



CENTRAL TOOL ROOM, LUDHIANA

Ministry of Micro Small & Medium Enterprises

Government of India

केन्द्रीय टूल रूम

सुक्ष्म, लघु एवं मध्यम उद्योग मंत्रालय.

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IMPORTANT: TENDERERS SHOULD READ THE TENDER PAPERS CAREFULLY; SUBMISSION OF TENDER SHALL MEAN THAT THE TENDERER HAS READ AND UNDERSTOOD ALL THE TERMS AND CONDITIONS OF THE TENDER AND AGREES AND BINDS HIMSELF/THEMSELVES TO THE SAME. ALL PAGES OF THE TENDER DOCUMENTS SHOULD BE SIGNED BY THE TENDERER(S) AND RETURNED WITH THE TENDER.

TENDER NO: CTR/LDH/1810/Mach/2017-117

DUE ON : 04.10.2017

DATED: 15.09.2017

AT: 02:00 p.m.

PART – I

INVITATION OF TENDER

From: The General Manager.
Central Tool Room
A-5, Focal Point
Ludhiana-141 010
India.

To :

- 1.0 Sealed Tender for “**Pneumatic Training Kit**” as per specifications given in the attached Schedule (Part-III) are invited by the General Manager, Central Tool Room, Ludhiana, India (hereinafter called the “Tool Room and/or the Purchaser”). The tenders shall be received up to 02.00 p.m. on 04.10.2017 and shall be opened in the presence of intending tenderers at 3:00 p.m. on the next day i.e. 05.10.2017. Tenders received late will not be accepted. Tenders should be accompanied by interest free Earnest Money of an amount of Rs. 40,000/- (Rupees forty thousand only) in the form of Demand Draft / Bank Guarantee in favour of “Central Tool Room Ludhiana” payable at Ludhiana. Tenders without Earnest Money or bank guarantee in lieu thereof will not be accepted. Tenderers registered with DGS&D/GeM and/or NSIC for machine/equipment/goods mentioned in Part-III are exempted from depositing Earnest Money and Security Deposit on submission of proof of registration, alongwith the tender.

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- 2.0 Tenders must be submitted only on on-line on www.eprocure.gov.in portal before the stipulated date and time.
- 3.0 a) The tenders should be submitted in two parts. Part 'A' should contain the technical specifications of the kit, which should be described in sufficient details. Detailed technical literature should be enclosed. It should also be accompanied by a list of organizations where similar kits have been supplied by the tenders in India. No price should be indicated in this Part 'A'. DD FOR EARNEST MONEY SHOULD ALSO BE ENCLOSED IN THE SAME ENVELOP, AT THE TIME OF SUBMISSION. All pages of this tender document are to be signed and submitted with this part 'A'.
This envelop should be marked as follows-
- PART 'A'*
Tender for : Pneumatic Training Kit
Tender No. : CTR/LDH/1810/Mach/2017-117
Due on : 04.10.2017
Dated : 15.09.2017
At : 02:00 p.m.
- b) Part 'B' of the tender should contain the prices quoted by the Tenderer for the Kit. It is very important that the prices are quoted with reference to the description of the kit offered in Part 'A' of the tender.
This envelop should be marked as follows-
- PART 'B'*
Tender for : Pneumatic Training Kit
Tender No. : CTR/LDH/1810/Mach/2017-117
Due on : 04.10.2017
Dated : 15.09.2017
At : 02:00 p.m.
- 4.0 The tender should be valid for acceptance for a period of 90 days from the date of tender opening (due date). It is understood that the tenderers are being permitted to tender in consideration of the stipulation on their part that after submitting their tenders they will not resale from their offer(s) or modify the terms and conditions thereof.
- 5.0 If the equipment tendered deviates from tender specifications, a deviation statement should be enclosed with the tender. If there is no deviation "Nil Deviation" confirmation should be enclosed with the tender.
- 6.0 a) If you are a firm (i.e. if you have a Partner or partner(s), the authorized partner holding the Power of Attorney must sign each page of tender. A copy of the partnership agreement should be enclosed. A copy of the Power of Attorney duly executed in his favour authorizing him to bind the firm in all matters pertaining to the contract, including the submission of any dispute relating to business of the firm to arbitration, should be attached to the tender. Original documents are to be shown if and/or when required.

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b) If you are not a firm, the following certificate is to be attached to the tender:

“I certify that I am the sole proprietor and there are no other partner doing business jointly with me.”

c) In case of the limited company, tender documents should be signed by the managing director and the following certificate should be attached to the tender:

“I certify that I am the managing director and I hold the power of attorney executed in accordance with the Articles of Association of the Company to sign all the documents on behalf of the company.”

d) THE REQUISITE CERTIFICATE AS PER (a), (b) OR (c) ABOVE, CURRENT INCOME TAX CLEARANCE CERETIFICATE AND CERTIFICATE OF REGISTRATION WITH DGS&D OR NSIC, IF APPLICABLE, ARE TO BE ENCLOSED WITH PART “A” OF THE TENDER.

7.0 The Tool Room reserves the right to reject any or all offers without assigning any reason whatsoever. The Tool Room also reserves the right to accept any tender in whole or in part without assigning any reason whatsoever. The successful tenderer shall be notified of the acceptance of the tender and till such intimation is received, tenderer(s) should not make any arrangement or incur any expenditure in anticipation of the receipt of notice of acceptance of the tender.

8.0 Machine/equipments/good/software are to be installed and used at Central Tool Room, Ludhiana, Punjab.

Other conditions of the Tender are:

- i) The basic consideration and the essence of the contract shall be strict adherence to the stipulated time schedule for the supply of contracted machine/equipment/goods/software i.e. “Time is the Essence of Contract”.
- ii) Failure and Termination: On acceptance of tender, if the tenderer whose tender is accepted fails to deliver the machine/equipment/goods/software within the period fixed for such delivery in the contract or as extended, or if the contractor repudiates the contract at any time before the expiry of such period, the purchaser may, without prejudice to their other rights-
 - a) Recover from the Contractor Liquidated Damages and by way of penalty a sum equivalent to 2% of the price of any machines /equipments/goods/software (including element of taxes, duties, freights, etc) which the Contractor have failed to deliver within the period fixed for delivery in the contract or as extended, for each month or part of a month for which the delivery of such machine/equipment/goods/software may be in arrears when deliver thereof is accepted after expiry of the aforesaid period subject to maximum of 10.0% of the contract value.

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OR

- b) Cancel the contract or a portion thereof and, if so desired and purchase the machine/equipment/goods/software not so delivered or others of a similar description (where machine/equipment/goods exactly complying with particulars are not, in the opinion of the Purchaser [which shall be final] readily procurable) at the risk and cost of the Contractor. It shall, however, be the discretion of the Purchaser to obtain or not, the Performance Guarantee Bond from the firm/firms on whom the contract is placed at the risk and expense of the defaulting firm/firms.
- iii) Force Majeure: The Contractor shall not be liable to forfeiture of security deposit, liquidated damages or termination for default, if and to the extent the delay in performance or other failures to perform its obligations under the contract is the result of an event of Force Majeure. For the purpose of this clause "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. If a Force Majeure situation arises, the Contractor shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Contractor shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
- iv) Any dispute or difference arising in interpretations or applications of provisions of the Contract shall be referred to the sole arbitration of Development Commissioner, Ministry of MSME, Govt. of India or any other person appointed by him. The award of the arbitrator shall be final and binding on both the parties. Arbitration shall be governed by Indian Arbitration Act. In case of any litigation the jurisdiction shall be Ludhiana
- v) In case of any change in the constitution of firm tenderer/contractor shall notify the same to the Tool Room provided that such change shall not relieve any former member/partner of the firm from any liability under the contract and provided that no new member/partner shall be accepted by the firm unless he agrees to abide by all the terms and conditions of this contract.
- vi) These tender documents are non-transferable.

For GENERAL MANAGER

Dated, Ludhiana, 20th September, 2017

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PART – II(a)

TENDER

To

The General Manager,
Central Tool Room,
A-5, Focal Point,
Ludhiana-141010. (India)

Dear Sir,

I/We agree, on acceptance of the tender in whole or in part, to supply to Central Tool Room, Ludhiana, India, the machine/equipment/goods and accessories, detailed in the Tender enclosed herewith at prices quoted by me/us therein. I/We agree to hold the offer open for 90 days from the due date. I/We have read and understood the terms and conditions of the Tender Documents which shall become Contract on acceptance of tender, and agree to be governed by the same. I/We specifically undertake that I/We will not resile from my/our offer or modify the terms and conditions thereof.

Signature of the Tenderer

Place : _____

Date : _____

Name : _____

Designation : _____

Name & Address : _____

Of the firm _____

WITNESS

Signature : _____

Name : _____

Designation : _____

Name & Address : _____

Of the firm. _____

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Part-II (b)

Tender

Performa for commercial bid :-

(Tenderer need not use this document exclusively but the offer should be in this format to the extent possible)

1. Tender No. & Date
2. Particulars of item/machine offered:-

<u>Sr. No.</u>	<u>Particulars</u>	<u>Qty.</u>	<u>Rate</u>	<u>Amount</u>
----------------	--------------------	-------------	-------------	---------------

Total _____

3. Particulars of Standard and Essential Accessories and Spares:-

<u>Sr. No.</u>	<u>Particulars</u>	<u>Qty.</u>	<u>Rate</u>	<u>Amount</u>
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Total _____

4. Particulars of optional Accessories & Spares:-

<u>Sr. No.</u>	<u>Particulars</u>	<u>Qty.</u>	<u>Rate</u>	<u>Amount</u>
----------------	--------------------	-------------	-------------	---------------

Total _____

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5. Total Offer Price of Main items and Essential Accessories (2+3): -

<u>Amount</u>	<u>Rate</u>
i) Basic Amount	:
ii) Packing charges	:
iii) Excise duty	:
iv) Sales Tax	:
(We can issue form 'C' and are covered under VAT)	:
v) Forwarding charges	:
vi) Freight (pl. mention mode of Transport also)	:
vii) Transit Insurance	:
viii) Installation charges	:
ix) Commissioning charges	:
x) Training charges (Pl. specify free training and paid training for no. of personnel and days separately)	:
xi) Any other charges (Pl. specify)	:

(CTR will be at liberty to load the bidders & overheads etc. in case these are not indicated explicitly)

Total _____

- xii) Delivery period
xiii) Warranty/Guarantee: -

(Pl. specify the details of parts not covered and mention whether the warranty is for replacement or for repair. Responsibility for transportation etc. for replacement/repair should also be clearly mentioned)

- xiv) Inspection Details: -
xv) Payment terms: -

(Our payment terms are within 30 days after successfully installation of machine. Deviations can be accepted in certain cases. But parties accepting our payment terms shall be preferred)

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PART – III

TECHNICAL SPECIFICATIONS

Required Qty. 02 Sets

1. BASIC PNEUMATIC TRAINING KIT:

- The Pneumatic Training kit shall be capable to demonstrate the following:
 - Basic design and function of a pneumatic system.
 - Function and identification of pneumatic components and their symbols.
 - Direct and indirect manual controls, stroke dependent controls, time dependent with time delay valves and pressure dependent controls with pressure sequence valves.
 - Logic AND / OR function to start signals
 - Application and fault findings of pneumatic controls functional diagrams.
 - Sequence Controls.
 - Methods for the drafting of circuit diagrams for pneumatic controls.
- The components should be capable of being mounted on an aluminum profile plate of size 1100 mm X 700 mm with grooves for secure and flexible positioning so that the components can be clamped firmly, quickly & safely through quick fix adapters. This should ensure flexibility in conducting experiments through various exercises.
- Pneumatic Plug-in type flexible connectors should be safe & airtight. These should be capable of being used for multiple applications. These connectors must be precision quick connector for plastic tubing 4 mm x 0.75 mm and for internal or external diameter calibrated tubes.
- Industrial components should be used in the kit so that the students get hands-on practical training in using Industrial components.
- The kit should be modular and upgradable so that future investments to higher levels of training are reduced.

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Each set should consist of:

S. No.	Items	Req. Qty.	Descriptions
1.	Profile plate	01 No.	All of the components should fit securely and safely onto the profile plate. Both sides should have grooves and, if required, both sides can be used. The grooves must be compatible with the ITEM profile system including Side caps. Grid dimensions: 50 mm. ; Size: 1100 x 700 mm.
2.	3/2-way valve with push button actuation, N.C.	03 Nos.	Poppet valve should be directly actuated; one side, with return spring. Operating pressure range: -0.95 – 8 bar Nominal flow rate 1.2 - 65 L / min.
3	3/2-way valve with push button actuation, N.O.	01 No.	Poppet valve should be directly actuated; one side, with return spring. Operating pressure range: 3.5 – 8 bar Nominal flow rate 1.2 - 120 L / min.
4	5/2-way valve with selector switch.	01 No.	The valve should be actuated by rotating the selector switch. When the selector switch is released, the current circuit state must be retained. The valve should be Poppet valve, Directly actuated, one side, with return spring. Operating pressure range: 0 – 8 bar Nominal flow rate 1.2 - 95 L/min.
5	Pressure gauge	02 Nos.	Bourdon tube pressure gauge Display range: 0 – 16 bar
6	Quick Exhaust Valve	01 No.	Quick-exhaust valve with built-in silencer. Type: Poppet valve Operating pressure range: 0.5 – 10 bar, Nominal flow rate: 2300 L/min, exhaust: 1100 L/min.
7	3/2-way roller lever valve, idle return N.C.	01 No.	Type: Poppet valve, directly actuated, one side, with return spring Operating pressure range: -0.95 – 8 bar Nominal flow rate 1.2 - 80 L/min.
8	3/2-way roller lever direct actuation N.C.	03 Nos.	Type: Poppet valve, directly actuated, one side, with return spring Operating pressure range: -0.95 - 8 bar Nominal flow rate: 1.2 - 80 L/min.
9	5/2-way pneumatic actuated valve, single sided	01 No.	Type: Poppet seat, Directly actuated, one side, with return spring Operating pressure range: 0 – 10 bar Nominal flow rate: 500 L/min, Response time: Optimum
10	5/2- way pneumatic actuated valve, double sided	03 Nos.	Type: Poppet seat, Directly actuated, both sides, Operating pressure range: 0 – 10 bar Nominal flow rate : 600 L/min, Response time - Optimum
11	Shuttle valve (OR)	01 No.	Type: OR gate (shuttle valve) Operating pressure range: 1 – 10 bar, Nominal flow rate: 500 L/min.
12	Dual-pressure valve (AND)	01 No.	Type: AND gate (dual-pressure valve) Operating pressure range: 1 – 10 bar, Nominal flow rate: 550 L/min.
13	Time-delay valve / adjustable N.C.	01 No.	Type: Poppet valve with Return spring, Operating pressure range: 2.5 – 8 bar, Nominal flow rate 1.2 - 92 L/min, Delay: 5 sec.

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14	One-way flow control valve	02 Nos.	Type: Combined flow control valve Operating pressure range: 0.5 – 10 bar, Nominal flow rate: 0 – 220 L/min.
15	Pressure sequence valve	01 No.	Type: Poppet valve with return spring, Operating pressure range: 1.8 – 8 bar, Nominal flow rate: 1.2 - 100 L/min
16	Single-acting cylinder	01 No.	Type: Piston cylinder Operating pressure: 10 bar Piston, diameter: 20 mm. Stroke length: Maximum 50 mm, Thrust at 6 bar : 169 N Spring return force minimal: 13.65 N
17	Double-acting cylinder	02 Nos.	Type: Piston cylinder Operating pressure: 10 bar, Piston diameter: 20 mm. Stroke length: Maximum 100 mm. Thrust at 6 bar : 188.5 N Return thrust at 6 bar : 158.3 N
18	On/Off valve with filter regulator and gauge	01 No.	Type: Sintered filter with water separator, diaphragm control valve Nominal flow rate: 750 L/min. Pressure control range: 0.5 - 12 bar Grade of filtration : 40 µm Condensate quantity: 22 cm ³ Connector: G 1/8"
19	Pressure regulator valve with gauge	01 No.	Type: Diaphragm regulator valve Nominal flow rate: 800 L/min. Pressure control range: 0.5 - 12 bar
20	Manifold	01 No.	Manifold should be with six (2 x 3) self-closing non-return valves.
21	Plastic tubing PUN 4	01 No.	Exterior diameter: 4 mm, Interior diameter: 2.8 mm, Length: 10 m.
22	Plastic tubing PUN 8	01 No.	Exterior diameter: 8 mm, Interior diameter: 6.5 mm, Length: 5 m.
23	Connection component Set	01 Set	This set should consist of different connectors.
24	T-connectors	10 Nos.	These should be used for branching of the tubes for making circuitry.
25	Manuals	01 Set	All reading material, operating manuals, experiments manual required for using the training kit should be supplied along with the consignment
26	Warranty	02 Years	Min 2 years of warranty should be provided by the supplier.

Note:

- Spare sets of connection components should be supplied (each 2 Nos. per set).
 - Quick push pull straight connector, M5
 - Quick push pull straight connector, G 1/8
 - Quick push pull angle connector, M5
 - Quick push pull angle connector, G 1/8

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2. ELECTRO PNEUMATICS TRAINING KIT

The kit should be capable of being used to demonstrate the following:

- Basic design and function of an Electro Pneumatic system.
- Function and identification of Electro pneumatic components and their symbols Logic AND / OR function to start signals.
- Application and fault findings of Electro Pneumatic controls Functional diagrams.
- Systematic design of Electro Pneumatic Sequence Controls.
- Methods for the drafting of circuit diagrams for Electro Pneumatic controls Pneumatic Power Section – Electric Control Section.

Each Electro pneumatic training kit must have the following items.

S. No.	Items	Req. Qty.	Descriptions
1	Relay, three fold	1 No.	The device should have three relays with terminals and two buses for power supply, 4 changeover switches, electricity supply rail, mass flow rail, ports for 4 mm safety plugs. Mounting with protection against accidental contact with a built-in lock grid ledge in the fixture for electrical port and control unit or else with plug-in adaptors for the profile plate Contact load: max. 5 A, Cut-off load: max. 90 W, Pick-up time: 10 ms, Drop-off time: 8 ms.
2	Signal Input, electrical	1 No.	The device must contain an illuminated pushbutton switch (control switch) and three illuminated pushbuttons (momentary contact switches) with terminals and two buses for power supply. 3 illuminated push buttons, 1 illuminated pressure switch, each with a mini bulb, bus bar, mass flow rail, 1 N/O contacts and 1 NC contacts for 4 mm security plugs. Mounting with protection against accidental contact with a built-in lock grid ledge in the fixture for electrical port and control unit or else with plug-in adaptors for the profile plate. Contact set: 1 makes, 1 breaks, Contact load: Maximum 2 A, Power consumption (Miniature bulb): 0.48 W
3	Proximity sensor with cylinder attachment	2 Nos.	A contactless proximity sensor should be provided for attachment to a cylinder for Non-contacting sensing with port cable and an operating status indicator. Protected against polarity reversal, overload and short circuit. Operating pressure: 10 to 30 V (DC), Output current: max. 200 mA, Switching capacity: 6 W (DC), Response time (on/off): max. 0.5 ms.
4	5/2 way Single solenoid valve with LED	01 No.	This valve should be Pilot actuated, single solenoid piston spool valve with pneumatic spring return, non-detenting and detenting manual override, and LED. Electrical connection via integrated 4 mm safety sockets, 24 V DC power supply Switching time on/off - 7/19 ms. Pneumatic connection via QS-4 push-in fitting Operating pressure 250 – 800 kPa (2.5 – 8 bar)

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5	5/2 Solenoid valve, double, with LED	02 Nos.	This valve should be Pilot actuated, double solenoid piston spool valve with non-detenting and detenting manual override, and LED. Electrical connection via integrated 4 mm safety sockets, 24 V DC power supply, Response time: 7 ms. Pneumatic connection via QS-4 push-in fitting, Operating pressure 150 – 800 kPa (1.5 – 8 bar), Safety and quick action mounting system for slotted profile plates.																																	
6	Pressure sensor with display	01 No.	This sensor must be 360° rotatable, detenting every 15° Connection via the 4 mm. safety connectors integrated in the quick connector system Power supply: 15 – 30 V DC, Switching output: PNP Analogue output: 0 – 10 V DC Pneumatic connection via QS-4 push-in fitting, Pressure measuring range: 0 – 1000 kPa (0 – 10 bar)																																	
7	Electrical Limit Switch, left actuated	01 No.	The micro switch should be actuated mechanically when the roller lever is pressed, for example by the trip cam of a cylinder. The micro switch can be wired as an N/O contact, N/C contact or a changeover switch, using the 4 mm safety sockets integrated in the quick action mounting system. Possible contact load: maximum 5 A																																	
8	Electrical Limit Switch, right actuated	01 No.	The micro switch should be actuated mechanically when the roller lever is pressed, for example by the trip cam of a cylinder. The micro switch can be wired as an N/O contact, N/C contact or a changeover switch, using the 4 mm safety sockets integrated in the quick action mounting system. Possible contact load: maximum 5 A																																	
9	Power Supply Unit	01 No.	Input voltage: 85 – 265 V AC (47 – 63 Hz), Output voltage: 24 V DC, short-circuit-proof, Output current: max. 4.5 A																																	
10	Set of Cables	10 Set	Complete set, consisting of 98 safety laboratory cables with 4 mm. safety plugs in the colours red and blue: <table border="1"><thead><tr><th>Color</th><th>Quantity</th><th>Length [mm]</th></tr></thead><tbody><tr><td>Red</td><td>1</td><td>1500</td></tr><tr><td>Red</td><td>3</td><td>1000</td></tr><tr><td>Red</td><td>21</td><td>500</td></tr><tr><td>Red</td><td>26</td><td>300</td></tr><tr><td>Red</td><td>10</td><td>50</td></tr><tr><td>Blue</td><td>1</td><td>1500</td></tr><tr><td>Blue</td><td>3</td><td>1000</td></tr><tr><td>Blue</td><td>12</td><td>500</td></tr><tr><td>Blue</td><td>11</td><td>300</td></tr><tr><td>Blue</td><td>10</td><td>50</td></tr></tbody></table>	Color	Quantity	Length [mm]	Red	1	1500	Red	3	1000	Red	21	500	Red	26	300	Red	10	50	Blue	1	1500	Blue	3	1000	Blue	12	500	Blue	11	300	Blue	10	50
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11	Manuals	01 Set	All reading material, operating manuals, experiments manual required for using the training kit should be supplied along with the consignment																																	
12	Warranty	02 Years	Min 2 years of warranty should be provided by the supplier.																																	

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CENTRAL TOOL ROOM, LUDHIANA

Ministry of Micro Small & Medium Enterprises

Government of India

केन्द्रीय टूल रूम

सुक्ष्म, लघु एवं मध्यम उद्योग मंत्रालय.

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3. MEASUREMENT AND CONTROL IN PNEUMATICS:-

Each training kit must have the following items.

S. No.	Items	Req. Qty.	Descriptions
1	I/O data cable, 2.5 m	01 No.	For connection of interfaces, for example an interface unit, with the universal connection unit, digital.
2	Universal connection unit, digital	01 No.	The universal connection unit should connect all 4 mm safety plugs with the 24-pin system connector as per IEEE 488. It thus becomes a universal interface between units with 4 mm connection technology and devices equipped with connectors as per IEEE488: Inputs: 3 safety sockets each for 8 three-wire sensors Outputs: 2 safety sockets each for 8 actuators Connections: 4 mm safety sockets for 24 V DC, connector (IEEE488) I/O status display: Via LED
3	Connection unit, analogue	01 No.	For ER-unit cabinet frame for the connection of 4 mm security sockets to an analogue cable. Permissible voltage range: 22 – 27 V DC, Reference Ground Analogue voltage input: Input U 4, Range: -10 – +10 V, (max. 30 V), Input resistance: 200 k Ω , Analogue voltage input I 4, Range: 0 – 20 mA, Input resistance: max. \pm 30 V, Analogue output: 2, Voltage: -10 – +10 V, Short circuit proof: max. \pm 30 V, protected, current: max. 20 mA
4	Analogue cable	01 No.	Analogue cable, parallel, 15-pin SUB-D type connector on both ends, 150 cm.
5	Interface unit	01 No.	2 x 24 pin IEEE 488 compatible plug connectors for mechatronics station, training package, PLCs each with 8 digital inputs and 8 digital outputs (16I/16O) 1 x SUB D 15-pin plug connector for mechatronic station, training package, PLC with 4 analogue inputs and 2 analogue outputs (12 bit resolution) 24 V power supply connection via separate screw terminals USB 2.0 interface to PC (galvanically separated) Large LCD display Display of digital signals via LED
6	Pressure sensor with display	02 Nos.	Sensor must be 360° rotatable, detenting every 15° Connection via the 4 mm safety connectors integrated in the quick connector system. Power supply: 15 – 30 V DC Switching output PNP Analogue output: 0 – 10 V DC Pneumatic connection via QS-4 push-in fitting Pressure measuring range: 0 – 1000 kPa (0 – 10 bar)

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7	Flow sensor with display	01 No.	Security and quick connector with click-on system for profile plates Indicator range 5-50 l/min Flow rate range 5-50 l/min Operating pressure -70 – 700 kPa (-0,7 - 7 bar) Operating voltage 12-24 V Precision FS 5%
8	Proportional-pressure regulator	01 No.	Power supply: 21,6 V – 26,4 V/3,6 W Residual ripple: 10 % Set point (value): 0 – 10 V Supply pressure: 7 – 8 bar Pressure regulation range: 0,15 – 6 bar Flow range: 600 l/min
9	Pressure regulator valve with gauge	01 No.	Diaphragm regulator valve, Nominal flow rate: 800 l/min Pressure control range :0.5 - 12 bar
10	Flow control valve	03 Nos.	Standard nominal flow rate 85 l/min QS-4 connection
11	Plastic tubing 4 mm blue	01 No.	Exterior diameter: 4 mm & Interior diameter: 2.6 mm
12	Non-return valve, delockable	02 Nos	Operating pressure: 0.5 - 10 bar Standard nominal flow rate: 108 l/min
13	Software for Measurement & Control in Pneumatics	01 User	Software for acquisition, display and documentation of analogue measured values in pneumatic equipment and systems through the use of common industrial sensors with voltage output signal for pressure, force and flow rate with exercises and didactic assistance. Results should be gauged with measuring points, printed out or exported to a spread sheet programme. Furthermore, the software also should include the entire collection of exercises as a PDF file. Software license must be academic and perpetual.
14	WorkStation with 1 drawer unit (for Pneumatic)	01 Unit	Dimension of table (LXWXH): 1200 x 900 x 900 mm. (min.) with four castor wheel and two lockable at front side. One drawer unit for storing pneumatic components.
15	Manuals	01 Set	All reading material, operating manuals, experiments manual required for using the training kit should be supplied along with the consignment
16	Warranty	02 Years	Min 2 years of warranty should be provided by the supplier.

Notes:

1. Certification training from OEM of min. 7 days (phase-wise) to be provided on FOC basis in CTR.
2. Authorization certificate from OEM to be provided.
3. The supplier shall be required to submit a performance bank guarantee of value equal to 10% of the order value, for the warranty period.

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PART – IV

SPECIAL CONDITIONS:

1. Training of Purchaser's staff is tenderer's responsibility.
2. Delivery Schedule: As per the terms of purchase order.
3. The tender is required to give on a separate sheet for Total Life Cycle costing of the supply.
4. Position of availability of Service Engineer in case of break down / support, along with expected time to reach CTR and position of availability of spare parts in future should clearly be stated.

Signature of the Tenderer

Place: _____

Name :

Date: _____

Designation :

Name & Address of the firm : _____

WITNESS

Signature :

Name :

Designation :

Name & Address of the firm :

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