

**NOTICE INVITING QUOTATIONS**

**Registrar** MNIT, JLN Marg, Jaipur invites sealed tenders for the supply of “**Equipments**” for **Advanced Manufacturing and Mechatronics Lab** in **Mechanical Engineering Department** of this Institute in **Two Bid System (Technical & Financial bids in separate envelop)** as per schedule given below.

<b>Event</b>	<b>Date &amp; Time</b>
Download of Tender	13.02.2020
Pre-Bid Meeting Date & Time	21.02.2020 by 2.00 PM
Bid Submission Last Date& Time	05.03.2020 by 2.00 PM
Technical Bid Opening Date & Time	05.03.2020 at 3.00 PM
Financial Bid Opening	Will be intimated later on
Tender Fees	Rs. 500.00 (Non-refundable) in the name of The Registrar, MNIT and payable at Jaipur
Earnest Money	Rs.22,000/- in the name of The Registrar, MNIT and payable at Jaipur <b>(Kindly attached the RTGS details with cancelled cheque along with the Earnest Money)</b>

Quotation must be enclosed in a properly sealed envelope address to the MNIT, Jaipur with kind attention to **Deputy Registrar (S&P), MNIT, Jawahar Lal Nehru Marg, Jaipur -302017** (E-mail address [storepurchase@mnit.ac.in](mailto:storepurchase@mnit.ac.in)) by designation and not by name. The quotations must be super scribed “Quotations for the supply of Equipments ----- as called for in Tender Notice No. ----- dated \_\_\_\_\_”DUE ON----- AT -----AM/PM. The Quotation must reach on or before -----AM/ PM on or before the due date and time mentioned in the tender notice/tender document. The documents must be dropped in the tender box available in Central Store during office hours (9.30am to 6.00pm) on all working days. Bids delivered to any other place or any individual shall not be considered as valid document. Quotations sent by e-mail will not be considered valid. The complete Tender document can be viewed and downloaded only from the website ([www.mnit.ac.in](http://www.mnit.ac.in)) and CPPP site <https://eprocure.gov.in/epublish/app> during the tender period.

## GENERAL TERMS & CONDITIONS

1. **THE RATES QUOTED SHOULD BE F.O.R. JAIPUR inclusive of all charges related to transportation from your end to MNIT, Jaipur in Indian rupees. For imported items, the rates are to be quoted CIF(Cost, Insurance & Freight) Delhi only in freely convertible foreign currencies. In case the rates are quoted CIF (Cost, Insurance & Freight) New Delhi, then it will be the responsibility of the supplier to intimate us well in advance prior to dispatch and submission of all the relevant documents in time which will be required in clearing the consignment from Custom. If, there is delay in sending the documents and demurrage is imposed, then it will be in the account of foreign supplier. Kindly note that if any amendment is required in LC, after its establishment, the Bank Charges in this respect will be in the account of beneficiary only.** Bid shall always be both in the figures and words. The words "No quotations" should be written across any or all of the items in the schedule for which a tender does not wish to tender.
2. As far as possible, bid should be given for goods of India manufacture which are readily available. Foreign goods quoted and proposed to be supplied should be covered by normal import quota of the dealer. This institute is exempted from payment of custom duty.
3. Detailed specifications and "make" of each item should be clearly given supported by the illustrated pamphlets wherever possible. Bid without specifying the make and other particulars may be rejected. The accessories included in the equipment should also be clearly mentioned.
4. Losses or damage in transit will be in to the account of the supplier in case of rates **F.O.R. JAIPUR**. The supplier may, if he so desires, get the goods insured
5. The payment for the ordered items would be made after the articles have been received, found in order and its successful installation. Payment will be made by RTGS to indigenous suppliers. Kindly send the RTGS details and cancelled cheque along with the Invoice. **The payment to foreign supplier will be made through FDD/Wire Transfer OR Letter of Credit as the case may be. However 90 percent payment will be released after receipt of items and remaining 10 present after its successfully installation**
6. Your rates should be valid at least for three months (minimum) from the last date of opening of bid.
7. All legal proceedings, if necessity arises to institute may be any of the parties (Institute or Contractor/Supplier) shall have to be lodged in the courts situated at Jaipur and not elsewhere.
8. The institute is not bound to accept the lowest tender and may reject any tender or any part of the tender without giving any justification for such an action.

9. (a) The Penalty Clause is as under:-

If the seller fails to deliver any or all of the Goods/Services within the original /re-fixed delivery period specified in the Purchase Order, this Institute will be entitled to deduct/recover the Liquidated Damages for the delay at the following percentage:

(i)	Delay up to one month	1%
(ii)	Delay exceeding one month but not exceeding two month	2%
(iii)	Delay exceeding two month but not exceeding three month	5%
(iv)	Delay exceeding three month	5% for each month and part there of subject to maximum 10%

- (b) In case of failure to supply the goods within the prescribed time and in accordance with the specifications give in the Quotations, the institute shall be free to cancel the order and make purchases from the next higher tenderer or from the open market as the case may be. In that case the loss sustained by the institute shall be recovered from the defaulting supplier. The institute will be at liberty to recover the loss from the permanent earnest money/or any other pending claims of the supplier without prejudice to its general right to affect recovery from the supplier.
10. The prospective bidders can be those who are the manufacturers of the equipment. For items manufactured outside India, the manufacturer itself can be a bidder or its authorised Indian agent can bid on behalf of its Principal that is the manufacturer.
11. In the event, the country of origin of goods is India, only the manufacturers shall be considered eligible for bidding. Authorised agents of Indian manufacturers may be permitted to submit the bid, provided the concerned manufacturer states that as its policy, it does not bid itself in India and that there is no qualitative difference between manufacturer and its agent as bidder in respect of quality of supplies, cost, and responsibility of maintenance and servicing. The Indian manufacturer must describe the alternatives in clear terms, in the event the bidding agent ceases to continue as agent of the concerned manufacturer within the stipulated warranty period.
12. If any Indian manufacturer requires importing an essential part from a foreign country, the said company may be given to enjoy the benefit of customs duty exemption with the aid of CDEC of MNIT, Jaipur provided the import of the concerned item is done on behalf of MNIT, Jaipur.

13. **THERE IS TWO BID SYSTEM:-**

**(TECHNICAL AND FINANCIAL BID, both bids should be submitted in separate envelopes):**

**(A) Technical Bid:**

- a) Bidder must be a manufacturer/authorized distributor/ Dealers and they have to enclose a certificate of authorization of manufacturer in format at **Annexure – A (Authorization certificate in any other format will not be valid)**. OEM itself or any one authorised dealer on behalf of OEM may participate in bid. OEM and its dealers both may not participate at the same time.

- b) The manufacturers should supply documentary proof i.e. Registration with the Registrar of Industries, National Small Scale Industries Corporation or with penal of MNIT in case of manufacturer. Offers other than the manufacturers should be supported with an authority letter from the manufacturers, authorizing them to quote rates standing guarantee for the satisfactory execution of supply orders failing which offers are liable to be ignored.
- c) One declaration by the Manufacturer to the extent that in case of failure of its local agent /office to provide service support to the satisfaction of MNIT Jaipur, it shall make immediate arrangement for required service support.
- d) **Bidder should enclose technical compliance from the Manufacturer. The specifications of items should be strictly as specified. Deviation, if any may please be mentioned separately. If there is no deviation than it should be mentioned as “No Deviation”.**
- e) The leaflets catalogue, related to quoted equipment/model etc. should be sent invariably, so that a proper evaluation of the equipment offered is possible.
- f) Mention must be made of the pre-installation requirements for the equipment quoted viz. ambient temperature, humidity, weather specifications, power specifications, civil works etc. When items are provided full performance satisfaction should be demonstrated.
- g) Bidder must enclose the acceptance of terms and conditions and must enclose the duly signed and stamped tender document.
- h) All the Annexure enclosed should be duly filled up and signed.
- i) Please attach proof/certificate of each condition required in the tender document.
- j) The firm should provide approximate area required for the setting/installation of the machine / equipment.
- k) Installation support and demonstration for utilizing the equipment is also needed
- l) To mention, if any additional setup/infra is required before installation of equipment (esp. Foundation etc. For larger m/c)
- m) Bidder shall enclose Earnest Money Deposit (EMD) and Tender Fee

**(B) Financial Bid:**

- a) The rates to be quoted by the bidder should be clearly mentioned without any overwriting
- b) If there is any cutting in the price box, issued be duly signed
- c) The bidders should clearly mentioned their payment terms & conditions
- d) The GST or any other taxes including Custom duty Etc. should be mentioned clearly

14. **Delivery Period:**-The ordered quantity of stores must be delivered within 12 to 14 weeks in the case of indigenous equipment and 14 to 16 weeks in the case of imported equipment after opening of L.C. / FDD and Wire Transfer. The extension of delivery period after placing the PO, if required, will be considered only on genuine reasons and proper justifications only.
15. **Installation:** - Successful BIDDER shall depute concerned specialist, for supervision of erection & commissioning of the machine to be carried out as and when necessary. The successful BIDDER shall make necessary arrangements during the entire warranty period at their own expenses for stay, transport and other expenses of their specialist during their stay in Jaipur;

16. **Warranty:** All the bidders are required to provide minimum **01 Year + 60 Days** warranty on the quoted equipment / instrument
17. **Performance Bank guarantee**  
Successful Bidder has to Provide Performance security @ 10% of the equipment cost, valid for stipulated warranty period plus 60 days which should be in the form of Bank's Guarantee from a commercial bank in format at **Annexure – B**. Warranty will cover repair/replacement of all defective parts, if any, with the same or equivalent make for any part removed. Maintenance will be provided at site. The supplier will provide after sale service during the warranty period from nearest place to installation. The supplier will attend the complaint within 24 working hours and not beyond 5 working days.
18. **EARNEST MONEY:** A Demand Draft of Rs.22,000/- from a Commercial bank only in the name of the Registrar, M.N.I.T. and payable at Jaipur may please be sent along with your tender as Earnest Money **No tender shall be considered without earnest money / tender fee. Cheques are not accepted as earnest money amount.** No interest is payable by us on the amount of earnest money. **Kindly attach the RTGS details with cancelled cheque along with the Earnest Money.** The firms registered with NSIC/MSME are exempted for furnishing of EMD / Tender Fee. The Hard copy of NSIC/MSME registration certificate is to be enclosed in technical bid positively.
19. **Jurisdiction:**The Courts of Jaipur alone will have the jurisdiction to try any matter, dispute or difference between the parties arising out of this tender/contract. It is specifically agreed that no Court outside and other than Jaipur court shall have jurisdiction in the matter.
20. **Arbitration Clause: - In the eventuality of any dispute, the sole Arbitrator shall be MNIT, Jaipur and his decision shall be binding on all the parties.**
21. **Force Majeure :** Any failure of omission or commission to carry out the provision of this contract by the supplier shall not give rise to any claim by one party, one against the other, if such failure of omission or commission arises from an act of God; which shall include all acts of nature calamities such as fire, flood, earthquake, hurricane, or nay pestilence or from civil strikes, compliance with any statute and / or regulations of the Government, lockouts and strikes, riots, embargoes or from any political or other reason beyond the supplier's control including war (whether declared or not) civil war or stage of insurrection, provided that notice of the occurrence of any event by either party to the other shall be given within two weeks from the date of occurrence of such an event which could be attributed to Force Majeure conditions.
22. **Risk &Cost :** In the event of failure to carry out the contractual obligations, within the stipulated period or extended period and determination of the contract for any reason, violation of warranties etc. the MNIT Jaipur shall have the right to carry out the unfinished obligation at the exclusive - cost and risk of the bidder/firm, after due notice and the difference so accrued shall be recoverable from the bidder/firm.
23. The material found defective upon opening by the supplier representative in presence of Central stores personnel / indenter of MNIT Jaipur or not as per tendered specifications will have to be lifted back by the supplier at their own cost and risk. The material lying in MNIT Jaipur premises would be at supplier's risk and cost.

24. **Custom Duty** : The MNIT, Jaipur is a public funded research Institution registered with Department of Scientific & Industrial Research and concessional Custom Duty @5.15% is applicable for the goods purchased for research purpose vide Government of India Notification No.51/96-Customs dated 23.07.1996
25. **GST**:MNIT, Jaipur is a public funded research Institution registered with Department of Scientific & Industrial Research for concessional GST @5% applicable for the goods purchased for research purpose vide Ministry of Finance (Department of Revenue) Notification No.47/2017-Integrated Tax dated 14.11.2017 & Notification No.45/2017-Central Tax dated 14.11.2017.
26. **Bid Validity**: 90 days (Minimum)
27. **Opening of Bids**: The Bids shall be opened by authorised officials of the institute as per schedule given in Date Sheet.In case, the day of bid opening is declared a holiday by the government, the Bids will be opened on the next working day at the same time. No separate intimation shall be sent to the bidders in this regard.Only opening of bids and accepting the bid will not mean that the firm is technically or financially qualified.
28. **Institute right to vary Quantities at Time of Award or later** : Institute reserves the right at the time of awarding the contract to increase or decrease the quantity of goods and services originally mentioned in our NIT without any change in unit price or other terms and conditions.
29. While submitting the tender, the **GST Registration No., PAN No.&E-mail Address** is to be mentioned by the bidder positively. Failing this, there bid will be treated as non responsive.
30. **After Sales Service Certificate** :After sales service certificate is to be furnished by successful bidder in the prescribed form as **annexure –C**
31. Specification Enclosed as annexure - D

Deputy Registrar  
(Store & Purchase)

**MANUFACTURERS' AUTHORIZATION FORM**

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer.]

Date : [insert date (as day, month and year) of Bid Submission]

Tender No. :[insert number from Invitation For Bids]

To : [insert complete name and address of Purchaser]

WHEREAS

We [insert complete name of Manufacturer],who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of Manufacturer's factories], do hereby authorize [insert complete name of Bidder]to submit a bid the purpose of which is to provide the following Goods, manufactured by us [insert name and or brief description of the Goods],and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 2.20 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: [insert signature(s) of authorized representative(s) of the Manufacturer]

Name: [insert complete name(s) of authorized representative(s) of the Manufacturer]

Title: [insert title]

Duly authorized to sign this Authorization on behalf of: [insert complete name of Bidder]

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ [insert date of signing]

\*(Not required in case the bidder itself is the manufacturer)

**PERFORMANCE BANK GUARANTEE**

(To be executed on Stamp Paper of Rs. 100/- or such higher value as per the Stamp Act of the State in which the Guarantee is issued. Stamp Paper should be in the name of the Bank Issuing the Guarantee.)

BANK GUARANTEE NO. :

DATED :

Dear Sirs,

1. THIS DEED OF GUARANTEE made on this ..... day of..... between **MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY, JAIPUR** (hereinafter called the "MNIT" which expression shall unless excluded by or repugnant to the context includes its successors and assignees) of the one part and the ..... (hereinafter called the "**Bank**" which expression shall unless excluded by or repugnant to the context include its successors and assignees) of the other part.

2. AND WHEREAS as per clause \_\_\_\_\_ of the purchase order in question the supplier shall furnish a Performance Bank Guarantee of 10% of P.O. Value i.e. Rs. .... (Rs.....

..... only) valid for the period of two months beyond warranty period as and by way of security for satisfactory working of the ..... AND WHEREAS at the request of the supplier, the Bank executes these presents.

3.0 THIS DEED WITNESSETH AND IT IS HEREBY AGREED AND DECLARED BY AND BETWEEN PARTIES HERETO AS FOLLOWS:

3.1 The Bank hereby guarantees to the MNIT, Jaipur that the equipment / service contracted are capable of performing the work as demanded by the MNIT, Jaipur. In the event of equipment / service failing to perform to the satisfaction of the MNIT, Jaipur, which shall be final and conclusive of the factum of non-performance, the Bank shall indemnify and keep the indemnified to the extent of ..... of P.O. Value i.e. Rs. .... (Rupees .....) valid for the period of two months beyond the warranty period against any loss or damage that may be caused to or suffered by the MNIT, Jaipur consequent to non-performance of the contracted equipment / services to be supplied by the supplier.

3.2 In consideration of the aforesaid premise and at the request of the supplier, we the Bank hereby irrevocably and unconditionally guarantee that the supplier shall perform in an orderly manner their contractual obligations in accordance with the terms and conditions set forth in the Purchase order dated ..... and in the event of the supplier's failure to do so, the Bank unconditionally pay to the MNIT, Jaipur on demand, any amount up to the value mentioned in Clause 3.1 above without any reference to the supplier and without questioning the claim.

3.3 The guarantee herein shall remain in full force for a period of two months beyond the warranty period from the date of certification by the MNIT, Jaipur of successful installation and commissioning of the equipment/ service contracted. Date of start of warranty period will be notified by MNIT, Jaipur to the Bank.

3.4 The decision of the MNIT, Jaipur regarding the liability of the Bank under the guarantee and the amount payable there under shall be final and conclusive and binding on us without



question. The Bank shall pay forthwith the amount demanded by the MNIT, Jaipur not withstanding any dispute, if any, between the MNIT, Jaipur and the supplier.

- 3.5 The Bank further agrees that the guarantee herein shall remain in full force during the pendency of aforesaid period mentioned in Clause 3.3 above and also any extension of the guarantee which has been provided by the Bank for this purpose beyond the aforesaid period provided, further, that if any claim accrues or against the Bank by virtue of this guarantee, should be lodged with us within a period of 60 days from the date of expiry of the guarantee period.
- 3.6 This Guarantee shall not be affected by any change in constitution of the supplier, MNIT, Jaipur or us not shall it be affected by any change in constitution or by any amalgamation or absorption or reconstruction thereof otherwise, but will ensure for and be available to and endorsable by the absorbing amalgamated company or concern.
- 3.7 The MNIT, Jaipur has the fullest liberty without affecting the guarantee to postpone at any time or from time any of the powers exercisable by it against the supplier, either to enforce or forbear the clause governing guarantee in the terms and conditions of the said contract and Bank shall not be released from its liabilities under the guarantee by any matter referred to or by reason of time being given to the supplier or any other forbearance, act or omission on the part of the MNIT, Jaipur or any material or things whatsoever which under the law relating to sureties shall but for the provisions hereof have the effect of so releasing the Bank from its liabilities.
- 3.8 We further agree that the MNIT, Jaipur shall have the fullest liberty without affecting in any way our obligations hereunder with or without our consent or knowledge to vary any of the terms and conditions of the said contract or to extend the time of delivery from time to time.
- 3.9 The Bank undertakes not to revoke this guarantee during its currency except with the previous consent in writing of the MNIT, Jaipur.
- 3.10 We further agree that in order to give full effect to the guarantee herein contained MNIT, Jaipur shall be entitled to act as if we were its principal debtors in respect of its claim against the Supplier hereby guaranteed by us as aforesaid and we hereby expressly waive all our rights of suretyship and other rights if any which are in any way inconsistent with the above provision of this Guarantee.

Notwithstanding anything herein before, liability of the Bank under this guarantee is restricted to Rs. .... (Rupees ..... only) and it will remain in force up to the period specified in Clause 3.3 unless a suit to enforce any claim under the Guarantee is filed against the Bank before the period specified in Clause 3.4. All your rights under this Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

COUNTERSIGNED

Signature :	Signature :
Name :	Name :
Designation :	Designation :
Organization :	Organization :

AFTERSALE SERVICE CERTIFICATE

From:

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To

The Registrar,  
 Malaviya National Institute of Technology (MNIT),  
 Jaipur

Whereas, we M/s (Bidder Name) are established & reputable manufacturers (Make of items) of [items name] having service offices at Delhi, Jaipur and in the state of Rajasthan. Details are as under:

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Sr.No.	Address of Service Centre	Phone No.	Number of Engineers
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1.

2.

3.

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 We do hereby confirm that:

Services including repair/replacement of defective parts will be done by us. Replacement of defective Systems/parts will be done by equivalent or better systems/parts of the same make. We will attend all the complaints/service calls within 24 working hours and not beyond 5 working days. Down time will not exceed beyond 5 working days. In case, down time exceed 5 working days then we will extend the warranty period of that item(s) double of the down time.

(Signature)

Name :

Designation :

(Head or Senior Executive of Firm)

Address :

Phone No :

Fax No:

Mobile No :

## Detailed Technical Specification for Hydraulic Pneumatic Kit

### A. Pneumatic Trainer Kit

Sr.No.	SPECIFICATION	
1.	<b>The Training system should consist the following features</b>	
	a. Using actual industrial standard valves and components	
	b. No tools should be used for connecting the tubes with fittings. All the pneumatic fittings should be of Push-in type fittings (One Touch Fittings) for easily connecting and disconnecting the tubes manually with fittings.	
	c. All One Touch Fittings should be suitable for tube size 4 mm outer diameter	
	d. Cylinders and limit switches should be fitted on an aluminum plate coupled with a moulded plastic guide plate base unit (to avoid scratching on the Aluminum anodized worktable)	
	e. Cylinders and limit switches should be provided with turn-to-lock / unlock mechanism for clamping & unclamping with the worktable	
	f. All valves and other components should be mounted on an Aluminum cast block (of 40 mm x 60 mm size) fitted with plastic base (to avoid scratching on the Aluminum anodized work table) and with inbuilt button operated Push-to-lock / unlock mechanism for easy clamping & unclamping with the work table	
	g. Working medium: Compressed air filtered	
<b>2.</b>	<b>Pneumatic Trainer Kit compatible with existing compressor line - equipment set:</b>	<b>1 No</b>
<i>Set should contain</i>		
<b>2.1</b>	<b>Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge</b>	<b>1 No.</b>
	Port size -1/4 inch, Flow rate – 500 LPM, Maximum supply pressure – 10 bar Filtration – 40 micron, Minimum operating flow – 12 l/min Filter Bowl capacity – 9 ml, Lubricator Bowl capacity – 20 ml Connection for tube 8 dia input and 8 dia output Mounting – Push to lock / Unlock mechanism	
<b>2.2</b>	<b>Junction Box with slide valve</b>	<b>1 No.</b>
	Junction box fitted with 3/2 slide valve & 7 Nos of self-sealing fittings of 4 mm dia Max. Working pressure – 10 bar Junction box Material – Aluminum Mounting – Push to lock / Unlock mechanism	
<b>2.3</b>	<b>Push Button (Green) Valve - for impulse pilot operation of a SAC / DAC</b>	<b>1 No.</b>
	Material – Extruded aluminum, with anodized finish Push button – Flush head type, Design – Spool type, Size – 1 / 8”, Type – 3/2 Normally closed Flow rate – 450 LPM, Working pressure range – 1 – 8 bar Mounting – Push to lock / Unlock mechanism	
<b>2.4</b>	<b>Push Button (Red) Valve - for impulse pilot operation of a SAC / DAC</b>	<b>1 No.</b>
	Material – Extruded aluminum, with anodized finish Push button – Flush head type, Design – Spool type, Size – 1 / 8”, Type – 3/2 Normally closed Flow rate – 450 LPM, Working pressure range – 1 – 8 bar Mounting – Push to lock / Unlock mechanism	
<b>2.5</b>	<b>3/2 NC Roller lever valve (Pneumatic limit switch – for Reversing) – single cycle &amp; multi cycle automation of DAC</b>	<b>2 Nos</b>
	Material – Aluminum machined, Anodized finish Size – M5, Type – 3/2 Normally closed, Maximum pressure – 10 bar Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.6</b>	<b>3/2 NC Roller lever valve (Pneumatic limit switch – for Forwarding) – single cycle &amp; multi cycle automation of SAC</b>	<b>2 Nos</b>
	Material – Aluminum machined, Anodized finish Size – M5, Type – 3/2 Normally closed, Maximum pressure – 10 bar Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.7</b>	<b>5/2 Double external pilot operated valve (Memory Valve) – single cycle&amp; multi cycle automation of DAC</b>	<b>4 Nos.</b>

	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Design – Spool type Pressure range – 2 – 10 bar, Flow rate – 450 LPM Mounting – Push to lock / Unlock mechanism	
<b>2.8</b>	<b>5/2 External Pilot Operated Valve with spring return</b>	<b>1 No.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Design – Spool type, Pressure range – 2 – 10 bar, Flow rate – 450 LPM Mounting – Push to lock / Unlock mechanism	
<b>2.9</b>	<b>5/2 Hand lever with spring return – for direct operation of a SAC &amp; DAC</b>	<b>1 No.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Design – Spool type, Pressure range – 2-10 bar, Flow rate – 450 LPM Mounting – Push to lock / Unlock mechanism	
<b>2.10</b>	<b>5/2 Valve with Lever head - for maintained pilot operation of a SAC</b>	<b>1 No.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Design – Spool type, Pressure range – 2 – 10 bar, Flow rate – 450 l / min Mounting – Push to lock / Unlock mechanism	
<b>2.11</b>	<b>5/2 Hand Lever Valve with detent – for maintained pilot operation / multi cycle operation</b>	<b>1 No.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Design – Spool type, Pressure range – 2 -10 bar, Flow rate – 450 LPM Mounting – Push to lock / Unlock mechanism	
<b>2.12</b>	<b>5/2 Valve with Mushroom head – for emergency operation</b>	<b>1 No.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Design – Spool type Pressure range – 2 – 10 bar, Flow rate – 450 LPM Mounting – Push to lock / Unlock mechanism	
<b>2.13</b>	<b>Flow control valve - Metering IN &amp; OUT – to control the speed of DAC(2 Nos / set)</b>	<b>2 Sets</b>
	Material – Plastic body, Size – Dia 4 mm, Type – Inline Pressure range – 1 to 10 bar, Mounting – Push to lock / Unlock mechanism	
<b>2.14</b>	<b>Shuttle Valve (OR valve) – for operating SAC / DAC from two different positions</b>	<b>2 Nos</b>
	Material – Aluminium machined, Anodized finish Size – 1 / 8” , Flow rate – 400 LPM, Pressure Range – 1.5 to 10 bar Mounting – Push to lock / Unlock mechanism	
<b>2.15</b>	<b>AND valve</b>	<b>1 No.</b>
	Material – Aluminium machined, Anodized finish, Size – 1 / 8” , Flow rate – 400 LPM, Pressure Range – 1.5 to 10 bar, Mounting – Push to lock / Unlock mechanism	
<b>2.16</b>	<b>Quick exhaust valve for operation of DAC</b>	<b>1 No.</b>
	Material – Aluminium machined, Anodized finish, Size – 1 / 8”, Pressure Range – 1 to 10 bar	
<b>2.17</b>	<b>Double Acting Cylinder (DAC)</b>	<b>2 Nos.</b>
	Material – SS barrel, Size – 25 dia, Stroke – 100 mm, Type – Miniature cylinder (Magnetic) Maximum pressure – 10 bar, End cushioning: Adjustable end cushioning Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.18</b>	<b>Single acting cylinder(SAC)</b>	<b>1 No.</b>
	Material – SS barrel, Size –25 dia, Stroke – 50 mm, Type – Miniature cylinder (magnetic) Maximum pressure – 10 bar, End cushioning: Fixed end cushioning Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.19</b>	<b>Multi distributor fittings (for Cascading circuit designing)</b>	<b>3 Nos.</b>
	Material – Plastic body, Size – 4 dia, Maximum pressure – 10 bar, Mounting – Push to lock / Unlock mechanism	
<b>2.20</b>	<b>One touch fittings</b>	<b>1 Set</b>
	Union T fitting & Union Y fitting: – Each 4 Nos, Size – Suitable for tubes with 4 dia Outer Diameter Material – Plastic body, Maximum pressure – 10 bar	
<b>2.21</b>	<b>Ø4 Plug</b>	<b>6 Nos.</b>
	Size – 4 dia Outer Diameter, Material – Plastic body, Maximum pressure – 10 bar	
<b>2.22</b>	<b>Ø8 Polyurethane tube</b>	<b>5 Mtrs</b>
	Material – Polyurethane ,Size – 8 dia Outer Diameter, Maximum pressure – 10 bar	
<b>2.23</b>	<b>Ø4 Polyurethane tube</b>	<b>10 Mtrs</b>
	Material – Polyurethane, Size – 4 dia Outer Diameter, Maximum pressure – 10 bar	
<b>2.24</b>	<b>Tube cutter with safety lock</b>	<b>1 No.</b>
	Material: Body – Plastic, Blade – S.S, Should cut tubes from 4 mm dia up to 12 mm dia	
<b>2.25</b>	<b>5/3 Double external pilot operated valve with spring centered</b>	<b>1 No.</b>

	Material – Extruded aluminium, with anodized finish, Size – 1 / 8”, Design – Spool type Type – All ports blocked, Pressure range – 2 – 10 bar, Flow rate – 450 LPM Mounting – Push to lock / Unlock mechanism	
<b>2.26</b>	<b>Idle return valve assy - Forwarding</b>	<b>1 No.</b>
	Material – Aluminium machined, Anodized finish, Size – M5, Maximum pressure – 10 bar Type – Idle return roller lever with spring return, Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.27</b>	<b>Time Delay Valve</b>	<b>1 No.</b>
	Operation - Time delay (2 – 30s). Size – M5, Type - Spring return, Inlet / Outlet – ø4, Minimum & Maximum pressure – 2 - 6 bar, , Mounting - Press to lock/ Unlock	
<b>2.28</b>	<b>Pneumatic counter</b>	<b>1 No.</b>
	Operation - Pulse count (0-99999), Size – M5, Type - Spring return, Inlet / Outlet – ø4, Minimum & Maximum pressure – 2 - 8 bar, Mounting -Press to lock/Unlock	
<b>2.29</b>	<b>Anti-ram vale</b>	<b>1 No.</b>
	Type – Proportional Pressure control, Pressure range - 0.5 -10 bar, Tubing Connection - Inlet / outlet ø4 Mounting - Press to Lock/Unlock	
<b>2.30</b>	<b>Pressure sequence valve</b>	<b>1 No.</b>
	Adjustment method - Adjusting knob, Type - Direct operated poppet type, Flowrate – 70 LPM @6bar Pressure range - 2-8 bar, Tubing Connection - Inlet / outlet ø4, Mounting - Press to Lock/Unlock	
<b>2.31</b>	<b>Back pressure valve</b>	<b>1 No.</b>
	Port size - M5, Type – NO (Normally open), Mode of actuation – Air operated, Pressure range - 2-6 bar, Tubing Connection * - Inlet / outlet ø4	
<b>2.32</b>	<b>Pneumatic Proximity switch</b>	<b>1 No.</b>
	Port size - Cone type fittings for 4 dia tube, Type - NC (Normally closed), Mode of actuation – Magnet, Pressure range - 2-6 bar, Tubing Connection * - Inlet / outlet ø4	
<b>2.33</b>	<b>Pneumatics - Text Book</b>	<b>1 No.</b>
<b>2.34</b>	<b>Pneumatics – Exercises book</b>	<b>1 No.</b>

## B. Electro Pneumatic trainer kit

Sr. No.	SPECIFICATION	
1.	<b>The Training system should consist the following features</b>	
	a.	Using actual industrial standard valves and components
	b.	No tools should be used for connecting the tubes with fittings. All the pneumatic fittings should be of Push-in type fittings (One Touch Fittings) for easily connecting and disconnecting the tubes manually with fittings.
	c.	All One Touch Fittings should be suitable for tube size 4 mm outer diameter
	d.	Cylinders and limit switches should be fitted on an aluminium plate coupled with a moulded plastic guide plate base unit (to avoid scratching on the Aluminium anodized work table)
	e.	Cylinders and limit switches should be provided with turn-to-lock / unlock mechanism for clamping & unclamping with the work table
	f.	All valves and other components should be mounted on an Aluminium cast block (of 40 mm x 60 mm size) fitted with plastic base (to avoid scratching on the Aluminium anodized work table) and with inbuilt button operated Push-to-lock / unlock mechanism for easy clamping & unclamping with the work table
	g.	Working medium: Compressed air filtered
<b>2.</b>	<b>Electro pneumatic Trainer Kit compatible with existing compressor line - equipment set:</b>	<b>1 No</b>
	<b>Set should contain</b>	
<b>2.1</b>	<b>Filter Regulator Combination with Lubricator (FRL Unit) with pressure gauge</b>	<b>1 No.</b>
	Port size -1/4 inch, Flow rate – 500 LPM, Maximum supply pressure – 10 bar, Filtration – 40 micron, Minimum operating flow – 12 LPM, Filter Bowl capacity – 9 ml, Lubricator Bowl capacity – 20 ml, Connection for tube 8 dia input and 8 dia output, Mounting – Push to lock / Unlock mechanism	
<b>2.2</b>	<b>Junction Box with slide valve</b>	<b>1 No.</b>
	Junction box fitted with 3/2 slide valve & 7 Nos of self-sealing fittings of 4 mm dia Max. Working pressure – 10 bar, Junction box Material – Aluminium	

	Mounting – Push to lock / Unlock mechanism	
<b>2.3</b>	<b>Flow control valve - Metering IN &amp; OUT – to control the speed of DAC(2 Nos / set)</b>	<b>2 Sets</b>
	Material – Plastic body, Size – Dia 4 mm, Type – Inline, Pressure range – 1 to 10 bar Mounting – Push to lock / Unlock mechanism	
<b>2.4</b>	<b>Double Acting Cylinder (DAC)</b>	<b>2 Nos.</b>
	Material – SS barrel, Size – 25 dia, Stroke – 100 mm, Type – Miniature cylinder (Magnetic) Maximum pressure – 10 bar, End cushioning: Adjustable end cushioning Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.5</b>	<b>Single acting cylinder(SAC)</b>	<b>1 No.</b>
	Material – SS barrel, Size –25 dia, Stroke – 50 mm, Type – Miniature cylinder (magnetic) Maximum pressure – 10 bar, End cushioning: Fixed end cushioning Mounting – Turn to lock / Unlock mechanism with slot stone	
<b>2.6</b>	<b>Multi distributor fittings (for Cascading circuit designing)</b>	<b>3 Nos.</b>
	Material – Plastic body, Size – 4 dia, Maximum pressure – 10 bar Mounting – Push to lock / Unlock mechanism	
<b>2.7</b>	<b>One touch fittings</b>	<b>1 Set</b>
	Union T fitting & Union Y fitting: – Each 4 Nos, Size – Suitable for tubes with 4 dia Outer Diameter Material – Plastic body, Maximum pressure – 10 bar	
<b>2.8</b>	<b>Ø4 Plug</b>	<b>6 Nos.</b>
	Size – 4 dia Outer Diameter, Material – Plastic body, Maximum pressure – 10 bar	
<b>2.9</b>	<b>Ø8 Polyurethane tube</b>	<b>5 Mtrs</b>
	Material – Polyurethane, Size – 8 dia Outer Diameter, Maximum pressure – 10 bar	
<b>2.10</b>	<b>Ø4 Polyurethane tube</b>	<b>10 Mtrs</b>
	Material – Polyurethane, Size – 4 dia Outer Diameter, Maximum pressure – 10 bar	
<b>2.11</b>	<b>Tube cutter with safety lock</b>	<b>1 No.</b>
	Material: Body – Plastic, Blade – S.S, Should cut tubes from 4 mm dia up to 12 mm dia	
<b>2.12</b>	<b>Pneumatics - Text Book</b>	<b>1 No.</b>
<b>2.13</b>	<b>5/2 Single sol. op. valve with spring Return</b>	<b>1 No.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Operating voltage – 24V DC, Design – Spool type, Pressure range – 2 – 10 bar Flow rate – 450 LPM, Mounting – Push to lock / Unlock mechanism	
<b>2.14</b>	<b>5/2 Double sol. op. valve(With LED)</b>	<b>2 Nos.</b>
	Material – Extruded aluminium, with anodized finish Size – 1 / 8”, Operating voltage – 24V DC, Design – Spool type, Pressure range – 2 – 10 bar Flow rate – 450 LPM, Mounting – Push to lock / Unlock mechanism	
<b>2.15</b>	<b>Magnetic sensor with clamp for Miniature Cyl</b>	<b>6 Nos.</b>
	Type - Solid state output –PNP, Connection – M8 male QD connector, Operating voltage – 24V DC Mounting – Clamping type	
<b>2.16</b>	<b>Electrical pushbutton module</b>	<b>1 No.</b>
	Operating voltage - 24V DC, Type - NO / NC type with LED indicator, LED operating voltage 24V DC Spring return - Green Colour button, Detent - Red colour button, Mounting - Press to Lock/ Unlock	
<b>2.17</b>	<b>Electrical Connection set</b>	<b>1 No.</b>
	Connector type – 4mm banana plug, Cable colours – Red and black	
<b>2.18</b>	<b>Relay Logic Unit - 4C/O - 3 Relays</b>	<b>2 Nos.</b>
	Operating voltage - 24 VDC	
<b>2.19</b>	<b>ON &amp; OFF Delay timer module</b>	<b>1 No.</b>
	Operating voltage - 24VDC, On delay timer - 1 – 10s, OFF delay timer - 0.5 – 10s, Connection type - 4mm banana plug, Mounting – Press Lock/ Unlock	
<b>2.20</b>	<b>Electrical counter Module</b>	<b>1 No.</b>
	Operating voltage - 24VDC, Type - NO / NC type, Connection type - 4mm banana plug, Display - 6 digits LCD display, Mounting – Press to Lock/ Unlock	
<b>2.21</b>	<b>Electrical buzzer with indicator module</b>	<b>1 No.</b>
	Operating voltage - 24VDC, Buzzer decibel value - 60dB, Connection type - 4mm banana plug LED Colour- Orange, Mounting – Press to Lock/ Unlock	

2.22	<b>Inductive proximity sensor assy</b>	<b>1 No.</b>
	Operating voltage - 24VDC, Operating distance - 5mm ± 10%, Connector Type - 3pin male QD connector Sensor type - Flush head type, Mounting – Turn to Lock/ Unlock	
2.23	<b>Capacitive proximity sensor assy</b>	<b>1 No.</b>
	Operating voltage - 24VDC, Operating distance - 8mm ± 10%, Connector Type - 3pin male QD connector, Sensor type - Flush head type, Mounting – Turn to Lock/ Unlock	
2.24	<b>Optical proximity sensor assy</b>	<b>1 No.</b>
	Operating voltage - 24VDC, Operating distance - 260mm ± 10%, Connector Type - 3pin male QD connector, Sensor type –Light sensing type, Mounting – Turn to Lock/ Unlock	
2.25	<b>Anti-ram valve</b>	<b>1 No.</b>
	Type – Proportional Pressure control, Pressure range - 0.5 -10 bar, Tubing Connection - Inlet / outlet ø4 Mounting - Press to Lock/Unlock	
2.26	<b>Pressure sequence valve</b>	<b>1 No.</b>
	Adjustment method - Adjusting knob, Type - Direct operated poppet type, Flowrate – 70 LPM @6bar, Pressure range - 2-8bar, Tubing Connection - Inlet / outlet ø4, Mounting - Press to Lock/Unlock	
2.27	<b>Electro pneumatics - Text Book</b>	<b>1 No.</b>
2.28	<b>Electro pneumatics – Exercises book</b>	<b>1 No.</b>
2.29	<b>Switch mode power supply</b>	<b>1 No.</b>
	Input voltage – 230V AC 50 HZ Output voltage – 24V DC Output current rating – 3 amps Input connection – 3 pin power cord, 1m length Output connection – 4mm banana socket, Red - Positive, Black - Negative	

### C. Magnetic Symbols

1.	<b>Magnetic Symbols (Hydraulic, Pneumatic, electro-hydraulic and electro-pneumatic)</b>	<b>1 No.</b>
	Hydraulic, Pneumatic, electro-hydraulic and electro-pneumatic symbol shall comply ISO5599 standard. The kit should consist of symbols printed on light weight board, laminated and should have magnetic strips pasted on the back side to enable snapping of the printed symbols on a metallic board, to use as a handy aid by the tutor for pneumatic and electro pneumatic circuit designing.	

### D. Pneumatic & Hydraulic Animation Software

1.	<b>Compatible Pneumatic &amp; Hydraulic Animation Software</b>	<b>1 No.</b>
	The software should be a training aid for the tutor to <ul style="list-style-type: none"> <li>a. Explain the functional features of products &amp; components</li> <li>b. Display the virtual cut sectional animations of individual components and as a circuit let the students to know the internal details of the product &amp; to understand the functions better</li> <li>c. Enable students learn at a very short period, so as to have ample time on using trainer kits to gain more practical knowledge</li> <li>d. Enable easy learning of pneumatic products even at beginner level</li> <li>e. Be as a handy tool for Flow calculation and Cylinder selection to guide the selection of pneumatic components for student projects</li> <li>f. It shall be provided with hardware lock key</li> </ul>	

## E. HYDRAULIC TRAINER KIT

Sr. No	SPECIFICATION	Qty
1.	<b>The Training system should consist the following features</b>	-
	a. Using actual industrial standard valves and components	
	b. No tools should be used for connecting the hoses with fittings. All the hydraulic fittings should be of quick coupler for easily connecting and disconnecting the hoses manually with nipples.	
	c. All quick couplers should be suitable for nipples size 1/4 inch	
	d. Cylinders and accessories should be fitted on an SS plate coupled with a molded plastic guide plate base unit (to avoid scratching on the Aluminium anodized work table)	
	e. Cylinders , accessories and P&T junction box should be provided with turn-to-lock / unlock mechanism for clamping & unclamping with the work table	
	f. All valves and other components should be mounted on an Aluminium cast block (of 40 mm x 60 mm size) fitted with plastic base (to avoid scratching on the Aluminium anodized work table) and with inbuilt button operated Push-to-lock / unlock mechanism for easy clamping & unclamping with the work table	
	g. Working medium: Hydraulic oil with suitable grade	
	h. All Hydraulic components shall be complied with CETOP standards	
	i. Oil cleanliness requirement – As per ISO 16/30 or better	
	j. Operation of a double acting cylinder using 4/2 Hand Lever valve	
2.	<b>Hydraulic Trainer Kit to be powered by Hydraulic power packat 2.18 of para F- equipment set:</b>	<b>1 Sets</b>
	<b>Set should contain</b>	
2.1	<b>Hydraulic Cylinder</b>	<b>1 No.</b>
	Size – 32/12/200, Type – Double acting Cylinder, Max. operating pressure – 20bar Operating pressure – 0 - 20 bar	
2.2	<b>4/2 Hand lever Operated valve spring return</b>	<b>1 No</b>
	Construction - Spool type, Nominal flow – 63 LPM, Operating Pressure – 0 - 60bar Working Temperature range – (-20C to +70C)	
2.3	<b>4/3 Hand lever Operated valve, relieving mid-position with detent(AB to T)</b>	<b>1 No</b>
	Construction - Spool type, Nominal flow – 63 LPM, Operating Pressure – 0 - 60bar, Working Temperature range – (-20C to +70C)	
2.4	<b>4/3 Hand lever Operated valve with detent (close mid. pos)</b>	<b>1 No.</b>
	Construction - Spool type, Nominal flow – 63 LPM, Operating Pressure – 0 - 60bar Working Temperature range – (-20C to +70C)	
2.5	<b>Flow Control valve(Two Way)</b>	<b>1 No.</b>
	Operating pressure – 0 - 60 bar , Max. Operating pressure – 120 bar, Flow -	
2.6	<b>Flow Control valve(One Way)</b>	<b>1 No.</b>
	Operating pressure – 0 - 60 bar, Max. Operating pressure – 120 bar, Flow -	
2.7	<b>Pressure Gauge with Mounting</b>	<b>3 Nos.</b>
	Port Size – 1/4inch, Accuracy – 1.6% of full scale , Range – 0 to 160	
2.8	<b>Non return valve type Pilot Operated</b>	<b>1 No.</b>
	Flow direction - Free flow from A to B , Piloted Flow from B to A Operating pressure – 0 - 60 bar, Cracking Pressure – 1 bar, Max. flow - 80 LPM Area ratio – Pilot piston : Decompressing poppet 16:1 & Pilot piston : Main poppet 2:1	
2.9	<b>Non return valve (0.5 MPa Opening)</b>	<b>1 No</b>
	Flow direction - Free flow from A to B , Leak free closure in opposite direction Cracking Pressure – 5 bar, Operating pressure – 0 - 60 bar, Nominal flow handling capacity – 15 LPM	
2.10	<b>4 way junction box</b>	<b>2 Nos.</b>
	Port Size – 1/4inch	
2.11	<b>P&amp;T Junction box with shut off valve</b>	<b>1 No.</b>
	Type- 2/2 Ball valve, Working Temperature range - (-20C to +70C), Size – 1/4 inch Max. operating pressure – 120bar	
2.12	<b>T-Distributor</b>	<b>1 No.</b>
	Port Size- 1/4inch	



2.13	<b>Hose-1200,100,500mm</b>	1 Set.
	Material – Thermoplastic, Nominal size – 6mm, Max working pressure - 220bar Mountings- Both ends with quick coupler fittings	
2.14	<b>Pressure relief valve</b>	1 No.
	Operating pressure – 0 - 60 bar, Max. Operating pressure – 120 bar, Pressure setting range - 0 -100 bar, Working Temperature range – (-20°C to +70°C)	
2.15	<b>Hydraulic Motor</b>	1 No.
	Displacement – 19.9 cm <sup>3</sup> /rev, Maximum RPM –1250 rpm, Max oil flow – 25 LPM, Max inlet pressure – 175bar, Max return line pressure – 140 bar	
2.16	<b>Hydraulic - Text Book</b>	1 No.
2.17	<b>Hydraulic – Exercises book</b>	1 No.

## F. ELECTROHYDRAULIC TRAINER KIT

Sr. No	SPECIFICATION	Qty
1.	<b>The Training system should consist the following features</b>	-
	a. Using actual industrial standard valves and components	
	b. No tools should be used for connecting the hoses with fittings. All the hydraulic fittings should be of quick coupler for easily connecting and disconnecting the hoses manually with nipples.	
	c. All quick couplers should be suitable for nipples size 1/4 inch	
	d. Cylinders and accessories should be fitted on an SS plate coupled with a molded plastic guide plate base unit (to avoid scratching on the Aluminium anodized work table)	
	e. Cylinders , accessories and P&T junction box should be provided with turn-to-lock / unlock mechanism for clamping & unclamping with the work table	
	f. All valves and other components should be mounted on an Aluminium cast block (of 40 mm x 60 mm size) fitted with plastic base (to avoid scratching on the Aluminium anodized work table) and with inbuilt button operated Push-to-lock / unlock mechanism for easy clamping & unclamping with the work table	
	g. Working medium: Hydraulic oil with suitable grade	
	h. All Hydraulic components shall be complied with CETOP standards	
	i. Oil cleanliness requirement – As per ISO 16/30 or better	
2.	<b>Electrohydraulic Trainer Kit - equipment set:</b>	1 Sets
	<b>Set should contain</b>	
2.1	<b>Pressure relief valve</b>	1 No.
	Operating pressure – 0 - 60 bar, Max. Operating pressure – 120 bar Pressure setting range - 0 -100 bar, Working Temperature range – (-20°C to +70°C)	
2.2	<b>Flow Control valve(Two Way)</b>	1 No.
	Operating pressure – 0 - 60 bar, Max. Operating pressure – 120 bar, Flow -	
2.3	<b>Flow Control valve(One Way)</b>	1 No.
	Operating pressure – 0 - 60 bar, Max. Operating pressure – 120 bar, Flow -	
2.4	<b>Non return valve (0.5 MPa Opening)</b>	1 No
	Flow direction - Free flow from A to B , Leak free closure in opposite direction Cracking Pressure – 5 bar, Operating pressure – 0 - 60 bar, Nominal flow handling capacity – 15 LPM	
2.5	<b>4/2 Single solenoid valve with spring return</b>	1 No
	Construction - Spool type, Nominal flow – 80 LPM, Operating Pressure – 0 - 60bar Working Temperature range – (-20°C to +60°C)	
2.6	<b>4/2 Double solenoid valve</b>	1 No
	Construction - Spool type, Nominal flow – 80 LPM, Operating Pressure – 0 - 60bar Working Temperature range – (-20°C to +60°C)	
2.7	<b>4/3 Double solenoid with mid-position closed</b>	1 No
	Construction - Spool type, Nominal flow – 80 LPM, Operating Pressure – 0 - 60bar Working Temperature range – (-20°C to +60°C)	
2.8	<b>P&amp;T Junction Box</b>	1 No.
	Type- 2/2 Ball valve, Working Temperature range - (-20°C to +70°C), Size – 1/4 inch Max. operating pressure – 120bar	
2.9	<b>Add-on carrier mounting for electrical controls</b>	1 No.

	Size (L x W x H) – 1160 x170 x180 mm, Profile groove width – 8.3 mm, Groove to groove distance – 40 mm , Material – Aluminium, steel	
<b>2.10</b>	<b>Hydraulic Cylinder</b>	<b>2 Nos.</b>
	Size – 32/12/200, Type – Double acting Cylinder, Max. operating pressure – 20bar Operating pressure – 0 - 20 bar	
<b>2.11</b>	<b>Mounting Kit for cylinder</b>	<b>1 No.</b>
	Scale range – 0 to 300mm	
<b>2.12</b>	<b>T-Distributor</b>	<b>2 Nos.</b>
	Port Size- 1/4inch	
<b>2.13</b>	<b>4-way junction box</b>	<b>2 Nos.</b>
	Port Size- 1/4inch	
<b>2.14</b>	<b>Pressure Gauge with Mounting</b>	<b>2 Nos.</b>
	Port Size – 1/4inch, Accuracy – 1.6% of full scale, Range – 0 to 160	
<b>2.15</b>	<b>Pressure switch</b>	<b>1 No.</b>
	Max Operating Pressure: 100bar, Switching frequency – 80 Cyl/min, electrical rating – 6 A,125/250 V AC Electrical connector - Plug in connector conforms to DIN 43650	
<b>2.16</b>	<b>Hose-1200,100,500mm</b>	<b>1 Set.</b>
	Material – Thermoplastic, Nominal size – 6mm, Max working pressure - 220bar Mountings- Both ends with quick coupler fittings	
<b>2.17</b>	<b>Electrohydraulic Exercise Book</b>	<b>1 No.</b>
<b>2.18</b>	<b>Hydraulic power pack</b>	<b>1 No.</b>
	Tank Capacity – 40 Ltr, Size (L x B x H) – (515 x415x317) mm, Operating Voltage – 230V AC 50Hz Maximum pressure - 60bar, Motor Capacity - 1HP, Output flow – 4.8 LPM	
<b>2.19</b>	<b>Power supply unit</b>	<b>1No.</b>
	Input voltage – 220V AC, Output Voltage – 24V DC Output connections: 24 VDC & zero potential with 4 mm socket for banana plug connection	

### G. Vertical work bench

<b>1.</b>	<b>Vertical work bench</b>	<b>2 Nos.</b>
	Size (W x H x D) – (1160 x755 x1535) mm, Profile groove width – 8.3 mm, Material – Aluminium, steel, and Wood, Leveling casters for quick setting and smooth movement, Draw unit for storing the components, Effective work area per side on the Frame unit – 1000 mm x 640 mm, Groove to groove distance – 40 mm	

Deputy Registrar  
(Store & Purchase)