

दूरभाष :  
TELEPHONE :  
तार : बार्क-मुंबई, चेम्बूर.  
TELEGRAMS : BARC-MUMBAI, CHEMBUR.  
फेक्स संख्या : ९१-२२-२५५० ५१५१  
FAX NUMBER : 91-22-2550 5151



ट्रॉम्बे,  
मुंबई-४०० ०८५.  
TROMBAY,  
MUMBAI-400 085.

भारत सरकार  
GOVERNMENT OF INDIA  
भाभा परमाणु अनुसंधान केन्द्र  
BHABHA ATOMIC RESEARCH CENTRE

Enquiry No. – BARC/ RTD/RK/MF/ 08/2018/

date – 10/09 /2018

**SUB:** Procurement of raw material, fabrication, inspection and delivery of high flow hydraulic manifold -1Set to BARC, Trombay, Mumbai, Maharashtra.: RTD/S&CS/ high flow manifold/02.

**Dear Sirs,**

Sealed Quotations are invited on behalf of President of India by Head, RTD in sealed envelope for “: Procurement of raw material, fabrication, inspection and delivery of high flow hydraulic manifold -1Set to BARC, Trombay, Mumbai, Maharashtra as per our technical specification No. .: RTD/S&CS/ high flow manifold/02.”

- 1. Scope of Work : As per attached specification** ((Technical Specification. No.: RTD/S&CS/ high flow manifold/02).
- 2. Work completion and Validity period:** Within 2 (two) months after confirmation of order. Price should be firm throughout period of contract. The rates quoted shall remain valid for 60 days.
- 3. Price:**  
Bidder should quote for the entire job in lump sum (including all taxes and duties) as per our technical specification No.: RTD/S&CS/ high flow manifold/02, which involves Procurement of raw material, fabrication, inspection and delivery of high flow hydraulic manifold -1Set to BARC, Trombay, Mumbai, Maharashtra.: The lumpsum cost will be used for cost comparison.

#### **4. Payment:**

- a) Payment will be made as per rules, after the completion of the work to purchaser's satisfaction against submission of original bill in triplicate and advance stamped receipt. Advance/Part payment cannot be made.
- b) 100% payment shall be made by cheque / ECS (Please furnish details) after completion of job subjected to the satisfaction of purchaser.
- c) **Deduction of Taxes: Income tax @2% and Educational cess as applicable will be deducted from the bill**
- d) A penalty @ 0.5% per week (max. 5%) shall be levied for delay in completion of work.
- e) Payment shall be made only on satisfactory completion of work and on production of bill & advance stamped receipt.

#### **5. Guarantee/Warranty :**

The entire job shall be guaranteed for 12 months from the date of completion.

#### **6. Delivery :**

All the work shall be completed and delivered to BARC, Trombay, Mumbai, Maharashtra within 2 (two) months after confirmation of Work Order.

#### **7. Confidentiality clause :**


- a) Confidentially:  
Party shall not disclose any information to any third party concerning the matters under this contract generally. In particular, any information identified as "Property" in nature by disclosing party shall be kept strictly confidential by receiving party and shall not be disclosed to any third party without the prior consent of the original disclosing party. This clause shall apply to sub-contractors, consultants, advisors or the employees engaged by the party with equal force.
- b) Restricted information:  
Categories under section 18 of the Atomic Energy Act, 1962 and "Official Secrets" under section 5 of the official Secret Act, 1923 - Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant, adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation.
- c) Prohibition against use of BARC'S name without permission for publicity purpose:  
The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC'S name for any publicity purpose through any public media like press, Radio, T.V. or Internet without the prior written approval of BARC.

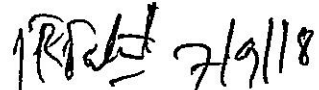
#### **8. General:**

- a) Proof of ability: A brief list of similar jobs executed, if any, and name of the organization to be furnished.
- b) The bidder shall comply with each and every condition specified in the tender document. The bidder's attention is drawn to the fact that no tender will be considered unless the bidder shall satisfy the purchaser about his technical capability.
- c) The purchaser reserves the right to accept the tender in whole or in part or reject any or all the tenders without assigning any reason. The lowest or any tender shall not necessarily be accepted. Tender not supported by the information requested in the tender document or not complying with the tender document will not be accepted.
- d) The price quoted must be firm for the entire period of contract and shall not be subjected to any change.
- e) Work extension, if any required, the request letter for the extension shall be forwarded before expiry of contract period to the Engineer-in-charge indicating the current progress and reasons for extension.
- f) Supplier should have GST registration. He should clearly write GST No. and PAN No. in his quotation, otherwise the quotation will not be considered.
- g) Sealed envelope containing quotation must reach on or **before 15.00 hrs., 15/10/2018**  
**To: Head, RTD Engg. Hall No. 7, BARC, Trombay, Mumbai -400 085.**
- h) The envelope **must be sent by "speed post" only** to reach within above mentioned period. Any other mode of delivery is not acceptable.
- i) Following information shall be clearly written on the envelope containing the quotation  
**Attention: Shri. Ramakrishna.P, SO/G, RTD Ref. no. BARC/ RTD/RK/MF/O8 /2018/ , Due date: 15/10/2018 till 15:00 hrs.**
- j) The Bids will be opened on 16/10 /2018 at 14.00 hrs.
- k) For any clarification regarding the job bidder shall contact Shri Ramakrishna.P  
**Ph.022-25593980.**

Thanking you,

Yours Sincerely,

  
(S. Raghunathan) 7/9/18  
Head, RTD

  
(Sh. P. R. Patil) 7/9/18  
AD, RD&DG

जी. आर. पाटील  
P. R. Patil  
सह निदेशक, रिएक्टर डिजाइन एवं विकास वर्ग  
Associate Director, Reactor Design & Development Group

Technical Specification No.: RTD/S&CS/ high flow  
manifold/02

Technical specification for procurement of raw material,  
fabrication, inspection and delivery of high flow hydraulic  
manifold -1Set to BARC, Trombay, Mumbai, Maharashtra.

## 1.0 Introduction :

A high flow hydraulic manifold needs to be designed and fabricated to meet the fast-acting requirement of a hydraulic actuator.

## 2.0 Scope of work :

- Design of hydraulic circuit and sizing of ports.
- Selection of compatible low flow valves to produce combined high flow and procurement only after approval of purchaser.
- Design of manifold and manufacturing drawing and submitting to the purchaser along with bought out items specifications for approval.
- Procurement of raw material as per ASTM A276 A479 410, approved low flow valves and bought out items.
- Machining of manifold.
- Dimensional Inspection & assembly trials
- Delivery to BARC, Trombay, Mumbai, Maharashtra.

### Technical requirements:

- 2.1 Procurement of ASTM A276 A479 410 material for manifold block. The material shall be as per this specification.
- 2.2 The ultrasonic testing of material will be carried out as per ASTM-A-388 and the report submitted to purchaser for approval. Back Wall Echo technique shall be used for carrying out the Ultrasonic examination. A 4 MHz 10mm diameter probe should be used for diameter /thickness below 50 mm. Acceptance Criteria: Any individual indication equal to or exceeding 20% of FSH and/or reduction in back wall echo to 50% of FSH or below, over an area twice the diameter of probe. Supplier shall be responsible for any variation or defect found in material of manufactured component.
- 2.3 The raw materials shall be tested for chemical properties from approved material test laboratories. The test results shall be submitted to the purchaser for approval. If supplier provides traceability of original material with copy of original test certificate, then test can be omitted.
- 2.4 Detailed fabrication procedure of component including achievable geometric tolerances, all fabrication steps involved in fabrication of each component shall be prepared by the supplier and shall be submitted to the purchaser for their approval.
- 2.5 Two low flow electrohydraulic valves are to be procured and mounted on the hydraulic manifold. Rated flow of low flow valves should be 38lpm at 70bar differential pressure across entire valve for an input of +/-20mA. It should be for

maximum operating pressure of 250bars. The main spool should be 4-way and axis cut without any overlap or underlap. Flow characteristics should be linear. The Frequency response with  $\pm 100\%$  of input signal should be as specified below: -3dB Gain cut off frequency greater than 100Hz and 90Deg Phase lag frequency greater than 120Hz. The exact model number of low flow valves shall be submitted to the purchaser for their approval.

- 2.6 The manufacturing of the components as per Fig1 shall be carried only after approval of raw materials and their final approved fabrication procedure from the purchaser. No design concession shall be allowed.
- 2.7 The two low flow valves shall be mounted on the hydraulic manifold along with appropriate O-rings and mounting bolts as shown in Fig 2 for combining the output flow.
- 2.8 Precision grinding should be carried out to achieve the specified geometric tolerances on flatness and required surface finish.
- 2.9 4nos of Parker O-rings should be supplied along with manifold.
- 2.10 Unless otherwise stated on applicable drawings/sketches tolerances on the linear dimensions shall be as per IS-2102.

### 3.0 Applicable standards & Drawings :

IS-2102	: Tolerances on linear dimensions
ASTM-A-388	: Ultrasonic testing
ASTM A276 A479 410	: SS 410

S.No.	Drg. No.	Title
1.	Fig No.1	Schematic design of manifold block
2.	Fig No.2	Schematic Hydraulic Flow sheet

### 4.0 Workmanship :

Workmanship shall be in accordance with high grade practice. All the components shall be adequately cleaned to the satisfaction of the purchaser before carrying out Inspection.

### 5.0 Inspection requirements:

The contractor shall provide all the services & facilities for all the inspection & test required under this specification. Dimensions and geometric tolerances of components as mentioned in drawings has to be carried out at 25Deg C and submitted as inspection report. The testing shall be conducted in a manner satisfactory to, and shall be subject to the approval of Purchaser's engineer. The Purchaser's engineer shall have right to specify additional inspection/testing if considered necessary to ensure that the quality of the job is consistent with this specification.

- a) Dimensions and geometrical tolerances for all components shall be checked and submitted as inspection report to the purchaser before the visit for inspection.

- b) All inspection tools, apparatus, gauges and equipments shall be provided by supplier and shall be carried by supplier. Some of the random selected components and their dimensions shall be inspected by the purchaser representative. No deviation shall be allowed between supplier's report data and actual data obtained/observed in presence of purchaser's representative. Any such deviation will cause for rejection of inspection report and component.

#### 7.0 Acceptance Criteria :

The manifold will be accepted based on the dimensional inspection report, bought out items meeting technical requirements, workmanship and assembly trials.

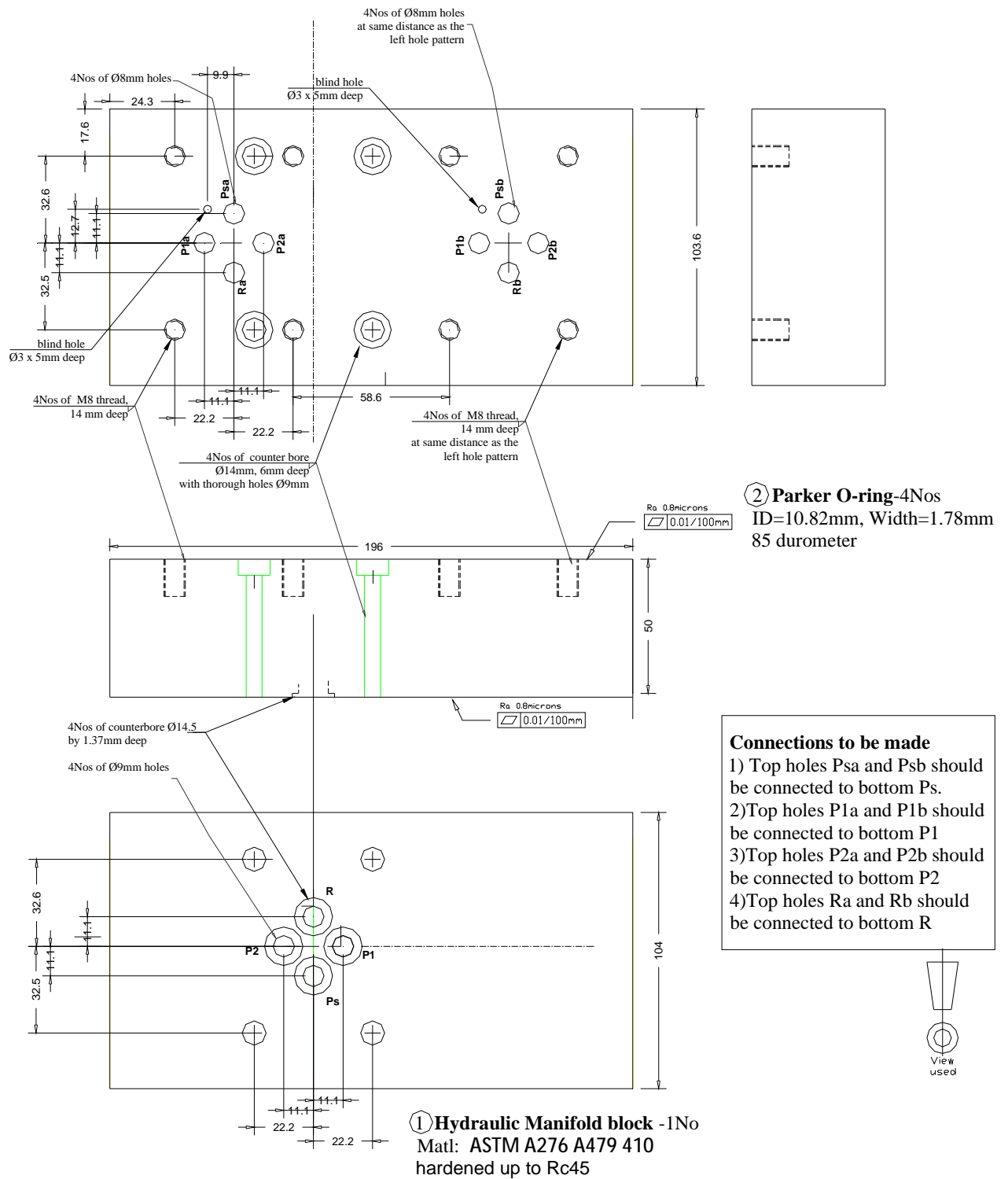
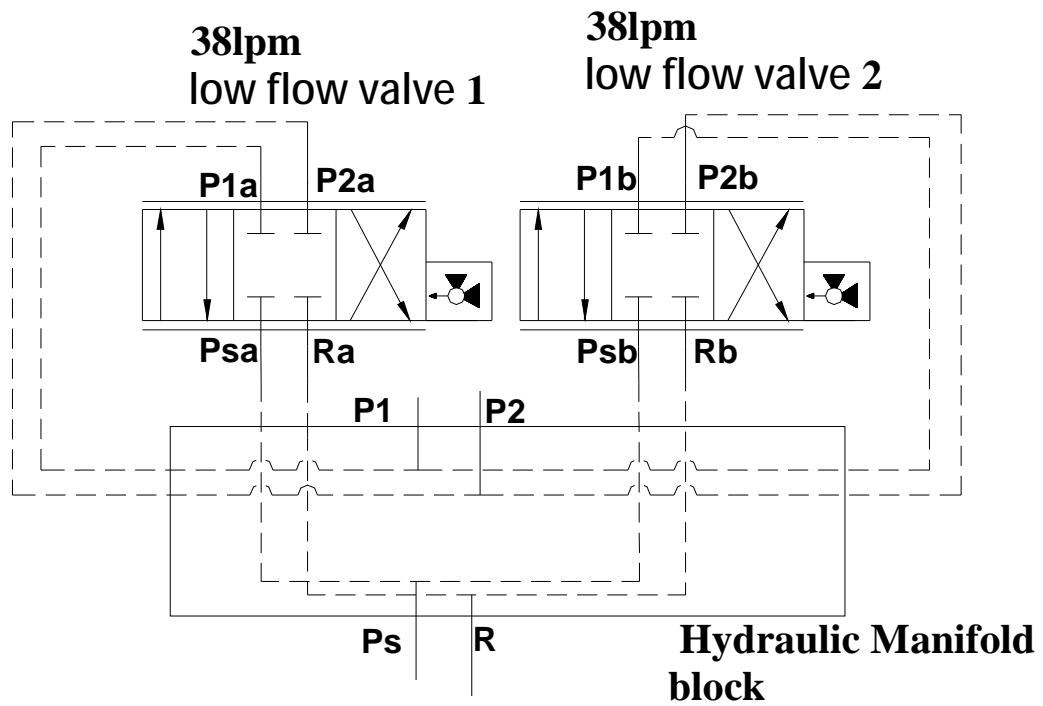


Figure 1 Schematic design of manifold block





## ② Hydraulic Flow sheet of Manifold block

Figure 2 Schematic hydraulic flow sheet