

Jordan Petroleum Refinery Co. Ltd.

شركة مصفاة البترول الأردنية المساهمة المحدودة

مناقصة رقم 2024/139

Tender No. 139/2024

Upgrade of Automation System for Water Treatment Unit No. (2) at Zarqa Refinery Commissioning, and Startup of PLC & HMI - Turnkey Project.

ترقية نظام الأتمتة لوحدة معالجة المياه رقم (2) في موقع including Supply, Installation, النررقاء، بما في ذلك التوريد والتركيب والتسليم والتشغيل لأجهزة (PLC&HMI) - تسليم مفتاح.

- ANNEX.
- TENDER AND CONTRACT INVITATION.
- QUALIFICATION FORM.
- COMMERCIAL OFFER FORM.
- STANDARD SPECIFICATION NO. 1223/1/2024
- ATTACHMENTS.

- دعوة العطاء والعقد/الشروط العامة.
 - نموذج التأهيل.
 - نموذج العرض المالي.
- المواصفة القياسية رقم: 2024/1/1223
 - المر فقات.

ANNEX

- * Offers must be submitted in sealed envelopes on or before the closing date on Thursday 16/1 ./2025not later than 12:30 (Jordan Local Time) - Offers received after that time be disregarded.
- * Local agents must submit with their offers a valid copy of their registration certificates in the Ministry of Industry & Commerce and their registration certificates in Great Amman Municipality.
- * JPRC is entitled to cancel the tender or to postpone the opening of bids, to date it deems adequate.
 - Participants will however be notified of the time and place of opening the bids.
- * Enclosed herewith a form to be filled accurately, as it is an integral part of Contract conditions.

Please abide strictly the required conditions and specifications.

ملحق

- * يجب تسليم العروض بالظرف المختوم قبل الساعة 12:30 من ظهر يوم الخميس الموافق 16/ 1/2025 توقيت الأردن ولي يقبل أي عرض بعد الموعد المذكور.
- على الوكلاء والوسطاء التجاريين أن يرفقوا مع العرض نسخة من سجلهم التجاري ورخص المهن الصادرة من وزاره الصناعة والتجارة وأمانة عمان الكبرى.
- * يحق للمصفاة الغاء المناقصة أو تأجيل فتح العروض للوقت الذي تراه مناسبا على أن يتم إعلام المشاركين بالمناقصة بالموعد الجديد لفتح العروض ومكانه.
 - * مرفق نموذج لتعبئته و إرفاقه مع العرض.
 - إرفاق ثلاثة نسخ من العروض أو نسخة إلكترونية.

راجين الالتزام تماما بالشروط والمواصفات المطلوبة.

بات المورد والوكيل	نموذج معلوم	مناقصة
SUPPLIER & LOCAL AGE	SUPPLIER & LOCAL AGENT INFORMATION	
الوكيل المحلي Local Agent	المورد Supplier	البنود المطلوبة
		الاسم التجاري Commercial Name
		أسماء مالكي الشركة Director/ Manager Name
		هاتف رقم Tel No:
		فاکس رقم Fax -no
		بريد الكتروني E-mail
		خلوي :Mobile
		رخص مهن Profession License Certificate
		سجل تجاري Trading Registration Certificate
		رأس مال الشركة Capital
		البنك Reference Bank
		مجموع الإيرادات السنوية Turnover
		مجموع حقوق الملكية Owners' Equity

-TENDER AND CONTI	RACT INVITATION	و العقد/الشر وط العامة	- دعوة العطاء

JORDAN PETROLEUM REFINERY CO. LTD

TENDER NO. 139/2024

Upgrade of Automation System for Water Treatment Unit No. (2) at Zarqa Refinery Site including Supply, Installation, Commissioning, and Startup of PLC & HMI - Turnkey Project.



I. Tender & Contract Invitation

 The following Instructions and General Conditions are integral part of the invitation, and have the power of the purchase contract.

The listed conditions hereunder are binding for the tenderers, unless otherwise is stated in the documents.

Offers (technical & commercial) shall be submitted in triplicate, in English language, including the following details, before the CLOSING DATE on Thursday 26/12/2024, at 12.30 PM (Jordan Local Time).

2. Identifications:

The Company: Jordan Petroleum Refinery Company Ltd., (JPRC).

The Manager: Chief Executive Officer.

The Contractor: The successful Tenderer/ Supplier/ Manufacturer.

The Tenderer: The participant in tender.

Offers shall include the following:

- A. Printed price and clearly written in figures and capital letters. (Currency shall be JOD).
- B. Valid for (120) days, at least, from closing date, unless otherwise stated, and also fixed during the completion period.
- C. Execution time: the shortest execution period to be stated in your offer.
- D. Country of origin: origin of goods shall be stated.
- E. Any extra optional and / or additional services to the required specifications should be clearly detailed & priced.
- F. Manufacturer's name and full address.
- Catalogues: Operation, maintenance and spare parts manuals, as well as any necessary leaflets
 and information shall be submitted in English language, all shall comply with tender
 documents requirements, if any.
- Required Certificates: Test Reports Laboratory certificate, API, Baseeffa, UL listing, FM
 approvals, Mill Test Certificate, Third Party Inspection Certificates and/or as required by
 Tender documents, codes, etc.
- The Tenderer guarantees that materials are to be supplied brand new, updated in design, free
 from any failure, fault, damage, or defects in material, design, or manufacturing, and of
 latest model, unless the offer states otherwise.
- 7. Any items or accessories necessary to have the offered system/ equipment complete in every respect shall be quoted even if they are not mentioned in this standard specification, noting that failure of the Contractor to do so shall be at his full responsibility, and the said equipment / system shall be rectified as necessary at the Contractor's own expense.
- The COMPANY is not obliged to award on any offer or the lowest offered prices.
- The COMPANY has the right to cancel any part or the whole Tender without justifications.
- The COMPANY is not bound to consider any offer which does not follow closely Tender requirements.

- 11. The COMPANY shall be exempted from serving notarial notice/s on the tender.
- The Tenderer is required to provide qualification documents with his offers.

These documents shall include details of his production and general catalogues, and explain, in detail, his past experience in same required equipment and projects, and provide reference lists including customers/refineries to which he delivered similar equipment and projects, dates, and contract values. The COMPANY has the right to disregard any offer which may be received from unqualified Tenderers and / or Manufacturer. The COMPANY shall not accept any responsibility or liability of any type or any kind in any way whatsoever.

13. The Tenderer shall submit all documents which show financial statement of the supplier for the latest three years including balance sheet and profit and loss accounts with the offer.

Qualification Form (attached to the tender documents) shall be completely filled by the Tenderer and submit with the offer.

- 14. It is the full responsibility of the Tenderer to provide all required information during the offering stage, where any lack or misguidance of the required information provided by the Tenderer shall be considered a cause of rejection of his offer.
- 15. Payment method:
 - A- Payment shall be made either by Bank Transfers or Cheques against contractor's tax invoices
 - B- Payment in advance is not acceptable.
 - C- A payment schedule connected to the project milestones shall be included in the submitted offer.
- 16. Instructions of the Central Bank: All parties to this transaction are advised that where the U.S., EU, UN impose specific sanctions against certain countries, entities and individuals banks may be unable to process a transaction that involves a breach of such sanctions, and authorities may require disclosure of information.

II. Successful Tenderer/ Supplier shall be responsible for the following:

- All the documents pertaining to the General Conditions, Specifications, Drawings and any Annexes shall form an integral part of the agreement/contract/purchase order.
- 2. After awarding any change in the offered specifications shall not be acceptable.
- 3. Performance guarantee (bank guarantee) equal (10%) of the total amount through a local Jordanian bank, shall be submit within (10) days of award of tender, to guarantee that materials will be supplied and the works will be executed according to tender specifications and conditions, submitted offer on this tender, and related correspondences as well as to guarantee that the whole consignment will be delivered within the specified period.

This guarantee must be valid for period of not less than (24) months after the work completion unless otherwise is stated, subject to extension when required and payable partially or totally to COMPANY at first demand.

Copy of bank guarantee text is herewith attached.

- 4. (6) per one thousand of Contract value shall be paid to cover revenue stamps to be paid to the Ministry of Finance according to prevailing Jordanian law. The total sum shall be paid within (10) ten days after the date of award letter to avoid delay penalty, or deduct it from the purchase order.
- No assigning of the awarded Tender (partially or totally) to any other contractor without a written permission from the COMPANY.

- 6. Delivery delay liquidated damages: in the event that the Supplier failed to execute the required works within the specified period, which prevents putting the project in service, the sum of JOD (50) per day or any part thereof shall be paid by the supplier to COMPANY. (Not exceeding 15 % of contract value).
- 7. As the contract is a Jordanian one, any dispute arising between COMPANY and the Contractor on the interpretation or execution of the contract, which can't be solved amicably, shall be governed by and construed in accordance with Jordanian laws, and shall be referred to arbitration. Arbitration shall be conducted in Arabic, or English translated into Arabic. The venue of arbitration shall be in Amman Jordan.
- 8. The COMPANY in cashing the guarantees shall not be deemed to have waived any of its rights under the Contract. For tender performance purpose, the local agent and the Contractor are jointly and severally responsible. The COMPANY has the right to claim its rights legally against each, or both of them, in ease they do not comply with any of the Tender conditions.
- The COMPANY has the right to reject of any supplied materials and/or performed works which
 not in conformity with the required specification, and shall hold the contractor liable for any
 damage resulting there from including taxes, custom fees, clearance fees ...etc.)
- 10. If the defect or function failure can't be corrected, the Contractor / Supplier shall promptly replace said equipment (free of charge) or remove the equipment with refund the full purchase price

III.Important Notes for Tenderers:

- Offers shall be submitted in two separated, closed and scaled envelopes (One original and two copies) indicating clearly contents of each envelope as follows:
 - The 1st envelope shall include the technical offer and qualification documents.
 - The 2nd envelope shall include the commercial offer.
- Name and address of Tenderer is to be printed on closed and sealed envelope in addition to Tender number and closing date. Noting that different offers shall be treated separately.
- Offers shall be submitted to the following address:

Jordan Petroleum Refinery Co. Jabal Amman, 1st Circle, Rainbow St., Building No. 44 Amman - Jordan

Offers by fax or e-mail are only acceptable on:

Fax No.: (+962 6 4657 630)

E-mail (ceo.jprc@jopetrol.com.jo),

Offers by telephone are strictly prohibited.

- Any questions regarding the Tender shall be addressed in writing to: E-mail: administration&services@jopetrol.com.jo
- Tenderer is absolutely not permitted to contact and or meet and or visit any one of the technical team during tender study stage without prior post coordination and written approval by JPRC.
- Any offer after the closing date shall not be accepted.
- The offers must be signed and stamped by the Tenderer; otherwise, it shall be disregarded.
 And shall be submitted to the COMPANY as prepared and arranged by the manufacturer.
- Tenderers shall provide the COMPANY with the name and full address of the Agent or Representative / Regional office in Jordan and his registration number, if available.
- 10 Local Agent shall submit a valid Career License and Registration Certificate with the offer.

- QUALIFICATION FORM	ـ نموذج التأهيل الغني والمالي

QUALIFICATION FORM

FOR COMPANIES PARTICIPATING IN TENDER NO. (139/2024)

TENDER NAME: Upgrade of Automation System for Water Treatment Unit No. (2) at Zarqa Refinery Site including Supply, Installation, Commissioning, and Startup of

	PLC & HMI - Turn	key Pro	ject.		•
NAME OF THE	COMPANY REQUESTIN	G QUA	LIFICATI	ON:	
***********				****	
DATE OF ESTAE					***************************************
PERMANENT PL	ACE OF BUSINESS :				
CITY	*				*******************
STATE	*			S	TREET :
TELEPHONE	1			F	AX NO. :
ADDRESS	1				
FINANCIAL CA	APABILITY:				
		1	LOCAL		
			CURREN	CY	EQUIVALENT □ US\$ □ EURO
- CAPITAL					
- ANNUAL INV	ESTMENT (TURNOVER)			
- NAME OF BA	NKERS				·
					OW HIS FINANCIAL SITUATION FOR SHEETS AND PROFIT AND LOSS
ACCOUNTS.	, ISSUED BY THIRD PAR	RTY AU	DITOR(S).	
BUSINESS AND	ORGANIZATION				
(DESCRIBE TYPE	AND SCOPE OF ACTIVITY	AND ST	RUCTURE	OF Y	YOUR ORGANIZATION)
ACTIVITY		YES	NO	NO	OTES
ENGINEERING					
PROJECT MAG	ENGMENT				
TURNKEY PRO	DJECT JOBS				
	, COBISTRUCTION, ESTING,ETC.				
OTHERS					

A. TECHNICAL CAPABILITY:

WE ARE APPLYING FOR QUALIFICATION FOR THE SUPPLY & CONSTRUCTION OF REQUIRED EQUIPMENT AND PROVIDE DOCUMENTS TO COVER THE FOLLOWING:

A1) PREVIOUS EXPERIENCE IN UPGRADE & EXPANSION OF AUTOMATION SYSTEM (PLC & HMI) SIMILAR TO THE REQUIRED ONE (5 PROJECTS MINIMUM)

COUNTRY/ CUSTOMER/ ADDRESS	MAIN ACTIVITIES	SUPERVISION FIRM	COST	EXECUTION PERIOD AND DATE

A2) ACCREDDIATIONS AND AUTHORIZATION CERTIFICATE OWNED BY THE CONTRACTOR:

NATIONAL CODE	NATIONAL REGULATION	INTERNATIONAL CODE	INTERNATIONAL REGULATION

A3) FOLLOWING ARE OUR RENOWNED CLIENTS:

S. NO.	CLIENT NAME/COUNTRY	DETAILS OF PROJECT	DELIVERY YEAR
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

A4) PLEASE ANSWER THE FOLLOWING QUESTIONS:

S. N	QUESTION	ANSWER
1.	Advise type approvals for automation system (PLC & HMI)	
2.	Advise brand name for the offered automation system (PLC & HMI)	
3.	Do you have authorization / accreditation certificate issued by an authority / agency / association specialized in facilities and certify you to manufacture similar equipment according to international codes and regulations?	
4.	Do you have the capability to solve all problems, which may be encountered by the client, including carrying out necessary or desirable alterations, replacement and repairs of defective equipment?	
5.	Can you perform specialized training courses to qualify operators to operate and carry out maintenance work on the required equipment at Refinery site?	
6.	Do you have a local agent in Jordan who is authorized to provide maintenance and spare parts services?	

B) COMPANY BRANCHES AND LIECENSING	

C) DESIGN CODES AND REFERENCES USED BY US	
0.0000000000000000000000000000000000000	
D) LOCAL BRANCHES OR AGENCIES AND THEIR CLASSIFICATION	_
STANDARD STA	

THE FOLLOWING IS A LIST OF MAJOR SUPPLIES EXECUTED BY US WITHIN LAST 5 YEARS: (USE SUPPLEMENTARY SHEETS IF REQUIRED)

CLIENT	COUNTRY	COST	EXECUTION PERIOD AND DATE

F) THE FOLLOWING IS A LIST OF CONTRACTS ON HAND AT THIS TIME:
(BIDDER SHALL EXTEND TABLE BY MEANS OF SUPPLEMENTARY SHEETS, IF REQUIRED).

S. NO.	TYPE OF WORK	CONTRACT PRICE (US\$)	EXPECTED DATE OF COMPLETION

- COMMERCIAL OFFER FORM	 نموذج العرض المالي

TO: M/S: JORDAN PETROLEUM REFINERY CO LTD AMMAN-JORDAN

FROM:

COMMERCIAL OFFER FORM

TENDER NO. 139/2024

SUBJECT: Upgrade of Automation System for Water Treatment Unit No. 2 at Zarqa Refinery Site including Supply, Installation, Commissioning, and Startup of PLC & HMI

- Turnkey Project.

Item No.	Description	Unit	Price to be filled by the Contractor (JOD)
1.	Upgrade of Automation System for Water Treatment Unit No. (2) Including Supply, Installation, Commissioning, Start-up, and Training of All Equipment and Instruments in Compliance with The Tender Standard Specification "Turnkey Project".	Lump Sum	
2.	SALES TAX (%)		
3.	OTHER TAXES, FEES, EXPENSES,ETC. (IF ANY) (CONTRACTOR TO SPECIFY IN DETAILS)		
TOT	AL IN WRITTEN	TOTAL:	

SIGNATURE: -

TENDERER'S STAMP: -L.S= LUMP SUM

- STANDARD SPECIFICATIONS NO. 1223/1/2024	 المواصفة القياسية رقع 2024/1/1223

JORDAN PETROLEUM REFINERY COMPANY LTD. P.O. BOX 1079 AMMAN - JORDAN

STANDARD SPECIFICATIONS NO. 1223/1/2024

Upgrade of Automation System for Water Treatment Unit No. 2 at Zarqa Refinery Site including Supply, Installation, Commissioning, and Startup of PLC & HMI - Turnkey Project

ISSUED : NOV, 2024 REVISION : 2

SUPERSEDES :

STANDARD SPECIFICATIONS NO. 1223/1/2024 CONTENT PAGE NO. PART-1 GENERAL REQUIREMENTS. 1. INTRODUCTION. 1.1 PURPOSE. 3 1.2 SCOPE. 1.3 EXISTING SYSTEM 1.4 RELATIONSHIP WITH OTHER DOCUMENTS. 3 4 1.5 INSTRUCTIONS TO TENDERERS. 4 2. QUALIFICATION OF MANUFACTURER. 3. PAYMENT METHOD. 5 DRAWINGS, MANUALS AND MANUFACTURING DATA. 5 5. UTILITY AT SITE. 6 ACCESS TO SITE. 6 SAFETY PRECUATION. 6 RESPONSIBILITY FOR ACCIDENTS. 6 9. INSURANCE. 7 GUARANTEE & WARRANTY. 8 PART-11 TECHNICAL REQUIREMENTS. 9 1. GENERAL REQUIREMENTS. 9 2. TECHNICAL REQUIREMENTS. 10 SPARE PARTS 13 4. ATTACHMENTS 13

	STANDARD SPECIFICATIONS NO. 1223/1/2024					
PA	RT-	I GENERAL REQUIREMENTS:				
s. NO.		SPECIFICATION	DEVIATION			
1.	INT	RODUCTION:				
	1.1	Purpose:				
		The purpose of this publication is to set forth the specification for the supply, Installation, commissioning, start-up of equipment's to be replaced, upgraded of the automation system at water treatment unit No. (2) located in Zarqa site. The objective is to enhance the reliability, efficiency and safety of the system by incorporating the latest industry standards. The entire job is to be undertaken on a turnkey basis covering instrumentation, PLC & electrical works including supply of all required material for electrical				
		works.				
	1.2	Scope:				
		This specification shall cover the Company's requirements for the replacement and upgrading of water treatment unit No. (2) control system. The scope of work shall include the replacement, design, manufacturing, testing, supply, installation of a new water treatment automation system, commissioning, documentation, guarantee, and warranty. The work includes (but is not limited to) the following: 1. Removal of Existing Control Cabinet: Dismantle and remove the existing control cabinet and all related items. 2. Supply and Installation of New Control Panel: Supply and install a new control panel, including PLC and HMI, with all necessary accessories. 3. Supply and Installation of Pneumatic Panel: Supply and install a new weatherproof, harsh environment, and humidity-resistant pneumatic panel, including all necessary electrical cables and solenoids to convert electrical signals to pneumatic signals. Existing copper tubes shall be utilized. 4. Supply and Installation of Limit Switches for the Sequence Valves: Supply and install (50) new limit switches with all necessary cables and accessories on all shut-off valves to provide feedback (ON/OFF) signals to the control system. 5. Supply and Installation of the following Meters and Analyzers: a. (1) One Feed Conductivity Meter. b. (1) One Product Conductivity Meter. c. (1) One Silica Analyzer. d. (1) One pl Meter. including all necessary cabling and accessories				
		including all necessary cabling and accessories.				
		6. Supply and Installation of (5) five Vibronic (Tuning Fork) Point Level Switch for Liquids.				
	1.3	Existing System				
		The existing system comprises of:				
		 (25) Sequence valves. Electrical & Pneumatic cabinet containing the following components: 110 Vac Solenoid Valves: These are used for controlling pneumatic signals. 				
		 Timers: For timing functions within the system. 				
		c. Pushbuttons: Manual controls for various functions.				

S. NO.				SPECIFICATION	DEVIATION
		The incl but Add 4.	Flow M - Feed - Weal of wa - Prod se flow udes ar does no litiona Silica one. Level S	wes. Weters: Water Flow Meter (FT-8301): Measures the flow of feed water. k Anion Filter Feed Water Flow Meter (FT-8309): Measures the flow ater feeding the weak anion filter. Buct Flow Meter (FT-8316): Measures the flow of the final product. w meters' signals are connected to a separate recorder. The system also noutdated conductivity meter, which is connected to the same recorder of trigger any corresponding actions (such as alarms or trips). Il Component: Analyzer: None available, and there is no suitable mounting place for Switches: five level switches, only three are present but lack functional ation (such as alarms or trips). Mounting flanges for the level switches of the level switches.	
	1.4			nip with Other Documents:	
		This	s public ein. In	cation shall be read in conjunction with any standard or code referred to case of discrepancy between requirements of this publication and codes, the requirements of codes shall prevail.	
	1.5	Inst	ructio	ns to Tenderers:	
		1.	to fill	erers shall refer to each clause of the specification and mention if they abstituting it with other idea or not complying. Tenderers are required the column titled (DEVIATION) by (NONE) if the specification of the is complying with our requirements. Deviations from our requirements, y, shall be clearly explained and specified in the above-mentioned nn.	
		2.	In this	item, or accessory necessary to have the offered equipment complete in respect, shall be quoted even if it is not mentioned in this specification. s case, detailed quotation with technical clarifications is to be submitted toffer.	
1		3.		nformation, documents and correspondences shall be in English.	
		4.	All I	nstructions and General Conditions in the "Tender and Contract ation" shall be met.	
		5.	The Coffer.	Commercial offer form shall be completely filled and provided with the	
		6.	shall	pletion period from date of awarding up to complete the commissioning be specified in the offer.	
		7.	offers		
1			7.1	Short execution period.	
			7.3	Degree of conformity with JPRC and reference Code requirements. Quality Control Plan of manufacturer's Workshop.	
			7.4	Tenderer's capabilities: Short listed Tenderers shall be required to attend a meeting, in the JPRC's offices, with the JPRC's technical people to evaluate the Tenderer's capabilities and to finalize all technical points at Tenderer's own expense and responsibility, and without any obligation or responsibility of any kind to JPRC in anyway whatsoever.	

S. NO.				SPECIFICATION	DEVIATION
		8.		odes and standards for manufacture, testing, inspection etc. shall be est editions.	
		9.	A tin	ne schedule is requested for the works that will be done from date of ding. The works shall include the supply, installation, commissioning, tart up.	
		10.	Packi	ing:	
			10.1	All equipment's shall be dry, clean and free from moisture, dirt and loose foreign materials of any kind.	
			10.2	All equipment's shall be protected from rust, corrosion and any mechanical damage during transportation and storage.	
		11.	order neces requir	erers shall visit the Company at Zarqa Site on Tuesday 10/12/2024 in to get a better understanding of the project requirements, collect the sary data for preparing comprehensive offer, completed with the red site preparation requirements. <u>Tenderers shall notify the Company to the visit date in order to issue site entry permits.</u>	
2.	QU	ALIF		ON OF MANUFACTURER:	
	and	comp	letely f	ested to submit, at time of offering his Tender, Qualification Documents illed Qualification Form (attached) which shall show the following:	
	1.			ons of the team proposed for this project.	
	2.			lerstanding and approach.	
	3.	wor	k plan/	schedule, in full details. detailed plan shall be provided after awarding.	
	4.			ons of the firm.	
	5.	shov	ving w	e similar previous projects completed by the project team members ith full name and address of clients with contact person details and clear description.	
3.	PAY			THOD:	TEN TO
			hin (2) e by JI	months of Successful Commissioning, Startup, Training and Final PRC.	
4.	DRA	WIN	GS, M	IANUALS AND MANUFACTURING DATA:	
	4.1	Cor tech this Cor acco	ntractor mical l specifi npany. ompani	shall provide at the time of offering his offer triplicate copies of iterature, data sheets, performance data and all information required in ication, in order to permit comparison and evaluation to be made by the The Company reserves the right to disregard any offer, which is not ied with sufficient data.	
	4.2	con		oint wiring diagrams indicating all termination points for each and for each device, cable types and color coding of each termination.	
	4.3	-	-	s and datasheets of all equipment shall be submitted prior to supply.	
	4.4	Afte	er com	missioning and final acceptance test all as-built drawings in softcopy opies (drawn by AutoCAD or equivalent program) shall be delivered to	
	4.5	Upo (1) 1. 2. 3. 4.	on proje softcop P&I Di Electric Instrun Datash	Documents: ect completion, it is required to provide JPRC with (3) hardcopies and by the following drawings and documents: iagram. cal and instrumentation wiring diagram. nent list. eet and manual for each instrument and component. & effect diagram.	

S. NO.	SPECIFICATION	DEVIATION
	6. Control Narrative.	J. J
	7. Certificates.	
5.	UTILITY AT SITE	
	5.1 Service water for construction & potable water for drinking a Contractor use at site. The Contractor shall arrange for proce- his own expense from any available source.	arement of water at
	5.2 Electric power is not available for construction purposes. T provide his own power generators at his own expense.	
	5.3 Local transport and limited workshop facilities (i.e., crane, any vehicle, machine, handling tools etc.) are not available. I arrange to provide all required equipment at his own expense.	he contractor shall
	5.4 Work yard and/or storage yards, other than the working area of are not available inside the refinery site without prior arrange representative and the Contractor shall be responsible to arroute outside the site, if needed for his own use at his own expense.	of the required work, ments with refinery range for any yards
6.	ACCESS TO SITE	
	6.1 The Contractor can use the existing access road in project Contractor has to visit the site, investigate, make available additional required accesses to the work site, or to the storage &	e and provide any
	6.2 that may be arranged by the Contractor outside the site, after n arrangements and taking all approvals of Company for the lo and the proper access to them at his own expense.	naking all necessary ecation of such sites
	6.3 Accesses at the main site shall be at all times coordinated a JPRC representative.	and agreed with the
7.	SAFETY PRECUATION	
	7.1 The Contractor shall be responsible for taking adequate measure working and for the prevention of fires and accidents. The regulations shall be followed and strictly adhered to by the Conformal of Refinery Safety Regulations shall be given to successful Tabasis. The Company Representative may stop any work at a opinion that unsafe practices are being carried out, or which may to the project or the existing installations, but this will not in a Contractor of his responsibilities. Such stopping shall cause Company. The Contractor shall be responsible to follow st Safety Regulations as well as any other regulations of the authorities.	tractor. Two copies cenderer on borrow my time if it is his ay cause any hazard my way absolve the no liability to the rictly the Refinery e Company or the
	7.2 The tenderer shall guarantee that the equipment shall be professional manner so that the Automation System shall satisfactory in a safe and reliable manner, and assured a normal risk of fire, damaged or personnel injury due to electrical eliminated, all material and equipment shall be supplied in current safety regulations and standard requirements, and the brought to a low level.	fulfill its function d life. Furthermore, al current shall be n accordance with
8.	RESPONSIBILITY FOR ACCIDENTS:	
	8.1 The Contractor shall be absolutely responsible for accidents ar fatal or otherwise, damage or losses occurring to any person or the Permanent Works which may result from or in the Representative be traceable to the operations of the subcontractors or their respective Agents or their personnel or	property other than e opinion of the Contractor or his

s. NO.		SPECIFICATION	DEVIATION
		execution of the Works or any failure on the part of the Contractor to observe and	
		perform any of his obligations under the Contract Documents	
	8.2	The responsibility of the Contractor as above described shall extend to all cases	
		of accidents, injuries, damages or losses which may occur to any person or	
		property other the Permanent.	
	8.3	Works including, but not limited to the following:	
		a. Persons employed upon or about the works by the Company, the Contractor	
		and his sub-contractors or by the Government.	
		b. The Representative and his staff.	
		c. Persons being for any lawful purpose upon or about the Works.	
		d. The Contractor shall be solely liable for all compensation becoming payable	
		for loss or damage suffered by reason of or in consequence of any accidents	
		or injuries whether fatal or otherwise, as expressed in subclause (a.) of this	
		clause to workmen or others in the employment of the Contractor or any sub-	
		contractor or other persons acting on the Contractor's behalf in accordance	
		with the Jordan Workman's Componentian Law 1979	
		with the Jordan Workmen's Compensation Law 1970 and with any	
		modification thereof which may be put into force by the Government during the continuance of the Contract.	
		e. The Contractor shall ensure that his staff and labor have been issued with all	
		necessary personal safety equipment and shall further ensure that all said	
		equipment is properly used. The Contractor shall comply with the applicable	
		Company Safety Regulations. The Company reserves the right to inspect all	
	****	electrical and safety appliances.	
).		URANCE	
	9.1	The Contractor shall, throughout the duration of the Contract and until the	
		issuance of the Completion Certificate, maintain insurance coverage for the	
		Permanent Works. The insurance policy shall be of the Contractor's All Risks	
		type from a local insurance company and shall be in his name and the name of	
		JPRC and shall be procured at the Contractor's expense. The coverage must	
		protect against all standard insurable risks, excluding war risks. The insurance	
		policy shall include the following:	
		A. Third Party insurance in the amount of 115% of Contract Price.	
		B. Works and equipment insurance in the amount of 115% of Contract Price.	
		C. Surrounding properties insurance in an amount not less than 10,000 JOD.	
		D. Debris removal insurance in an amount not less than 5% of Contract Price.	
3	9.2	The Contractor's obligation to insure in accordance with subclause (9.1) of this	
	.,	clause shall be satisfied in respect of insurance against compensation to be paid in	
		accordance with subclause (8.2 & 8.3) of clause (8) to persons employed by sub-	
		contractor if said sub-contractor shall have insured against the liability in respect	
		of such persons in such a manner that the Company is indemnified under the policy.	
	9.3	The second of th	
	9.3	The Contractor shall whenever be required by the Company Representative	
		produce the policy or policies of insurance as meant in subclause (9.1) of this	
		clause as well as the receipt for payment of the current premiums and cause any	
		sub-contractor to produce the policy or policies of insurance as meant in subclause	
		(9.2) of this clause as well as the receipts for payment.	
	9.4	In case the Contractor fails to effect and/or keep in force the insurance referred to	
		in the preceding subclauses of this clause or any other insurance which he may be	
		required to effect under the Contract Documents, then the Company	
		Representative may effect and keep in force any such insurance and pay such	

s. NO.	SPECIFICATION					
		premiums as may be necessary for that purpose and deduct the amounts paid from any moneys due or which may become due to the Contractor or recover the same as a debt due from the Contractor.				
	9.5	If the terms of the insurance policy stipulate the existence of a mandatory deductible, the Contractor must pay these values in the event of any claim in this regard.				
	9.6	The Contractor is obligated to insure the workers and employees who work for him and his subcontractors against accidents and work injuries to the extend not covered by Social Security.				
10.	GUA	RANTEE & WARRANTY				
	10.1	The Contractor/Supplier shall provide a full guarantee that all equipment is brand new, updated in design and materials, free from faults in design, workmanship, and material, and is of sufficient size and capacity to meet the specified operating conditions.				
	10.2	Coverage Period: 24 months from the date of successful commissioning.				
	10.3	Responsibilities: The Contractor is responsible for repairing or replacing any defective parts or items free of charge within the warranty period. If defects arise during the first year of operation, the Contractor shall make all necessary repairs or replacements free of charge, including covering transportation costs. If the defect cannot be corrected, the Contractor must replace the equipment or refund the full purchase price.				
	10.4	Guarantee: Performance Guarantee: 10% of the contract value, valid for (24) months from the date of successful commissioning and until the company issues a Completion Certificate. Performance guarantee shall be submitted or confirmed by a local Jordanian bank according to the attached form (attachment No. 2). The warranty covers all required damaged parts at the Contractor's expense.				

STANDARD SPECIFICATIONS NO. 1223/1/2024

PART- II TECHNICAL REQUIREMENTS:

O.			SPECIFICATION	DEVIATION				
	GEN	ERA	L REQUIRMENTS:					
	1.		new control system and all other components shall be from a well-known nufacturer.					
	2.	gua	y newly supplied components shall be in active phase of its life cycle with tranteed availability of spare parts for a period not less than 10 years from the e of delivery.					
	3.	und coll iter						
	4.	The programming of the new PLC and HMI will be executed to ensure that the Water Treatment Unit operates in accordance with the Control Philosophy (Attachment No. 4).						
	5.	soft pas	the end of the project, the contractor shall submit to JPRC all engineering tware, application, and programs for the new PLC, HMI along with all swords. No portion of the program shall be blocked, and all programs shall be ensed and registered in the name of JPRC					
	6.							
1	rating of IP56 or higher. Additionally, they will be epoxy coated to withstand harsh humidity environments effectively. 7. The work shall include but not limited to the following: a. The examination and survey of project site.							
		a.	The examination and survey of project site.					
		Ъ.	Job Specifications for electrical and instruments works.					
1		C.	The engineering design and supervision for all works.					
		d.	Procurements and supply at site of all material and equipment needed for complete construction and commissioning of the project.					
		c.	Procurements and supply at site of spare parts and tools for all equipment, machinery & material adequate for first guaranteed year and the following two years of operation.					
		f.	Fabrication, construction, erection, painting, testing, inspection.					
		g.	Remove the existing control panel.					
	8.	The	following shall be included in the offer:					
		a.	Specify name of manufacturer, origin.					
		b.	Submit all the required documents, catalogues, manufacturers' specifications, and preliminary design work and calculations according to IEC.					
		c.	Each part of the required systems shall be certified (having certification mark by international approved certification office, institute, laboratory etc., according to IEC standards latest editions.					
		d.	Provide comprehensive materials specifications, typical installation drawings and procedures, commissioning procedure and operation instructions according to latest editions of approved international standards such as IEC and.					
		e.	All electrical & instruments materials, wiring, cables, and equipment's shall be supplied & installed in best condition by the contractor as part of his obligation under the contract.					

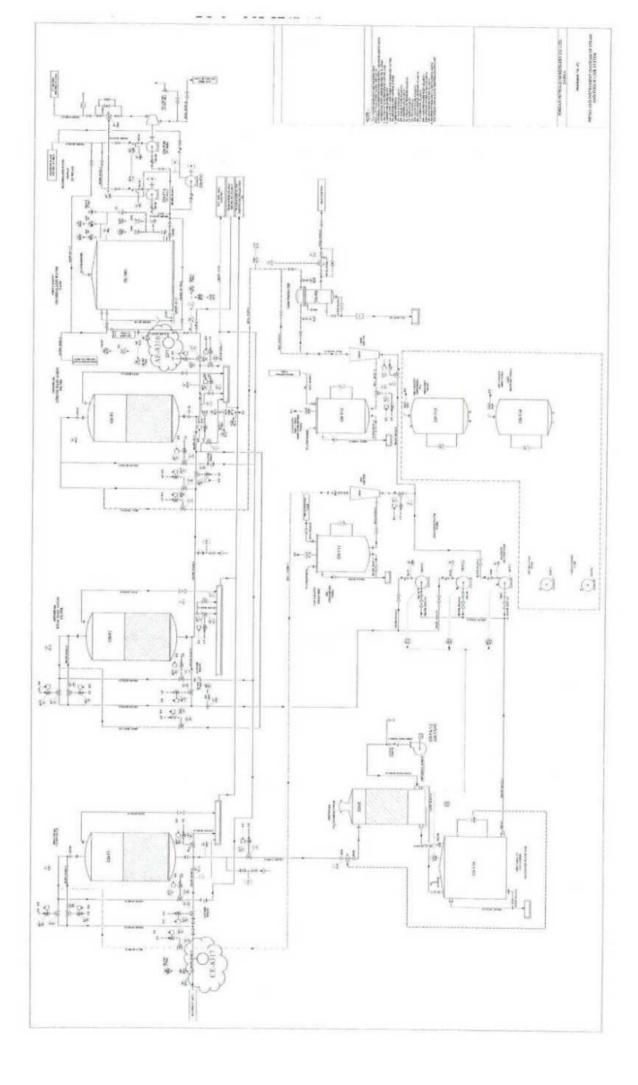
	f.	Other requirements pertaining to this specification in addition to any other	A	
		other requirements pertaining to this specification in addition to any other		
		items which deem to be necessary for complete project in every respect are		
		to be provided in details and included in the offers.		
	g.	Restriction signs or barriers of road tankers at weighbridge to prevent		
		touching the sides of weighbridge by road tankers and finally prevent the		
TEN CO		dropping of weigh shall be included in the offer.		
		CAL REQUIRMENTS:		
2.1		CAL CONDITION:		
	a.	The atmosphere is sulfurous, tropical and dusty.		
	b.	The elevation of site is less than 550 m above sea level.		
	C.	Minimum / Maximum ambient temperature= -5 °C / +55 °C.		
	c.	Maximum shade temperature = + 45 °C.		
	f.	Maximum relative humidity = 96%.		
	a.	PLC shall be state of art and sourced from a well-known manufacturer.		
	b.			
	C.	The PLC manufacturer should provide regular software updates, technical		
		support and maintenance services to ensure long life -term reliability &		
		performance of the system		
	d.	PLC configuration software license is to be supplied to allow future		
	-	engineering & troubleshooting by JPRC staff		
	-	Redundancy is only required for power supplies.		
	1.	The required memory should utilize up to 50% of the CPU memory (RAM		
2.2	111	and ROM) for optimal speed and performance.		
2.3				
		1F1 LCD touch screen with at least 19" display size and multi touch support		
	-	Backlight to be led type with long life time		
		Shall be rated for operation at ambient temperature of 0 to 60C°		
	-	Support alarms and logging functionality		
		Support logging data and displaying the logged data in trend views		
	g.	HMI configuration software original license shall be supplied to allow future		
	,	engineering and troubleshooting by JPRC staff		
	-			
2.4				
	-			
	1.	Device composition: body, door, cable gland plate, locking system with		
	g.	This cabinet is designed to withstand high humidity environments with its		
		The state of the s		
2.5		No. of the Control of		
	_	Material: EGRP (Glass Reinforced Polyester) or Stainless Steel		
		Environmental Suitability: Designed for use in high humidity environments		
	c.			
	2.2	2.2 PL a. b. c. d. e. f. 2.3 HN a. b. c. d. e. f. g. h. 2.4 Ma a. b. c. d. e. f. g.	2.2 PLC: a. PLC shall be state of art and sourced from a well-known manufacturer. b. The PLC should reserve 25%extra I/Os for future use. c. The PLC manufacturer should provide regular software updates, technical support and maintenance services to ensure long life -term reliability & performance of the system d. PLC configuration software license is to be supplied to allow future engineering & troubleshooting by JPRC staff e. Redundancy is only required for power supplies. f. The required memory should utilize up to 50% of the CPU memory (RAM and ROM) for optimal speed and performance. HMI: a. TFT LCD touch screen with at least 19" display size and multi touch support b. Component Type flat screen c. Backlight to be led type with long life time d. Shall be rated for operation at ambient temperature of 0 to 60C° e. Support alarms and logging functionality f. Support logging data and displaying the logged data in trend views g. HMI configuration software original license shall be supplied to allow future engineering and troubleshooting by JPRC staff h. Colored with resolution not less than 1024X768 2.4 Main Control Panel: a. Floor Standing Electrical Cabinet. b. compact enclosure single door with mounting plate c. Impact protection: IK10 d. 2.0 mm wall thickness. c. Installation accessory type: floor-standing f. Device composition: body, door, cable gland plate, locking system with handle door, mounting plate g. This cabinet is designed to withstand high humidity environments with its stainless-steel construction. 2.5 Pneumatic Control Panel: a. Material: EGRP (Glass Reinforced Polyester) or Stainless Steel b. Environmental Suitability: Designed for use in high humidity environments	

Э.			SPECIFICATION	DEVIATIO
		d.	Components: Solenoid valves and associated accessories. Block terminals. External lock rings for connecting existing copper tubes, which transmit pneumatic signals to the shut-off valves.	
		e.	Durability: Resistant to corrosion and degradation from humidity.	
-		f.	Safety: Complies with relevant safety standards for industrial environments	
1	2.6	1000	edback Limit Switches:	
		a.	Two separate feedback switches per shut-off valve (one for open state and one for close state).	
		b.	Mounting:	
			 Location: To be mounted on all shut-off valves. Mounting Type: Designed for secure attachment to valve body or actuator, ensuring reliable position feedback. 	
		c.	Mechanical Specifications:	
			 Actuation Mechanism: Designed to accurately detect valve positions through mechanical or proximity-based actuation. Materials: Constructed from high-quality materials to withstand environmental conditions and mechanical stresses. 	
		d.	Protection Degree: 1P67	
		e.	 Installation Features: Adjustability: Allows for fine adjustment to ensure accurate positioning and feedback. Connectivity: Equipped with appropriate terminals or connectors for easy wiring and integration into the control system. 	
		f.	Certification and Standards: Compliance: Meets relevant industry standards and certifications for quality and safety.	
2	2.7	Vib	ronic (Tuning Fork) Point Level Switch for liquids	
		a.	Accuracy +/-1mm.	
		b.	Construction: Made from durable materials to withstand harsh industrial environments and ensure long-term reliability.	
		c.	Output: Provides reliable output signals for integration with the control system. Power Supply: Compatible with standard industrial power supplies and control systems.	
		d.	Compliance: Meets relevant industry standards and certifications for quality and safety	
2	2.8	Pro	duct Conductivity Meter (Item No. 320-CE-8313 + 320-CT-8313)	
Γ		a.	Calibration certificate required	
	- 1	b.	0-50 μs/cm	
		c.	Accuracy :0.5% of full reading	
	1	d.	3/4" NPT Male Connection	
		c.	Conductivity Meter amplifier with output suits the PLC input channel	
		f.	Temperature Compensation	
		g.	To be used in Harsh, Acidic and corrosive environment	
	- 1	h.	Refer to Conductivity Analyzer Data Sheet (Attachment No. 7)	

NO.			SPECIFICATION	DEVIATION
	2.9	Fee	ed Conductivity Meter (Item No. 320-CE-8317 + 320-CT-8317)	T
		a.	Calibration certificate required	
10		b.	0-500 μs/cm	
		C.	Accuracy :0.5% of full reading	
		d.	3/4" NPT Male Connection	
		e.	Conductivity Meter amplifier with output suits the PLC input channel	
		f.	Temperature Compensation	
		g.	To be used in Harsh, Acidic and corrosive environment	
		h.	Refer to Conductivity Analyzer Data Sheet (Attachment No. 8)	
	2.10		ica Analyzer (Item No. 320-AE-8315 + 320-AT-8315)	
		a.	Measurement range (0 to 1) ppm SiO2	
		b.	Accuracy 1% of reading	
		C.	Calibration 2-point, automatic calibration	
		d.	Silica Analyzer amplifier with output suits the PLC input channel.	
		e.	V₂" NPT male connection	
		f.	Calibration certificate required	
		g.	Compliance: Meets relevant industry standards and certifications for quality	
			and safety	
		h.	Refer to Silica Analyzer Data Sheet (Attachment No. 6)	
	2.11	PH	Meter (Item No. 320-AE-8316 + 320-AT-8316)	
		a.	Calibration certificate required	
		b.	1/2" NPT Male Connection	
		C.	Range PH: 0 to 14 PH	
		d.	mV Measurement: 0+/-1999 mv	
		e.	Resolution PH: 0.01	
		f.	Accuracy PH: 0.01	
		g.	Temperature Compensation	
		h.	To be used in Harsh, Acidic and corrosive environment	
		i.	Compliance: Meets relevant industry standards and certifications for quality and safety	
		j.	Refer to pH Analyzer Data Sheet (Attachment No. 5)	
	2.12	Tra	aining	
		a.	Training shall only be done after commissioning and final acceptance test	
			has been completed and passed. Any training done prior to final acceptance	
			will not be accounted for the formal training requested and contractor shall	
			do the training after the final acceptance test is passed at no additional cost	
			to the JPRC.	
		b.	Provide a comprehensive overview of the automation system, explaining its	
			purpose, components, and how it integrates with existing processes and	
			equipment.	
		c.	Explain the architecture of the automation system. Help the staff understand	
			how data flows through the system and how different components interact.	
		d.	Familiarize the staff with the user interface of the automation system. Train	
			them on how to navigate through the screens, access different functionalities,	
			and interpret the displayed information	
		e.	Teach the staff how to handle system alarms effectively. Explain the different	
			types of alarms, their priorities, and the appropriate actions to take when	
			alarms are triggered. Emphasize the importance of timely response and	
			troubleshooting to prevent disruptions	

S. NO.			SPECIFICATION	DEVIATION
		f.	Data Logging and Reporting: Train the staff on how to configure and utilize the data logging capabilities of the automation system. Show them how to generate reports, analyze historical data, and extract relevant information for process optimization and decision-making. Troubleshooting: Provide troubleshooting techniques for identifying and	
			resolving common issues that may arise in the automation system. This includes diagnosing hardware or software problems, verifying communication integrity, and restoring system functionality.	
		h.	Maintenance Procedures: Educate the staff on routine maintenance tasks required for the automation system. Cover topics such as cleaning, calibration, equipment checks, and preventive maintenance schedules. Ensure they understand the importance of adhering to maintenance procedures to maximize system performance and lifespan	
		i.	Documentation and Resources: Provide comprehensive documentation, user manuals, and reference materials related to the automation system. Ensure the staff knows how to access and utilize these resources for ongoing learning and troubleshooting.	
	2.13		etrical Wiring:	
		b.	Electrical wiring shall be according to British standard BS 5308. All electrical wiring shall be Protected against rodent, rain water, sewer water, corrosion, erosion and Hydrocarbon liquid.	
	00.1	c.	Proper earthling system shall be provided.	
3.		-	ARTS:	
	1.	qua Ana	detailed spare parts list shall be provided, including at a minimum one item untity of the following: a PLC CPU Card, a PLC Analog Input Card, a PLC alog Output Card, a PLC Digital Input Card, a PLC Digital Output Card, a C Redundant Power Supply Card, and an HMI (Human-Machine Interface).	
	2.	In of including for with	case that any spare parts needed during the first guaranteed year and not luded in the offered spare parts, the Contractor shall provide these spare parts the first guaranteed year and next two years operation at his own expense, hin shortest time (by air freight).	
	3.	dra	are parts lists shall be provided with parts numbers cross referenced to relevant wings.	
	4.	gua afte	e Tenderer shall guarantee, and secure to the Company, the Manufacturer(s) trantec(s) for the supply of spare parts upon the Company's request for 15 years or receiving the equipment at the site.	
	5.	The	spare parts shall be delivered at the same time as the main equipment and ll be clearly labeled to distinguish them from the main equipment.	
4.	ATT	ACH	MENTS:	
	No.1		ing & instrument diagram (P&ID) of steam & feedwater system.	
	No.2		formance Guarantee form.	
	No.3		ality assurance plan and inspection & testing plan.	
	No.4		tem Control Philosophy.	
	No.5		Analyzer Data Sheet	
	No.6		ca Analyzer Data Sheet	
	No.7		duct Conductivity Analyzer Data Sheet	
	No.8	Fee	d Conductivity Analyzer Data Sheet	

ATTACHMENTS	المرفقات



Attachment No. (2)

PERFORMANCE GUARANTEE

MESSRS: JORDAN PETROLEUM REFINERY CO. LTD P.O.8OX 1079 AMMAN-JORDAN DEAR SIRS. AT THE REQUEST OF MESSRS..... (HEREINAFTER CALLED "THE ACCOUNTEE"), WE HEREBY ISSUE IN YOUR FAVOUR OUR L/G NO. AS FOLLOWS: WE....., AMMAN / JORDAN IRREVOCABLY AND UNCONDITIONALLY HEREBY UNDERTAKE TO PAY YOU WITHOUT DELAY ON YOUR FIRST WRITTEN DEMAND AND NOTWITHSTANDING ANY OPPOSITION OR OBJECTION BY THE ACCOUNTEE WITHIN THE VALIDITY OF THIS GUARANTEE, THE AMOUNT OF IN RELATION TO TENDER NO. FOR THE SUPPLY OF..... THIS GUARANTEE SHALL REMAIN VALID UNTIL AND

THE VALIDITY OF THIS GUARANTEE SHALL BE RNEWED AUTOMATICLLY AND WILL NOT BE CANCALLED WITHOUT YOUR WRITTEN CONSENT (ON THE

ACCOUNTEE OWIN EXPENSE)

Attachment No. (3)

1.	UALITY ASSURANCE PLAN AND INSPECTION & TESTING PLAN REQUIREMENTS: QA PLAN
	Contractor during bidding stage shall submit his quality assurance plans (QAP) consisting or relevant procedures covering various activities like design and engineering, material procurement, manufacture inspection and testing, documentation, dispatch to site, erection and commissioning wherever applicable, and maintenance of quality records in the post-order stage. The contractor shall submit the QAP to the site engineer for approval within 2 weeks from the date of receipt of the purchase order, whichever is earlier. The QAP shall be approved by the authorized representative of JPRC within a week of submission.
2.	TIP
	The contractor shall submit an inspection and test plan for approval within 2 weeks of the purchase order and before the commencement of manufacture to JPRC, as well as to the third-party inspection agency (TPIA) that the contractor wishes to appoint for carrying our inspection and testing. This document should clearly specify the name and designation of the person concerned (with telephone/mobile number and email) and the communication address of the TPI.
3.	DRAWING SCHEDULE
	Contractor shall submit a total index of drawings and documents required for (approval / review / records) along with the scheduled date of submission of each drawing/document within 2 weeks from date of issue of purchase order.
4.	PROGRESS REPORT AND SCHEDULE
	Contractor shall subunit monthly progress report and update procurement engineering and manufacturing schedule ever month starting from 2 weeks from date of issue purchase order.
5.	WAIVING AND DEVIATION
	Contractor shall strictly comply with the purchase order stipulations, as well as no deviations shall be permitted.
6.	PROCUREMENT OF BOUGHT OUT MTERIALS
	All critical materials (such as easting, forging, fitting, pressure holding parts electrical and instrument accessories etc.) shall be purchased by the contractor from subcontractors which instrument accessories having JPRC approval. Contractor shall submit a list of bought out materials for JPRC approval within 2 weeks from the date of issue of purchase order whichever is earlier.
7.	CALIBRATION RECORDS
	Contractor shall only use calibrated measuring, test instruments and maintain calibration records- Contractor shall furnish records of calibration of measuring and test instruments including recalibration records to Third party inspection agency on demand.
8.	INSPECTION TEST STATUS
	Inspection and test status of products shall be identified by using markings (Authorized stamps, tags, route cards, inspection eardsetc.) during the course of manufacturing to clearly indicate acceptance/rejection of tests/stages of inspection performed during manufacturing cycle. The identification of test status shall be maintained and submitted the records demanded b JPRC/TPIA.
).	QUALITY RECORDS
	Contractor shall maintain quality records as per his procedures- Inspection reports & test records copies shall be furnished to JPRC/TPIA.

10.	IDE	NTIFICATION AND TRACEABILITY
	Con proc proc avai proc thro	tractor shall establish and maintain a written standard procedure for identifying the lucts from applicable drawing specifications or other documents during all stages of luction, delivery and installation. A copy of this standard procedure shall be made lable to JPRC/TPIA. The contractor shall ensure that each product that is going in the ess of fabrication / manufacture / construction / erection has proper identification uphout the process including the final output.
11.	CO	NTRACTOR DOCUMTENT FOR REVIEW AND RECORDS GENERAL
	1	All documents shall be in English language and SI system of units
	2	review of the contractor drawing by third part inspection agency/ J PRC would be only to review compatibility with basic design and concepts and in no way absolve the contractor of his responsibility to comply with purchase order requirements, applicable codes, specifications and statutory rules/regulations
	3	Submission Of documents for review/records shall commence within 2 weeks from the date issue of purchase order.
	4	The contractor shall submit all drawings and documents in four copies.
	5	The documents shall also be submitted in soft copies to expedite the process of approval/review.
	6	Contractor shall ensure that each drawing shall contain the following information: Purchase Order of Equipment, Tag No. and Part No., name of Project, Client, Drawing No./ Document Title, No. Revision and Date.
	7	The drawing document shall be checked, approved, duly signed and stamped by the contractor revisions and date.
12.	• A	iments under review category: wing codes shall be used for reviewing issues of the contractor documents / drawings: iFI: Approved for Inspection. iFM: Approved for Manufacturing / Fabrication as per comments contractor shall esubmit the same after incorporating the comments before carrying out final inspection by TPIA and Dispatch. iot Approved: Resubmission required in cases of major non-conformities with respect to purchased order.
13.	Final Built JPRC origin Instal	documents and drawings consisting of manual technical data as a compilation of Ascertified drawing and manufacturing data and test records which duly certified by TPIA should be submitted in three sets along with soft copy of the same with the nal copy of reports to site. Iation, Operating and Maintenance Instructions of the equipment / material (wherever eable) shall also be submitted in hard copy (three sets) and in soft format (two CDs).

Attachment No. (4)

Water Treatment System Control Philosophy

Control system for the Water Treatment Unit allows for semi-automatic startup, shutdown, supply and regeneration.

* Water Treatment Unit Equipment

The Water Treatment Unit consists of the following main equipment for treatment, storing and transport:

Designation	Item
Feed Water Pumps	31-415 A, B, C
Cation Filter	320 - F1
CO ₂ Degassifier	320 - D
Degasified Water Tank	320 - V10
Degasified Water Pump	320 - P11 A, B
Air Fan	320 - FA
Weak Base Anion Filter	320 - F2
Strong Base Anion Filter	320 - F3
Dematerialized Water Storage Tank	320 - T1
HCl Measuring Tank	320 - V11
HCl Ejector	320 - E1
NaOH Measuring Vessel	320 - V12
NaOH Ejector	320 - E2
NaOH Solution Preheater*	320 - PH1
Reagents Dilution Pump	320 - P12

^{*} Currently the heater is out of service, and may be used in the future.

The following HMI operators are given to control how the Water Treatment System is made:

· "Standby" button:

- After completion of The Water Treatment Unit regeneration sequence.
 Returning the regenerated unit to "Standby" mode by selecting the "Standby" button.
- When the Demin Storage Tank No. 7001 level rises above the high level set point. Water Treatment Unit will then return to "Standby" mode by selecting the "Standby" button.
- During "Service" mode when the Feed water Pumps are unavailable. Water Treatment Unit will then return to "Standby" mode by selecting the "Standby" button.

· "Service" button:

- After completion of The Water Treatment Unit regeneration sequence.
 Returning the regenerated unit to "Service" mode by selecting the "Service" button.
- When the Demin Storage Tank No. 7001 level falls under the lower level set point. Water Treatment Unit will then return to "Service" mode by selecting the "Service" button.

· "Regeneration Start" Push Button:

 During "Service" mode when the unit regeneration is required (conductivity of treated water is higher than 20 μs /cm) the unit will stay in "Service" till selecting the respective "Regeneration Start" button.

Description of Control Machines

1. Regeneration Timer

- In this timer, the motor, cams and micro switches are engaged. It takes 360 minutes for one revolution. The number of internal cams and micro switches is 10.
- When the knob for timer is placed at position "AUTO" (A) the cam shaft and motor clutch will be connected and the regenerating process will progress autumnally. When placed at position "Manual" (M) cam shaft and motor clutch will be disengaged, resulting in stopping of the timer. When the knob for timer is placed at position "M", the cam shaft can be turned manually and regeneration can be made from any process.
- But in the case the knob is positioned at (M) the cam shaft will be separated from the motor. Therefore, as it does not progress automatically, the process at the position will be kept continuing.

2. Pilot lamp for Process

- Water supply process (Service)
- Regeneration process (Regeneration)

Process	Cation Unit	Weak Base Anion Filter	Strong Base Anion Filter
Water supply process	Cation service	Weak Anion service	Strong Anion service
Back washing process	Cation back washing	Weak Anion back washing	Strong Anion back washing
Settling process	Cation rest	Weak Anion rest	Strong Anion rest
Regeneration process	New HCl feeding	From Strong Base Anion Filter	New NaOH feeding
Extruding process	Cation Displacement	Weak Anion Displacement	Strong Anion Displacement
Water washing	Cation rinsing	Weak Anion rinsing	Strong Anion No.1 rinsing
process			Strong Anion No.2 rinsing
Already measured	HCl consumption vessel high level	_	NaOH consumption vessel high level

3. Alarms

- a. Pilot lamp for signaling decrease in water quality: when water quality increases over 20 micromhos/cm, the "high conductivity" lamp stays on.
- Pilot lamp for increasing of water silica concentration:
 When water silica concentration is higher than alarm set value (0.5 ppm) the "HIGH SILICA" lamp stays on.
- c. Pilot lamp for increasing of NaOH temperature (For Future): When the temperature is higher than alarm set value (40 °C) the "NaOH High Temperature" lamp stays on.
- d. <u>Pilot lamp for measure failure</u>: In case the liquid level of LC has not reached the upper limit until Cation rest starts, the main timer will stop and the "Measure fail" lamp stays on.
- e. Pilot lamp for low level in CO₂ degasified water tank: When the liquid level in tank is lower than set water level, the "Degasified water tank low level" will be lighted.
- f. Pilot lamp for low level in treated water tank: When the liquid level in tank is lower than set water level the "Treated water tank tow level" will be lighted.
- g. Pilot lamp for high level in treated water tank: When the liquid level in tank is higher than set water level, the "Treated water tank high level" will be lighted.

Alarm System Operation

Alarm system for alarm points mentioned above (see items a to g) is standard type 'A' as follows:

 Normal condition 	No light or audible alarm
- Fault occurs	Flashing light and audible alarm
- Alarm accepted	Steady light and audible alarm silenced
- Condition returns to normal	Light goes out

When fault occurs, flashing light (one from items a to g) and audible alarm (horn H) are in operation. When the push button "ACCEPT" is pressed, alarm is accepted and horn H is silenced, but light stays on.

Pilot lamps for motor running

When one motor (from those listed below) is in operation, the own "MOTOR RUNNING" lamp will be lighted. The same is valid for the following 7 motors:

- Air fan No.1 (320-FA/l)
- Air fan No.2 (320-FA/2) (Currently the fan is not available and may be installed in the future)
- Degasified water pump No.1 (320-P11/I)
- Degasified water pump No.2 (320-P11/2)
- Reagents diluting pump (320-P12)

4. Switches

Provide the valve position to a PLC to quickly and easily determine a valve's position is recommended.

- S1- Main switch for sequence circuit
- S2- Switch for sequence circuit of Cation unit
- S3- Switch for sequence circuit of Anion unit
- b1- Push button switch for regeneration start
- b2- Push button switch for lamp test
- b3- Push button switch for horn reset

1b1 to 7b1- Rotary selector switch four positions (for motor control regime choice):

- R- remote control
- H- hand control
- O- off
- A- automatic

1b2 to 7b2 - Push button for motor starting

1b3 to 7b3 - Push button for motor stopping

- · Push button switch for "Standby Mode" is recommended.
- Push button switch for holding regeneration procedure at any time and at any stage, and resume it to complete the regeneration procedure is recommended.

Usual Regeneration Process

Before the regeneration process commence it is assumed that raw water is being supplied, raw water is metered by local flow indicator 320-FI-8301 and by flow 2-pen recorder 320-FR-8302 and 320-FR-8309 (on first pen) located at control panel.

When the demineralized water conductivity increases exceeding 20 µs/cm, the signal from conductometer 320-CT-8313 gives an acoustical signal (320-CAH-8313) and the operator orders the beginning of the regeneration cycle by pressing the push button of regeneration start (tag b1). Regeneration duration is 6 hours (360 minutes).

The regeneration cycle consists of the following operation sequence.

1. Backwashing

a. Strong Base Anion Filter, Item 320-F3

- Valves 320-XV-P1, P2 and P10 are closed
- Valves 320-XV-P3 and P4 are opened
- Timer (Start & Finish Times): 0' to 20'
- Operation duration is 20 minutes
- Flow rate is 30 40 m³/hr
- Water Source is degasified water from Degasified Water Tank 320-V10 using degasified water using pumps (320-P11 A, B)

During this period of time 320-F2, the degassing tower 320-D, the fan 320-FA and the pump 320-P11 will be kept in operation. After 20' the valves 320-XV-P3 and P4 are closed.

b. Weak Base Anion Filter, Item 320-F2

- After 20' from the regeneration beginning the valve 320-XV-A1 is closed and the valves 320-XV-A2 and A3 are opened.
- Timer (Start & Finish Times): 20' to 40'
- Operation duration is 20 minutes
- Flow rate is 30 40 m³/hr
- Water Source is degasified water using pumps (320-P11 A, B)

After the backwashing period of time the valves 320-XV-A2 and A3 are closed and the pump 320-P11 is stopped.

c. Cation Filter, Item 320-F1

- After 40' the fan item 320-FA is stopped, the valves 320-XV-K1 and K2 are closed and the valves 320-XV-K3 and K4 are opened.
- Timer (Start & Finish Times): 0' to 35'
- Operation duration 20' is 35 minutes
- Flow rate is 78 -80 m³/hr
- Water Source is RO permeate water from TK-194 using pumps (31-415 A, B, C)
 After 35' from the beginning of the cycle the valves 320-XV-K3 and K4 are closed.

2. Rest

- a. Strong Base Anion Filter, Item 320-F3
- Rest duration is 80 minutes
- b. Weak Base Anion Filter, Item 320-F2
- Rest duration is 80 minutes
- c. Cation Filter, Item 320-F1
- Rest duration is 5 minutes
- d. Degassing tower and fan 320-D & 320-FA
- Rest duration is 205 minutes

3. Reagents Feeding

a. Cation Filter - Item 320-F1

Feeding with fresh HCl begins at the moment when the timer reaches 40'. This operation consists of:

- Opening of the valve 320-XV-K11 on the HCl pipe to the ejector (item 320-E1) and the valve 320-XV-K13 on the impulse water pipe of the ejector, item 320-E1, also opening of the valves 320-XV- K6 outlet of HCl ejector 320-E1 to Cation Filter 320-F1 and 320-XV-K7.1 (out to pit).
- Starting-up of the dilution pump item 320-P12
- 8% Hydrochloric acid flow rate downstream the ejector is 20 m³/hr (15.3 m³/hr of water and 4.7 m³/hr of HCl)
- Timer (Start & Finish Times): 40' to 80'
- Operation duration is 40 minutes

- Water Source is degasified water from Degasified Water Tank 320-V10 using dilution pump 320-P12
- Chemical Source is HCL measuring tank / consumption vessel (320-V11)

b. Strong Base Anion Filter 320-F3

Feeding with fresh soda solution begins at the moment when the timer reaches 100'. This operation consists of:

- When the soda solution level reaches the maximum value in the vessel item 320-V12, the valve 320-XV-P11 on the NaOH pipe to the ejector (item 320-E2) and the valve P13 on the water pipe are to be opened.
- The dilution pump 320-P12 is started
- The valve 320-XV-P6 outlet of NaOH ejector 320-E2 to Strong Base Anion Filter 320-F3 and 320-XV-P7.1 (out to pit) are opened
- 4% sodium hydroxide flow rate downstream the ejector is 17.5 m³/hr (15 m³/hr of water and 2.5 m³/hr of NaOH)

The temperature controller TC-8324 to control the solution temperature is out of service.

- Timer (Start & Finish Times): 100' to 145'
- Operation duration is 45 minutes
- Water Source is degasified water from Degasified Water Tank 320-V10 using dilution pump 320-P12
- Chemical Source is NaOH measuring tank / consumption vessel (320-V12)
- After 20 minutes of NaOH regeneration for polisher P7.1 is closed and A6 is opened to start regenerating the anion via the partially spent NaOH.

c. Weak Base Anion Filter - item 320-F2

Feeding with soda solution from Strong Base Anion Filter 320-F3 begins at the moment when the timer reaches 120'. This operation consists of:

- The valve 320-XV-A6 outlet line from Strong Base Anion Filter 320-F3 and 320-XV-A7.1 (out to pit) are opened
- Soda solution flow rate is 17.5 m³/hr.
- Timer (Start & Finish Times): 120' to 145'
- Operation duration is 25 minutes
- Water and chemical Sources is from Strong Base Anion Filter 320-F3

4. Displacement

a. Cation Filter - item 320-F1

First Stage of Displacement:

- When the level in the vessel 320-V11 has come down to the minimum value level switch 320-LSL-8318 initiates the closing of valve 320-XV-K11 on the HCl pipe.
- Valves 320-XV- K6, K13 and K7.1 are still opening.
- Displacement water flow rate is 15 m³/hr
- Timer (Start & Finish Times): 80' to 100'
- Operation duration is 20 minutes
- Water Source is degasified water from Degasified Water Tank 320-V10 using dilution pump 320-P12

Second Stage of Displacement:

- Closing of valves 320-XV-K6 & K13.
- Valve 320-XV-K7.1 is still opening.
- Opening of valve 320-XV-K8 of Cation Filter 320-F1
- Displacement water flow rate is 20 m³/hr
- Timer (Start & Finish Times): 100' to 170'
- Operation duration is 70 minutes
- Water Source is RO permeate water from TK-194 using pumps (31-415 A, B, C)

b. Strong Base Anion Filter item 320-F3

First Stage of Displacement:

- When the level in the vessel 320-V12 comes down to the minimum value, level switch 320-LSL-8320 initiates the closing of the valve 320-XV-P11 on the NaOH pipe and valve 320-XV-P7.1
- Valves 320-XV-P13 & P6 are still opening
- Displacement water flow rate is 15 m³/hr
- Timer (Start & Finish Times): 145' to 205'
- Operation duration is 60 minutes
- Water Source is degasified water from Degasified Water Tank 320-V10 using dilution pump 320-P12
- The outlet water from Strong Base Anion Filter 320-F3 is being directed to Weak Base Anion Filter 320-F2

During the period from 205' to 290' all valves of the Strong Base Anion Filter 320-F3 are closed and the filter will be rest.

c. Weak Base Anion Filter 320-F2

First Stage of Displacement:

- Valves 320-XV-A6 & A7.1 are still opening
- Displacement water flow rate is 15 m³/hr
- Timer (Start & Finish Times): 145' to 205'
- Operation duration is 60 minutes
- Water Source is from Strong Base Anion Filter 320-F3

Second Stage of Displacement:

- Closing of valve 320-XV-A6.
- Opening of valve 320-XV-A8 of Weak Base Anion Filter 320-F2
- Displacement water flow rate is 20 m³/hr
- Timer (Start & Finish Times): 205' to 250'
- Operation duration is 45 minutes
- Water Source is from Strong Base Anion Filter 320-F3
- Water Source is degasified water from Degasified Water Tank 320-V10 using degasified water using pumps (320-P11 A, B)

5. Washing (Rinsing)

a. Cation Filter item 320-F1

- When the timer indicates 170 minutes, the valve 320-XV-K8 is initiated to close and 320-XV-K1 to open for water washing. Also, the valve 320-XV-K7.1 is initiated to close and the valve 320-XV-K7.2 to open.
- Washing water flow rate is 78 m³/hr
- Timer (Start & Finish Times): 170' to 205'
- Operation duration is 35 minutes
- Water Source is RO permeate water from TK-194 using pumps (31-415 Λ, B,
 C)
- After 35 minutes, the washing is over. Valve 320-XV-K7.2 is closed and valve 320-XV-K2 is opened and the filter is ready to produce Cation - free water.

b. Weak Base Anion Filter 320-F2

- When the timer indicates 250 minutes, the valve 320-XV-A8 is initiated to close and the valve 320-XV-A1 to open for water washing. Also, the valve 320-XV-A7.1 is initiated to close and the valve 320-XV-A7.2 to open.
- Washing water flow rate is 78 m³/hr
- Timer (Start & Finish Times): 250' to 290'
- Operation duration is 40 minutes
- Water Source is degasified water from Degasified Water Tank 320-V10 using degasified water using pumps (320-P11 A, B)

c. Strong Base Anion Filter 320-F3

First Stage of Rinsing

- For the washing, the valves 320-XV-P1 and 320-XV-P7.2 are open.
- Washing water flow rate is 78 m³/hr
- Timer (Start & Finish Times): 290' to 330'
- Operation duration is 40 minutes
- Water Source is degasified water from Degasified Water Tank 320-V10 using degasified water using pumps (320-P11 A, B)

Second Stage of Rinsing

- The valve 320-XV-P1 is kept open.
- Closing the valve 320-XV-P7.2, and opening the valve 320-XV-P9
- Washing water flow rate is 78 m³/hr
- Timer (Start & Finish Times): 330' to 360'
- Operation duration is 30 minutes
- Water Source is degasified water from Degasified Water Tank 320-V10 using degasified water using pumps (320-P11 A, B)

The conductivity gets lower an after 360 minutes it is 20 µs/cm that means the second stage of washing is over and the filter is ready for operation.

* Demineralized Water Supply

a. Cation Filter (320-F1)

After 205 minutes the valve 320-XV-K7.2 is closed, the valve 320-XV-K2 is opened and the valve 320-XV-K1 is kept open. The water is sent through the degasifying tower into the degasified water tank 320-V10. At the same time the fan 320-FA is started up.

b. Weak Base Anion Filter (320-F2)

After 290 minutes the valve item 320-XV-A1 is kept open. The valve 320-XV-A7.2 is closed, and water is sent to the strong base Anion filter, 320-F3.

c. Strong Base Anion Filter (320-F3)

The valves 320-XV-P1 is kept open and 320-XV-P9 is closed. When the conductivity decreases under 20 µs/cm the conductometer 320-CT-8313 initiates the opening of valve 320-XV-P2 to the demineralized water tank, item 320-T1.

Attachment No. (5)

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Attachment No. (6)

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Location: At Water Treatment Unit outlet line (Strong Base Auton Filter 320-E3 discharge line)	Lecution: A Water Treatment Unit outlet line (Strong Base Anton Filter 320 - F5 discharge line) Environment		zer to co	ontinuously measure the silica concentration of d	demineralized water	1	
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Attachment No. (7)

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Attachment No. (8)

Analyzet Analyzet Analyzet to continuously, measure the conductivity of water Vater Treatment Unit inlet line (Cation Filter 320 - F1 feed line) The atmosphere is tropical, sulfurous and dusty Childhor Safe - Area ENVIRONMENTAL P TRANSMITTER 0 - 500 µS.cm 10 - 500 µS.cm 2 - 500 µS.cm 2 - 500 µS.cm 3 - 50 n.s F.c. TRANSMITTER 0 - 500 µS.cm 2 - 6 n.s F.c. Nes TRANSMITTER TRANSMITTER 7-clectrode type 0 1 cm	PLANT LOCATION DRAWING DN DATA ON DATA PROTECTION Repeatability Stability Stability Min. Ambient Temperature Max. Ambient Temperature Humidirit Limits	Water Treatment Unit - 2 Utilities - 2 Attachement No. 1
COF Conductivity Measurement EQTD One Analyzer One Analyzer One Analyzer At Water Treatment Unit inlet line (Catton Filter 320 - F1 feed line) one of the state of the st		Utilities - 2. Affachement No. 1
togram Conductivity analyzer to continuously measure the conductivity of water and water Treatment Unit inlet line (Caten Filter 320 - Fi feed line) INSTALLATION INSTALLATION Instant Conductivity analyzer to continuously measure the conductivity of water at least fleation INSTALLATION INST		Affachement No.1
nn: At Water Treatment Unit inlet hine (Cation Filter 320 - FI feed line) INSTALLATIO nnent		
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rature Protection Sunshade TRANSMITTER 0 - 500 µS.km 1 Temp. Compatibility 1 0.5% of reading 1 Temp. Coefficient 2 Temp. Coefficient 3 Temp. Coefficient 4 Temp. Coefficient 2 Temp. Coefficient 3 Temp. Coefficient 4 Temp. Coeffici	REDATA Repetability Stability Min. Ambient Temperature Max. Ambient Temperature Max. Shade Temperature Mat. Shade Temperature Humidity Limits	
TRANSMITTER	R DATA Repealability Stability Min. Ambient Temperature Max. Ambient Temperature Max. Shader Temperature Humidire Limits	
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Treng, Coefficient a 0 - 800 µS cm ### According to EN 64326 ### According to EN 64326 #### According To EN 64326 ###################################	Repeatability Stability Min. Ambient Temperature Max. Ambient Temperature Max. Staber Temperature Max. Staber Temperature Humidity Limits	
range to 9.5% of reading rom agnetic Compatibility According to EN 61326 for the Confine to 10.5% of reading "C Integrated and EN The Messages read Conn. The Messages The Messa	Stability Min. Ambient Temperature Max. Ambient Temperature Max. Shade Temperature Humidire Limits	± 0.5% of reading
remagnetic Compatibility According to EN 61336 fent Temp. Coefficient 10 05% of reading "C 10 05% of reading "C 11 05% of reading "C 12 0 mA IX 12 0 mA IX 12 0 mA IX 13 0 mA IX 14.50 mA IX 15 0 mA IX 16 0 mA IX 16 0 mA IX 17 0 mA IX 18 0 mA IX 18 10	Min. Ambient Temperature Max. Ambient Temperature Max. Shade Temperature Humidity Limits	0.5% of reading 24h
rent trapp. Coefficient # 0.05% of reading "C. briggraded +-20 mA EX. re Messages Yes re Messages Yes read Coun. PLCG IN PLOW DETE Selectrode type Onstant O, 1 cm stion PEEK (polyether-chier-ketone) FLOW FITTH	Max. Ambient Temperature Max. Shade Temperature Humidity Limits	.5=2.
mment Signal - A 20 m.A DX re Messages riest Conn. TBA PLIG IN PLOW DETE 2-electrode type 0,1 cm 0,1 cm PEEK (polyether-elner-ketone) FLOW FITTI	Hamidity Limits	45 °C
rical Contr. Yes TBA TBA PLUG IN FLOW DETE Selectrode type 0,1'cm 0,1'cm PEEK (polyether-winer) FLOW FITTI	Humidity Limits	7.66
rieat Conn. TBA PLUG IN FLOW DETE Survivale type 0,1'cm 0,1'cm 316 stanless steel PEEK (polyether-wiher-ketone) FLOW FITTI		is various occurrent surveying at 35 %,
Substant 2-electrode type PLUG IN FLOW DETE 0,1 cm 0,1 cm 316 stanless steel PEEK (polyether-ether-ketone) PEEK (polyether-ether-ketone) FLOW FITTI	ī	value - 90%
onstant 2-electrode type 6,1/cm 0,1/cm 0,1/cm 316 stanless steel 816 stanless steel 9EEK (polyether-ether-ketone) 9EEK (polyether-ether-ketone) 16. (c. (c. (c. (c. (c. (c. (c. (c. (c. (c		
Surstant 2-electrode type 0,1'cm 316 standers steel pEEK (polyether-ether-ketone) FLOW FITTI	ECTOR DATA	
onstant of the standars steel ation PEEK (polyether-ether-ketone) FLOW FITTI	Type of installation	Retractable
ation 316 standers steel PEEK (polyether-ether-ketone) FLOW FITTI	Max. Temperature	15 °C
ation 316 standers steel PEEK (polyether-ether-ketone) FLOW FITT	Maximum Pressure	6 kg·cm
PEER (polyether-ether-ketone) FLOW FITT	E landsonda	4.5
FLOW FITT	Factorities	Characteristics of continues for a plant All.
FLOW FITT		magnesium with epoxy polyester coalding
16 10 16 10	TING	
temperature wange of Sample	Max Pressure	6 kg cm²
By Vendor	Process Connections	3/4 inch NPT teffon coated
riah		
Retaining nut		
TESTING AND CERTIFICATES	KTIFICATES	
Alibration Certificate Yes		
Material Certificate Yes		
GENERAL NOTES	OTES	
- Chiltres available electrical power 110 V AC, 50 Hz		
Ventor to privide cable from detector to amplifier transmitter		
-All equipment shall be tronscaled to eleminate middew, times and other determental referes of money, recomment. Predictions shall be corrected for charmony and stocked money assessed to element the control of the co	ical cremomers. Pickenin chall be corre-	to fee chamming and storage mades to an and