

No	Item	Unit	QTY	Unit Price	Sub Total Price
3	Flow Computer Input Signal 4-20 mA Hart/ Pulses (Pulse per Kg, Pulse Per Litter) Output Signal 4-20 mA Communication Modbus RTU Protocol RS485, Modbus TCP/IP Supply Voltage 24 DCV Flow rate and Proving Calculations AGA6, AGA9 Gas Property Calculations AGA5, AGA8 Part 1, AGA8 Part 2, AGA10 Country of Origin USA, England, Germany, Switzerland, Italy	Piece	2		
4	Pressure Transmitter Accuracy ± 0.1 % of span (or better) Pressure Range [Kg/cm ²][g] 0 - 60 Display LCD Unit Bar Ingress Protection, Certification IP 65 or Higher, Ex "d" Supply Voltage 24 DC V Calibration Certificate Required Country of Origin USA, England, Germany, Switzerland, Italy	Piece	4		
5	Temperature Transmitter Accuracy ± 0.1 % of span (or better) Temperature Range [°C] 0 ... 100 Display LCD Ingress Protection, Certification IP 65 or Higher, Ex "d" Supply Voltage 24 DC V Calibration Certificate Required Country of Origin USA, England, Germany, Switzerland, Italy	Piece	4		
6	Pressure Gauge Accuracy 1% of span Pressure Range [barg] 0 ... 60 Dial Size [mm] 150 Ingress Protection IP 65 or Higher Calibration Certificate Required Country of Origin USA, England, Germany, Switzerland, Italy	Piece	2		
7	Temperature Gauge Accuracy 1% of span Temperature Range [°C] 0 ... 100 Dial Size [mm] 150 Ingress Protection IP 65 or Higher Calibration Certificate Required Country of Origin USA, England, Germany, Switzerland, Italy	Piece	2		
8	Isolation valve Size [inch] 6" ANSI Class 300, Sh.80 Type Ball Valve End Connection Flanged, RF as per ASME B16.5 Valve Operator Motorised Manual Operated Required, by hand wheel Function On/off Application Dry gas measurement, custody transfer applications Operating Temperature [°C] 0 - 50 Operating Pressure [barg] 10 - 38 Supply Voltage 1 Φ , 220V AC, 50 Hz Ingress Protection, Certification IP 65 or Higher, Ex "d" Country of Origin USA, England, Germany, Switzerland, Italy	Piece	5		

No	Item	Unit	QTY	Unit Price	Sub Total Price
15	Electrical and Mechanical Works This encompasses, but is not limited to: <ul style="list-style-type: none"> - Provision and installation all associated pipes, Flanges, fittings, isolation valves, PRVs and drain valves - Provision and installation appropriate metering skid canopy - Pipe cutting in situ, supplying and welding the opposite upstream and downstream flanges, and the installation of the whole metering skid. - Provision and wiring up all electrical and signal cables, PLC, cable tray, electrical panels, earthing system, and junction boxes - Supply, laying, and wiring up all power and signal cables in trench with depth 120 cm and width 30 cm, from the metering skid to control room (400 m maximum). The work includes digging of the trench (manual and automated according to the site), laying the cables and warning tapes then backfill the trench with soil. 	Totally	Totally		
16	Training Five days training "excluding travel days" should be given for custody transfer dep. personnel. Training shall be conducted in Country of Origin. The training program shall encompass the aspects below: <ul style="list-style-type: none"> - System operation - General and preventive maintenance. - General system familiarization including design. - Measuring techniques. - Troubleshooting. 	Person	5		
17	Factory Acceptance Test (FAT) <ul style="list-style-type: none"> - The (FAT) shall be conducted following the approved FAT Plan. - The FAT Plan shall be prepared by the vendor and submitted to the first party (MDOC) for review and approval. - The full skid system integration test for the FMS package (Flow Computers, UFM, supervisory computers, PLC, field instrumentations) shall be done at factory before shipping. - Four personnel from Midland Oil Company shall witness the Factory Acceptance Test (FAT) in the presence of a third-party inspector for a period of five days, excluding travel days. 	Person	4		
18	Site Acceptance Test (SAT) and Commissioning This test shall take place at site, SAT tests plan shall be submitted to MDOC to review and approval, any punch list items from FAT shall be retested during SAT. An accredited third-party inspector shall be present to witness and endorse the SAT Test report. A ten-day commissioning period is also required for the entire metering skid.	Totally	Totally		

Total Price	
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No	Item	Unit	QTY	Unit Price	Sub Total Price
9	Pressure Control Valve Size/Rating 6" ANSI Class 300, Sh.80 Function Downstream Pressure Control Valve Type Vender to Advise End Connection Flanged, RF as per ASME B16.5 Actuator Electro-Hydraulic or Motorized operated Manual Operated Required, by hand wheel Supply Voltage 1 ϕ , 220V AC, 50Hz Control Mode Integral Regulating Type (4-20mA) End Connection Flanged, RF as per ASME B16.5 Application Flow meters calibration Process Fluid Dry Gas Operating Flow Rate [MMSCF/D]: 6 – 20 Maximum Inlet Pressure [Kg/cm ² (g)] 38 Outlet Pressure [Kg/cm ² (g)] 30 \pm 2 Operating Temperature [°C] 0 – 50 Ingress Protection, Certification IP 65 or Higher, Ex "d" Country of Origin USA, England, Germany, Switzerland, Italy	Piece	2		
10	Flow Conditioner Size [inch] 6 Process Connection RF, Cl.300 as per ASME B16.5 Country of Origin USA, England, Germany, Switzerland, Italy	Piece	2		
11	On-Line Gas Density Meters Accuracy \pm 0.1% of span Output Signal 4 - 20 mA SMART with HART Protocol, 2 wire Electrical Safety EExd suitable for Zone 2, Gas group IIB, Temp. Class T4 Ingress Protection, Certification IP66, Ex "d" Calibration Certificate Required Country of Origin Romania	Piece	2		
12	Supervisory Computer Type Desktop SPU 14th Generation Intel(R) Core i9. (or Higher) Storage 1TB SSD (or Higher) Memory (RAM) 32 GB (or Higher) OS Win11 Home, 64-bit, Genuine with Key (or Higher) Screen Size 24" Full HD Supply Voltage 220 ACV,50 Hz Country of Origin China	Piece	2		
13	Supervisory Software Function - Generates daily, monthly, alarms and events reports - Remote control of all electrical valves - The execution of calibration process and creating relevant calibration reports Storage Capacity 1 Year (Minimum) License validity 15 Year (Minimum)	Piece	1		
14	Spare parts - Flow meter sensor x (2) set - Flow Transmitter x (1) Piece - Pressure Transmitter x (1) Piece - Temperature Transmitter x (1) Piece	Totally	Totally		

Seven: Site Acceptance Test (SAT) and Commissioning

1. SAT tests plan shall be submitted to MdOC to review and approval
2. Any punch list items from FAT shall be retested during SAT.
3. An accredited third-party inspector shall be present to witness and endorse the SAT Test report.
4. A ten-day commissioning period is also required for the entire metering skid.

Eight: Third Party Inspector Requirements

Third Party Inspector for inspection activities which are related to the measuring and calibration equipment shall meet the below requirements:

1. Accreditation certificate as inspection body in compliance with the requirements of ISO/IEC 17020:2012. And also required that, the accreditation scope shall be relevant to calibration of measuring and calibration equipment.
2. A membership in TIC.
3. Similar works as a TPI for calibration of measuring and calibrating equipment.
4. Inspectors shall have a discreet resume as TPI (calibration of measuring and calibrating equipment).

Nine: The Drawings

Diagram No.1 (Presented by us)

Ten: Address

Midland Oil Company, Baghdad, Bob Al Sham/ behind Al-Quds power plant.

Notes:

- 1) Country of origin for the instruments and equipment listed from 1-10 in the table of quantities, as mentioned in front of each material: USA, England, Germany, Switzerland, Italy
- 2) Country of origin for item 11 in the table of quantities: Romania
- 3) Country of origin for item 12 in the table of quantities: China
- 4) A Country of origin certificate is required for items 1-11 in the table of quantities, as stated in front of each item.
- 5) All Country of origin Certificates, shall be ratified by Trade Bureau and Iraqi embassy therein.
- 6) All Calibration Certificates shall undergo review and approval by an accredited third-party inspector, and must be valid.
- 7) The execution period of purchase order is (365) days, which encompass delivery installation, site commissioning, SAT, and training as well.
- 8) (365) days of warranty once initial acceptance certificate issued
- 9) Environmental Data of items
 - Ambient Temperature [°C]: ≤55 (Under Sunshade) ≤80 (Direct Sun Light)
 - Barometric Pressure [Kg/cm²(g)]: 1.01325
 - Relative Humidity (%): 5 ... 95
- 10) The gas flow metering system shall consist of two streams: one duty stream and one standby stream, each with 100% flow capacity. Therefore, one stream shall function as duty stream, while the other stream shall serve as a redundant at all levels, including:
 - Redundant PLCs
 - Redundant PCs, Supervisory Software and flow computers
 - Redundant PCVs
 - Redundant Density Meter
 - Redundant Power Supply
- 11) Gas Composition

The below gas specifications is based on Iraqi Marketing Specifications for export dry gas:

Test	%
C1 Vol% (min)	75.0
C2 Vol% (max)	20.0
C3 Vol% (max)	0.50
Butane% (max)	0.25
Pentane and heavier Vol% (max)	0.25
Nitrogen (N ₂) Vol% (max)	1.20
Carbon Dioxide (CO ₂) Vol% (max)	2.50
H ₂ S (ppmv) (max)	4.00
Mercaptan (RSH) (mg/m ³) (max)	15.00
Total Sulfur (mg/m ³) (max)	40.00
Water Dew Point [°C] @ 40 Bar (max)	-40
Hydrocarbon Dew Point [°C] @ 40 Bar (max)	-36
Gross Heating Value (BTU/SCF) (max)	1150
Mercury (ng/m ³) (max)	10.00
Oxygen Vol% (max)	0.10

Four: Requirements

1. Purchase and delivery the equipment in the quantities and the technical specification mentioned in table of quantities paragraph three above.
2. The execution period of purchase order is (365) days, which encompasses design, fabrication, assembly, testing (FAT), installation, commissioning, SAT and training as well.
3. Initial test (test run) of the equipment mentioned in paragraph three above, for duration period of (10) days.
4. Warranty for (365) days starting from the date of issuance of the initial acceptance certificate.
5. Provide a user manual for the devices and equipment (one English copy).
6. All the related diagrams shall be supplied (2 hard copy, 2 soft copy).
7. Country of origin for the instruments and equipment listed from 1-10 in the table of quantities, as mentioned in front of each material: USA, England, Germany, Switzerland, Italy.
8. Country of origin for item 11 in the table of quantities: Romania
9. Country of origin for item 12 in the table of quantities: China
10. A Country of origin certificate is required for items 1-11 in the table of quantities, as stated in front of each item, and shall be ratified by the Trade Bureau and the Iraqi embassy therein.
11. Calibration certificates, valid and approved by third-party inspector, are required as mentioned for the items in the quantity table.

Five: Training

1. Five days of training excluding travel days shall be given for five personnel from custody transfer department.
2. Training Location: Country of Origin
3. Training program shall encompass the aspects below:
 - System operation
 - General and preventive maintenance.
 - General system familiarization including design.
 - Measuring techniques.
 - Troubleshooting.

Six: Factory Acceptance Test (FAT)

1. The (FAT) shall be conducted following the approved FAT Plan.
2. The FAT Plan shall be prepared by the vendor and submitted to the first party (MDOC) for review and approval.
3. The full skid system integration test for the FMS package (Flow Computers, UFM, supervisory computers, PLC, field instrumentations) shall be done at factory before shipping.
4. Four personnel from Midland Oil Company shall witness the Factory Acceptance Test (FAT) in the presence of a third-party inspector for a period of five days, excluding travel days.

5- Test and Engineering Inspection

5- الاختبار والفحص الهندسي

1. The (FAT) shall be conducted following the approved FAT Plan.
2. The FAT Plan shall be prepared by the vendor and submitted to the first party (MDOC) for review and approval.
3. Comprehensive integration test of the entire calibration equipment such as (flow computers, flowmeters, valves, pumps, Variable frequency drives, SVP and PLCs) shall be performed at the factory prior to The full skid system integration test for the FMS package (Flow Computers, UFM, supervisory computers, PLC, field instrumentations) shall be done at factory before shipping.
4. Four personnel from Midland Oil Company shall witness the Factory Acceptance Test (FAT) in the presence of a third-party inspector for a period of five days, excluding travel days.
5. Third Party Inspector for inspection activities which are related to the measuring and calibration equipment shall meet the below requirements:
 - a. Accreditation certificate as inspection body in compliance with the requirements of ISO/IEC 17020:2012. And also required that, the accreditation scope shall be relevant to calibration of measuring and calibration equipment.
 - b. A membership in TIC.
 - c. Similar works as a TPI for calibration of measuring and calibrating equipment.
 - d. Inspectors shall have a discreet resume as TPI (calibration of measuring and calibrating equipment).

- 1- يجب إجراء الفحص المعلمي وفقاً لخطة الفحص المعلمي المصادق عليها.
- 2- يتم إعداد خطة الفحص المعلمي من قبل المجهز، وترسل إلى الطرف الأول (شركة نطق الوسط) لغرض المراجعة والمصادقة.
- 3- كافة أجزاء منظومة القياس الممتثلة بـ (Flow Computers, UFM, Supervisory Computers, PLC, Field instrumentations) يتم إجراء الفحوصات عليها في المعمل وقبل الشحن بعد ربط تلك الأجزاء بشكل كامل.
- 4- يجب أن يشهد موظفين عدد/4 من شركة نطق الوسط تنفيذ فعاليات الفحص المعلمي وبحضور فاحص ثالث، ولمدة خمسة أيام عدا أيام السفر.
- 5- الفاحص الثالث لأنشطة الفحص ذات الصلة بأجهزة ومعدات المعايرة يجب أن يكون مستوفياً للشروط التالية:
حاصل على شهادة اعتماد كجهة فحص طبقاً للمواصفة (ISO/IEC 17020:2012). ويشترط ان يكون مجال الاعتماد ذو صلة بمعايرة معدات القياس والمعايرة، والالتزام بموقع مزاوله أنشطة الفحص المثبت بشهادة الاعتماد.
بعضو في منظمة (TIC).
بممتلك أعمال معاملة كجهة فحص لأنشطة ذات الصلة بمعايرة أجهزة ومعدات المعايرة.
بممتلك فاحصين ذوي سيرة ذاتية رصينة كفاحص ثالث (في مجال معايرة أجهزة ومعدات المعايرة).

4- Drawings

4- المخططات

Bid documents include drawings.

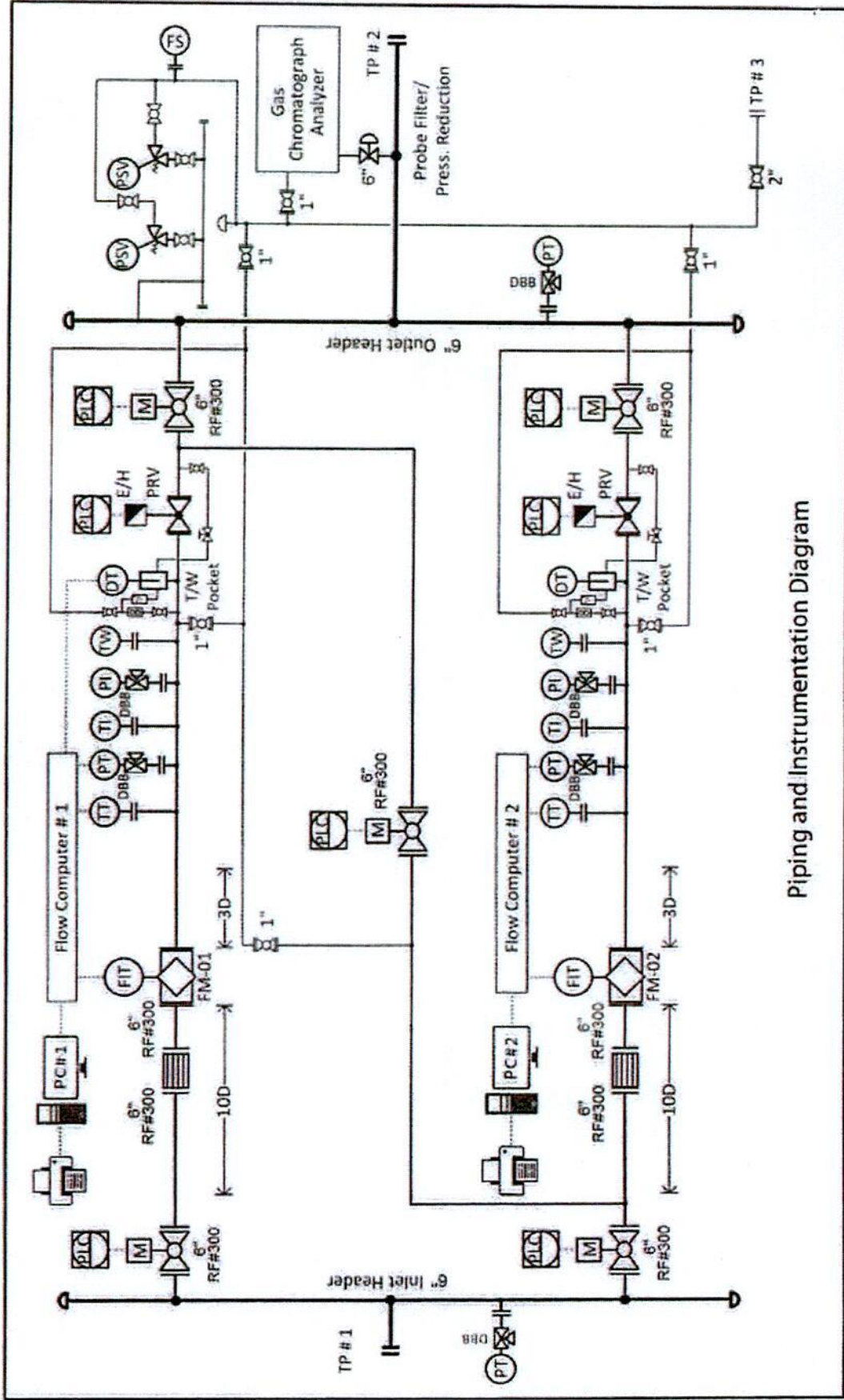
[Insert the following list of drawings if these documents will be included]

وثائق العطاء هذه تتضمن مخططات.

[ادخل قائمة المخططات الآتية إذا كانت هذه الوثائق سيتم تضمينها]

قائمة المخططات		
الغرض	اسم المخطط	رقم المخطط
استرشادي	Piping and Instrumentation Diagram	---

List of Drawings		
Drawing Number	Drawing Name	Purpose
---	Piping and Instrumentation Diagram	Guidance



Piping and Instrumentation Diagram