

# Republic of the Philippines

# **DEPARTMENT OF SCIENCE AND TECHNOLOGY**

Philippine Science High School – Zamboanga Peninsula Region Campus Cogon, Dipolog City



October 24, 2020

**Contract Identification Number** 

: 020-10-0289

Name of Contract

: TECHNICAL AND SCIENTIFIC EQUIPMENT (REBID)

Location of the Contract/Project : Cogon, Dipolog City

# Supplemental/Bid Bulletin

Addendum No. 3

This Addendum No. 3 is issued to modify or amend an item in the Bidding Documents. This shall form an integral part of the Bidding Documents, to wit:

Particulars	References	Amendment/Addendum
Change of address from the school's temporary site to the school's permanent site	Supplemental/Bid Bulletin No. 1 and Supplemental/Bid Bulletin No. 2	From: Dipolog Sports Complex, Olingan, Dipolog City
		To: Cogon, Dipolog City
2. Technical Specifications of the Project	TERMS OF REFERENCE FOR THE PROCUREMENT OF TECHNICAL AND SCIENTIFIC EQUIPMENT (SUPPLY, DELIVERY, INSTALLATION, AND TRAINING)	Texts highlighted in red color are addendum/modification.  Texts highlighted in blue color are no longer part of the specifications.
		cf attached table

For guidance and information to all concerned.

**BAC Chairperson** 

# **ENCLOSURE No. 1**

			LOT 1	
Ite m No	Quant ity	Uni t	ITEM DESCRIPTION	ITEM DESCRIPTION
1	1	Set	Laboratory Furniture	Laboratory Furniture
			Two (2) Laboratory Rooms	Two (2) Laboratory Rooms
			Specifications per Laboratory Room	Specifications per Laboratory Room
			Six (6) Rectangular working tables with four (4) electrical outlets, water, and gas outlets, end-sink with faucet and rack dryer.  2m x 1.2m x 0.90m Phenolic Resin Top Typical Section Table Thickness: 20mm or better Chemical Resistant Scratch-resistant Safe to moisture UL Classified Fire-rated Anti-static material SEFA 8-1998 Chemical Resistant Testing Greengard Certified Phenolic Resin Technical Data on chemical resistance to acids, bases, salts halogens, organic chemicals, solvents and biological stains under 24 hours test with corresponding test result based on SEFA as well as the main reagents from the PSI or any American and European Testing Laboratory.  Counter top test on material properties with corresponding test method on test result under En, STM and ISO With laminated finished based cabinet with breakdown as:	Six (6) Rectangular working tables with four (4) electrical outlets, water, and gas outlets, end-sink with faucet and rack dryer.  2m x 1.2m x 0.90m Phenolic Resin Top Typical Section Table Thickness: 20mm or better Chemical Resistant Scratch-resistant Safe to moisture UL Classified Fire-rated Anti-static material (SEFA 8 certification) Greenguard Certified ISO 14001 certified Phenolic Resin Technical Data on chemical resistance to acids, bases, salts halogens, organic chemicals, solvents and biological stains under 24 hours test with corresponding test result based on SEFA as well as the main reagents from the PSI or any American and European Testing Laboratory.  With laminated finished based cabinet with breakdown as  Dimension: 4800mm-length With powder coated finished based cabinet with breakdown as

- Dimension:
- 4800mm-length
  With powder coated finish metal base frame and legs with adjustable leveler.
- Three (3) units hanging type one swing outdoor cabinet in hand grab type handle and adjustable shelf.
- Two (2) units open type leg rooms
- Two (2) units swing outdoors and fixed panel
- Four (4) units two gang electrical outlets
- One (1) Ducted Fume Hood with Vertical Sash
  - o 2m x 0.8m x 2m (WxDxH) or better
  - o With by-pass grill
  - Sash work height 500mm
  - With airfoil
  - o With storage cabinet
  - With controller for airflow and sash alarm
  - o With baffles
  - With electrical receptacles
  - With the safety valve for water and gas
  - o Chamber type duct
  - With power supply, socket, fan switch, light switch
- 1 unit Eye washer
- 1 unit Laboratory Shower
- 1 unit Demonstration Table with, electrical outlet, water, and gas outlets, end-sink with faucet and rack dryer.

- frame and legs with adjustable leveler.
- Three (3) units hanging type one swing outdoor cabinet in hand grab type handle and adjustable shelf.
- Two (2) units open type leg rooms
- Two (2) units swing outdoors and fixed panel
- Four (4) units two gang electrical outlets
- One (1) Ducted Fume Hood with Vertical Sash
  - Within 1.5-2m x 0.8m x 2m (WxDxH) or better
  - o With by-pass grill
  - Sash work height 500mm
  - With airfoil
  - With storage cabinet
  - With controller for airflow and sash alarm
  - With baffles
  - With electrical receptacles
  - With the safety valve for water and gas
  - Chamber type duct
  - With power supply, socket, fan switch, light switch
  - Ducting up to roof top of 3-floor building
- 1-unit Eye washer
- 1-unit Laboratory Shower
- 1-unit Demonstration Table with, electrical outlet, water, and gas outlets, end-sink with faucet and rack dryer.

- o 2m x 1.2m x 0.90m
- Side-tables with cabinets and lavatory
- 4 Display Cabinets (2m x 1m x 0.5m)
- 30 pcs Laboratory Stool
- 1 unit tool case cabinet
- 1 unit First-aid Cabinet
- 1 unit Fire Blanket
- 1 unit Chemical Spill Kit
- 1 unit compressed gas holder

## o 2m x 1.2m x 0.90m

- Side-tables with base cabinets and lavatory (Please refer to floor plan)
- 4 Display Cabinets (2m x 1m x 0.5m)
- 30 pcs Laboratory Stool
  - Circular seat diameter within 13"-15"
  - Diameter foot ring within 16"-18"
  - Made from 18-gauge steel
  - Height within 24"-30"
- 1 unit tool case cabinet
- 1 unit First-aid Cabinet (5"x16"x27")
  - o Glass Cover
- 1 unit Fire Blanket
- 1 unit Chemical Spill Kit
  - Absorbent materials, such pillows, pads
  - Neutralizing materials (sodium bicarbonate for acids and citric acid for bases)
  - PPE (gloves and splash goggles)
- 1 unit compressed gas holder

## One (1) Chemical preparation room

- Side table with lavatory
  - Phenolic Resin Top Typical Section
  - Table Thickness: 20mm or better
  - o Chemical Resistant
  - Scratch-resistant
  - o Safe to moisture
  - o UL Classified
  - o Fire-rated
  - o Anti-static material
  - SEFA 8-1998 Chemical Resistant Testing Greengard Certified
  - Phenolic Resin Technical Data on chemical resistance to acids, bases, salts halogens, organic chemicals, solvents and

# One (1) Chemical preparation and Laboratory Stockroom

- Side table with lavatory
  - Phenolic Resin Top Typical Section
  - Table Thickness: 20mm or better
  - o Chemical Resistant
  - o Scratch-resistant
  - o Safe to moisture
  - o UL Classified
  - o Fire-rated
  - o Anti-static material
  - o SEFA 8-1998 (SEFA 8 certification)
  - Greenguard Certified
  - ISO 14001 certified
  - Phenolic Resin Technical Data on chemical resistance to acids, bases, salts halogens, chemicals, solvents and

biological stains under 24 hours test with corresponding test result based on SEFA as well as the main reagents from the PSI or any American and European Testing Laboratory.

- Countertop test on material properties with corresponding test method on test result under En, STM and ISO
- Chemical Reagent Cabinet (2m x 1m x 0.5m) with exhaust piping
- Ducted Chemical Fume Hood with vertical sash
  - o 1m x 0.8m x 2m (WxDxH)or better
  - With by-pass grill
  - Sash work height 500mm
  - With airfoil
  - o With storage cabinet
  - With controller for airflow and sash alarm
  - With baffles
  - With electrical receptacles
  - With the safety valve for water and gas
  - o Chamber type duct
  - With power supply, socket, fan switch, light switch
- Center Table with Reagent Rack

# One (1) Instrumentation Room

- Solid Phenolic Resin Top table with electrical outlet, with drawers and hanging cabinets.
  - o Phenolic Resin Top

biological stains under 24 hours test with corresponding test result based on SEFA as well as the main reagents from the PSI or any American and European Testing Laboratory.

- Countertop test on material properties with corresponding test method on test result under En. STM and ISO
- Chemical Reagent Cabinet (2m x 1m x 0.5m) with exhaust piping
- Ducted Chemical Fume Hood with vertical sash
  - 1.5m-1.8m x 0.8m x 2m (WxDxH)or better
  - With by-pass grill
  - Sash work height 500mm
  - With airfoil
  - With storage cabinet
  - With controller for airflow and sash alarm
  - With baffles
  - With electrical receptacles
  - With the safety valve for water and gas
  - o Chamber type duct
  - With power supply, socket, fan switch, light switch
  - Ducting up to roof top of 3-floor building
- 10 Laboratory Cabinets (2m x 1m x 0.5m)
- Center Table with Reagent Rackx

# One (1) Instrumentation Room

- Solid Phenolic Resin Top table with electrical outlet, with drawers and hanging cabinets.
  - o Phenolic Resin Top

- Typical Section
- Table Thickness: 20mm or better
- o Chemical Resistant
- o Scratch-resistant
- o Safe to moisture
- UL Classified
- Fire-rated
- Anti-static material
- SEFA 8-1998 Chemical Resistant Testing Greengard Certified
- Phenolic Resin Technical Data on chemical resistance to bases, salts halogens. organic chemicals, solvents and biological stains under hours test with corresponding test result based on SEFA as well as the main reagents from the PSI or any American and European Testing Laboratory.
- Countertop test on material properties with corresponding test method on test result under En, STM and ISO

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### Service and Warranty

- 1-year warranty on parts and services after commissioning and acceptance.
- Provide detailed design layout and drawing based on the above specifications and floor plan.
- Complete with necessary installation accessories for immediate operation and startup
- During the warranty period, the supplier must repair or replace any system component on-site at no charge. Labor and travel must be included in the warranty program.
- Deliver, uncrate, set into place, make all the final connections and start-up of the laboratory furniture.

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#### **Training**

 The training should cover lectures and intensive hands-on operation. Basic and advanced troubleshooting and maintenance including the verification of lab furniture's performance should also be discussed. The training shall be conducted on-site.

#### Documentation

- Authenticated training certificate
  of Service Personnel from the
  manufacturer related to the
  installation, lab furniture
  maintenance, and
  troubleshooting.
- Manufacturer's certificate of compliance and inspection.
- 1 original copy and 1 photocopy of operating and service manuals in English.
- Must provide the necessary information and test procedures required to prove that the lab furniture meets the specified requirements.
- A certificate of qualification must also be issued.

## **Testing and Acceptance**

- Acceptance testing will occur after completion of the training course and after the supplier states the system is installed and ready to perform in compliance with specifications.
- If the system does not meet standard performance expectations, the Supplier will have one month to rectify the defects and clear the acceptance test, failing which, PSHS-ZRC reserve the right to get the equipment replaced by the Supplier at no extra cost to PSHS-ZRC. Succeeding conduct of the validation/qualification shall also

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### Site Visitation

- It is the supplier's responsibility to become thoroughly familiar with the site of the intended installation. to determine everything necessary to accomplish the installation. Failure of the supplier to make a site visit does not relieve the supplier of responsibility to fully understand what is necessary to accomplish a successful and complete installation. The supplier should quote all essential pre-installation requirements and utility requirements.

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				LOT	2	
Ite m No	Quant	Uni t	ITEM DESCR	RIPTION		ITEM DESCRIPTION
1	1	Set	CNC Router (Full-size	Gantry)		CNC Router (Full-size Gantry)
			Accessories include:			Accessories include:
			Spindles & Routers			Spindles & Routers
			Bits and Collets			Bits and Collets
			Automatic Tool Change	er		Automatic Tool Changer with at least 10 slots
			Vacuum Systems			Vacuum Systems
			Dust Collectors			Dust Collectors
			Rotary Indexers			Rotary Indexers
			Enclosures			Enclosure is optional
			Production Aids			Production Aids
			Machine Specifications	:		Machine Specifications:
			Cutting speed	10 in/s	(250	Cutting speed 10 in/s (250
			mm/s)			mm/s)
			Jogging speed	30 in/s	(760	Jogging speed 30 in/s (760

mm/s)		
Move speed (X, Y)	12 in/s	(305
mm/s)		
Move speed (Z)	6 in/s	(153
mm/s)		
Positioning speed (X, Y)	30 in/s	(760
mm/s)		•
Positioning speed (Z)	15 in/s	(380
mm/s)		, I
Step resolution 0	.0004"	(0.010
mm)		`
Positional repeatabilit	γ	0.002"
(0,051 mm)	•	
Linear cutting power	1:	50 lbs
(68kg)		
X- and Y-axis drive syst	em Ra	ck and
pinion		
Z-axis drive system	Rad	ck and
pinion		
Input voltage	220V, 60	)Hz 3-
phase	,	, 0

#### Features:

Fast, closed-loop motors fitted with low-backlash, tapered-hob gear heads on all three axes (two on the X-axis)

Tough precision linear bearings on the moving gantry and hardened steel rails for the x-axis.

Reliable rack-and-pinion power transmission on each axis.

Impressive cutting speeds of up to 600 inches per minute (depending on cutting bit and material) and rapid transit speeds of 1,800 inches per minute.

Step resolution of .0004".

The positional accuracy of +/- .002". Sealed Industrial UL Certified Control Box.

Emergency Stop disconnect switch in the Control Box with integrated and cabled remote Emergency Stop Buttons. Z-zero Touch-Off Plate and XY Proximity Switches.

software to run your CNC.

Dust Skirt ready to connect to your dust collector.

Each new tool comes bundled with two powerful software programs to create

mm/s)		
Move speed (X, Y)	12 in/s	(305
mm/s)		
Move speed (Z)	6 in/s	(153
mm/s)		
Positioning speed (X, Y	) 30 in/s	(760
mm/s)	46.1	(0.00
Positioning speed (Z)	15 in/s	(380
mm/s)	2 000 411	10.010
	0.0004"	(0.010
mm)	<b>.</b> .	0.000
Positional repeatabilit	ıy	0.002"
(0,051 mm) Linear cutting power	41	50 lbs
(68kg)	1 3	SOI DS
X- and Y-axis drive sys	tem Ra	ck and
pinion	tom rta	CK allu
Z-axis drive system	Ra	ck and
pinion	710	on and
Input voltage	220V, 60	)Hz 3-
phase	,	, 0
•		

#### Features:

# Should fit in 4ftx8ft plyboard Cut and movement area is 4ftx8ft

Fast, closed-loop motors fitted with lowbacklash, tapered-hob gear heads on all three axes (two on the X-axis)

Tough precision linear bearings on the moving gantry and hardened steel rails for the x-axis.

Reliable rack-and-pinion power transmission on each axis.

Impressive cutting speeds of up to minimum 600 inches per minute (depending on cutting bit and material) and rapid transit speeds of 1,800 inches per minute.

Step resolution of .0004".

The positional accuracy of +/- .002". Sealed Industrial UL Certified Control Box.

Emergency Stop disconnect switch in the Control Box with integrated and cabled remote Emergency Stop Buttons. Zzero Touch-Off Plate and XY Proximity Switches.

software to run your CNC.

Dust Skirt ready to connect to your dust collector.

Each new tool comes bundled with two

CNC projects.

Shipped as four ready-to-assemble modules. On-site assembly and training are available.

Free Tech Support and User Forum.

#### Service and Warranty

- 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site.
- Complete with necessary installation accessories for immediate operation and startup
- During the warranty period, the supplier must repair or replace any system component on-site at no charge. Labor and travel must be included in the warranty program.
- Deliver, uncrate, set into place, make all the final connections and start-up of the instrument
- Calibration certificate traceable to international standards.

#### **Training**

training should cover lectures on the theory and principles of the instrument, its applications. software applications, data process, and interpretation. as intensive hands-on operation. Basic and advanced troubleshooting maintenance including the verification of equipment's performance should also be discussed. The training shall be conducted on-site.

#### Documentation

 Authenticated training certificate of Service Personnel from the manufacturer related to the installation, equipment powerful software programs to create CNC projects.

Shipped as four ready-to-assemble modules. On-site assembly and training are available.

Free Tech Support and User Forum.

#### Service and Warranty

- 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site.
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### **Training**

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# Documentation

 Authenticated training certificate of Service Personnel from the manufacturer related to the installation, equipment

- maintenance, and troubleshooting.
- Manufacturer's certificate of compliance and inspection.
- 1 original copy and 1 photocopy of operating and service manuals in English.
- Must provide the necessary information and test procedures required to prove that the instrument meets the specified requirements.
- Test data and calibration certificates of the calibrating instruments used must be attached. A certificate of qualification must also be issued.
- Brochure with pictures must be provided during bid opening.

## **Testing and Acceptance**

- Acceptance testing will occur after completion of the training course and after the supplier states the system is installed and ready to perform in compliance with specifications.
- If the system does not meet standard performance expectations, the Supplier will have one month to rectify the defects and clear the acceptance test, failing which, PSHS-ZRC reserve the right to get the equipment replaced by Supplier at no extra cost to PSHS-ZRC. Succeeding conduct of the validation/qualification shall also be the responsibility and at the cost of the Supplier.

## maintenance, troubleshooting.

- Manufacturer's certificate of compliance and inspection.

and

- 1 original copy and 1 photocopy of operating and service manuals in English.
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			LOT 3	
Ite m No	Quant ity	Uni t	ITEM DESCRIPTION	ITEM DESCRIPTION
1	1	Uni t	DRYING OVEN, 220 V  Specifications: Volume capacity is at least 50 liters; the Number of shelves is 3 or more and should be adjustable, Setting temperature 15 to 300°C or better, Stainless steel interior and housing, with natural convection, stainless steel door and insulated with tempered glass observation window, LED display.	DRYING OVEN, 220 V  Specifications: Volume capacity is at least 50 liters; the Number of shelves is 2 or more and should be adjustable, Setting temperature 15 to 300°C or better, Stainless steel interior and housing, with natural convection, stainless steel door and insulated with tempered glass observation window, LED display. Temperature Precision within 0.01°C-0.1°C, Thermal Fluctuation within 0.1°C-0.5°C, Ambient Temperature within 3-45°C. With over temperature protection.
			- 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site - Complete with necessary installation accessories for immediate operation and start-up - During the warranty period, the supplier must repair or replace any system component on-site at no charge. Labor and travel must be included in the warranty program Deliver, uncrate, set into place, make all the final connections and start-up of the instrument - Calibration certificate traceable	- 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site - Complete with necessary installation accessories for immediate operation and start-up - During the warranty period, the supplier must repair or replace any system component on-site at no charge. Labor and travel must be included in the warranty program Deliver, uncrate, set into place, make all the final connections and start-up of the instrument - Calibration certificate traceable
			to international standards.  Training  - The training should cover lectures on the theory and principles of the instrument, its applications, software applications, data procession, and interpretation, as well as intensive hands-on operation.	to international standards.  Training  - The training should cover lectures on the theory and principles of the instrument, its applications, software applications, data procession, and interpretation, as well as intensive hands-on operation.

Basic and advanced troubleshooting maintenance including verification of performance should also be discussed. The training shall be conducted on-site.

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#### **Documentation**

- Authenticated training certificate of Service Personnel from the manufacturer related to the installation. equipment maintenance. and troubleshooting.
- Manufacturer's certificate compliance and inspection.
- 1 original copy and 1 photocopy of operating and service manuals in English.
- Must provide the necessary information and test procedures required to prove that the instrument meets the specified requirements.
- Test data and calibration certificates of the calibrating instruments used must attached. certificate of qualification must also be issued.

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#### Site Visitation Site Visitation - It is the supplier's responsibility to - It is the supplier's responsibility to become thoroughly familiar with become thoroughly familiar with the site of the intended site of the intended installation. to determine installation. determine everything necessarv everything to necessary installation. accomplish accomplish the the installation. Failure of the supplier to make a Failure of the supplier to make a site visit does not relieve the site visit does not relieve the supplier of responsibility to fully supplier of responsibility to fully understand what is necessary to understand what is necessary to accomplish a successful and accomplish a successful and complete installation. The complete installation. The supplier should auote all supplier should auote all essential pre-installation essential pre-installation requirements and utility requirements and utility requirements. requirements. 2 1 **UV-VIS** Set Spectrophotometer-Double UV-VIS Spectrophotometer-Double beam, 220V beam, 220V Wavelength range: 190 - 1100nm Wavelength range: 190 - 1100nm Spectral bandwidth: 0.5nm - 5nm Spectral bandwidth: 0.5nm - 5nm Photometric mode: Transmittance. **Photometric** mode: Transmittance. Absorbance Absorbance Photometric range: -0.3-3.0 Abs Photometric range: -0.3-3.0 Abs Photometric Accuracy: ± 0.002 Abs at Photometric Accuracy: ± 0.002 Abs at 0.5 Abs, ±0.004 Abs at 1.0 Abs, ±0.006 0.5 Abs. ±0.004 Abs at 1.0 Abs. ±0.006 Abs at 2.0 Abs Abs at 2.0 Abs Photometric Repeatability: < ± 0.001 Abs Photometric Repeatability: < ± 0.001 Abs at 0.5 Abs, < ±0.001 Abs at 1 Abs, < at 0.5 Abs, < ±0.001 Abs at 1 Abs, < ±0.003 Abs at 2 Abs ±0.003 Abs at 2 Abs Baseline flatness: < ±0.0006 Abs (1000 to Baseline flatness: < ±0.0006 Abs (1000 to 190 nm one hour after light source turned 190 nm one hour after light source turned on) on) Noise level: < 0.00005 Abs (700 nm) Noise level: < 0.00005 Abs (700 nm) Detector: Silicon Photo diode Detector: Silicon Photo diode Compartment: reference and sample Compartment: reference and sample compartment analyze simultaneously for compartment analyze simultaneously for 6 samples or more. 6 samples or more. Stray light: < 0.02% at 220nm (Nal), < Stray light: < 0.02% at 220nm (Nal), < 1.0% nm (KCI) 1.0% nm (KCI) Inclusions Inclusions UV-Vis Spectrophotometer workstation: UV-Vis Spectrophotometer workstation: **UV Probe Software Complete UV Probe Software Complete** UV-Vis Spectrophotometer Accessories: UV-Vis Spectrophotomete Accessories: Quartz cuvette, 10mm path length -Quartz cuvette, 10mm path length-

(2pcs), complete PC system and printer with continuous ink, O/S: Microsoft Windows 10, Hard Disk Drive: 1TB, Monitor: 21.5" LED Color monitor or better, Processor: i7, 32G RAM PC controlled or stand-alone placement of memory possible in PC, built-in and USB 1nm bandwidth.

Service and Warranty

- 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site
- Complete with necessary installation accessories for immediate operation and startup
- During the warranty period, the supplier must repair or replace any system component on-site at no charge. Labor and travel must be included in the warranty program.
- Deliver, uncrate, set into place, make all the final connections and start-up of the instrument
- Calibration certificate traceable to international standards

## **Training**

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#### **Documentation**

 Authenticated training certificate of Service Personnel from the manufacturer related to the installation, equipment (2pcs), complete PC system and printer with continuous ink, O/S: Microsoft Windows 10, Hard Disk Drive: 1TB, Monitor: 21.5" LED Color monitor or better, Processor: i7, 32G RAM PC controlled or stand-alone placement of memory possible in PC, built-in and USB 1nm bandwidth.

## **Service and Warranty**

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## **Training**

The training should lectures on the theory and principles of the instrument, its applications. software applications, data procession, and interpretation, as well as intensive hands-on operation. Basic and advanced troubleshooting maintenance including verification of equipment's performance should also be discussed. The training shall be conducted on-site.

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- maintenance, troubleshooting.
- Manufacturer's certificate or compliance and inspection.
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## **Testing and Acceptance**

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			complete installation. The supplier should quote all essential pre-installation requirements and utility requirements.	complete installation. The supplier should quote all essential pre-installation requirements and utility requirements.
3	1	set	Digital Rotary Evaporator, 220V	Digital Rotary Evaporator, 220V
			Specifications:  Bath:  Heating Capacity – 1300W or better Temp. range heating bath – 20-210°C Temp. accuracy bath - ±1°C, or better Material Heating Bath – Stainless Steel Volume Heating Bath – 4.5 liters, maximum Display- Digital LCD	Specifications:  Bath:  Heating Capacity — 1300W or better  Temp. range heating bath — within 20- 210°C  Temp. accuracy bath - ±1°C, or better  Material Heating Bath — Stainless Steel  Volume Heating Bath — 4.5 liters,  maximum  Display- Digital LCD
			Rotary Evaporator Display rotation speed range — 10-280 rpm or better Display — Digital LCD that indicates rotation speed, heating bath, and vapor temperature Height adjustment — 155mm, or better Condensing surface — 2,200 cm² Inclusions: Diagonal coil condenser, vapor tube for the diagonal condenser, 1L receiving flask, 1L evaporator flask, feed tube with stopcock, vacuum seal, conical clip, spherical joint clip	Rotary Evaporator Display rotation speed range — 10-280 rpm or better Display — Digital LCD that indicates rotation speed, heating bath, and vapor temperature Height adjustment — 155mm, or better Condensing surface — 2,200 cm² Inclusions: Diagonal coil condenser, vapor tube for the diagonal condenser, 1L receiving flask, 1L evaporator flask, feed tube with stopcock, vacuum seal, conical clip, spherical joint clip
			Vacuum Pump – Variable vacuum, flowrate 19L/min  Cooler System Cooling Capacity – 400W or better Temp. range20 to 30°C Capacity – 2 liters or better Pump rate – 8 L/min or better	Vacuum Pump – Variable vacuum, flowrate 19L/min  Cooler System Cooling Capacity – 400W or better Temp. range20 to 30°C Capacity – 2 liters or better Pump rate – 8 L/min or better
			Service and Warranty  - 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site  - Complete with necessary	Service and Warranty  - 1-year warranty on parts and services after commissioning and acceptance and 1-year free calibration and preventive maintenance on site  - Complete with necessary

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# 4 25 Uni

## **Binocular Microscope**

#### Body-interchangeable, inclined binocular body, 360° rotatable head, Eyepieceshighest quality 10X wide-angle antifungus field evepiece. Objectiveparfocal, antifungals coated 4x, 10x, 40x and 100x (oil immersion) with plan achromatic correction. Stage horizontal mechanical stage preferably 100 x 140 mm with fine graduations designed with convenient coaxial adjustment for slide manipulation preferable through 30x70 mm. Substage-abbe condenser focusable, continuously variable iris diaphragm. Illuminator-built-in LED light source with adjustable white light. Should provide dust cover and immersion oil. Electrical safety certification. Should work with input 220Vac supply.

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5	1	Uni	Human Skeleton Model	Human Skeleton Model
		t	<ul> <li>Height: 168cm or more</li> <li>Hanged or platformed base with wheels.</li> <li>Complete human adult bones.</li> </ul>	Height: 168cm or more     Hanged or platformed base with wheels. Complete human adult bones.
6	5	Set	Laboratory Micropipette Kit	Laboratory Microphysta Kit
1		Set	Per set must have the following:	Laboratory Micropipette Kit Per set must have the following:
		Set		
		Set	<ul> <li>4 units of adjustable single channel micropipette (0.5-10μL, 10-1000 μL, 100-5000 μL)</li> <li>With digital display and tip ejector</li> <li>Rotatable piston for volume adjustment</li> <li>With pipette stand for 4 or more pipettes</li> <li>8 racks of sterile tips (2 racks for 10μL, 2 racks for 200μL, 2 racks for 1000μL)</li> <li>Tip Ejector collar and Tip cone must be made of chemical-</li> </ul>	<ul> <li>• 4 units of adjustable single channel micropipette (0.5-10μL, 10-100μL, 100-1000 μL, 1000-5000 μL)</li> <li>• With digital display and tip ejector</li> <li>• Rotatable piston for volume adjustment</li> <li>• With pipette stand for 4 or more pipettes</li> <li>• 8 racks of sterile tips (2 racks for 10μL, 2 racks for 200μL, 2 racks for 100μL, 2 racks for 1000μL)</li> <li>• Tip Ejector collar and Tip cone must be made of chemical-</li> </ul>

- and drawing based on the above specifications and floor plan.
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## **Training**

- The training should cover lectures and intensive hands-on operation. Basic and advanced troubleshooting and maintenance including the verification of lab furniture's performance should also be discussed. The training shall be conducted on-site.

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