activated Carbon Filter

TITLE: PLANT LAYOUT FOR 12 m3/BATCH	
CLIENT : ADOR WELDING LTD.	
REF : WES/DWG/016-17/009	
PREPARED BY P.V.B.	WESTERN ENVIRO SOLUTIONS
CHECKED BY H.D.N.	

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Exp. Dt: 1 Mar. 2021
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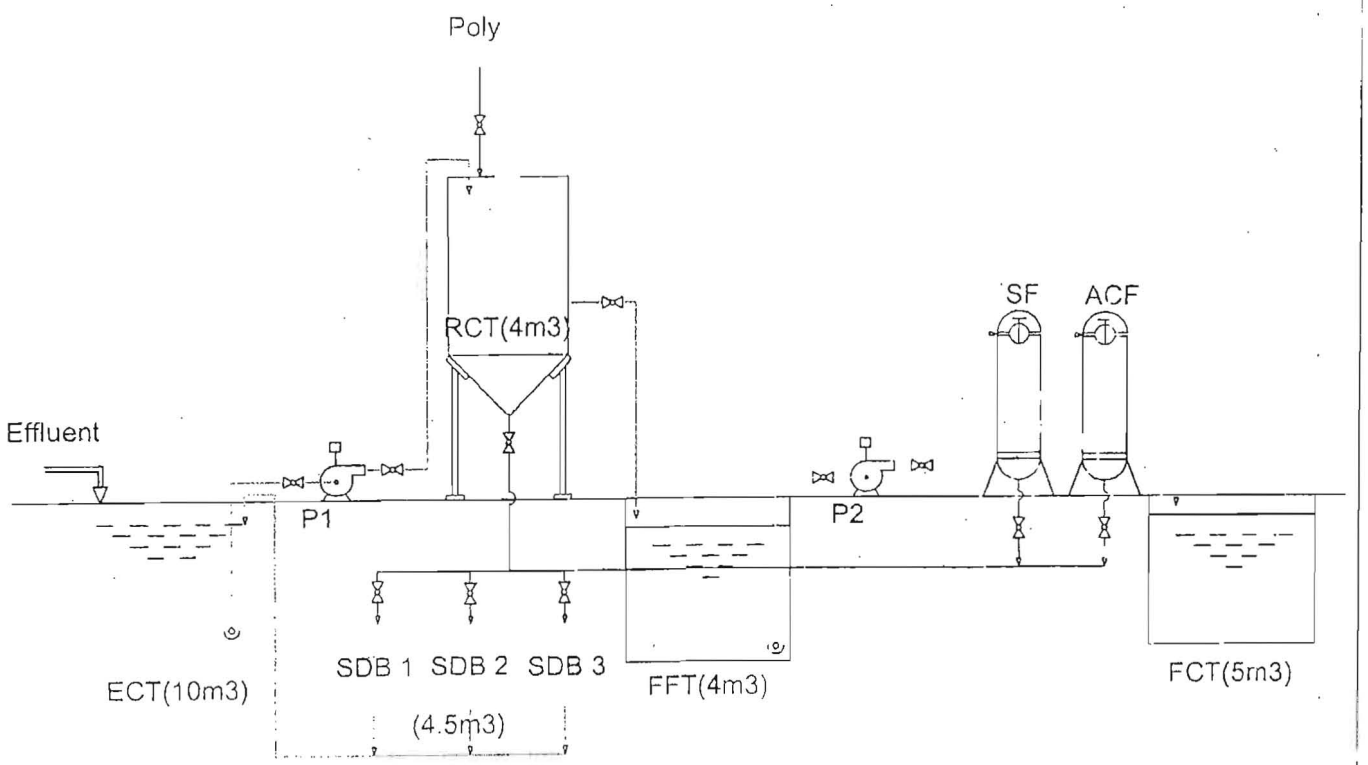
Associate Professor, Mech. Engg.
VJTI Mumbai-19 (India)



ELECTRO-MECHANICAL EQUIPMENTS	
LEGENDS	DESCRIPTION
P1	Effluent Transfer Pump
P2	Filter Feed Pump
SF	Sand Filter
ACF	Activated carbon filter

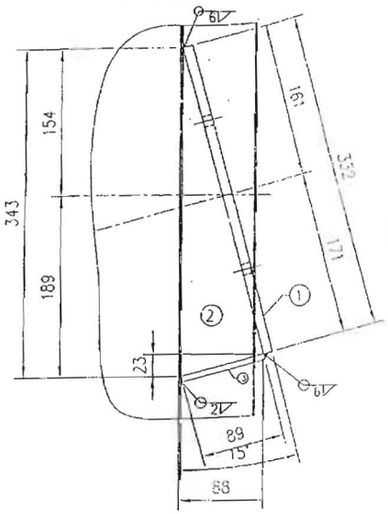
TANKS	
LEGENDS	DESCRIPTION
ECT	Effluent Collection Tank
RCT	Reaction Cum Settling Tank
FCT	Final Collection Tank
FFT	Filter feed Tank

TITLE :	PROCESS FLOW DIAGRAM
CLIENT :	ADOR WELDING LTD.
WESTERN ENVIRO SOLUTIONS Ion 7,Opp. Shraddha Heritage,Near Hotel Keys , Pimple Chowk Mumbai-Pune Highway, Jimpri, Pune	Drawing No. : WES/DWG/016-17/006 Date : 04.07.16

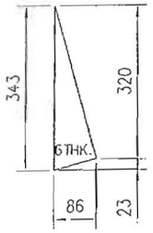
Dr. Nitin P. Gulhane
Ph.D., IIT B.
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

NOTARY GOVT. OF MAHARASHTRA
Name G. H. Shaikh
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar 2021

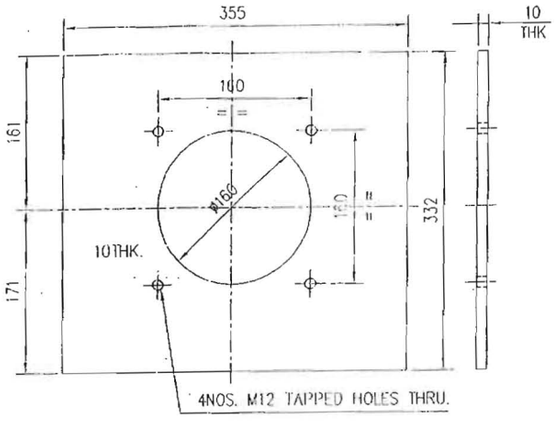
BURR FREE | REMOVE ALL SHARP CORNERS | APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES | ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE | DO NOT SCALE DRG. | IF IN DOUBT ASK



BRACKET DETAILS FOR PRI. BURNER MODEL NO.35 PW

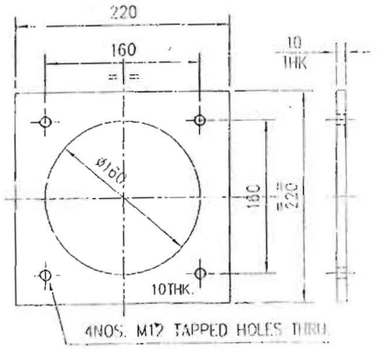


SR. NO. 02



SR. NO. 01

GAS FIRE BURNER MODEL NO.35 PW



SR. NO. 04

BRACKET DETAILS FOR SEC. BURNER MODEL NO.35 P

NOTES

1) ALL DIMENSIONS ARE IN MM, UNLESS OTHERWISE STATED.
2) REMOVE ALL SHARP CORNERS & EDGES.
3) TOTAL WEIGHT = 15 KGS.

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS
04	PLATE FOR SECONDARY BURNER	–	IS 2062 Gr.B	220 x 220 x 10 THK Ø160	1	2.50	PROFILE CUT
03	BOTTOM PLATE	–	IS 2062 Gr.B	89 x 355 x 6 THK	1	1.49	
02	SIDE PLATE	–	IS 2062 Gr.B	343 x 86 x 6 THK	2	1.39	SEE DETAIL
01	PLATE FOR PRIMARY BURNER	–	IS 2062 Gr.B	332 x 335 x 10 THK Ø160	1	8.75	PROFILE CUT

INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.	INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM
▽ ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT: FFC STD
MODEL: FF1

	DATE	SIGN.
DRAWN BY	08.01.16	V.V.C
CHKD. BY	08.01.16	P.G.K
APPD. BY	08.01.16	R.J

SCALE: 1:2.5
FILE NAME: CRM-FF1-16-STD-01/5
DESIGN NO. (IF ANY):

ADOR WELDING LIMITED
PUNE - 411019

BURNER MOUNTING FLANGE DETAIL FOR PRIMARY & SECONDARY BURNER

CRM-FF1-16-STD-01/5 | 0

SUPERSEDES No.

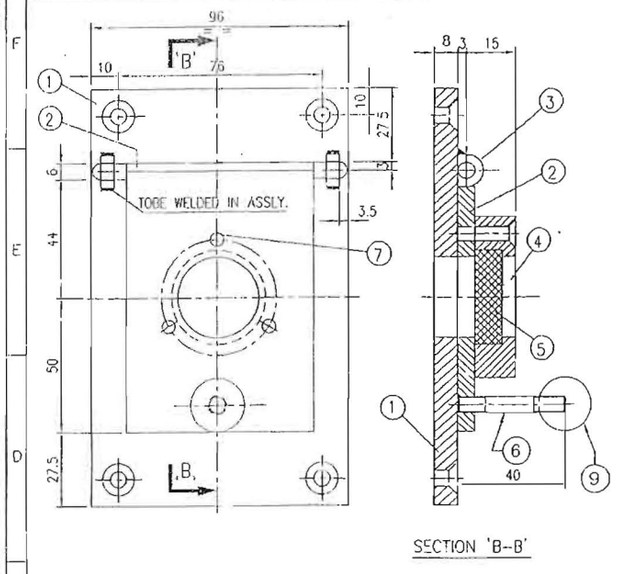
SUPERSEDED BY No.

NOTARY
GOV. OF MAHARASHTRA
Name G. H. Shaikh
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027

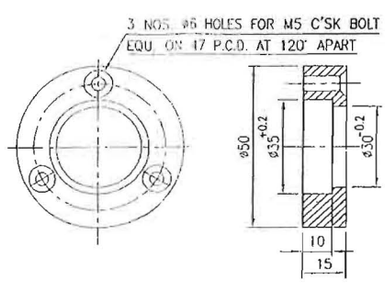
(Dr. P. P. Bhave)

132

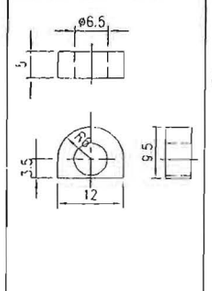
BURR FREE | REMOVE ALL SHARP CORNERS | APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES | ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE | DO NOT SCALE DRG. | IF IN DOUBT ASK



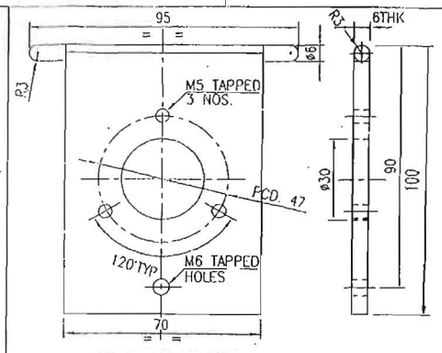
SECTION 'B-B'



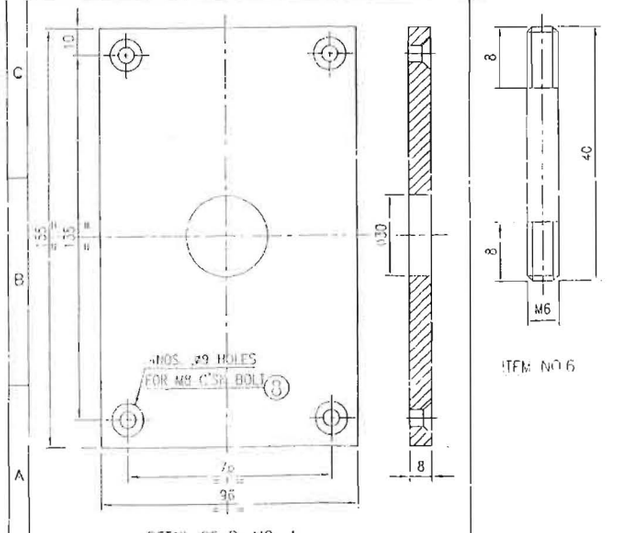
DETAIL OF P. NO. 4



DETAIL OF P.NO.3



DETAIL OF P NO.2



DETAIL OF P. NO. 1

ITEM NO.6

NOTES:-

1) ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.
2) TOTAL WEIGHT 1.54 KGS. FOR ONE ASSEMBLY.
3) ROUND OFF ALL SHARP EDGES.

Dave
Nitin P. Gulhane
Ph.D., M.Tech., B.E. (Mech.)
Associate Professor, Mech. Engg. Dept.
V.J.T.I., Mumbai

SR. NO.	DESCRIPTION	DRG.NO /MATERIAL/STANDARD.	SIZE FINISH	QTY	WT./PC KGS.	TTL/WT KGS.	REMARK
09	BALL KNOB	PLASTIC	M6	01	–	–	–
08	C'SK BOLT (SLOTTED HEAD)	HT 8.8	M 8 x 20 LG.	04	–	–	–
07	COUNTER SUNK SCREW	HT 8.8	M5 x 18 LG	03	–	–	–
06	HANDLE BAR	IS:2062 GR B.	ø6 x 40 LG.	1	0.01	0.01	–
05	GLASS	PYREX GLASS	ø34 x 10THK	01	–	–	–
04	VIEW PORT	IS:2062 GR B.	O.D.60 x I.D.30 x 15THK	01	0.15	0.15	AS SHOWN
03	PLATE (HINGE)	IS:2062 GR B	12 x 10 x5THK	02	0.004	0.008	–
02	PLATE	IS:2062 GR.B.	95 x 100 x 6THK	01	0.45	0.45	AS SHOWN
01	PLATE	IS:2062 GR B	155 x 96 x 8THK	01	0.93	0.93	–

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN mm
▽ ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT FFC STD.
MODEL FF1

2016	DATE	SIGN.
DRN. BY	08.01.16	Chalke
CHD. BY	08.01.16	PGK
APD. BY	08.01.16	RT

SCALE –

FILE NAME
CRM-FF1-16-STD-02/7

DSGN 4031/03/R1

ADOR WELDING LIMITED
PUNE - 411019

VIEW PORT ASSEMBLY
AND DETAILS

CRM-FF1-16-STD-02/7 | 0

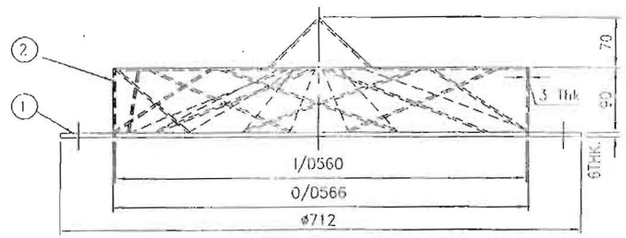
SUPERSEDES No

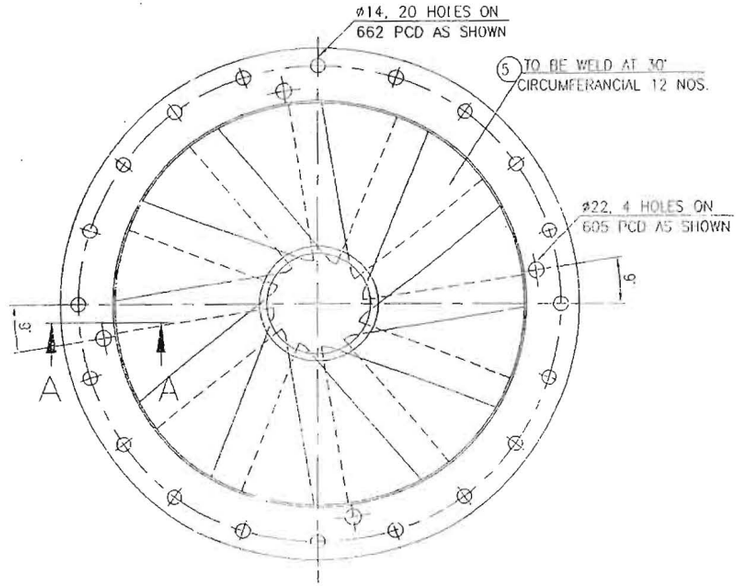
SUPERSEDED BY No

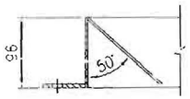
133

NOTARY
GOV. OF MAHARASHTRA
Name G. H. Shaikla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027

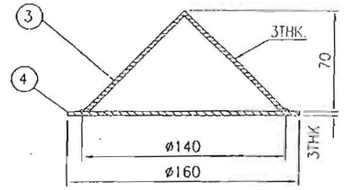
BURR FREE	REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES	ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE	DO NOT SCALE DRG.	IF IN DOUBT ASK



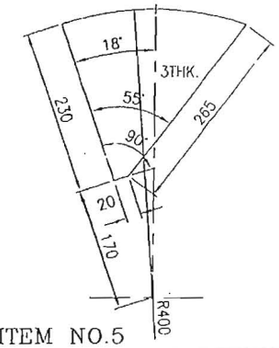




VIEW FROM "A" – "A"



ITEM NO.3 & 4



ITEM NO.5

NOTES:

1) ALL DIMENSIONS ARE IN MM
2) ALL FILLET WELD ARE 3mm THK. ALL ROUND
3) TOTAL WEIGHT = 16.52 KGS.
4) QUANTITY = 2 NOS / SCRWBBER

SR. NO.	DESCRIPTION	DRG.NO./MATL/STD.	SIZE	QTY	WT/PC KGS	TTL/WT KGS	REMARK
5	RIB	SS304	AS PER DRG.	12	0.37	4.44	
4	PLATE	SS304	ø160x3THK.	1	0.47	0.47	
3	CONE	SS304	AS PER DRG.	1	0.80	0.80	
2	SHELL	SS304	OD-566ID-560x96 LG	1	4.00	4.00	
1	FLANGE	SS304	OD-712ID-568x6THK.	1	6.81	6.81	

CUST-STD.

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM
▽ ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT FFC STD
MODEL FF1

2016	DATE	SIGN
DRN. BY	8.01.16	Chalke
CKD. BY	8.01.16	PGK
APD. BY	8.01.16	RJ

SCALE 1:6
FILE NAME
CRM-FF1-16-STD-04/1
DSGN 4031/3/R1

ADOR WELDING LIMITED
PUNE - 411019

MIST ELEMINATOR ASSEMBLY

CRM-FF1-16-STD-04/1

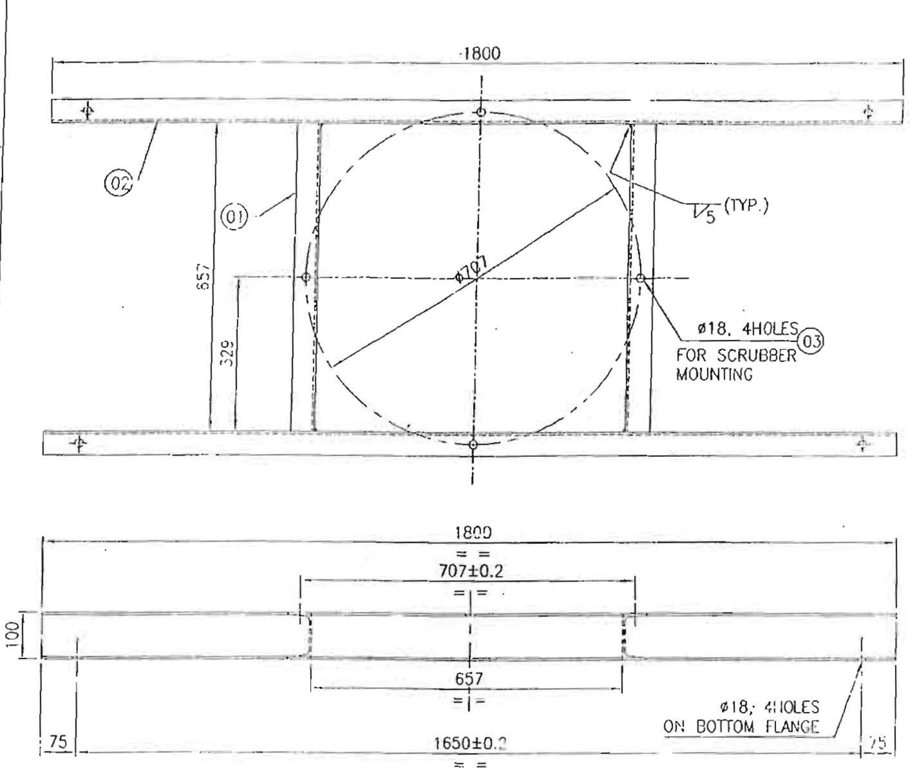
SUPERSEDES No.

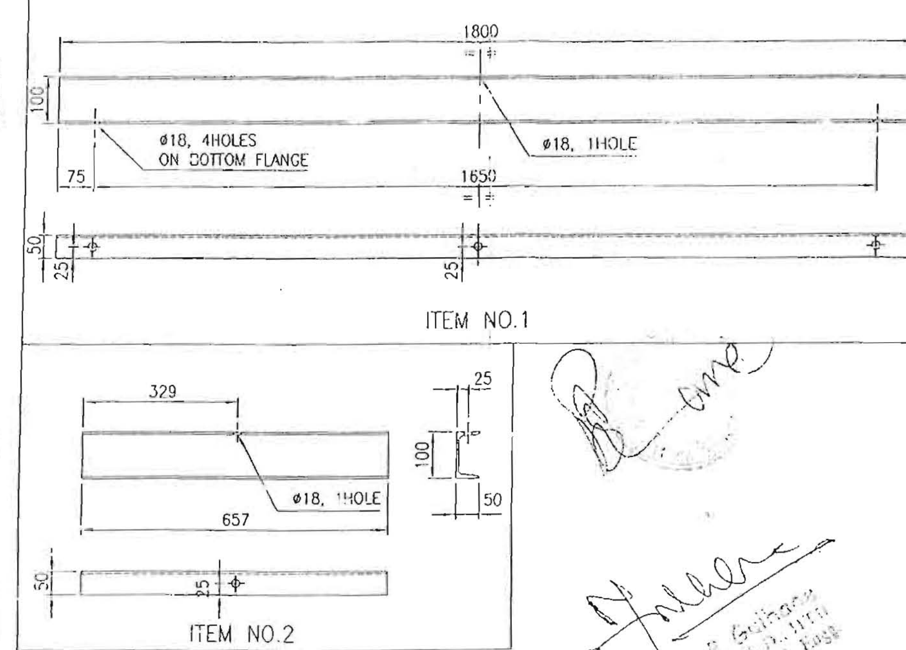
SUPERSEDED BY No.

NOTARY GOV. OF MAHARASHTRA
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121184
Exp. Dt.: 1 Mar. 2021

134

8	7	6	5	4	3	2	1
BURR FREE	REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES		ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE		DO NOT SCALE DRG.	IF IN DOUBT ASK





NOTES :

1. ALL DIMENSIONS ARE IN mm,UNLESS OTHERWISE SPECIFIED.
2. TOLTAL WEIGHT= 45.98 Kgs.
3. WELD THIKNESS 5mm MIN.UNLESS OTHERWISE SPECIFIED
4. TOLERANCE : ±1mm/MTR.
5. TOLRANCE BETWEEN CENTER OF HOLES ±0.2 mm
6. PAINTING : 2 COATS OF RED OXIDE (50 MICRONS DFT) & ONE COAT OF FINISHED PAINT (25 MICR.DFT) DOVE GRAY, ISI SHADE . 631 BEFORE PAINTING PROPER CLEANING TO BE DONE.

SR. NO.	DESCRIPTION	DRG.NO /CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS
04	NUT,BOLT & WASHER	-	H.T. 8.8	M16 x 100 LG.	04	0.25	50 mm THRD. LENGHT
03	NUT,BOLT & WASHER	-	IS 2062	M16 x 45 LG.	04	0.07	
02	CHANNEL	-	IS 2062	ISMC 100x50x1800Lg.	02	16.56	
01	CHANNEL	-	IS 2062	ISMC 100x50x657Lg.	02	6.29	

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM
ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT FFC STD
MODEL FF1

2016	DATE	SIGN.
DRN. BY	08.01.16	Chalke
CKD. BY	08.01.16	PGK
APD. BY	08.01.16	RJ

SCALE 1:10

FILE NAME CRM-FF1-16-STD-04/3

DSGN 4031A3/R1

ADOR WELDING LIMITED
PUNE - 411019

SUPPORT FOR SCRUBBER SYSTEM

ador WELDING

CRM-FF1-16-STD-04/3 0

SUPERSEDES No.

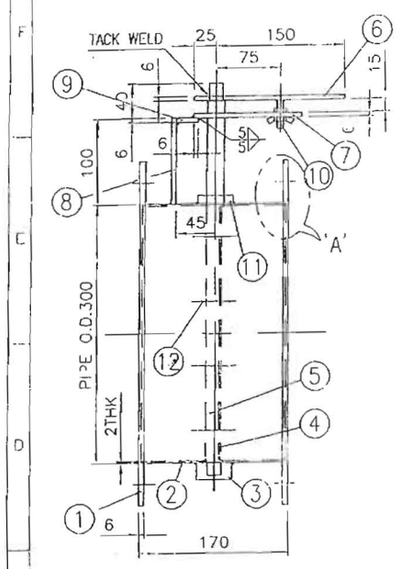
SUPERSEDED BY No.

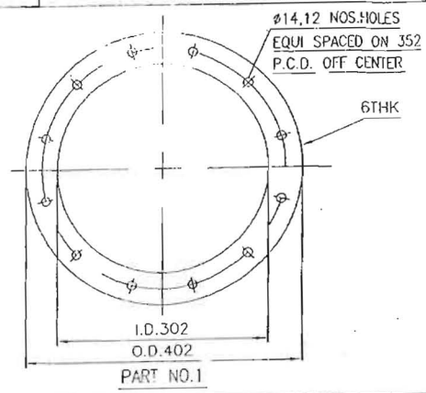
Dr. Nitin P. Gulhane
Mech. Engg.
Mumbai-19 (India)

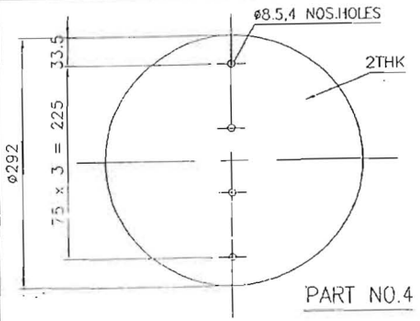
NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

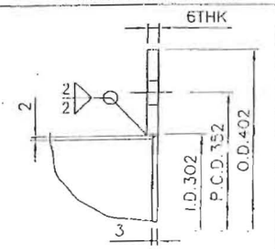
71

BURR FREE | REMOVE ALL SHARP CORNERS | APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES | ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE | DO NOT SCALE DRG. | IF IN DOUBT ASK









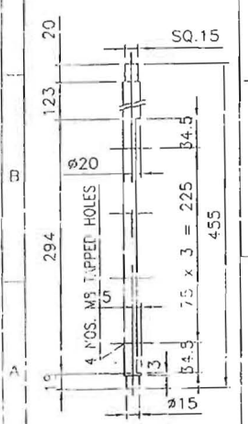
NOTES:-

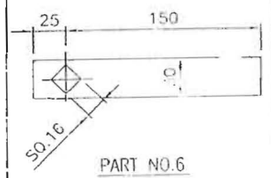
1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.
2. ROUND OFF ALL SHARP CORNERS.
3. TOTAL WEIGHT = 11.71 Kgs.
4. ALL FLANGE HOLES SHOULD STRADDLE TO MAIN AXIS.

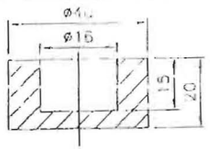
SR. NO.	DESCRIPTION	DRG.NO/MAT/STD	SIZE	QTY.	WT/PC Kgs.	TTL/WT Kgs.	REMARK
12	SCREW	SS 304	M8 x 20 lg.	04	0.01	0.04	–
11	PLATE	SS 304	O.D.40 x I.D.20.5 x 12THK	01	0.07	0.07	–
10	STUD+NUT+WING NUT+2WASHER	SS 304	M8 x 40 lg.	01	–	–	–
09	FLAT	SS 304	ISF 6THK x 25 x 25 Lg	01	0.02	0.02	–
08	FLAT	SS 304	ISF 6THK x 25 x 100 Lg.	01	0.10	0.10	–
07	PLATE	SS 304	208 x 150 x 6THK	01	1.23	1.23	–
06	FLAT	SS 304	ISF 6THK x 30 x 175 Lg.	01	0.25	0.25	–
05	ROD	SS 304	ø20 x 455 Lg.	01	1.13	1.13	–
04	FLAP	SS 304	O.D.292 x 2THK	01	1.06	1.06	–
03	BUSH	SS 304	I.D.16 x O.D.40 x 20THK	01	0.19	0.19	–
02	PLATE	SS 304	930 x 164 x 2THK	01	2.42	2.42	–
01	FLANGE	SS 304	O.D.402 x I.D.302 x 6THK	02	2.62	5.24	–

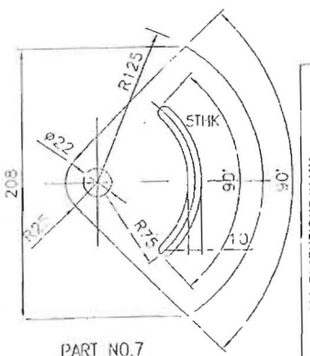
SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.









ALL DIMENSIONS IN MM
▽ ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT FFC STD
MODEL FF1

	2016	DATE	SIGN
DRN. BY		08.01.16	V.V.C
CKD. BY		8.1.16	P.G.K.
APD. BY		8.1.16	R.J.

SCALE 1:5
FILE NAME CRM-FF1-16-STD-04/4
DSGN 4031/03/R1

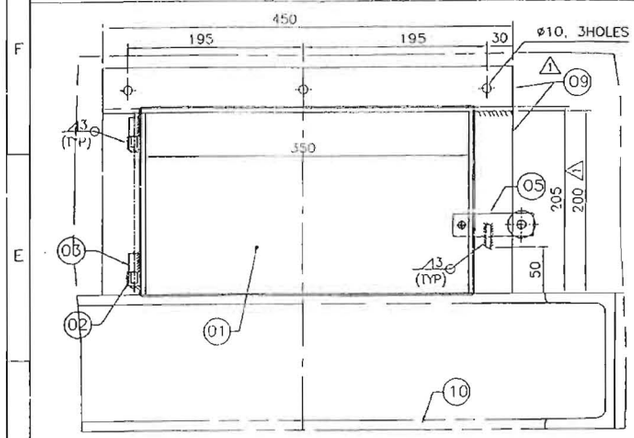
ADOR WELDING LIMITED
PUNE - 411019

DAMPER DETAILS FOR FLUE DUCT (300 DIA.)

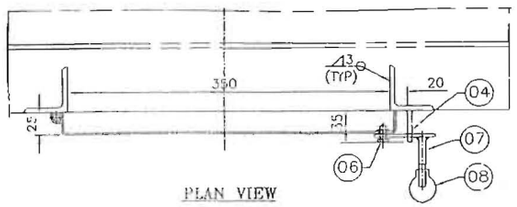
CRM FF1-16-STD-04/4 | 0

SUPERSEDES No. | SUPERSEDED BY No.

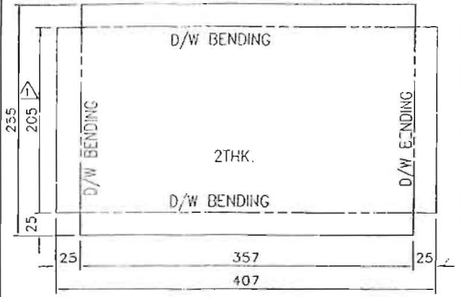
BURR FREE	REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES	ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE	DO NOT SCALE DRG.	IF IN DOUBT ASK



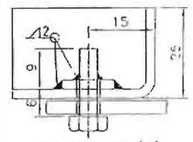
FRONT ELEVATION



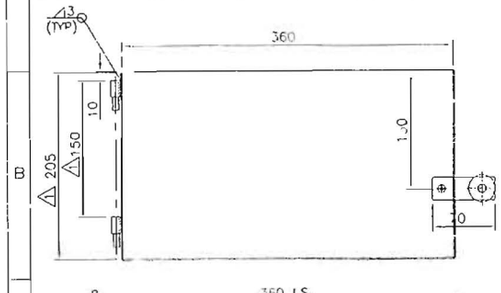
PLAN VIEW



SR.NO. 01
(DEVELOPMENT)

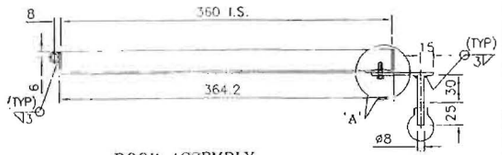


DETAIL AT 'A'



SR.NO. 05

SR.NO. 04



DOOR ASSEMBLY

SR.NO. 02 SR.NO. 03

ALL DIMENSIONS IN mm
▽ ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

NOTES:-

1) ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.
2) TOTAL WEIGHT 6 KGS. APPROX.
3) ROUND OFF ALL SHARP EDGES.
4) PAINTING :- TO BE POWDER COATED WITH GLOSSY FINISH.
   SHADE - SIGNAL WHITE (RAL NO. 9003)
5) P. NO. 2 & 4 TO BE WELD WITH STRL. ASSLY.

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS
10	STRUCTURAL ASSLY	CRM-FF-16-001-04	–	–	–	–	–
09	ANGLE	IS 2062		ISA 50x50x5THK.-1000LG.	01	3.80	CUT TO SUIT
08	ROUND KNOB	PLASTIC		M8	01	–	–
07	ROUND BAR	IS 2062		ø8 x 55LG	01	0.025	–
06	BOLT & 2 THK. WASHER	IS 2062		M6 x 15 LG.	01	–	–
05	FLAT	IS 2062		25 x 70 x 3THK	01	0.030	–
04	FLAT	IS 2062		25 x 35 x 5 THK	01	0.053	AS SHOWN
03	PIN FOR HINGE	IS 2062		AS SHOWN	02	0.020	AS SHOWN
02	HINGE	IS 2062		AS SHOWN	02	0.015	AS SHOWN
01	SHEET	CRCA		255 x 407 x 2 THK	01	1.63	–

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.

PROJECT FFC STD
MODEL FF1

	2016	DATE	SIGN.
DRN. BY		08.01.16	Chalke
CKD BY		8.1.16	P.G.K
APD. BY		8.1.16	R.J.

SCALE 1:10

FILE NAME
CRM-FF1-16-STD ASH_DOOR

DSGN 4031/03/R1

ADOR WELDING LIMITED
PUNE - 411019

ASSLY & DETAILS
FOR ASH DOOR

ador WELDING

CRM-FF1-16-STD-06/3 | 0

SUPERSEDES No.

SUPERSEDED BY No.

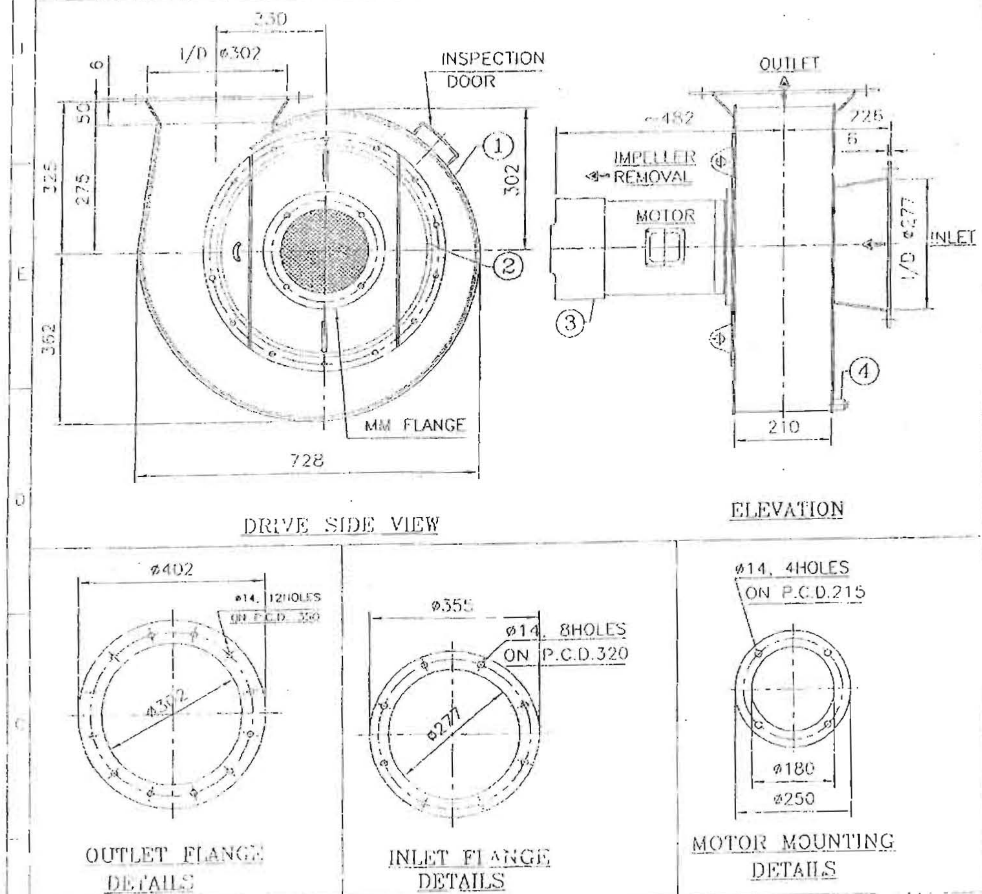
NOTARY
GOVT. OF MAHARASHTRA
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027

Dr. Nitin P. Gulhane
Ph.D., M.E.
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

137

75

BURR FREE	REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES	ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE	DO NOT SCALE DRG.	IF IN DOUBT ASK



TECHNICAL DATA:-

Flow Volume	:	3500	m^3/hr
Static Pressure	:	200	mmWG
Operating Temp.	:	60	°C
Motor	:	5.0/2880	hp/rpm
Fan Speed	:	2880	rpm
Static Efficiency	:	75.46	%
Power at Working	:	3.66	kg-f
Power at 20°C	:	4.21	kg-f
Application	:	EXHAUST BLOWER	
Fan Orientation	:	HOLD (CW360)	
Fan Qty.	:	1NO./FURNACE	
Model no.	:	J432325.0DM	
Impeller size	:	ø432	
Motor mounting	:	FLANGE MOUNTED	
Impeller Type	:	Backward Curved	

Dr. Nitin P. Gulhane
Ph.D., IITB
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

NOTES :-

M.O.C FOR IMPELLER

DESCRIPTION	MATERIAL	THICKNESS
BACKPLATE	SS304	3 THK
SHROUD	SS304	2 THK
BLADE	SS304	3 THK

ALL DIMENSIONS IN MM

▽ ROUGH ▽▽SMOOTH ▽▽▽ FINISH

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS
5	HARDWARE	S.S.304	STD.		1LOT	-	JEEPL
4	DRAIN PLUG	S.S.304	25 NB		1	-	JEEPL
3	ELECTRIC MOTOR	CGL(FRAME-ND160L)	5HP/2P		1	-	JEEPL
2	IMPELLER	REFER MOC TABLE			1	-	JEEPL
1	CASING/SCROLL	S.S.304	3mm THK		1	-	JEEPL

INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.	INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.

2016	DATE	SIGN.
DRWN. BY	5.01.16	V.V.C.
CHKD. BY	8.01.16	A.K.
APRD. BY	8.01.16	R.J.

SCALE : 1:10

FILE NAME: CRM-FF1-STD-08 GA OF EXH. BL

DSGN 4031/14

PROJECT :-

MODE :-

ADOR WELDING LIMITED
PUNE - 411019

ador WELDING

G.A. DRAWING OF EXHAUST BLOWER

SHEET NO. 1 OF 2

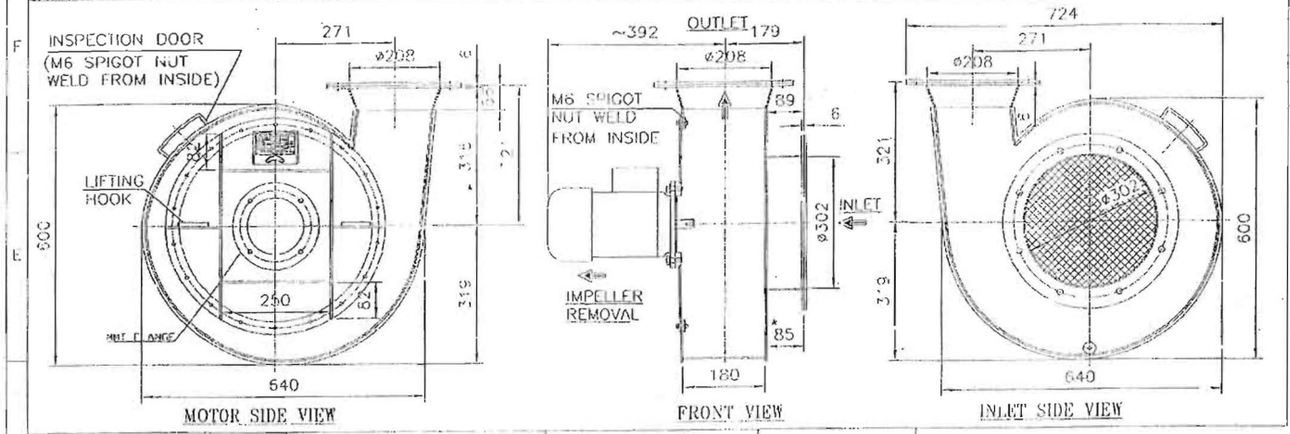
CRM-FF1-16-STD-08 | 0

SUPERSEDES No.

SUPERSEDED BY No.

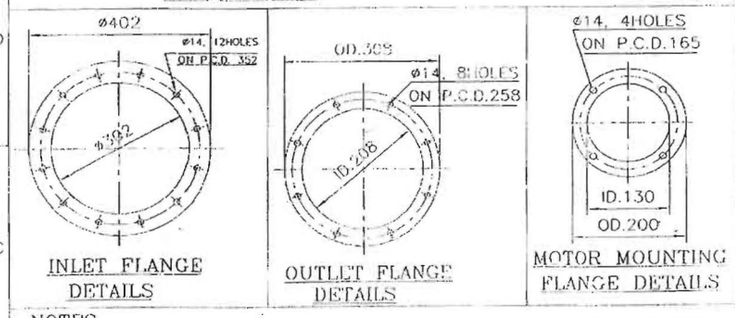
NOTARY
Name G. H. Shakla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

BURR FREE	REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES	ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE	DO NOT SCALE DRG.	IF IN DOUBT ASK



TECHNICAL DATA:-

Flow Volume	:	1000	m^3/Hr
Static Pressure	:	50	mmWG
Operating Temp.	:	40	°C
Fan Speed	:	1440	rpm
MOTOR	:	1/1440	HP/rpm
Static Efficiency	:	75.24	%
BHP at Working	:	0.26	HP
BHP at NTP	:	0.28	HP
Application	:	CENTRIFUGAL FAN	
Fan Orientation	:	CCW 360	
Fan Qty.	:	1 NO./Furnace	
Impelier Type	:	Backward Curved	



NOTES :-

1) PAINTING :- 2 COATS RED OXID PRIMER & 1 COAT ENAMEL SHOROZI BLUE
2) RECOMMENDED DATA FOR ACTUATOR
   TORQUE = - kg-m THRUST= - kg-f/STROKE= mm
3) DYNAMIC BALANCING SHALL BE CARRIED OUT AS PER ISO:1940, G 6.3
4) NOISE PRESSURE LEVEL AT 1m DIST. FROM THE FAN SHALL BE LIMITED TO 85 db(A) IN DUCTED CONDITION AT SITE
5) CRITICAL SPEED = 1.3 x NORMAL OPERATING SPEED(minimum)
6) THE VIBRATION LEVEL WILL BE AS PER ISO 14694/7902.3(E) -IIMS READS
7) MOTOR HOLDING DOWN BOLTS, NUTS & WASHERS WILL BE SUPPLIED BY JEEPL
8) INLET & OUTLET FLANGES ARE NOT DESIGNED FOR CARRYING EXTERNAL LOAD
9) CIVIL WORK IS ONLY PICTORIAL VIEW. JEEPL IS NOT RESPONSIBLE FOR CIVIL DESIGN
10) TESTING AS PER IS4894

M.O.C FOR IMPELLER

DESCRIPTION	MATERIAL	THICKNESS
BACKPLATE	S.S. 304	3 MM THK
BLADE	S.S. 304	3 MM THK
SHROUD	S.S. 304	2 MM THK

Deviation Class Of	Including Up to &	3	6	30	120	400	1000	2000	4000
	Above	0.5	3	6	30	120	400	1000	2000
Range Of Nominal Dimensions									
Coarse		±0.2	±0.3	±0.5	±0.8	±1.2	±2.0	±3.0	±4.0
Medium		±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2.0
Fine		±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	–

Deviations For linear dimensions in Millimeters As Per IS : 2102

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS
7	Inlet wire mesh	S.S.304	STD.		1	–	JEEPL
6	Outlet Matching flanges	S.S.304	STD		1	–	JEEPL
5	HARDWARE	S.S.304	STD.		HOT		JEEPL
4	DRAIN PLUG	S.S.304	25 NB		1		JEEPL
3	Elect. Motor(415v,all-2.50hz)	CGL(FRAME-ND80)	1HP/4P/3ph		1		JEEPL
2	IMPELLER	REFER MOC TABLE			1		JEEPL
1	CASING/SCROLL	S.S.304	3mm THK		1	–	JEEPL

INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.	INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM
ROUGH ∀∀ SMOOTH ∀∀∀ FINISH

PROJECT :-
MODEL :-

2015	DATE	SIGN
DRWN. BY	8.01.16	V.V.C.
CHKD. BY	8.01.16	A.K.
APRD. BY	8.01.16	R.J.

SCALE : 1:10
FILE NAME
CRM-FF1-STD-08 GA OF FR. ABL
OSGN 4031/44/R0

ADOR WELDING LIMITED
PUNE - 411019

G.A .DRAWING OF FRESH AIR BLOWER

SHEET NO. 2 OF 2

CRM-FF1-16-STD-08 | 0

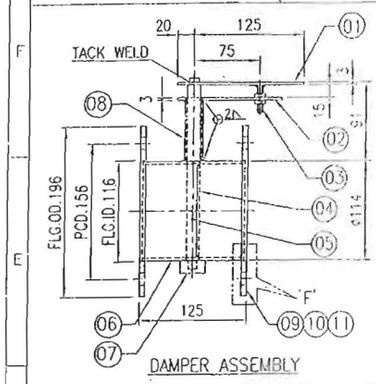
SUPERSEDES No.

SUPERSEDED BY No.

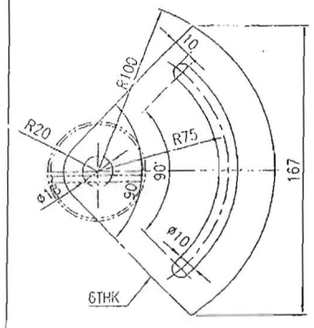
A3

139

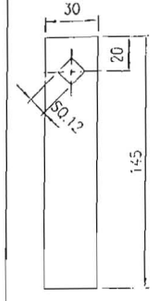
BURR FREE | REMOVE ALL SHARP CORNERS | APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES | ALL FABRICATED & STEEL ITEMS TO BE PAINTED WITH RED OXIDE | DO NOT SCALE DRG. | IF IN DOUBT ASK



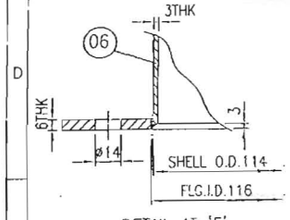
DAMPER ASSEMBLY



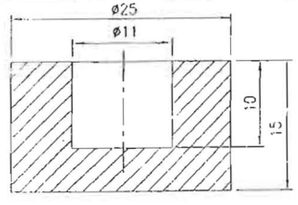
DETAIL OF P.NO.02



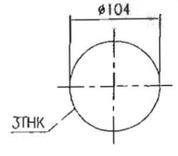
DETAIL OF P.NO. 01



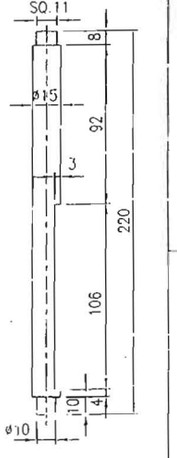
DETAIL AT 'F'



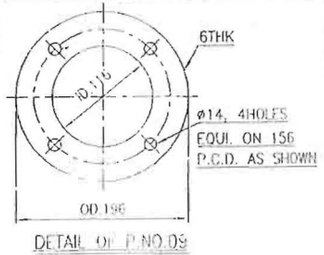
DETAIL OF P.NO.07



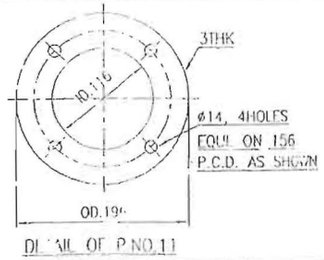
DETAIL OF P.NO.04



DETAIL OF P.NO.05



DETAIL OF P.NO.09



DETAIL OF P.NO.11

NOTES:-

1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.
2. ROUND OFF ALL SHARP CORNERS.
3. TOTAL WEIGHT = 5 Kgs. APPROX.
4. ALL FLANGE HOLES SHOULD BE STRADDLE TO MAIN AXIS.
5. QUANTITY = 2 NOS / ASSEMBLY

Dr. Vilas P. Gulhane
Ph.D., IIT B
Associate Professor, Mech. Engg.
VJTI, Mumbai-19 (India)

SR. NO	DESCRIPTION	DRG.NO/MAT/STD	SIZE	QTY	WT/PC Kgs.	TTL/WT Kgs.	REMARK
11	GASKET	C.A.F.	O.D.196 x I.D.116 x 3THK	2	–	–	–
10	NUT,BOLT & WASHER	H.T. 8.8	M12 x 40 LG.	8	0.04	0.32	–
09	PLATE FLANGE	IS 2062 GR.B	O.D.196 x I.D.116 x 6THK	2	0.92	1.84	–
08	PIPE	SA 106 GR.B	1/2"NBx70LG., 2.11THK.	1	0.07	0.07	–
07	BUSH	IS 2062 GR.B	O.D.25 x I.D.11 x 15THK	1	0.05	0.05	–
06	SHEET	CRCA	350 x 119 x 3THK	1	0.98	0.98	–
05	ROD	IS 2062 GR.B	ø15 x 220LG	1	0.31	0.31	–
04	SHEET	CRCA	ø104 x 3THK	1	0.20	0.20	–
03	STUD + 2 NUT	H.T. 8.8	M10 x 50 LG.	1	0.03	0.03	–
02	PLATE	IS 2062 GR.B	120 x 167 x 6THK	1	0.94	0.94	–
01	FLAT	IS 2062 GR.A	3THK x 30 x 145 LG.	1	0.10	0.10	–

SR. NO	DESCRIPTION	DRG.NO./CODE NO STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS

INDEX	M. NO.	DESCRIPTION	DATE	SIGN.	INDEX	M. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM
ROUGH ▽▽ SMOOTH ▽▽▽ FINISH

PROJECT FFC STD.
MODEL FF1

2016	DATE	SIGN.
DRN. BY	08.01.16	Challa
CKD. BY	08.01.16	PGK
APD. BY	08.01.16	RJ

SCALE 1:5
FILE NAME CRM-FF1-16-STD-10/1
DSGN 4031/13/R1

ADOR WELDING LIMITED
PUNE - 411019

DAMPER DETAILS FOR 4"NB SIZE

SUPERSEDES No.
SUPERSEDED BY No.

CRM-FF1-16-STD-10/1 | 0

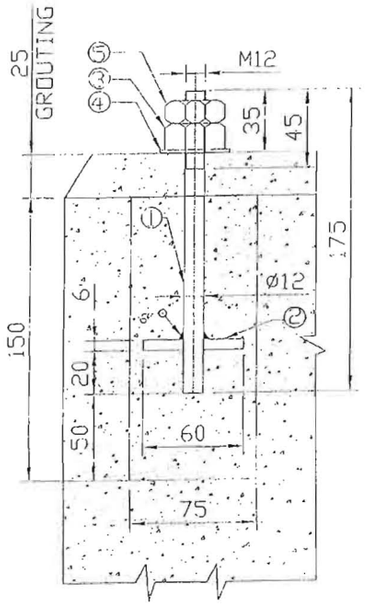
NOTARY
GOV. OF MAHARASHTRA
Name O. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. 1 Mar. 2017

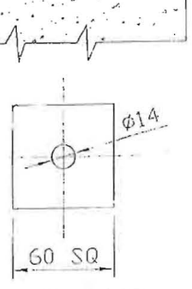
140

BURR FREE	REMOVE ALL SHARP CORNERS	APPLY RUST PREVENTIVE OIL TO ALL MACHINED SURFACES	ALL FABRICATED & STEEL ITEMS TO Be PAINTED WITH RED OXIDE	DO NOT SCALE DRG.	IF IN DOUBT ASK

NOTES

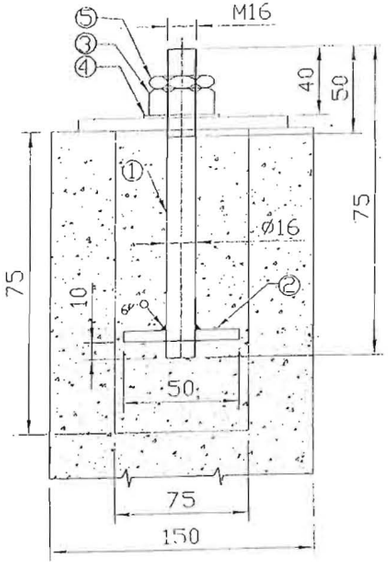
1. ALL DIMENSIONS ARE IN mm,UNLESS OTHERWISE SPECIFIED.
2. ALL FOUNDATION BOLTS SHALL BE SUPPLIED WITH EQUIPMENT BY AVL.

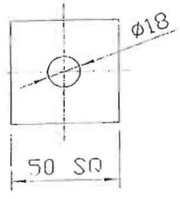




FOUNDATION BOLT DETAIL FOR PUMP

QTY :- 2NOS.





FOUNDATION BOLT DETAIL FOR SCRUBBER SUPPORT

QTY.:- 4NOS.

TOTAL QTY OF SCRUBBER FDN. BOLT = 4 SETS

SR. NO.	DESCRIPTION	MOC	SIZE	QTY.	WT.P.C.	TO.WT.	REMARK
5	WASHER	IS 2062 Gr.B	M16 BOLT	1	-	-	
4	LOCK NUT	SA 194 Gr.2H	M16	1	-	-	
3	NUT	SA 194 Gr.2H	M16	1	-	-	
2	PLATE	IS 2062 Gr.B	50X50X6 THK	1	0.16	0.16	
1	ROUND BAR	IS 2062 Gr.B	ø16X75 Lg.	1	0.28	0.28	

BILL OF MATERIAL FOR SCRUBBER SUPPORT FOUNDATION BOLT

SR. NO.	DESCRIPTION	MOC	SIZE	QTY.	WT.P.C.	TO.WT.	REMARK
5	WASHER	IS 2062 Gr.B	M12 BOLT	2	-	-	
4	LOCK NUT	SA 194 Gr.2H	M12	2	-	-	
3	NUT	SA 194 Gr.2H	M12	2	-	-	
2	PLATE	IS 2062 Gr.B	60X60X6 THK	2	0.17	0.34	
1	ROUND BAR	IS 2062 Gr.B	ø12X175 Lg.	2	0.16	0.32	

BILL OF MATERIAL FOR PUMP FOUNDATION BOLT

SR. NO.	DESCRIPTION	DRG.NO./CODE NO. STANDARD	MATERIAL	SIZE	NOS. REQ.	WT./PC Kgs.	REMARKS

INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.	INDEX	MOD. NO.	DESCRIPTION	DATE	SIGN.

ALL DIMENSIONS IN MM

7 ROUGH 2.5 SMOOTH FINISH

PROJECT FFC STD

MODEL FF1

2016	DATE	SIGN.
DRWN. BY	08.01.16	V.V.C
CHKD. BY	08.01.16	PGK
APRD. BY	08.01.16	R.J.

SCALE: 1:5

FILE NAME CRM-FF1-16-STD-12/2

DSGN 4031/13/R1

ADOR WELDING LIMITED
PUNE - 411019

FOUNDATION BOLTS DETAILS FOR PUMP & SCRUBBER SUPPORT

CRM-FF1-16-STD-12/2

SUPERSEDES No.

SUPERSEDED BY No.

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOVT. OF MAHARASHTRA

Nitin P. Gulhane
Ph.D., IIT B
Mech. Engg.
Associate Professor, VJTI, Mumbai

EXHIBIT - D (Colly)

ADOR[illegible]EL[illegible]ING LIMITED

Monthly Maintenance Service Report No.01/2024 /2025

Subject: Comprehensive Opearnion Maintenance contract of 2 Nos .PNG furances at Babulbi Crematorium Borivali[w] In P/N ward.
Deprtment: Ex .Engineer M&R
Sanction No.
Your P.O No.: Your P.O No
C.O.M Period: up to
Maintenance Period : 01.04.2024 to 30.04.2024

Sr..No.		Daily Maintenance		Remarks
1	a)	Clean Body charging chember		✓
	b)	check and clean body charging Trolly .	OK	✓
	c)	Cleaning furnace and scrubber Surrounding	OK	✓
2		**Weekly maintainence**		
	a)	Furnace main door alignment & servicing.		✓
	b)	Furnace leakage prevntion		✓
	c)	Maindoor limit Swith ,& wiring.		✓
	d)	Thermocouple cleaning		✓
	e)	Vaccum gauge conuction cleaning		✓
	f)	Primary & secondary Burner servicing.		✓
	g)	scrubber water tank cleaning		✓
3		Monthly maintainence		
	a)	Gear box & chain servicing & lubrication		✓
	b)	Main door insulation &		✓
	c)	Refractory repair and /rectification		✓
	e)	Fresh air blower cleaning & [illegible] servicing		✓
	f)	Panel wiring & indication lamps		✓
	g)	Exhaust demper servicing		✓
	h)	Trolley se[illegible]		✓
	i)	M.C.B for Ex.blowar Replce		✓
4		**Quarterly maintenance**	OK	✓
	a)	chimney cleaning		
	b)	ETP cleaning & servicing		
	c)	DG set servicing	OK	✓
5	a)	Emargence calls attending & Repair	OK	✓

Sanjay Gaikwad

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

ADOR WELDING LIMITED

Monthly Maintenance Service Report No.03/2024 /2025

Subject : Comprehensive Opearrion Maintenance contract of 2 Nos .PNG furances at Babahi crematorium Borivali[w] In P/N ward.
Deprtment : Ex Engineer M&E
Sanction No
Your P.O No. : Your P.O No
C.O.M Period : up to
Maintenance Period : 01.05.2024 to 31.05.2024

Sr. No.		Daily Maintenance		Remarks
1	a)	Clean Body charging chember.	OK	✓
	b)	check and clean body charging Trolly	OK	✓
	c)	Cleaning furnace and scrubber Surrounding	OK	✓
2		Weekly maintainence	OK	
	a)	Furnace main door alignment & servicing.		✓
	b)	Furnace leakage prevntion.	OK	✓
	c)	Maindoor limit Swith ,& wiring		✓
	d)	Thermocouple cleaning.		
	e)	Vaccum gauge conuction cleaning.	OK	✓
	f)	Primary & secondary Blower servicing		✓
	g)	Scrubber water tank cleaning		✓
		Monthly maintainence		
	a)	Gear box & chain servicing & lubrication		
	b)	Main door insulation & sealing	OK	
	c)	Refractory repair and /rectification		
	d)	Fresh air blower & scrubber blower service		
	f)	Panel wiring & indication lamps	OK	
	g)	Exhaust demper servicing	OK	
	h)	Trolley servicing	OK	
	i)	M.C.B for Ex.blowar Replce	OK	✓
4		Quarterly maintenance	OK	
	a)	chimney cleaning	OK	
	b)	ETP cleaning & servicing	OK	
	c)	DG set servicing		
5	a)	Emargence calls attending & Repair		✓

Checked by

Attended by

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

ADOR WELDING LIMITED

Monthly Maintenance Service Report No.03/2024 /2025

Subject : Comprehensive Opeartion Maintenance contract of 2 Nos .PNG furances at Babahi crematorium Boriveli[w] In P/N ward.
Deprtment : Ex .Engineer M&E
Sanction No.
Your P.O No. : Your P.O No
C.O.M Period : up to
Maintenance Period : 01.06.2024 to 30.06.2024

Sr..No.	Daily Maintenance		Status	Remarks
1	a)	Clean Body charging chember.	OK	✓
	b)	check and clean body charging Trolly .	OK	✓
	c)	Cleaning furnace and scrubber Surrounding	OK	✓
2	Weekly maintainence		OK	
	a)	Furnace main door alignment & servicing.	OK	✓
	b)	Furnace leakage prevntion.	OK	✓
	c)	Maindoor limit Swith ,& wiring.	OK	✓
	d)	Thermocouple cleaning.	OK	✓
	e)	Vaccum gauge conuction cleaning.	OK	✓
	f)	Primary & secondary Burner servicing.	OK	✓
	g)	scrubber water tank cleaning.	OK	✓
3	Monthly maintainence			
	a)	Gear box & chain servicing & lubrication	OK	✓
	b)	Main door insulation & sealing	OK	✓
	c)	Refractory repair and /rectification	OK	✓
	e)	Fresh air blower &scrubber blower service	OK	✓
	f)	Panel wiring & indication lamps	OK	✓
	g)	Exhaust demper servicing	OK	✓
	h)	Trolley servicing	OK	✓
	i)	M.C.B for Ex.blowar Replce	OK	✓
4	Quarterly maintenance			
	a)	chimney cleaning	OK	✓
	b)	ETP cleaning & servicing	OK	
	c)	DG set servicing	OK	✓
5	a)	Emargence calls attending & Repair	OK	✓

Checked by

Attended by

Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

Approved by

मृत्यु नोंदणी कारकून
बाभई हिंदु श्मशान भूमि,
बोरीवली (पश्चिम).

ADOR WELDING LIMITED

Monthly Maintenance Service Report No.04/2024 /2025

Subject : Comprehensive Opeartion Maintenance contract of 2 Nos .PNG furances at Babahi crematorium Boriveli[w] In.
Deprtment : Ex .Engineer M&E
Sanction No,
Your P.O No. : Your P.O No
C.O.M Period : up to
Maintenance Period : 01.07.2024 to 31.07.2024

Sr..No.	Daily Maintenance		Status	Remarks
1	a)	Clean Body charging chember.	OK	✓
	b)	check and clean body charging Trolly .	OK	✓
	c)	Cleaning furnace and scrubber Surrounding	OK	✓
2	**Weekly maintainence**		OK	
	a)	Furnace main door alignment & servicing.	OK	✓
	b)	Furnace leakage prevntion.	OK	✓
	c)	Maindoor limit Swith ,& wiring.	OK	✓
	d)	Thermocouple cleaning.	OK	✓
	e)	Vaccum gauge conuction cleaning.	OK	✓
	f)	Primary & secondary Burner servicing.	OK	✓
	g)	scrubber water tank cleaning.	OK	✓
3	**Monthly maintainence**			
	a)	Gear box & chain servicing & lubrication	OK	✓
	b)	Main door insulation & sealing	OK	✓
	c)	Refractory repair and /rectification	OK	✓
	e)	Fresh air blower &scrubber blower service	OK	✓
	f)	Panel wiring & indication lamps	OK	✓
	g)	Exhaust demper servicing	OK	✓
	h)	Trolley servicing	OK	✓
	i)	M.C.B for Ex.blowar Replce	OK	✓
4	**Quarterly maintenance**			
	a)	chimney cleaning	OK	✓
	b)	ETP cleaning & servicing	OK	
	c)	DG set servicing	OK	✓
5	a)	Emargence calls attending & Repair	OK	✓

Checked by

Attended by

Approved by

मृत्यु नोंदणी विभाग

मुंबई - ४०० ०१२.

Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOVT. OF MAHARASHTRA

ADOR WELDING LIMITED

Monthly Maintenance Service Report No.05/2024 /2025

Subject : Comprehensive Opeartion Maintenance contract of 2 Nos .PNG furances at Babahi crematorium Boriveli[w] In.
Deprtment : Ex .Engineer M&E
Sanction No.
Your P.O No. : Your P.O No
C.O.M Period : up to
Maintenance Period : 01.08.2024 to 31.08.2024

Sr..No.	Daily Maintenance		Status	Remarks
1	a)	Clean Body charging chember.	OK	✓
	b)	check and clean body charging Trolly .	OK	✓
	c)	Cleaning furnace and scrubber Surrounding	OK	✓
2	Weekly maintainence		OK	
	a)	Furnace main door alignment & servicing.	OK	✓
	b)	Furnace leakage prevntion.	OK	✓
	c)	Maindoor limit Swith ,& wiring.	OK	✓
	d)	Thermocouple cleaning.	OK	✓
	e)	Vaccum gauge conuction cleaning.	OK	✓
	f)	Primary & secondary Burner servicing.	OK	✓
	g)	scrubber water tank cleaning.	OK	✓
3	Monthly maintainence			
	a)	Gear box & chain servicing & lubrication	OK	✓
	b)	Main door insulation & sealing	OK	✓
	c)	Refractory repair and /rectification	OK	✓
	e)	Fresh air blower &scrubber blower service	OK	✓
	f)	Panel wiring & indication lamps	OK	✓
	g)	Exhaust demper servicing	OK	✓
	h)	Trolley servicing	OK	✓
	i)	M.C.B for Ex.blowar Replce	OK	✓
4	Quarterly maintenance			
	a)	chimney cleaning	OK	✓
	b)	ETP cleaning & servicing	OK	✓
	c)	DG set servicing	OK	✓
5	a)	Emargence calls attending & Repair	OK	✓

Checked by

Attended by

10/9/24
Approved by

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOV. OF MAHARASHTRA

GADARK LAB PVT. LTD.
INDUSTRIAL ANALYSTS & CONSULTANTS
LAB.: H-54, Additional M.I.D.C. Kudal, Taluka - Kudal, District - Sindhudurg - 416 525.
Tel. : (02362) 223519 • E-mail : info@gadark.in • Website : www.gadark.in
OFF.: 15, Hindustan Kohinoor Industrial Complex, L.B.S. Marg, Vikhroli (West), Mumbai - 83.
Tel.: (022) 2577 7069 / 2577 7070 / 2085 0091 • +91 93213 12367

TEST REPORT

Doc.No : GLPL/QF/7.8/02

Test Report No.	GA/AW/C/0901/24	**Test Report Date**	26/09/2024
Customer Name and Address	**M/S. ADOR WELDING LIMITED EQUIPMENT PLANT, CHINCHWAD, PUNE – 411 019.**		
Letter Ref / Date	---	**Page No.**	1 of 1
Sampling Done By	GLPL	**Sample Received on**	23/09/2024
Sampling Plan	GLPL/QF/7.3/06	**Analysis Period**	24/09/2024 To 26/09/2024

SITE - BABHAI HINDU SAMSHAN BHUMI,BABHI ROAD, VAZIRA NAKA, BORIVALI (WEST), MUMBAI

SAMPLING DETAILS - STACK EMISSION

Stack Attached to	**Scrubber Outlet**
Stack Dimension [mm]	500
Date of Sample collection	23/09/2024
Time of Sampling [Hrs.]	18:00
Temperature of flue gas [°C]	128
Average flue gas velocity [m/s]	6.3
Average volume of flue gas discharged [Nm^3/hr]	3310

ANALYSIS REPORT :

Parameters	Units	Results	Sampling & Analysis Methods
Particulate Matter	mg/Nm^3	45.2	IS 11255 (Part I) 1985
Sulphur Dioxide	ppm v/v	Nil	IS 11255 (Part II) 1985
	Kg/day	Nil	
NOx	mg/Nm^3	25.5	IS 11255 (Part VII) 2005
HF	mg/Nm^3	Nil	IS 11255 (Part 5) 2003
HCl	mg/Nm^3	Nil	By Morris B Jacob
Total Hydrocarbon as Toluene	mg/Nm^3	38.4	APHA 43101-02-71 T
CO	ppm	14.6	APHA Edition II-134
CO_2	ppm	21.7	
O_2	%	6.9	

End

For GADARK LAB PVT. LTD.

AUTHORISED SIGNATORY
[SACHIN B. GAONKAR]

NOTARY
Name G. H. Shukla
Area Gr. Mumbai
Reg. No. 121/84
Exp. Dt.: 1 Mar. 2027
GOVT. OF MAHARASHTRA

CHECKED BY

Note :
1. The results relate only to the samples tested
2. Test Report shall not be reproduced except in full, without written approval of the laboratory.
3. Samples will be preserved for a period 15 days from the delivery of Test Report.
4. Test Results relate only to the conditions prevailing at the time of sampling.
5. Customer complaint register is available at laboratory.