TENDER DOCUMENT

E-Tender:-
"Supply of Items for Lab,
MAE Department"
IGDTUW

e-NIT no. Mech/48/IGDTUW/PUR-CURIE/2018-19 (Part2)

Notice Inviting Authority

Registrar
INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN
(Established by Govt. of NCT of Delhi under Act 9 of 2012)
Kashmere Gate, Delhi-110006
E-mail: registrar@igdtuw.ac.in; www.igdtuw.ac.in

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E-Tender:-
"Supply of Robotic Training Cell,
MAE Department"
IGDTUW

SECTION- 1
NOTICE INVITING TENDERS (NIT)

1.1 Invitation for bidding:- e-Tenders (online open tenders) under two bid system are invited by "INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN, Kashmere Gate Delhi 110006, from eligible suppliers (manufacturers / authorized dealers) for "Supply of items for Lab," to the stores of IGDTUW on basis of free delivery at site, as per the schedule of requirements and technical specifications mentioned at Annexure-6, within a period of 45 days from the date of issue of Supply order/Work order /Award of contract whichever is the earliest with the terms and conditions in this tender.

1.2 Schedule of Tenders:-

1	Name of work	Supply of items for Lab, for MAE Department, IGDTUW
2	Date of release of advertisement of tenders through e-procurement web site	04/02/2020
3	Last date, time for submission of quotation/Due date and Time	26/02/2020, 5:00 pm
4	Date& time of opening of Tender (Technical bid)	26/02/2020 05.30 am
5	Financial bid shall be opened after evaluation of technical bid/time notified thereafter	

1.3 **EMD** 5 % of value in the form of DD/BC should be submitted as bid security. Bids can be given for individual Items.

1.4 The validity of bid should be 75 days from the due date of tender.

1.5 The e-procurement web site https://govtprocurement.delhi.gov.in. is to be used on line to avail and submit the tender documents & bids.

1.6 The place of clarification, physical submission (as per tender), and opening of bids shall be "INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN, Kashmere Gate Delhi 110006

1.7 Late Tenders are not acceptable.

SECTION- 2
ELIGIBILITY CRITERIA

The Tenderer should meet the following eligibility criteria to become technically qualified.

2.1 Bid Security (EMD): To be able to secure the bid, the tenderer should submit EMD amount of 5 % of value in the form of account payee Demand Draft/Banker's Cheque drawn in favour of **"Registrar, IGDTUW,** Delhi from any nationalized bank or commercial bank. The bid security is normally to remain valid for a period of forty-five days beyond the final bid validity period. The original instrument should be submitted in physical form in a sealed envelope not bigger than A-4 size mentioning address tender ID & due date of tender in the office of Purchase Officer, "INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN, Kashmere Gate Delhi 110006 before the last date & time of submission (refer section-1, clause-1.2) of this tender. Also the scanned copy of EMD is to be submitted online. The tenderer having valid NSIC registration for the goods / work/service required in this tender is exempted from submitting EMD. To support this, the scanned copy of such valid registration/ exemption certificate is to be submitted online.

2.2 Commercial capability

2.2.1 Terms & Conditions: The tenderer should be a manufacturer / authorized dealer for the tendered items & should not be blacklisted by any Govt. deptt. /Autonomous body/PSU etc. to become eligible for tendering. The tenderer should submit an undertaking for agreeing Terms & Conditions mentioned in all sections of this tender as per the format given at Annexure-1. The scanned copy of Annexure-1 is to be submitted online.

2.2.2 Minimum Financial Turnover: The tenderer should have supplied similar kind of goods/work/service from 1st April, 2015 onwards and should have annual average turnover of last three financial years more than the estimated cost of the tender value. The tenderer should submit an undertaking duly filled in the Annexure-1 to this effect. In support, the tenderer should submit online the scanned copies of audited accounts showing annual financial turnover for the last three financial years (2015-16, 2016-17 and 2017-18). In this tender, the definition of 'similar kind of goods/work/service' is 'supply, installation & commissioning of Lab/office machinery/equipments required for Technical Training Institutes / Universities / Colleges /Govt. depts. / Autonomous Institutions /PSU organizations'.

2.2.3 Minimum Work Experience: The tenderer in past (starting from 1st April, 2015 up to date) should have the experience of successful completion of work as detailed below:-

(i) Three similar natures of works per year each costing not less than the amount equal to 30% of the estimated cost of the tender value.

Or

(ii) Two similar natures of works per year each costing not less than the amount equal to 50% of the estimated cost of the tender value.

Or

(iii) One similar nature of works per year each costing not less than the amount equal to 80% of the estimated cost of the tender value.

The tenderer should submit an undertaking duly filled in the Annexure-1 to this effect. In support, the tenderer should submit online the scanned copies of the 'work

order copies with work completion certificates'. In this tender, the definition of 'similar kind of goods/work/service' is 'supply, installation & commissioning of Laboratories required for Technical Training Institutes / Universities / Colleges /Govt. depts. / Autonomous Institutions /PSU organizations'.

2.2.4 The tenderer should submit online the scanned copies of latest valid I.T.R (Income tax Return) and GST/VAT/Sale tax /service tax return.
2.2.5 Tenderer should submit signature authorization certificate duly filled in Annexure- 1.

2.3 Technical Capability

2.3.1 The tenderer should submit an undertaking in the format given at Annexure-2. The tenderer should be sound in terms of manufacturing facility/ Supplying & Servicing capability, Quality control measure, Inspection facility, installation, commissioning, providing after sale service, warranty facilities, experience & past performance to do the work satisfying the required specifications. The company/product with valid BIS or ISO certification or any other shall be mandatory to qualify technically. To fulfil this, Tenderers should submit online the scanned copy of the certificate.
2.3.2 The tenderer should submit online the scanned copy of the Manufacturer's Authorization Letter, as applicable, as per Annexure-3.
2.3.3 The tenderer should submit online the scanned copy of the 'Technical Compliance Statement' as per Annexure-4.
2.3.4 The tenderer should submit online the scanned copy of the 'Check list for Technical evaluation' as per Annexure-5.
2.3.5 The tenderer should submit in physical form any leaflet/ catalogue/Literature/specification sheet/photograph/drawings/sketches etc. in support of their product / service & specifications in the sealed envelope meant for submitting original instrument of EMD (refer section-2, clause-2.1).
2.4 Original documents: The tenderer should submit only following original documents in physical form before the due date & time of this tender no other documents shall be entertained except following.
2.4.1 Original instrument of EMD (As per clause-2.1).
2.4.2 Original copy of leaflet / catalogue /Literature/ specification sheet /photograph/Drawings/Sketches etc. (As per clause-2.3.5)
2.5 Scanned copies of documents: The tenderer should submit online the scanned copies of the following documents duly filled & signed before the due date & time of this tender. The scanned copies should be clearly visible & readable.
2.5.1 Scanned copy of EMD or valid EMD Exemption certificate (As per clause-2.1).
2.5.2 Scanned copy of latest valid return of ITR (As per clause-2.2.4).
2.5.3 Scanned copy of latest valid return for GST/VAT/Sale tax/service tax (As per clause-2.2.4).
2.5.4 Scanned copies of audited accounts showing annual financial turnover for the last three years (As per clause-2.2.2).
2.5.5 Scanned copies of Annexure 1, 2, 3, 4, 5 & 6 duly filled and signed (As per clause-2.2.1, 2.3.1, 2.3.2, 2.3.3, 2.3.4 respectively).
2.5.6 Scanned copy of BIS or ISO certification or any other (As per clause- 2.3.1).
2.5.7 Scanned copies of the work order copies with work completion certificates (As per clause-2.2.3).
2.6 Rejection of bid: The tender is liable for rejection at any stage during evaluation due to any of the reasons mentioned below.

2.6.1 Minimum Financial Turnover: The tenderer fails to meet the criterion of annual average financial turnover during the last three financial years, as per clause-2.2.2.
2.6.2 Minimum work experience: The tenderer fails to meet the criterion of minimum work experience as per clause-2.2.3.
2.6.3 Certification: The tenderer fails to meet the criterion that the company/product should have valid BIS/ ISO / any other certification as per clause-2.3.1.

2.6.4 Conditional bids: The tenderer submits a conditional bid document or submits an extra document other than those mentioned in clauses-2.4 & 2.5. Conditional bid shall be rejected. Tenderers should note that 'No Price should be indicated in the Technical Bid'. In case any price is mentioned in the technical bid, the Bid will be rejected out-rightly without any further correspondence.

2.6.5 Incomplete bids: : It is found that there is submission of incomplete, unsigned and uncertified bid document **or** Non-submission of tender within stipulated time **or** Submission of tender documents in unsealed envelope **or** Tender envelopes which are not super scribed with details of the tender ID/enquiry **or** Non-payment of Earnest Money Deposit (if not exempted) **or** Non-submission of required documents as shown in clause 2.4 & 2.5 **or** Submission of misleading / contradictory / false statement or information and fabricated / invalid documents.

2.6.6 Physical hard copy: Only e-tender shall be accepted & considered. In no case physical hard copy of tender shall be accepted except EMD as per clause 2.1 and any leaflet / catalogue /Literature/ specification sheet /photograph/Drawings/Sketches etc. as per clause-2.3.5.

2.6.7. As per CVC guidelines: In a tender either the Indian agent on behalf of the principal /OEM itself can bid, but both cannot bid simultaneously for the same item/ product in the same tender.

N.B:- Competent Authority, IGDTUW, reserves the right to accept or reject any tender without assigning any reason or to cancel the tendering process and reject all tenders at any time prior to award of contract without incurring any liability, whatsoever to the affected tenderer or tenderers and can take appropriate action as per Govt. rules.

SECTION-3
INSTRUCTIONS TO TENDERERS (IT)

3.1 Introduction & Eligibility: Definitions and abbreviations which have been used in these documents shall have the meanings as indicated in the Section-4 (Condition of contract). This Tender Document comprises of contents as mentioned in the 'table of contents' & is as per guidelines of Finance Dept, Govt. of NCT of Delhi. This section provides the relevant information, terms & conditions, procedure for tendering, opening of bid, evaluation, award of contract etc. However, the tenderers should also study and examine all the terms & conditions in rest of this tender document including eligibility criteria, CC, Undertakings & Annexures etc. before submitting the tenders. The tender submitted by the tenderer, all subsequent correspondence exchanged between the tenderer and the University and documents related to the tender, shall be written in English language only. The tenderers are instructed to ensure that they conform to the eligibility criteria as prescribed in section-2 before submitting the offer/tender.

3.2 The validity of bid should be **75 days** from the due date of tender.

3.3.1.1 The estimated cost of the goods is **Rs.48,00,000/- (Forty Eight Lakhs).**

3.4 Quoting of rate: The tenderers are instructed, price bearing elements before quoting rates/price. The tenderer should quote fixed prices/rates and not to be quoted higher prices/rates for the Inspection of same items /equipment/ kits, as tenderer /firm had supplied in this year in any Technical Training Institutes / Universities / Colleges /Govt. depts. / Autonomous Institutions /PSU organizations'.

3.5 Tender Sample Inspection: the tenderer must be capable of providing samples of the goods to be procured at IGDTUW; or at its factory; or at the place desired by the Technical/ Inspection Committee, if required, for inspection. The Technical/ Inspection Committee, if required, may visit the factory of the bidder to assess the capabilities and the quality of the goods to be procured during the tender processing as well as during supply.

3.5.1. The eligibility of firm shall further subject to satisfactory demonstration of product in front of Technical/ Inspection Committee constituted by the University for this purpose.

3.6 Clarification before bidding: prospective tenderers can obtain clarification to clear any doubt before bidding from Technical Committee / Authorized Committee in the office of Dy. Registrar/ Purchase Officer, IGDTUW, Kashmere Gate Delhi-110006 .

3.7 Amendments to the Tender documents: Registrar, IGDTUW / Authorized Officer of IGDTUW, at any time prior to the deadline for submission of tenders may, for any reason deemed to be fit, modify the tender documents by issuing amendments. Such an amendment will be notified in writing.

3.8 Preparation of Tenders

3.8.1 Availability of Tender Documents: Tender documents are available on the web site https://govtprocurement.delhi.gov.in. Prospective tenderers can access the same and they can download the tender documents, free of cost.

3.8.2 Technical Bid (TB): Tenderers should submit / upload technical bid containing original & essential requisite documents as per guidelines mentioned in Section-2, of this tender. **It should not contain any price**.

Tenderers may quote as per annexure-6 of the tender document. EMD will have to be submitted / uploaded accordingly.

3.8.3 Financial Bid (FB): 3.8.3.1 The bidder shall quote unit rate in INR, both in word and figures in the Financial Bid only. No alterations in the form of tender, in the schedule of quantities or additions etc. shall be permitted. In case of difference between the rates of items written in figures and in words, the rates of items written in words shall be taken as correct. No changes in unit rates shall be allowed. The rates quoted in schedule quantity are for finished and completed items and no extra amount for carting or transporting material, labour etc. shall be paid unless specifically so mentioned or provided for in tender. The rates should be inclusive of all leads and lifts for all materials in the completed items and also include all taxes, duties, royalties etc. including Work Contract Tax, labour cess, ESI, EPF etc. as applicable. No extra payment on this account will be made.

3.8.3.2 Income Tax/DVAT /TDS/TDS on GST shall be deducted at source at the rate that will be in force from time to time.

3.8.3.3 The bidder shall quote unit rate in INR, both in word and figures in the Financial Bid only.

3.8.4 Bid Security (EMD): Tenderers should submit EMD in INR only as prescribed**.** No interest shall be payable by the University on the EMD. EMD will be returned to the successful tenderers after receipt of Performance security. Bid securities of the unsuccessful bidders shall be returned to them at the earliest after expiry of the final bid validity.

3.8.5 Undertaking for acceptance of terms & conditions: Tenderers should submit an undertaking certifying that they accept all terms & conditions mentioned in this tender document in the format at Annexure-1 as per instruction given in section-2.

3.8.6 Authorization to sign and submit the tenders: The individual signing the tender or any other documents connected therewith should clearly indicate his full name and designation and also specify whether he/she is authorized signatory as per undertaking in Annexure-1.

3.9 Submission of Tenders

3.9.1 Registration: The prospective tenderer should be registered with Govt. of Delhi's e-Procurement Portal and should have Digital Signatures & proper training etc., to enable him to submit bids on-line through e-Tendering. For any assistance/training regarding registration & e-tendering, the intending tenderer may contact officials as referred in the website mentioned in clause-3.8.1.

3.9.2 Document file: Once the tenderer agrees to the terms & conditions of the tender, submission process can be started. The total size of all documents in all the covers put together should be less than 10 MB. The bidders are advised to scan the documents in low resolution (75 to 100 DPI) to reduce the size of the cover to facilitate uploading of all the required pages. If the documents could not be opened due to virus, during tender opening, or if incomplete page/document is opened in incomplete

form, then the bid is liable to be rejected. Proper training shall help in proper submission.

3.10 Alteration and Withdrawal of tender: The e-tender system allows the tenderer to alter/modify/withdraw the tender only within the deadline for submission of tenders. Alterations/modifications to tenders after the prescribed deadline will not be permitted by the system.

3.11 Opening of Bids: The tenders will be opened in the office of Purchase Officer / Deputy Registrar, Indira Gandhi Delhi Technical University for Women, Kashmere Gate Delhi-110006 by a tender opening committee of IGDTUW (DSC holders for e-tenders & purchase committee for tenders other than e-tenders) on date & time as specified under Section-1. The downloadable documents, original documents & submitted documents shall be compiled & attested by the bid openers and presented for evaluation to the Competent Authority /Purchase Committee.

In case the specified date of tender opening falls on a holiday or declared closed or any unforeseen technical problem in the computer system/server/networking occurs, then tenders will be opened on the appointed time and place on the next working day.

Authorized representatives of the tenderers, who have submitted tenders in time, may attend the online tender opening process, on production of letter of authority from the concerned tenderers or they can view the process on-line & the result will be informed online. During the tender opening, the tender opening committee may inform tenderers regarding number of uploaded tenders, name of the companies and any other special features, as deemed fit.

3.12 Scrutiny and evaluation of Tenders: The technical bids shall be scrutinized and evaluated by the competent Technical/ Purchase Committee / authority with reference to the parameters prescribed in the tender document including section-2. No new condition will be brought in while scrutinizing and evaluating the tenders.

3.13 Clarification of Bids: During evaluation and comparison of bids, the University may, at its discretion, ask the bidder for clarification on the scanned documents uploaded by them. The bidder should submit written clarification/documents within the stipulated time. The University may accept such clarification and receive documents related to the clarification sought. No change in prices or substance of the bid shall be sought, offered or permitted. No post-bid clarification at the initiative of the contractor shall be entertained.

3.14 Cartel formation/Pool Rates: Cartel formation or quotation of pool/co-ordinated rates leading to "Appreciable Adverse effect on Competition" (AAEC) as identified in Competition Act, 2002, as amended by Competition(Amendment) Act, 2007, would be considered as a serious misdemeanor and would be dealt accordingly as per the Section-4.

3.15 Negotiations: Normally, there would be no negotiation including price negotiation after financial bid opening. But the Competent Authority, IGDTUW, reserves its right to negotiate with the lowest acceptable contractor (L1) under special circumstances in accordance with CVC guidelines before award of contract/order.

3.16 Award of Contract

3.16.1 Contract Award criteria: An order/contract will be awarded to the lowest evaluated responsive Tenderer (L-1 tenderer) on the terms and conditions laid down in this tender/negotiated as per rule before notification of award of contract/order.
Competent Authority, reserves the option of giving purchase/price preference to the offer from Central / State Government Public sector undertakings in accordance with the policy of Govt. of India.

3.16.2 Notification of award / Acceptance of offer: Before expiry of the validity of tenders, Indira Gandhi Delhi Technical University for Women, Kashmere Gate Delhi 110006 will notify the successful tenderer in writing that its tender for supply of goods/work/service has been accepted.

The successful tenderer should respond satisfactorily as prescribed in the notification within 15 days from the date of issue of the letter of notification of award by the University sent by speed post to the address mentioned in its bids.

The communication of notification of award sent by University to the successful tenderer shall be treated to be complete as against the tenderer where it is put in the transmission to him/her so as to be out of the power of the Institute. The responsibility entirely lies on the tenderer to collect the letter of notification of award released by the University & respond to it. Until a formal contract is executed, this tender with written acceptance from purchaser thereof shall constitute a binding contract between the parties.

3.16.3 Conclusion of contract: The successful tenderer must furnish the required performance security within **15 days** from the date of issue of notification of award as per Section-4 to conclude the contract.

3.16.4 Safety and Security
Safety and Security of workers/staff, material, equipments, etc. will be the responsibility of the contractor. The university will not be held responsible on this account.

The University reserves the right, without being liable for any damages or obligation to inform the bidder, to:
(a) Amend the scope and value of contract to the bidder.
(b) Reject any or all the applications without assigning any reason. Any effort on the part of the bidder or his agent to exercise influence or to pressurize the University would result in rejection of his bid. Canvassing to any kind is prohibited.

SECTION-4
CONDITIONS OF CONTRACT (CC)

4.1 Definitions, Interpretations and Abbreviations: Terms and expressions not herein defined shall have the meanings assigned to them in the Indian Contracts Act, 1872 (as amended)/the Indian Sale of Goods Act, 1930 (as amended)/the General Clauses Act, 1897 (as amended)/GFR-2017/ guidelines by Finance Deptt. Govt. of NCT of Delhi as the case may be. University/IGDTUW means Indira Gandhi Delhi technical University for Women , Kashmere Gate Delhi-. Supplier/contractor means successful tenderer as mentioned in notification of award.

4.2 Definition of Contract & other terms: (a) "Contract" means the invitation to tender, instructions to tenderers, tender, acceptance of tender, particulars & the conditions specified in the acceptance of tender. No variation in the terms of a "concluded contract" can be made without the free consent of the parties. (b) "Acceptance of Tender" means the letter of notification of award by purchaser communicating to the contractor the acceptance of his tender.

4.3 Authority: Registrar & Competent Authority is referred to those of IGDTUW. The Purchaser, Indenter, Consignee, End user, Inspection authority & Paying authority shall be the respective Officers / Committees duly authorized by the Competent Authority of IGDTUW.

4.4 Performance Security (in Indian Rupees only): The successful bidder have to submit a Performance Security Deposit @ 10% of the quoted value (validity: warranty period + two months) in the form of Bank Guarantee /FDR drawn in favour of "Registrar, IGDTUW" Delhi within 15(Fifteen) days of the communication accepting the bid. EMD of successful bidder shall be refunded after submission Performance Security Deposit. The Performance Security Deposit shall be refunded without interest after completion of the guarantee period +two months.

4.5 Price bearing elements

4.5.1 Scope of supply of goods/work/service: The goods/work / service along with quantity to be supplied by the contractor under this contract shall conform to the technical specifications and quality control parameters mentioned in Section–5 "Schedule of Requirement & specification" of this tender document.

4.5.2 The quoted rates shall be in Indian Rupees only on the basis of free delivery at stores of IGDTUW, Kashmere Gate, Delhi, which are inclusive of appropriate packing, marking, forwarding, transit insurance, transportation, loading, unloading, installation & commissioning charges, training, after sale service, Repair/ replacement of defective parts during warranty period etc. amount of any local taxes / VAT/GST etc. should be indicated separately in the tender. All applicable Govt. deductions like ESI, TDS etc. shall be applied at prevailing rates, if applied.

4.5.3 Imported goods: If the goods are to be imported, the contractor will import the same by paying all incidental charges & duties (customs duty etc.) and supply the goods to the indenter. However, applicable local taxes will be paid by the indenter, if quoted.

4.5.4 Firm Prices: Prices quoted by the contractor shall remain firm and fixed during the currency of the contract.

4.5.5 Fall Clause: If at any time during the execution of the contract, the price of the ordered goods/Work/service, are reduced, in respect of supplies to any Govt. organization (including the purchaser of any department of the Govt. of N.C.T. of Delhi) at a price lower than the price quoted under this contract, the contractor shall immediately inform and forthwith pass such reduction to the purchaser. The price of such item, payable under this tender for the goods/Work/service supplied after the date of coming into force of such reduction, shall stand correspondingly reduced.

4.5.6 Tolerance clause: Competent Authority of IGDTUW reserves the right to increase or decrease the items / procurement / quantity within plus/minus 15% of tendered items without any change in terms & conditions & quoted price at any time before conclusion of contract without assigning any reason.

4.5.7 Other factors like term of & period of delivery, warranty / guarantee clause & free incidental services etc. that also have bearing on prices are prescribed in the following clauses.

4.6 Delivery of goods /work/service

4.6.1 Terms of delivery: The quoted rates shall be in Indian Rupees only on the basis of free delivery at sites of IGDTUW, Kashmere Gate, Delhi-06.

4.6.2 Advance Sample: The contractor shall initially deliver a sample item if possible and feasible and get it approved by IGDTUW preferably within **30 days** from the date of issue of supply order/work order /award of contract before delivering the balance lot.

4.6.3 Delivery, period & schedules: The delivery of complete goods/work/service in all respects as per order/contract should be made to the concerned store of this University on basis of free delivery at site within **45 days** from the date of issue of supply order/work order /award of contract whichever is the earliest. The contractor shall not arrange part-shipments and trans-shipments without permission of IGDTUW. The Insurance cover including insuring the goods against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery/commissioning shall be obtained by the contractor in his own name and not in the name of the Consignee. The Consignee will as soon as possible but not later than 30 days from the date of arrival of goods at destination notify the contractor of any loss or damage to the goods that may have occurred during transit. The date of delivery of goods/work/service stipulated in the order/contract shall be deemed to be the essence of the contract and delivery must be completed before the date of delivery as specified in the supply order/ work order/award of contract.

4.6.4 Actual date of delivery: The date of satisfactory completion of work duly accompanied by certified good receipt note & certificate of completion will only be considered as the actual date of supply/date of delivery of goods/work/service. Part supplies except the samples are not acceptable. The delivery will not be deemed to be completed until and unless goods/work/service are inspected & accepted by the Consignee /end user /Inspecting Authority of IGDTUW with Product information brochure and or Users/operating manual (two copies) supplied with goods/work/service, wherever applicable.

The Competent Authority, IGDTUW reserves the right to reject supplied goods/work/service which do not conform to the tendered specification or received after date of delivery to safeguard Government interests and in the interest of University.

4.7 Assignment / Sub-contracts: The contractor shall not assign either in part or whole its contractual duties/responsibilities and obligations to perform the contract to any third person and in all cases, the responsibility of fulfilling the contractual obligations will remain with the contractor only.

4.8 Incidental services: The supplier will provide required jigs & tools, operation manuals, installation, Commissioning, training & after sales service & Warranty/guarantee etc.

4.9 Warranty/guarantee: The contractor shall certify that the goods/ work /service supplied to the Purchaser under this Contract are of best quality and workmanship and new in all respects and are strictly in accordance with the specifications and particulars mentioned under Section–5 "Schedule of Requirement & specification ". Comprehensive Warranty/guarantee is for two **(2) years from the date of successful commissioning and training of the complete work & shall cover each and every part of the item including consumables, parts having limited life and non-consumable parts etc. The** University is not liable to pay any charges on any account during the warranty period. The contractor shall pay to the Purchaser such compensations that may arise by reasons of the warranty therein contained but not attended by the contractor.

4.9.1 The maximum response time for maintenance complaint during warranty period (i.e. time required for bidder's maintenance engineer to report at the installation after a request call/e-mail or letter is written) shall not exceed 01 day.

4.9.2 The period for correction of defects in warranty period is 03 days.

4.9.3 In case an item is not usable beyond the stipulated maximum downtime the contractor will be required to arrange for an immediate replacement.

4.9.4. In case the rectification of defects is not carried out within 03 days and replacement of defective items are not provided, a penalty of sum equivalent to 5% per week of the delivered price of that defective item(s) shall be levied. This penalty is applicable up to a maximum of 4 weeks (maximum 20%). Subsequently, the rectification shall be carried out by the University at the risk and cost of the contractor. The cost of repairs along with the penalty of 100% shall be recovered from the payment with held with University and the balance amount if any, will be paid to the contractor after completion of warranty obligations.

4.10 Payment terms: 100% Payment shall be made after receipt of complete goods/work/service, subject to due inspection, installation, successful commissioning and training and take over by the consignee/end user. The contractor has the entire responsibility of collecting/receiving satisfactory completion report from the end user and submitting it along with bills in triplicate at the paying authority. The payments shall be made in the currency authorized in the contract. No advance payment shall be made.

4.11 Amendment / modification of contract: If necessary, the purchaser may notify the contractor regarding modification / amendment of terms & conditions of the contract, by a written order not amounting to either increase or decrease in the accepted prices.

4.12 Default/Delay/penalties

4.12.1 Default after opening of tenders: EMD of tenderer will be forfeited in case the tenderer withdraws/ modifies / alters / amends its tender or impairs or derogates

from the tender in any respect after the due date of tender & within the period of validity of tenders.

4.12.2 Default after notification of award of contract: EMD of successful tenderer will be forfeited in case (i) The successful tenderer does not furnish Performance security within prescribed time as per tender terms & notification of award of contract **or** (ii) the successful tenderer responds to the notification of award without performance security but with a fresh condition/terms other than the ones in the tender/negotiated as per rule before such notification **or** (iii) Submission of misleading / contradictory / false statement or information and fabricated / invalid documents is detected after notification of award of contract/order.
(In case of registered contractor with NSIC having exemption from EMD, the Institute may impose a penalty including cancellation of registration and/or blacklisting the contractor as per rule, depending upon urgency of requirement as per final decision by the Competent Authority, IGDTUW)

4.12.3 Default after furnishing of Performance security: In the event of any loss to the purchaser, due to contractor's failure to fulfil the contractual obligations etc., the performance security will compensate the loss i.e. the Competent Authority; IGDTUW will deduct the amount from performance security and release the balance amount as stipulated.

Submission of misleading/false document: The Performance Security of the contractor will be forfeited with termination of contract if submission of misleading / contradictory / false statement or information and fabricated / invalid documents is detected after award of contract/order.

For Non-supply of goods/work/service: The Performance Security of the contractor will be forfeited with termination of contract If neither supply has been made nor prior extension of date for supply has been obtained. The University may procure the goods/work/service on risk purchase basis at the cost of contractor. The Institute may also impose a penalty and/or blacklist the Contractor, depending upon urgency of requirement as well as the loss of revenue due to non-availability of such store. The time period for making risk purchase shall be 3 months.

For delayed supply of goods/work/service: The delayed supply of goods/work/ service, for which prior approval for extension of date for supply has not been obtained, will be accepted only with penalty. The Competent Authority reserves the right to levy liquidated damages equivalent to 0.5 % of the price of the delayed goods/work/service per week which will be charged / deducted according to the delay in supply of the goods/work/service beyond expiry of the supply period subject to a maximum of 10% of the total value of the order.

Due date extension request: In case, the supply of goods/work/service cannot be delivered within the due date of delivery, the contractor shall have to obtain a prior permission for extension from the Competent Authority , IGDTUW. However, the extension of date of delivery is admissible only with penalty as per rule. In special circumstances, extension may be granted by the Competent Authority , IGDTUW without penalty.

4.12.4 Termination for Insolvency: If the contractor becomes bankrupt or otherwise insolvent, the Institute, reserves the right to terminate the contract at any time, by serving written notice to the contractor without any compensation, whatsoever, to the contractor, subject to further condition that such termination will not prejudice or

affect the rights and remedies which have been accrued and / or will accrue thereafter to the University.

4.12.5 Force Majeure: In the event of any unforeseen circumstances directly interfering with the supply of goods/work/service arising during the currency of the contract, such as war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, or acts of God, the Contractor shall, within a week from the commencement thereof, notify the same in writing to the Purchaser with reasonable evidence thereof. Either party shall have the option to terminate the contract on expiry of 90 days of commencement of such force majeure by giving 14 days' notice to the other party in writing. In case of such termination, no damages shall be claimed by either party against the other, except those which had occurred under any other clause of this contract prior to such termination.

4.13 Code of ethics: The Institute, as well as the Bidder / Contractors / Manufacturers / Authorised Supplier under the contract shall observe the highest standard of ethics including laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988", during the procurement or execution of such contracts. If the tenderers /contractors are found in Bid pooling or against law against fraud and corruption then their firms may be black listed.

4.14 Resolution of disputes/arbitration/jurisdiction: In case of any difference/dispute between the University and the contractor arising relating to the contract, the parties shall make every effort to resolve the same amicably by mutual consultations. If the Parties fail to resolve within 21 days of its occurrence, then either party may seek to refer the dispute for sole arbitration by any person to be nominated by the Competent Authority, Indira Gandhi Delhi Technical University , Kashmere Gate , Delhi. The award of the arbitrator so appointed shall be final and binding on both the parties. However during the arbitration proceedings the parties shall not delay or postpone the performance of their respective obligations pursuant to the contract. The courts of place from where the notification of award is issued shall alone have the jurisdiction to decide any dispute, court jurisdiction shall be Delhi.

SECTION-5
SCHEDULE OF REQUIREMENT & SPECIFICATION
LIST OF REQUIREMENTS:

5.1 Scope of supply of goods/work/service: The list of Requirement along with technical Specification of the goods/work/service is given in the annexure 6.

5.2 Technical compliance: The tenderer should submit a technical compliance statement in the prescribed format given under Annexure-4. No deviations will be considered.

5.3 Quality parameters: With reference to the specifications as per Annexure-6, the Quality, dimensions, adequate fittings, fasteners, weather proofing, edge blunting, aesthetic look, surface finish, injury proof, surface treatment including painting, appropriate packing, proper identification marking of goods including samples are the broad parameters of quality to manufacture, check, test & comply with in line with national/international standards. The Inspection authority/Technical committee of the University shall be the final authority to issue the certificate of compliance of the technical requirement.

Annexure-1
Undertaking (Commercial capability)
(To be submitted in Technical bid)

Tender ID..... Due date

Sir,

I/we undertake, certify & declare the following-

1. We have carefully read and understood all terms and conditions/instructions elaborated in all the sections including IT, CC & annexure of this Tender document and we shall abide by them. Also our organization is not blacklisted by any Govt. Department/ Autonomous body/PSU etc.

2. We are the .....(manufacturers / authorized suppliers) (tick appropriate option) of the goods/work/service required as per this tender document & our annual average financial turnover during the last three financial years (2015-16, 2016-17, 2017-18) in the books of accounts is Rs.....

3. As per clause-2.2.3 following are the details of are required: (A) three similar natures of works per year with cost not less than the amount equal to 30% of the estimated cost of this tender items, which we have executed successfully.

Or

(B) Two similar natures of works per year each costing not less than the amount equal to 50% of the estimated cost of the tender value.

Or

(C) One similar nature of works per year each costing not less than the amount equal to 80% of the estimated cost of the tender value.

S. No.	Name of Customer/ Address/ phone	Cost (in Rs.)	Brief description of work done
1			
2			

4. Our valid

i) TIN No. is.....valid upto.....

ii) PAN No. is.....valid upto.....

iii) Service Tax No. is.....valid upto.....

iv) GST No. .....

Latest ITR return is filed in the name of.....

5. Latest GST/VAT/Sales tax return/Service tax return is filed in the name of.....

6. The name of Proprietor / Authorized signatory is Mr./Ms.....

7. We authorize Mr./Ms.....having designation of .....to sign this offer/tender.

Note: As per CVC guidelines: In a tender either the Indian agent on behalf of the principal /OEM itself can bid, but both cannot bid simultaneously for the same item/ product in the same tender.

(Signature with date, name and designation)
For and on behalf of M/s.....
(Name, Address & Telephone No & seal of the Tenderer

Annexure-2

Undertaking (Technical capability)

(To Be Submitted in Technical Bid)

Tender ID: **Due date** **upto 2:00 PM**

Sir,

I/we undertake, certify & declare the following-

1. If our tender is accepted, we undertake to supply the goods/work/service with required specification and perform the services in accordance to the terms & conditions in this tender document including the delivery schedule.

2. Our company/product has.....Certification. (BIS/ISO/ other- specify:.....)

(Tick the appropriate option).

3. The details of our local service facility nearest to Delhi/New Delhi/NCR is

.....
.....
.....

(Responsible person, Name, Complete address, telephone no's, e-mail I.D. etc.)

4. The tentative schedule of training (if any) is.....

5. The details of Mode of dispatch are.....

6. The details of instructions for special preparation for installation (if any) are.....

7. Our details of Infrastructures are as follows-

S.No.	Parameter	**For "Manufacturer"**	**For "Non-Manufacturers"**
1	No. of personnel employed		
2	Manufacturing facilities		
3	Quality control systems		
4	After-sales-service facilities		
5	Any other information		

.....
.....

(Signature with date, name and designation)

For and on behalf of M/s.....

(Name, Address & Telephone No & seal of the Tenderer)

Annexure-3

Manufacturer's Authorization Letter

(To Be Submitted in Technical Bid on the Manufacturer's Letter Head)

Tender ID: **Due date** **upto 2:00 PM**

Yours faithfully

……

……

(Signature with date, name and designation)

For and on behalf of M/s……

(Name, Address & Telephone No & seal of the Tenderer)

Annexure-4
Technical Compliance Statement
(To Be Submitted in Technical Bid on Letter Head)
Tender ID: **Due date**

Note:
Tenderer should indicate "Yes, meets" OR "No, doesn't meet" under appropriate columns in the Technical Compliance Statement.

S.No.	Tender Technical Specifications	Specifications of the Work Item offered by the Tenderer	Whether the Offered Work item meets Tender Specifications or not	Deviation(s) from Tender Specifications, if any (in unambiguous Terms)
1				
2				

Yours faithfully
……
……
(Signature with date, name and designation)
For and on behalf of M/s……
(Name, Address & Telephone No & seal of the Tenderer)

Annexure-5

Checklist for Technical Bid Evaluation

(To Be Submitted in Technical Bid)

Tender ID: **Due date**

(Note: Please ensure that the following requirements are complied with)

S.No.	Information to be provided	To be filled by the Bidder		For office use
		Fill particulars	Reason for not filling	
1	Original instrument of EMD No. ..... Dated. .....of Amount Rs ..... is submitted in **physical form.**	Yes/NO		
2	Leaflets/Catalogues/literature/photographs /Drawings/Sketches for products as per clause-2.3.5 in **physical form** are submitted.			
3	Scanned copy of EMD/exemption certificate is submitted.			
4	**Scanned copy of BIS/ISO/ any other (specify.....) certification is submitted.**			
5	Scanned copy of latest Income Tax Return (ITR) is submitted.			
6	Scanned copy of latest GST is submitted.			
7	Scanned copies of audited accounts showing Annual financial turnover for the last three years (FY 2015-16, 2016-17 & 2017-18) is submitted.			
8	Scanned copies of 'Work Orders with work completion certificates' as per clause-2.2.3 are submitted.			
9	Scanned copies of annexure 1,2, 3, 4, 5 & 6 duly filled and signed are submitted.			
10	Average annual turnover for last 3 financial years ending March 2018 is Rs.----------& submitted.			
11	Minimum Work experience criteria as per clause- 2.2.3 is met.			
12.	Scanned copy of proof for authorized service centre in Delhi /NCR			

Note: Original copies of all requisite documents must be produced for verification of the information provided whenever called for.

Yours faithfully

.....

.....

(Signature with date, name and designation)

For and on behalf of M/s.....

(Name, Address & Telephone No & seal of the Tenderer)

Annexure-6

Schedule of requirement and **specification**

Note:- This annexure need to be submitted (only for reference)

	EMD Amount: (Rs.) 92,500.00 EMD should be submitted and uploaded accordingly	**Unit price in figure (inclusive of all taxes: (Rs.)**	**Unit price in words (inclusive of all taxes): Rupees**
Item Number			
1.	**Pin-on-disc Tribo Tester (Qty:01)** Approx cost : 18.50 Lakh 1) Variable Disk size (diameter x thickness) : up to (165 mm x 8mm) (05 nos each) 2) Pin diameter : 3, 6, 8, 10, 12 mm (10 nos each) 3) Ball diameter : 6, 8, 10, 12 mm (10 nos each) 4) Wear track diameter : up to 140 mm (Variable) 5) Disk rotation speed : 200-3000 rpm with least count of 1 rpm 6) Load : 1-250 N (Automated loading) 7) Frictional force : 0-250 N with least count of 1 N 8) Wear measurement range : 0 to 2000 μm 9) Lubrication module (Re-circulating type) 10) Environment chamber (Testing under effect of gaseous environment) 11) Latest Desktop computer system with original window compatible to acquire software 12) Angular Oscillation Module (Disk Oscillation 2 degree to 90 degree) 13) Chamber Heating up to 600 Degree C or higher 14) Latest defined algorithm signal processing technology to evaluate true wear properties. 15) Instrument strictly designed as per ASTM G-99. Separate ASTM disk needs to be provided. 16) Universal disc holder offered limit up to 500 degree C 17) Independent pin heating with thermocouple sensor and integrator 18) Scratch indenter holder 19) Safety Interlocks to ensure safe operations at all time within manufacturer permissible maximum limit shall be provided 20) Shall record and display: load, friction force, compound wear and rotational speed 21) Warranty: 2 years 22) Installation, commissioning and training in IGDTUW Training (03 days)		
	EMD Amount: (Rs.) 65,000.00 EMD should be submitted and uploaded accordingly	**Unit price in figure (inclusive of all taxes: (Rs.)**	**Unit price in words (inclusive of all taxes): Rupees**

2.1

Pneumatic Training Kit
(Qty:01)

Approx cost : 5.50 Lakh

The system to be a fully modular and flexible one designed for the development of professional skills related to pneumatics. A roll-able table having anodized extruded aluminium structure to be provided to include a panel which enables users to work on both sides at the same time. It should also include a support shelf for component drawers. All the components used should be of industrial grade which have been developed and manufactured by the supplier. These components should be mounted on a base plate and should be identified correctly by a label with a corresponding reference as well as standardized symbols.

Manuals to be provided in both hard copy (2 sets) and soft copy clearly explaining the circuits to be developed, with connections and basic theory involved

The pneumatic components to include fittings (push pull type) for quick connection for 4 mm OD PU / any other, tube used in Pneumatic system.

Each kit to consist of the following :

S No	**Description**	**Qty**
1	Rolling table with twin post panel of minimum dimensions 1150x750x25mm and minimum 2 no. drawer blocks with slide guides to house the components. External minimum dimension of the working panel to be 1200x800x1700mm with post-formed top for horizontal work, minimum1200x800mm.	01
2	3/2 way profile panel mounted valve with push button, normally closed (for pneumatic with spring return)	4
3	3/2 way profile panel mounted limit switch module, normally closed (pneumatic actuated roller lever spring return direction control valve)	10
4	Pneumatic direction control valve, 5/2 way valve pneumatically actuated spring return single pilot. Operating pressure: 0.15 MPa to 0.7 MPa manual override should be non locking push type.	2
5	Pneumatic valve, 5/2 way valve double pilot operated valve module profile panel mounted. Operating pressure: 0.1 MPa to 0.7 MPa	4
6	Shuttle valve (OR logic function valve).profile panel mounted. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.05 MPa Flow rate: minimum 210 L/min or better	2
7	AND logic function valve module, profile panel mounted. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.05 MPa. Flow rate: minimum 210 L/min or better	2
8	Pneumatic direction control Valve, pilot operated spring return, profile panel mounted, 3/2 way NO (air -remove) valve module. Operating pressure: 0.15 MPa to 0.7 MPa	2
9	Quick exhaust valve module profile panel mounted with built in silencer Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. MPa	4
10	One way speed controller valve inline type profile panel mounted for regulating cylinder piston speed. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.1 MPa Flow rate: minimum 210 L/min or better	4
11	Pneumatic time delay valve (range: 0.5-60 seconds), convertible from normally closed to normally open.	2
12	Pneumatic indicator module to indicate the presence of pneumatic	2

		pressure	
	13	Single acting cylinder module suitable for profile panel mounting, cylinder rod and barrel of stainless steel. Along with durable Rubber/Nylon attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Minimum stroke length 50 mm. Operating pressure max 1.0 MPa and minimum operating pressure for spring return at 0.18 MPa and proof pressure : 1.5 MPa or better	2
	14	Filter regulator module with 5 micron filtering with 3/2 discharge valve for connection and disconnection of the rest of the circuit. Possibility of vertical and horizontal positioning.	2
	15	Manifold block profile panel mounted with 8 outlet distribution with one touch fittings and non return valve.	2
	16	Set of 4mm OD PU tubes in black, blue red and green color. Min bending radius 10 mm or better	20 m
	17	Set of tee fittings for connection of circuit. Operating pressure: -100 KPa to 1.0 MPa. Proof pressure 3.0 MPa or better	2
	18	Set of plugs 4mm for plugging the connections	2
	19	Pneumatic valve profile panel mounted, 3/2 way normally closed with selector switch Operating Pressure: -100 KPa to 1.0 MPa	2
	20	Pneumatic valve profile panel mounted, 5/3 hand lever direction control valve Operating pressure: 0.15 MPa to 1.0 MPa	2
	21	Double acting cylinder module, profile panel mounted cylinder rod and barrel of stainless steel. Along with durable Rubber /Nylon attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Stroke length 100 mm max with rubber / air cushion. Operating pressure max: 1.0 MPa. Proof pressure: 1.5 MPa	4
	22	Screw compressor - 3 hp, minimum 8 cfm, with noise level 62 db or less with built in 200 litre (minimum) receiver, which can also be used for Electro-Pneumatic Kit along with all fittings for installation & commissioning.	1
	23	Compact rotary actuator, profile panel mounted, and double acting - vane type for 360 degrees rotation, with fitting suitable for 4 mm OD tubing.	1

23) Warranty: 2 years
24) Installation, commissioning and training in IGDTUW
Training (05+ days)

2.2.

Electro Pneumatic Training Kit
(Qty:1)
Approx cost : 7.5 Lakh

The system to be a fully modular and flexible one designed for the development of professional skills related to pneumatics. A roll-able table having anodized extruded aluminium structure to be provided to include a panel which enables users to work on both sides at the same time. It should also include a support shelf for component drawers. All the components used should be of industrial grade which have been developed and manufactured by the supplier. These components should be mounted on a base plate and should be identified correctly by a label with a corresponding reference as well as

standardized symbols.

Manuals to be provided in both hard copy (2 sets) and soft copy clearly explaining the circuits to be developed, with connections and basic theory involved.

The electro-pneumatic components to include push pull type fittings for quick connection for 4 mm OD PU tube used in Pneumatic system and have 2 mm test lead connections.

Each Kit to consist of the following:

S No	Description	Qty
1	Rolling table with twin post panel of minimum dimensions 1150x750x25mm and minimum 2 no. drawer blocks with slide guides to house the components. External minimum dimension of the working panel to be 1200x800x1700mm with post-formed top for horizontal work, minimum1200x800mm.	1
2	Quick exhaust valve module profile panel mounted with built in silencer Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. Operating pressure of 0.1 MPa or better	2
3	Speed controller valve inline type profile panel mounted for regulating cylinder piston speed. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.1 MPa. Flow Rate: minimum 100 L/min or better	2
4	Single acting cylinder module, cylinder rod and barrel of stainless steel. Along with durable Rubber attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Stroke length 50mm max. with magnet Operating pressure max 1.0 MPa and minimum operating pressure for spring return at 0.18 MPa Single acting cylinder module, cylinder rod and barrel of stainless steel. Along with durable Rubber attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Stroke length 50mm max. with magnet	2
5	Filter regulator module with 5 micron filtering with 3/2 discharge valve for connection and disconnection of the rest of the circuit. Possibility of vertical and horizontal positioning.	1
6	Manifold block profile panel mounted with minimum 8 nos. outlet distribution with one touch fittings and non return valve.	2
7	Set of 4 mm OD tubes in Black, blue red and Green colour. Min bending radius 10 mm.	20 m
8	Set of tee fittings for connection of circuit. Operating pressure: -100 KPa to 1.0 MPa Proof pressure 3.0 MPa or better	2
9	Set of plugs 4 mm for plugging the connections	2
10	Indicator module with minimum 8 pilot lights and a buzzer. Supplementary nuts for power distribution Minimum 2 mm nuts for snap connection cables.	1
11	Input electrical module(button pad with 3 push buttons) 2 mm terminals for use with snap connectors. Two push buttons and a locking push button with independent light indicators. Two push buttons switch contacts.	2
12	Electrical limit switch module, actuation via trip cams, consisting of a mechanically actuated micro switch actuated by a roller lever.	2

	13	5/2 way single solenoid valve module, profile panel mounted. Low power consumption : < 2W. LED display and surge absorber. Spring and air reset. Power assisted system.	2
	14	5/2 way double solenoid valve module, profile panel mounted Low power consumption: < 2W. LED display and surge absorber Spring and air reset. Power assisted system	2
	15	Set of 3 relay module with 24 V coil and 4 switchable contacts. Relay active LEDs.2 mm terminals for use with snap connection cables.	2
	16	Set of 2 timer modules with two timer relays, one for connection and other for disconnection. 24 V coil with switch contact. LED display of timer status. Time programmable between 01 sec and 1 hour.	1
	17	Optical sensor module, profile panel mounted. Detection distance; 100mm. Status display LED. Operating voltage 24V.	1
	18	Electric counter module with inputs for counting and is counting. Power supply: 24V. Electromechanical pre-selection with manual or electrical reset. Switch contact. 2 mm nuts for snap connection cables.	1
	19	Double acting cylinder module, profile panel mounted cylinder rod and barrel of stainless steel with magnet. Along with durable Rubber/Nylon attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Operating pressure max: 1.0 MPa or better Proof pressure: 1.5 MPa or better Minimum stroke length 100 mm max with rubber / air cushion.	2
	20	Connecting cable set of 50 number of 2 mm diameter one touch connection cables (with facility to connect one cable to another) with different colors and lengths (minimum 5 lengths to be of one metre, 10 lengths of 0.5 meter, and rest to be enough to make different circuits on the panel)	1 Set
	21	Digital pressure switch module profile panel mounted. Pressure range: -0.1 to 1.0 MPa. Min regulating unit: 0.001 MPa Current consumption: 45 mA. Three numerical digit display.NPN output. Safety Enclosures. Response time 2.5 msec or less	1
	22	Power Supply: 24 V DC	2
	23) Warranty: 2 years 24) Installation, commissioning and training in IGDTUW Training (3 days)		

	EMD Amount: (Rs.) **57,500.00** **EMD should be submitted and uploaded accordingly**	**Unit price in figure (inclusive of all taxes: (Rs.)**	**Unit price in words (inclusive of all taxes): Rupees**

3.	**Single Cylinder Four Stroke VCR Engine with open ECU** **(Qty:1)** Approx cost : 11.50 Lakh The setup should consist of single cylinder, four stroke, VCR (Variable Compression Ratio) engine connected to eddy current dynamometer. It should be provided with necessary instruments for combustion pressure, crank-angle, airflow, fuel flow, temperatures and load measurements. These signals should interface to computer through high speed data acquisition device. The set up shall have a stand-alone panel box consisting of air box, twin fuel tank, manometer, fuel measuring unit, transmitters for air and fuel flow measurements, process indicator and piezo powering unit. Rota meter should be provided for engine cooling water flow measurement. It should be possible to change the compression ratio without stopping the engine and without changing the compression chamber geometry by specially designed tilting cylinder block arrangement. In petrol mode engine shall work with programmable Open ECU, Throttle position sensor (TPS), fuel pump, ignition coil, fuel spray nozzle, trigger sensor etc. **The exhault has to go outside room to the roof / wall through a properly insulated metallic pipe system (nearly 20 metres long) from the engine and silencer fitted outside on the exhaust so that noise is reduced to acceptable limit of 75 dB.** The setup shall enable study of VCR engine performance for both Diesel and Petrol mode. Engine performance study should include brake power, indicated power, frictional power, BMEP, IMEP, brake thermal efficiency, indicated thermal efficiency, Mechanical efficiency, volumetric efficiency, specific fuel consumption, Air fuel ratio, heat balance and combustion analysis. **The set up should have the following features** 1. Changing of CR without stopping the engine 2. Study of open ECU and Performance optimization with Open ECU 3. Diesel and Petrol operation 4. Diesel injection point advancement 5. Combustion analysis, P Θ and PV Diagram, IP, IMEP, FP indication 6. Electric start **Open ECU in Petrol mode features** 1. Fuel control with fuel table 2. Barometric Pressure, Acceleration, Deceleration, Battery, Air Temp, Coolant Temp and Starting compensations 3. Adjustable injection timing control 4. Adjustable ignition control 5. Built in ignites 6. Advanced diagnostic features 7. Advanced turning software 8. Ethernet connection **Instrumentation:** The components like Open ECU, Combustion pressure sensor, Crank angle sensor, fuel flow transmitter, Pressure transmitter, high speed data acquisition device etc. should be supplied with best quality instruments. **Software** The software should be Lab view based package developed for engine performance monitoring. It should serve most of the engine testing application needs including monitoring, reporting, data entry, data logging. The software should evaluate power, efficiencies, fuel consumption and heat release. Various graphs should be obtained at different operating condition. While on line testing of the engine in RUN mode necessary signals should be scanned, stored and presented in graph. Stored data file should be accessed to view the data graphical and tabular formats. The data in excel format should be used for further analysis **System Component Details**

Engine	Single cylinder, 4 stroke, water cooled, stroke 110 mm, bore 87.5 mm, 661 cc., Diesel Mode: Power 3.5 KW, 1500 rpm, CR range 12-18 injection variation 0-25 deg BTDC, Petrol Mode: Power 4.5 KW, speed range 1200-1800 rpm, CR range 6-10
Dynamometer	Eddy current, water cooled with loading unit
Propeller shaft	With standard universal joints
Open ECU	Programmable ECU With solenoid injector driver, Calibration cable and versatile software or equivalent in petrol mode.
Common rail	With pressure sensor and pressure regulating valve
EGR	SS, Water cooled
Injector	Solenoid driven
Piezo sensor	Combustion Range 350bar with low noise cable
Crank angle sensor	Resolution 1 Deg, Speed 5500 RPM with TDC pulse with calibration certificate.
Data acquisition device	16-bit, 250kS/s or better
Temperature sensor	Type RTD, PT100 and Thermocouple, Type K with calibration certificate.
Temperature Transmitter	Type two wire, Input RTD PT100, Range 0–100 Deg C, Output 4–20 mA and Type two wire, Input Thermocouple C
Load sensor	Load cell, type strain gauge, range 0-50 Kg
Fuel flow transmitter	DP transmitter, Range 0-500 mm WC
Fuel tank	Capacity 15 litre, Type: Duel compartment, with fuel metering pipe of glass
Air flow transmitter	Pressure transmitter, Range (-) 250 mm WC or better
Air box	M S fabricated with orifice meter and manometer
Software	Reputed software for engine analysis (original version in CD)
Rotameter	Engine cooling 40-400 LPH with calibration certificate
Pump	Type Monoblock
Petrol and Diesel Sample testing	50 litre each
Warranty	2 years
Installation, commissioning and training	at IGDTUW Training (at least 03 days)

EMD Amount: (Rs.) 25,000.00 **EMD should be submitted and uploaded accordingly**	**Unit price in figure (inclusive of all taxes: (Rs.)**	**Unit price in words (inclusive of all taxes): Rupees**

4.	**Exhaust Gas Analyzers** **(Qty:1)** Approx cost : 5.00 Lakh

Measured quality:	**Measuring range:**	**Resolution:**	**Accuracy:**
CO:	0... 10 % vol	up to 0.01 % vol	< 0.6 % vol: ± 0.03 % vol ≥ 0.6 % vol: ± 5 % of ind. val.
CO_2:	0... 20 % vol	up to 0.1 % vol	< 10 % vol: ± 0.5 % vol ≥ 10 % vol: ± 5 % v. M.
HC:	0... 20000 ppm vol	≤ 2000: 1 ppm vol, > 2000: 10 ppm vol	< 200 ppm vol: ± 10 ppm vol ≥ 200 ppm vol: ± 5 % of ind. val.
O_2:	0... 22 % vol	up to 0.01 % vol	< 2 % vol: ± 0.1 % vol ≥ 2 % vol: ± 5 % v. M.
NO:	0... 5000 ppm vol	up to 1 ppm vol	< 500 ppm vol: ± 50 ppm vol ≥ 500 ppm vol: ± 10 % of ind. val.

Power Supply:	
Power consumption:	≈ 25 W

Miscellaneous	
Warm up time	≈ 7 min
Connector	60... 140 l/h, max. overpressure 450 hPa!
Connector Gas	≈ 180 l/h, max. overpressure 450 hPa!
Response time	$t_{95} \leq 15$ s
Operating temperature	5... 45 °C
Storage temperature	0... 50 °C
Relative humidity	≤ 95 %, non-condensing
Inclination	0... 90°∠
Warranty	2 years
Installation, commissioning and training	at IGDTUW Training (at least 02 days)

Annexure-6

Schedule of requirement and **specification**

PRICE BID

Item Number	Particulars	EMD Amount: (Rs.) 92,500.00 EMD should be submitted and uploaded accordingly	Unit price in figure (inclusive of all taxes: (Rs.)	Unit price in words (inclusive of all taxes): Rupees
1.	**Pin-on-disc Tribo Tester** **(Qty:01)** Approx cost : 18.50 Lakh 1) Variable Disk size (diameter x thickness) : up to (165 mm x 8mm) (05 nos each) 2) Pin diameter : 3, 6, 8, 10, 12 mm (10 nos each) 3) Ball diameter : 6, 8, 10, 12 mm (10 nos each) 4) Wear track diameter : up to 140 mm (Variable) 5) Disk rotation speed : 200-3000 rpm with least count of 1 rpm 6) Load : 1-250 N (Automated loading) 7) Frictional force : 0-250 N with least count of 1 N 8) Wear measurement range : 0 to 2000 μm 9) Lubrication module (Re-circulating type) 10) Environment chamber (Testing under effect of gaseous environment) 11) Latest Desktop computer system with original window compatible to acquire software 12) Angular Oscillation Module (Disk Oscillation 2 degree to 90 degree) 13) Chamber Heating up to 600 Degree C or higher 14) Latest defined algorithm signal processing technology to evaluate true wear properties. 15) Instrument strictly designed as per ASTM G-99. Separate ASTM disk needs to be provided. 16) Universal disc holder offered limit up to 500 degree C 17) Independent pin heating with thermocouple sensor and integrator 18) Scratch indenter holder 19) Safety Interlocks to ensure safe operations at all time within manufacturer permissible maximum limit shall be provided 20) Shall record and display: load, friction force, compound wear and rotational speed 21) Warranty: 2 years 22) Installation, commissioning and training in IGDTUW Training (03 days)			
2. 2.1	**Pneumatic Training Kit** **(Qty:01)** Approx cost : 5.50 Lakh The system to be a fully modular and flexible one designed for the development of professional skills related to pneumatics. A roll-able table having anodized extruded aluminium structure to be provided to include a panel which enables users to work on both sides at the same time. It should also include a support shelf for component drawers. All the components used should be of industrial grade which have been developed and manufactured by the supplier. These components should be mounted on a base plate and should be identified correctly by a label with a corresponding reference as well as standardized symbols. Manuals to be provided in both hard copy (2 sets) and soft copy clearly explaining the circuits to be developed, with connections and basic theory involved The pneumatic components to include fittings (push pull type) for quick connection for 4 mm OD PU / any other, tube used in Pneumatic system. **Each kit to consist of the following :**	65,000.00		

S No	Description	Qty
1	Rolling table with twin post panel of minimum dimensions 1150x750x25mm and minimum 2 no. drawer blocks with slide guides to house the components. External minimum dimension of the working panel to be 1200x800x1700mm with post-	01

			formed top for horizontal work, minimum1200x800mm.				
		2	3/2 way profile panel mounted valve with push button, normally closed (for pneumatic with spring return)	4			
		3	3/2 way profile panel mounted limit switch module, normally closed (pneumatic actuated roller lever spring return direction control valve)	10			
		4	Pneumatic direction control valve, 5/2 way valve pneumatically actuated spring return single pilot. Operating pressure: 0.15 MPa to 0.7 MPa manual override should be non locking push type	2			
		5	Pneumatic valve, 5/2 way valve double pilot operated valve module profile panel mounted. Operating pressure: 0.1 MPa to 0.7 MPa	4			
		6	Shuttle valve (OR logic function valve).profile panel mounted. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.05 MPa Flow rate: minimum 210 L/min or better	2			
		7	AND logic function valve module, profile panel mounted. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.05 MPa. Flow rate: minimum 210 L/min or better	2			
		8	Pneumatic direction control Valve, pilot operated spring return, profile panel mounted, 3/2 way NO (air -remove) valve module Operating pressure: 0.15 MPa to 0.7 MPa	2			
		9	Quick exhaust valve module profile panel mounted with built in silencer Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. MPa	4			
		10	One way speed controller valve inline type profile panel mounted for regulating cylinder piston speed. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.1 MPa Flow rate: minimum 210 L/min or better	4			
		11	Pneumatic time delay valve (range: 0.5-60 seconds), convertible from normally closed to normally open.	2			
		12	Pneumatic indicator module to indicate the presence of pneumatic pressure	2			
		13	Single acting cylinder module suitable for profile panel mounting, cylinder rod and barrel of stainless steel. Along with durable Rubber/Nylon attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Minimum stroke length 50 mm. Operating pressure max 1.0 MPa and minimum operating pressure for spring return at 0.18 MPa and proof pressure : 1.5 MPa or better	2			
		14	Filter regulator module with 5 micron filtering with 3/2 discharge valve for connection and disconnection of the rest of the circuit. Possibility of vertical and horizontal positioning.	2			
		15	Manifold block profile panel mounted with 8 outlet distribution with one touch fittings and non return valve.	2			
		16	Set of 4mm OD PU tubes in black, blue red and green color. Min bending radius 10 mm or better	20 m			
		17	Set of tee fittings for connection of circuit. Operating pressure: -100 KPa to 1.0 MPa. Proof pressure 3.0 MPa or better	2			
		18	Set of plugs 4mm for plugging the connections	2			
		19	Pneumatic valve profile panel mounted, 3/2 way normally closed with selector switch Operating Pressure: -100 KPa to 1.0 MPa	2			
		20	Pneumatic valve profile panel mounted, 5/3 hand lever direction control valve Operating pressure: 0.15 MPa to 1.0 MPa	2			
		21	Double acting cylinder module, profile panel mounted cylinder rod and barrel of stainless steel. Along with durable Rubber /Nylon attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Stroke length 100 mm max with rubber / air cushion. Operating pressure max: 1.0 MPa. Proof pressure: 1.5 MPa	4			

	22	Screw compressor - 3 hp, minimum 8 cfm, with noise level 62 db or less with built in 200 litre (minimum) receiver, which can also be used for Electro-Pneumatic Kit along with all fittings for installation & commissioning.	1			
	23	Compact rotary actuator, profile panel mounted, and double acting - vane type for 360 degrees rotation, with fitting suitable for 4 mm OD tubing.	1			

23) Warranty: 2 years
24) Installation, commissioning and training in IGDTUW
Training (05+ days)

2.2. **Electro Pneumatic Training Kit**
(Qty:1)
Approx cost : 7.5 Lakh

The system to be a fully modular and flexible one designed for the development of professional skills related to pneumatics. A roll-able table having anodized extruded aluminium structure to be provided to include a panel which enables users to work on both sides at the same time. It should also include a support shelf for component drawers. All the components used should be of industrial grade which have been developed and manufactured by the supplier. These components should be mounted on a base plate and should be identified correctly by a label with a corresponding reference as well as standardized symbols.
Manuals to be provided in both hard copy (2 sets) and soft copy clearly explaining the circuits to be developed, with connections and basic theory involved.
The electro-pneumatic components to include push pull type fittings for quick connection for 4 mm OD PU tube used in Pneumatic system and have 2 mm test lead connections.

Each Kit to consist of the following:

S No	**Description**	**Qty**
1	Rolling table with twin post panel of minimum dimensions 1150x750x25mm and minimum 2 no. drawer blocks with slide guides to house the components. External minimum dimension of the working panel to be 1200x800x1700mm with post-formed top for horizontal work, minimum1200x800mm.	1
2	Quick exhaust valve module profile panel mounted with built in silencer Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. Operating pressure of 0.1 MPa or better	2
3	Speed controller valve inline type profile panel mounted for regulating cylinder piston speed. Proof pressure range up to 1.5 MPa with operating pressure range: max 1.0 MPa and min. 0.1 MPa. Flow Rate: minimum 100 L/min or better	2
4	Single acting cylinder module, cylinder rod and barrel of stainless steel. Along with durable Rubber attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Stroke length 50mm max. with magnet Operating pressure max 1.0 MPa and minimum operating pressure for spring return at 0.18 MPa Single acting cylinder module, cylinder rod and barrel of stainless steel. Along with durable Rubber attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Stroke length 50mm max. with magnet	2
5	Filter regulator module with 5 micron filtering with 3/2 discharge valve for connection and disconnection of the rest of the circuit. Possibility of vertical and horizontal positioning.	1
6	Manifold block profile panel mounted with minimum 8 nos. outlet distribution with one touch fittings and non return valve.	2
7	Set of 4 mm OD tubes in Black, blue red and Green colour. Min bending radius 10 mm.	20 m
8	Set of tee fittings for connection of circuit. Operating pressure: -100 KPa to 1.0 MPa Proof pressure 3.0 MPa or better	2
9	Set of plugs 4 mm for plugging the connections	2
10	Indicator module with minimum 8 pilot lights and a buzzer. Supplementary nuts for power distribution Minimum 2 mm nuts for snap connection cables.	1
11	Input electrical module(button pad with 3 push buttons) 2 mm terminals for use with snap connectors. Two push buttons and a locking push button with independent light indicators. Two push buttons switch contacts.	2

	12	Electrical limit switch module, actuation via trip cams, consisting of a mechanically actuated micro switch actuated by a roller lever.	2		
	13	5/2 way single solenoid valve module, profile panel mounted. Low power consumption : < 2W. LED display and surge absorber. Spring and air reset. Power assisted system.	2		
	14	5/2 way double solenoid valve module, profile panel mounted Low power consumption: < 2W. LED display and surge absorber Spring and air reset. Power assisted system	2		
	15	Set of 3 relay module with 24 V coil and 4 switchable contacts. Relay active LEDs.2 mm terminals for use with snap connection cables.	2		
	16	Set of 2 timer modules with two timer relays, one for connection and other for disconnection. 24 V coil with switch contact. LED display of timer status. Time programmable between 01 sec and 1 hour.	1		
	17	Optical sensor module, profile panel mounted. Detection distance; 100mm. Status display LED. Operating voltage 24V.	1		
	18	Electric counter module with inputs for counting and is counting. Power supply: 24V. Electromechanical pre-selection with manual or electrical reset. Switch contact. 2 mm nuts for snap connection cables.	1		
	19	Double acting cylinder module, profile panel mounted cylinder rod and barrel of stainless steel with magnet. Along with durable Rubber/Nylon attachment threaded on piston rod so as to push a roller lever direction control valve at home position & at actuated position. Operating pressure max: 1.0 MPa or better Proof pressure: 1.5 MPa or better Minimum stroke length 100 mm max with rubber / air cushion.	2		
	20	Connecting cable set of 50 number of 2 mm diameter one touch connection cables (with facility to connect one cable to another) with different colors and lengths (minimum 5 lengths to be of one metre, 10 lengths of 0.5 meter, and rest to be enough to make different circuits on the panel)	1 Set		
	21	Digital pressure switch module profile panel mounted. Pressure range: -0.1 to 1.0 MPa. Min regulating unit: 0.001 MPa Current consumption: 45 mA. Three numerical digit display.NPN output. Safety Enclosures. Response time 2.5 msec or less	1		
	22	Power Supply: 24 V DC	2		
	23) Warranty: 2 years 24) Installation, commissioning and training in IGDTUW Training (3 days)				
3.	**Single Cylinder Four Stroke VCR Engine with open ECU** **(Qty:1)** Approx cost : 11.50 Lakh The setup should consist of single cylinder, four stroke, VCR (Variable Compression Ratio) engine connected to eddy current dynamometer. It should be provided with necessary instruments for combustion pressure, crank-angle, airflow, fuel flow, temperatures and load measurements. These signals should interface to computer through high speed data acquisition device. The set up shall have a stand-alone panel box consisting of air box, twin fuel tank, manometer, fuel measuring unit, transmitters for air and fuel flow measurements, process indicator and piezo powering unit. Rota meter should be provided for engine cooling water flow measurement. It should be possible to change the compression ratio without stopping the engine and without changing the compression chamber geometry by specially designed tilting cylinder block arrangement. In petrol mode engine shall work with programmable Open ECU, Throttle position sensor (TPS), fuel pump, ignition coil, fuel spray nozzle, trigger sensor etc. **The exhault has to go outside room to the roof / wall through a properly insulated metallic pipe system (nearly 20 metres long) from the engine and silencer fitted outside on the exhaust so that noise is reduced to acceptable limit of 75 dB.** The setup shall enable study of VCR engine performance for both Diesel and Petrol mode. Engine performance study should include brake power, indicated power, frictional power, BMEP, IMEP, brake thermal efficiency, indicated thermal efficiency, Mechanical efficiency, volumetric efficiency, specific fuel		57,500.00		

consumption, Air fuel ratio, heat balance and combustion analysis.

The set up should have the following features

1. Changing of CR without stopping the engine
2. Study of open ECU and Performance optimization with Open ECU
3. Diesel and Petrol operation
4. Diesel injection point advancement
5. Combustion analysis, P Θ and PV Diagram, IP, IMEP, FP indication
6. Electric start

Open ECU in Petrol mode features

1. Fuel control with fuel table
2. Barometric Pressure, Acceleration, Deceleration, Battery, Air Temp, Coolant Temp and Starting compensations
3. Adjustable injection timing control
4. Adjustable ignition control
5. Built in ignites
6. Advanced diagnostic features
7. Advanced turning software
8. Ethernet connection

Instrumentation: The components like Open ECU, Combustion pressure sensor, Crank angle sensor, fuel flow transmitter, Pressure transmitter, high speed data acquisition device etc. should be supplied with best quality instruments.

Software

The software should be Lab view based package developed for engine performance monitoring. It should serve most of the engine testing application needs including monitoring, reporting, data entry, data logging. The software should evaluate power, efficiencies, fuel consumption and heat release. Various graphs should be obtained at different operating condition. While on line testing of the engine in RUN mode necessary signals should be scanned, stored and presented in graph. Stored data file should be accessed to view the data graphical and tabular formats. The data in excel format should be used for further analysis

System Component Details	
Engine	Single cylinder, 4 stroke, water cooled, stroke 110 mm, bore 87.5 mm, 661 cc., Diesel Mode: Power 3.5 KW, 1500 rpm, CR range 12-18 injection variation 0-25 deg BTDC, Petrol Mode: Power 4.5 KW, speed range 1200-1800 rpm, CR range 6-10
Dynamometer	Eddy current, water cooled with loading unit
Propeller shaft	With standard universal joints
Open ECU	Programmable ECU With solenoid injector driver, Calibration cable and versatile software or equivalent in petrol mode.
Common rail	With pressure sensor and pressure regulating valve
EGR	SS, Water cooled
Injector	Solenoid driven
Piezo sensor	Combustion Range 350bar with low noise cable
Crank angle sensor	Resolution 1 Deg, Speed 5500 RPM with TDC pulse with calibration certificate.
Data acquisition device	16-bit, 250kS/s or better
Temperature sensor	Type RTD, PT100 and Thermocouple, Type K with calibration certificate.
Temperature Transmitter	Type two wire, Input RTD PT100, Range 0–100 Deg C, Output 4–20 mA and Type two wire, Input Thermocouple C
Load sensor	Load cell, type strain gauge, range 0-50 Kg
Fuel flow transmitter	DP transmitter, Range 0-500 mm WC
Fuel tank	Capacity 15 litre, Type: Duel compartment, with fuel metering pipe of glass
Air flow transmitter	Pressure transmitter, Range (-) 250 mm WC or better
Air box	M S fabricated with orifice meter and manometer
Software	Reputed software for engine analysis (original version in CD)
Rotameter	Engine cooling 40-400 LPH with calibration certificate
Pump	Type Monoblock

	Petrol and Diesel Sample testing	50 litre each			
	Warranty	2 years			
	Installation, commissioning and training	at IGDTUW Training (at least 03 days)			

4. **Exhaust Gas Analyzers (Qty:1)**
Approx cost : 5.00 Lakh

25,000.00

Measured quality:	**Measuring range:**	**Resolution:**	**Accuracy:**
CO:	0... 10 % vol	up to 0.01 % vol	< 0.6 % vol: ± 0.03 % vol ≥ 0.6 % vol: ± 5 % of ind. val.
CO_2:	0... 20 % vol	up to 0.1 % vol	< 10 % vol: ± 0.5 % vol ≥ 10 % vol: ± 5 % v. M.
HC:	0... 20000 ppm vol	≤ 2000: 1 ppm vol, > 2000: 10 ppm vol	< 200 ppm vol: ± 10 ppm vol ≥ 200 ppm vol: ± 5 % of ind. val.
O_2:	0... 22 % vol	up to 0.01 % vol	< 2 % vol: ± 0.1 % vol ≥ 2 % vol: ± 5 % v. M.
NO:	0... 5000 ppm vol	up to 1 ppm vol	< 500 ppm vol: ± 50 ppm vol ≥ 500 ppm vol: ± 10 % of ind. val.

Power Supply:	
Power consumption:	≈ 25 W
Miscellaneous	
Warm up time	≈ 7 min
Connector	60... 140 l/h, max. overpressure 450 hPa!
Connector Gas	≈ 180 l/h, max. overpressure 450 hPa!
Response time	t_{95} ≤ 15 s
Operating temperature	5... 45 °C
Storage temperature	0... 50 °C
Relative humidity	≤ 95 %, non-condensing
Inclination	0... 90°∠
Warranty	2 years
Installation, commissioning and training	at IGDTUW Training (at least 02 days)