



REF. PRODUCT STD.: HT 00259

Hydro Turbine Engineering Division

ANNEXURE- I

Major design input parameters

(To be filled by indenter)

For dimensional details refer filled in table given in sketch-1

1. Type : Double acting fixed back mounted type
2. Bore dia. : 180 mm
3. Piston rod dia. (Minimum)** : 85 mm
4. Stroke*(S) : 440 mm (tentative)
5. Design pressure (P_{design}) : 60 kg/cm^2
6. Test Pressure (P_{test}) : 90 kg/cm^2
7. Opening time (for full stroke) : 10-20 sec (adjustable range)
(excluding cushioning time)
8. Closing time (for full stroke) : 6-8 sec (adjustable range)
(excluding cushioning time)
9. Oil : ISO VG 46 / ISO VG 57 / ISO VG 68
10. Test pressure for mechanical lock : 2 x Design pressure as given above
11. Painting : As per enclosed sheet / Clause - 4.3
12. Cushioning time (t) : 6 sec to 12 sec
13. Cushioning Pressure ($P_{1\text{cushion}}$) : Design pressure as given above
14. Cushioning Pressure ($P_{2\text{cushion}}$) : $2/3^{\text{rd}}$ of design pressure as given above
15. Length of cushioning zone (L_{cushion}) : 10 % of stroke (S) or 44 mm

*** The final stroke shall be finalized during approval of drawing.**

**** Designer to do preliminary calculation using Euler's formula before filling the value.**

Name of project: Shahpurkandi HEP

Sign and seal of BHEL's designer

Purchase Indent No. 240292236

Date 30.11.2019

प्रभात कुमार / PRABHAT KUMAR

प्रबंधक / Manager

एच.टी.ई. विभाग / HTE Division
बी.एच.ई.एल., भोपाल / BHEL, Bhopal



REF. PRODUCT STD.: HT 00259

Hydro Turbine Engineering Division

ANNEXURE - II

LIST OF SPARES

Vendor to furnish detailed list of spares offered:

Sl. No.	Description	Vendor to submit offer item wise
1	Piston seals, piston rod seals and all other seals	1 set
2	Piston guide rings	1 set
3	Bearing bushes i.e. piston rod bushes & self-lubricating bushes for connecting link.	1 set
4	Sealing, gasket, O-rings, rubber cup seals, rubber cord etc.	1 set
5	limit switch each type	2 no.

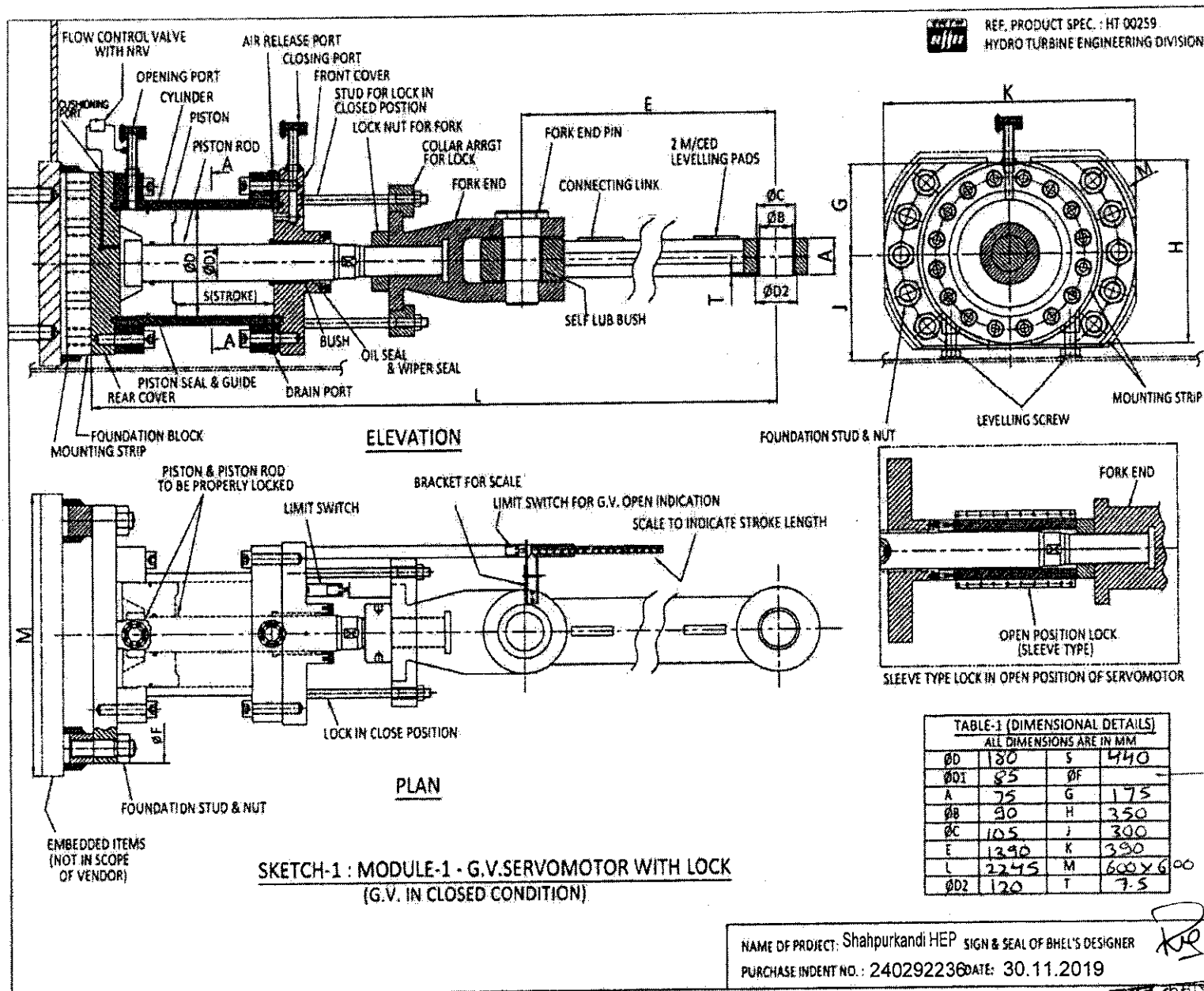
(Here one set means quantity required for one module-1 + one module-2 servomotors)

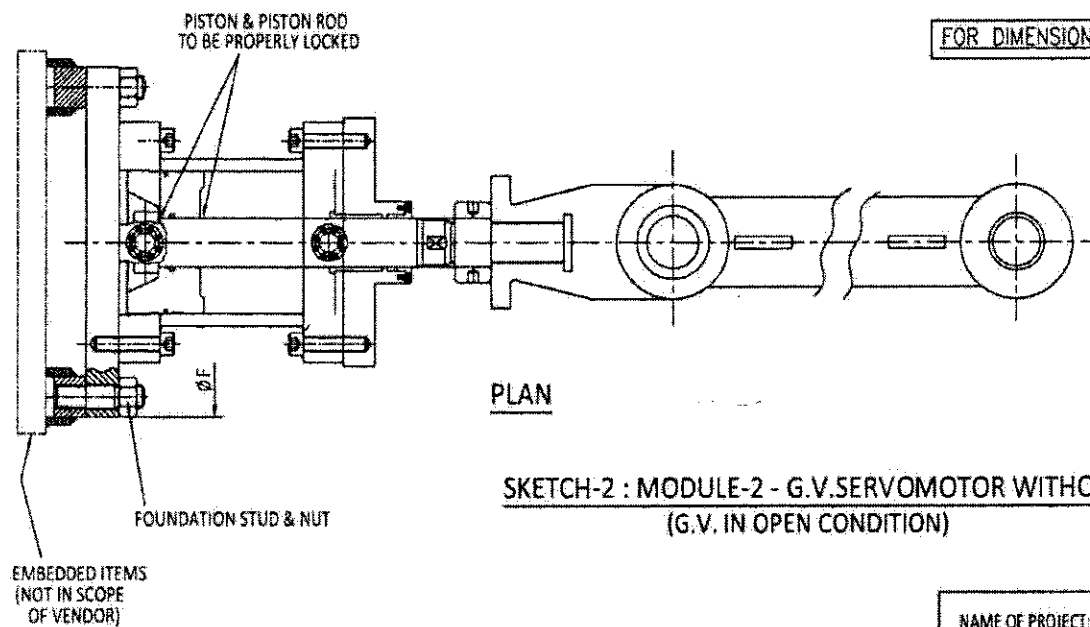
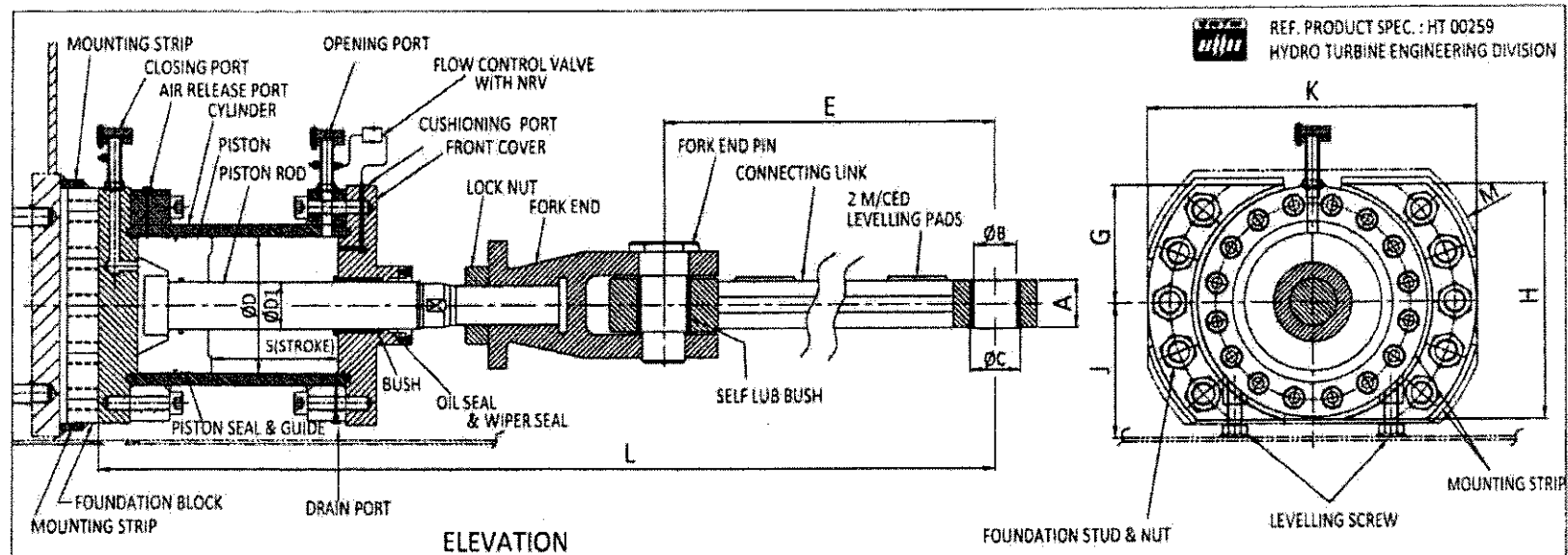
Name of project : Shahpurkandi HEP

Sign and seal of BHEL's designer :

प्रभात कुमार / PRABHAT KUMAR
प्रबंधक / Manager
एच.टी.ई. विभाग / H.T. Division
बी.एच.ई.एल., भोपाल / BHEL, Bhopal

Purchase Indent No. 240292236 Date 30.11.2019





**SKETCH-2 : MODULE-2 - G.V.SERVOMOTOR WITHOUT LOCK
(G.V. IN OPEN CONDITION)**

NAME OF PROJECT: Shahpurkandi HEP SIGN & SEAL OF BHEL'S DESIGNER
PURCHASE INDENT NO. : 240292236 DATE: 30.11.2019

प्रभात कुमार
एच.टी.ई.
बी.एच.ई.ए.
BHEL, B



REF. PRODUCT STD.: HT 00259

Hydro Turbine Engineering Division

ANNEXURE- I

Major design input parameters

(To be filled by indenter)

For dimensional details refer filled in table given in sketch-1

1. Type : Double acting fixed back mounted type
2. Bore dia. : 450 mm
3. Piston rod dia. (Minimum)** : 180 mm
4. Stroke*(S) : 592 mm (tentative)
5. Design pressure (P_{design}) : 60 kg/cm²
6. Test Pressure (P_{test}) : 90 kg/cm²
7. Opening time (for full stroke) : 10-20 sec (adjustable range)
(excluding cushioning time)
8. Closing time (for full stroke) : 6-8 sec (adjustable range)
(excluding cushioning time)
9. Oil : ISO VG 46 / ISO VG 57 / ISO VG 68
10. Test pressure for mechanical lock : 2 x Design pressure as given above
11. Painting : As per enclosed sheet / Clause – 4.3
12. Cushioning time (t) : 6 sec to 12 sec
13. Cushioning Pressure ($P_{1cushion}$) : Design pressure as given above
14. Cushioning Pressure ($P_{2cushion}$) : 2/3rd of design pressure as given above
15. Length of cushioning zone ($L_{cushion}$) : 10 % of stroke (S) or 59.2 mm

*** The final stroke shall be finalized during approval of drawing.**

**** Designer to do preliminary calculation using Euler's formula before filling the value.**

Name of project: Shahpurkandi HEP

Sign and seal of BHEL's designer

Purchase Indent No. 240292236

Date 30-11-2019

प्रभात कुमार / PRABHAT KUMAR
प्रबंधक / Manager
एच.टी.ई. विभाग / HTE Division
बी.एच.ई.एल., भोपाल / BHEL, Bhopal



REF. PRODUCT STD.: HT 00259
Hydro Turbine Engineering Division

ANNEXURE - II
LIST OF SPARES

Vendor to furnish detailed list of spares offered:

Sl. No.	Description	Vendor to submit offer item wise
1	Piston seals, piston rod seals and all other seals	2 set
2	Piston guide rings	1 set
3	Bearing bushes i.e. piston rod bushes & self-lubricating bushes for connecting link.	1 set
4	Sealing, gasket, O-rings, rubber cup seals, rubber cord etc.	1 set
5	limit switch each type	2 no.

(Here one set means quantity required for one module-1 + one module-2 servomotors)

Name of project : Shahpurkandi HEP

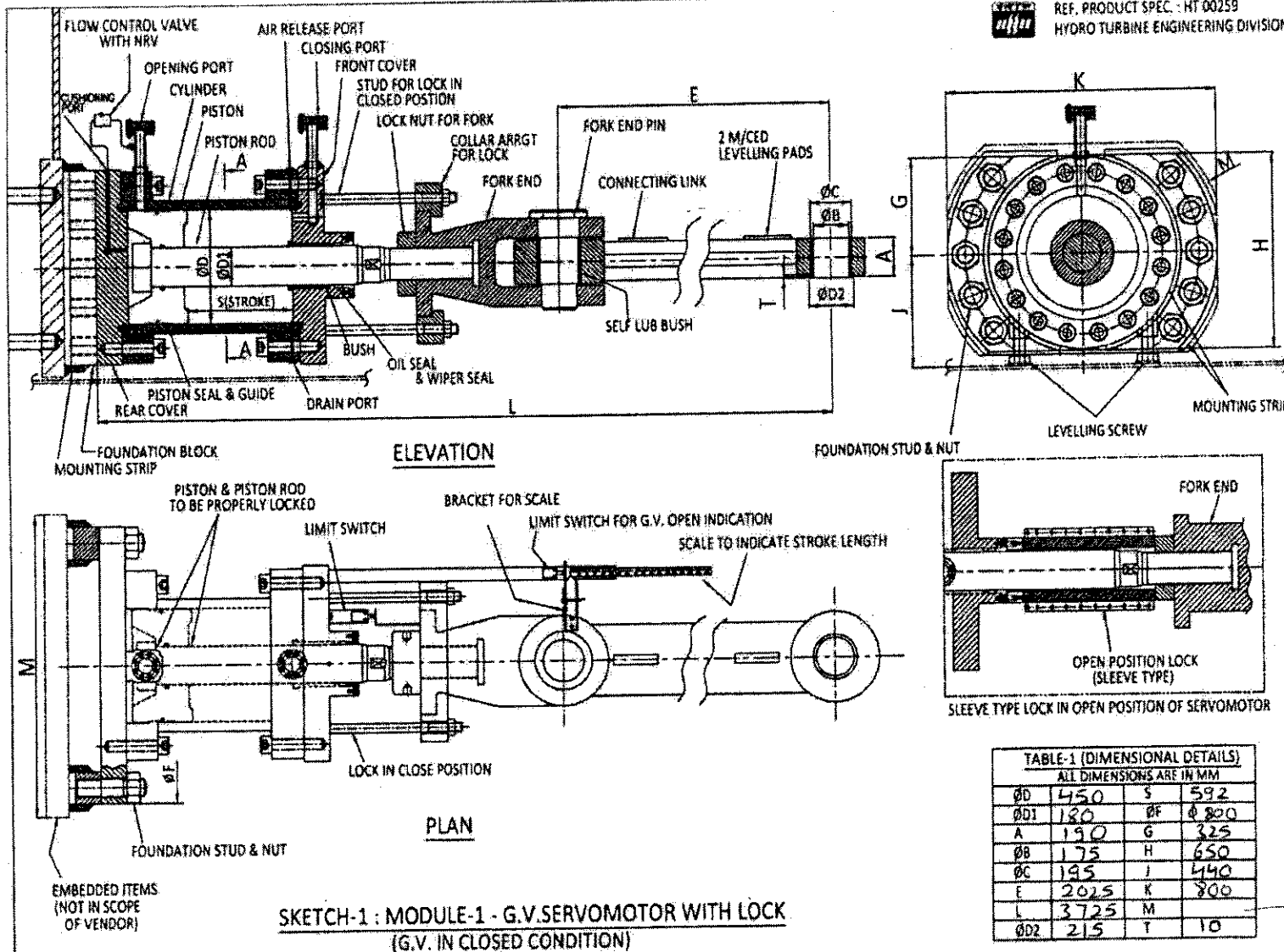
Sign and seal of BHEL's designer :

प्रभात कुमार / PRABHAT KUMAR
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Purchase Indent No. 240292236 Date 30-11-2019

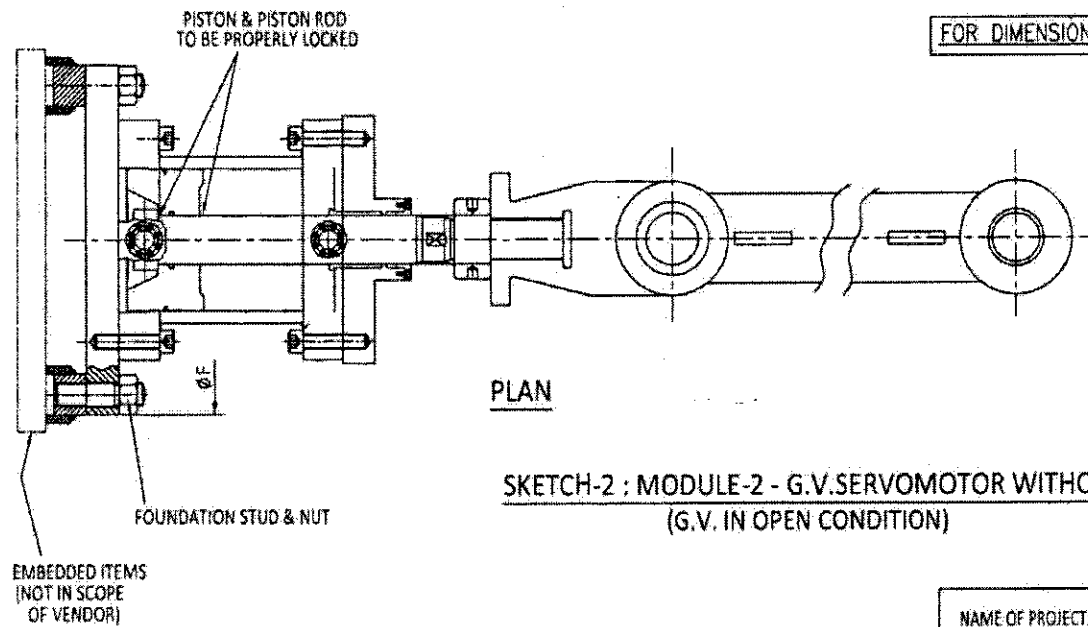
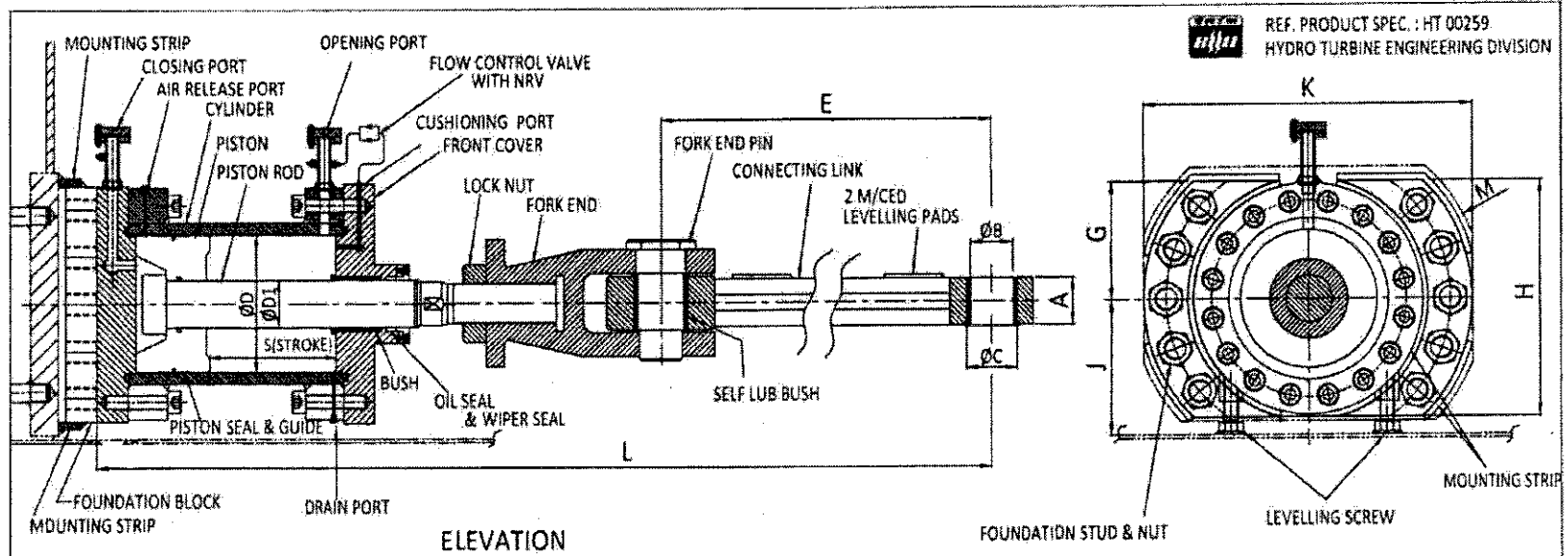


REF. PRODUCT SPEC. : HT 00259
HYDRO TURBINE ENGINEERING DIVISION



NAME OF PROJECT: Shahpurkandi HEP
PURCHASE INDENT NO.: 240292236
DATE: 30-11-2019

प्रभात कुमार / PRABHAT KUMAR
प्रबंधक / Manager
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बी.ए.न.ई.एल., भोपाल / BHEL, Bhopal



SKETCH-2 : MODULE-2 - G.V.SERVOMOTOR WITHOUT LOCK
(G.V. IN OPEN CONDITION)

FOR DIMENSIONAL DETAILS SEE TABLE-1 IN SKETCH-1

NAME OF PROJECT: Shahpurkandi HEP SIGN & SEAL OF BHEL'S DESIGNER
PURCHASE INDENT NO. : 240292236 DATE: 30-11-2019

प्रभात कुमार / PRABHAT
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बी.एच.ई.एल., भोपाल / BHEL