

**INSTITUTE FOR PLASMA RESEARCH**  
**NEAR INDIRA BRIDGE, BHAT, GANDHINAGAR 382 428**  
**GUJARAT STATE**

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**TENDER NOTICE DATED 23-10-2009**

Itemwise sealed tenders are invited from reputed and eligible parties for the following.

Sr. No	Tender Notice No.	Item	Quantity	Due Date & time of opening	Tender Fee (Rs.)	EMD (Rs.)
1.	IPR/TN/PUR/028/09-10	Supply and installation of Network Attached Disc Server for Library with 512 or more RAM (Expandable), holding capacity of more than 2500 CDs/DVDs	1 No.	26-11-2009 2.30 p.m.	100.00	5000.00
2.	IPR/TN/PUR/029/09-10	Design, fabrication and assembly of High Pressure High Temperature Water Circulation system	1 No.	03-12-2009 2.30 p.m.	100.00	5000.00

Tender documents are available on IPR Website : [www.ipr.res.in/purchasetenders.html](http://www.ipr.res.in/purchasetenders.html). Tenderers meeting the eligibility criteria mentioned in the tender documents may, at their option, download the tender documents from the website and submit their offer along with prescribed **Tender Fee (non refundable)** and **EMD** in the form of Demand Draft from any nationalized/scheduled bank drawn in favour of **Institute for Plasma Research** and payable at **Ahmedabad** as per the details given in the tender documents. In case party desires to collect the tender documents by post, they may contact the Purchase Officer along with prescribed tender fee. Tender documents will be issued upto **20-11-2009**. The representative who is going to attend the tender opening should carry an authorization letter from the organization for participation in the tender opening failing which he will not be allowed to attend the tender opening.

## TENDER NOTICE No.IPR/TN/PUR/029/09-10 DATED 23-10-2009

### For Design, fabrication and assembly of High Pressure High Temperature Water Circulation system – 1 No.

#### NOTE:

1. Full details and specifications of the items and general instructions to be followed regarding submission of tenders are indicated in the tender documents.
2. Proof for fulfillment of eligibility criteria mentioned hereunder should be submitted along with the tender. If the tender is submitted without valid documents, we shall not consider your offer. Tenders received without proof of eligibility criteria will be rejected.
3. Tender documents can also be obtained by submitting a written request to the Purchase Officer together with prescribed tender fee, provided that the eligibility criteria is fulfilled. Last date for issue of Tender documents is 20-11-2009.
4. While requesting for Tender Documents, such request shall indicate the **“REQUEST FOR TENDER DOCUMENTS AGAINST TENDER NOTICE NO.IPR/TN/PUR/029/09-10 DATED 23-10-2009”**.
5. The tender fee of Rs.100/- (non refundable) should be made in the form of **DEMAND DRAFT** from any nationalized/scheduled bank drawn in favour of *Institute for Plasma Research* and payable at *Ahmedabad*. Vendor's name and tender number shall be indicated on the reverse side of the Demand Draft.
6. DD should not be prior dated to the date of advertisement. Separate request letter and separate Demand Draft shall be sent for each tender.
7. Those who use the downloaded tender documents from IPR Website may submit the prescribed Tender Fee keeping in a separate envelope along with the tender.
8. Tenders received without the prescribed tender fee will be rejected.
9. No request for the extension of due date will be considered.
10. Late/Delayed offers will not be accepted.
11. Tenders in a sealed envelope superscribing the envelope with the above tender no., date, due date and brief description of tendered item along with EMD for Rs.5,000/- by way of Demand Draft from a nationalized/scheduled bank drawn in favour of *Institute for Plasma Research* and payable at *Ahmedabad* should be submitted to the *Purchase Officer* at the above address by 1.00 p.m. on 3<sup>rd</sup> December, 2009. Tenders received upto 1.00 p.m. on 3-12-2009 will be opened on the same day at 2.30 p.m. in the presence of attending tenderers.

12. In the event of any date indicated above is a declared Holiday, the next working day shall become operative for the respective purpose mentioned herein.
13. IPR will not be responsible for any delay/loss of documents in transit.
14. Tenders received without the details asked for including proof of eligibility for participating in the tender may not be considered.
15. Tenderers should furnish/enclose full technical details/literature, delivery period and confirm the terms and conditions attached with the tender.
16. **Those who do not meet with the eligibility criteria need not submit Tender.**
17. **Those who are quoting on behalf of their foreign Principals should submit a Proforma Invoice of Foreign Principals in foreign currency.**
18. The Director, IPR reserves the right to accept or reject any offer in full or part thereof without assigning any reason thereof.
19. **Quotations received without EMD will not be considered.**
20. **The representative who is going to attend the tender opening should carry an authorization letter from the organization for participation in the tender opening failing which he will not be allowed to participate in the tender opening.**

**ELIGIBILITY CRITERIA:** Vendor/fabricator must have experience in design and fabrication of pressurized water circulation/supply system with pressures of 20bar or more (submit documentary proof, i.e. copies of Purchase orders received for similar type of systems, supporting above mentioned experience with the quotation. In absence of such proof, IPR may summarily reject the quotation).

**NOTE:** Issue of tender documents does not mean that a vendor is qualified to submit tenders. IPR's decision to consider as to whether a vendor has met with the eligibility criteria is final.

### **INSTRUCTIONS TO BIDDERS AND TERMS AND CONDITIONS**

1. The quotation and any order resulting from this tender/enquiry shall be governed by our Conditions of contract and supplier quoting this tender shall be deemed to have read and understood the same in toto.
2. Where counter terms and conditions have been offered by the supplier, the same shall not be deemed to have been accepted by us, unless our specific written acceptance thereof is obtained.
3. **Tender Fee:** Tenders received without the prescribed Tender Fee will be rejected.

4. **Clarifications:** Any technical and commercial questions, information, clarifications, etc. that may be required pertaining to this Tender/enquiry may be obtained from the Purchaser before submitting the tender.
- 4.1 Bids shall be complete in all respects and shall include properly filled in prices, other specifications, schedules, relevant drawings and catalogues as necessary alongwith the bid covering letter, all in duplicate.
5. **Quotation:** Your quotation superscribing our tender/enquiry No., date, due date and short description of item should be submitted to the Purchase Officer, IPR in a sealed envelope on or before the due date. Late and delayed quotations will not be considered. IPR will not be responsible for postal delays or any other delays in receipt of quotation. Envelopes received without Tender number, date, due date and short description of item may be rejected. The quoted prices should be firm for a period of 120 days from due date for placing order. IPR is not bound to accept lowest rate/s. IPR reserves the right to place order on one or more parties irrespective of whether he is lowest or not. The scope of supply includes insurance by the Contractor/Supplier.
6. **Specifications:** Material should be offered strictly conforming to our specifications/drawings. Deviation, if any, should be clearly indicated by the supplier in their quotation. The supplier should also indicate the Make/Type number of the materials offered and catalogues, technical literature and samples, wherever necessary should accompany the quotation.
7. **Terms of prices:** Quotation should be submitted on door delivery basis without extra charge wherever possible. For quotations on Ex-Works, Ex-godown basis the approximate packing and forwarding charges should be indicated by the supplier. In the case of local suppliers, the material is to be delivered at our stores free of charge. Unit rate/s should be valid throughout the validity of purchase order/contract period for addition/deletion purposes. Break-up of price should be furnished. The quoted price should not be subject to price escalation for whatsoever reasons. The quoted price shall be firm, fixed and non-revisable during the validity/extended validity of purchase order/contract.
- 7.1 Prices are required to be quoted according to the units indicated in the tender form. When quotations are given in terms of units other than those specified in the tender form, relationship between the two sets of units must be furnished.
- 7.2 Wherever options are specified in the tender documents, IPR reserves the right to accept any option/s irrespective of whether all the vendors have quoted for all the options or not. The decision of IPR in this regard will be final.
8. Tender should be free from Correction and Erasures. Corrections, if any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail.
9. IPR shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portion of the quantity offered and the tenderers shall supply the same at the rates quoted.
10. **Sales Tax etc.:** We have no "C" or "D" form. The percentage of Sales Tax/VAT, surcharge, if applicable, and other levies legally leviable and intended to be claimed

should be clearly indicated in the tender. Where this is not done, no claim on these accounts would be admissible later.

- 10.1 **VAT Registration:** You may submit a copy of VAT Registration certificate along with your quotation (if applicable).
- 10.2. **Service Tax:** Wherever Service tax is applicable, it should be mentioned clearly. You may indicate percentage of Service Tax in your quotation.
- 10.3 **Excise Duty:** As per Notification No.10/97-CE (Central Excise) dated 1-3-1997, the Purchaser is entitled for availing Excise Duty exemption at present. Excise Duty Exemption Certificate, wherever applicable, and as per rules will be issued at the appropriate time. Hence Excise Duty should not be included in the BID. However, prevailing percentage of Excise Duty may be indicated.
- 10.4 **Octroi:** Octroi is not applicable in our case.
11. **Delivery Date:** The supplier must indicate the firm delivery date by which the materials will be despatched/delivered by them from the date of our order.
12. **Inspection:** Materials on its arrival at IPR will be inspected by Stores In-charge, and his decision in the matter will be final.
13. **Earnest Money Deposit (EMD):** Tenderer should furnish EMD for Rs.5,000/- (Rupees Five thousand only) by way of Demand Draft from a nationalized/scheduled bank drawn in favour of *Institute for Plasma Research* and payable at *Ahmedabad* should be submitted along with quotation. Tender received without EMD will not be accepted.
- 13.1 **EMD of unsuccessful Bidder will be returned after finalizing the Contract/placing Purchase order.**
- 13.2 **The EMD shall be forfeited in case the selected Bidder does not start the work within the time limit specified or fail to complete the work within the stipulated delivery period or fail to comply with any of the terms and conditions in the purchase order/contract.**
14. **Payment:** Within 30 days from the date of acceptance. Wherever, advance payment is involved, it will be paid only against Bank Guarantee from Nationalised/Scheduled Bank.
15. No correspondence will be entertained within 30 days from the date of receipt of material and bills, whichever is later.
16. Quotation should be valid at least for 120 days from the date of opening of the tender.
17. Delivery periods be clearly indicated against each item separately.
18. **Guarantee:** The Stores/material/goods/equipment offered by the bidder should be guaranteed for a minimum period of twelve months, against defective materials, design, workmanship, operation or manufacture. For defects noticed during the Guarantee period, replacement/ rectification should be arranged free of cost within a reasonable period of such notification. In cases where our specifications call for a guarantee period more than 12 months specifically, then such a period shall apply.

19. **Security Deposit:** The successful Bidder will have to furnish to the Purchaser an interest free security deposit for 10% (Ten percent) of the order value in the form of Bank Guarantee of an equivalent amount from a nationalised/scheduled Bank within 15 days from the date of LOI/Purchase order and the said Guarantee should be valid till the goods are accepted by IPR. The Security deposit shall be forfeited in case the selected Bidder does not start the work within the time limit specified or fail to complete the work within the stipulated delivery period or fail to comply with any of the terms and conditions in the purchase order/contract.
20. **Liquidated Damages:** In addition to forfeiting Security Deposit, Liquidated Damages for the delay shall be 1/2% (half percent) of the total order value for the delay of each week in the scheduled time of supply or the scheduled date of final completion for the work as the case may be, subject to a maximum of 5% (five percent) of total order value. Liquidated Damages will be recovered from the payment due to the supplier.
21. **Performance Bank Guarantee:** The Contractor/Supplier will have to furnish to the Purchaser (IPR) an interest free performance bank guarantee for 10% (Ten percent) of the order value/ contract value by Demand Draft or by way of providing a Bank Guarantee from a Nationalised/Scheduled Bank valid for a period of 12 months/guarantee period mentioned in the order from the date of installation/acceptance for satisfactory performance of the work carried out by the Contractor.
22. The Contractor/Supplier shall at all times indemnify the purchaser against all claims which may be made in respect of the stores/material/goods/equipment for infringement of any right protected by Patent Registration of design or Trade Mark and shall take all risk of accidents or damage, which may cause failure of supply from whatever cause arising and the entire responsibility for sufficiency of all means used by him for the fulfillment of the contract.
23. **BAR/PERT Charts:**  
To be provided as per the requirement of Purchaser.
24. **Sub-Contract:** All sub-contractors are required to be appraised and approved by the Purchaser before placement of orders by the Vendor.
25. **Jurisdiction:** The contract/Purchase order shall be governed by the Laws of India for the time being in force. The Courts of Ahmedabad only shall have jurisdiction to deal with and decide any legal or dispute arising out of this contract.
26. **Settlement of disputes:** Any disputes or difference arising out of or in connection with the Contract/Purchase order shall be to the extent possible settled amicably between the parties.  
  
If amicable settlement cannot be reached then all disputed issues shall be settled by arbitration.
27. **Arbitration:** In the event of any dispute or difference arising under this Contract, the matter shall be referred to the Arbitrators one each nominated by the Purchaser and Contractor from their respective organisations. In case the said Arbitrators are not able to settle the dispute by themselves, the matter shall be referred to the Arbitrator mutually nominated by the Purchaser and the Contractor and whose decision will be final and binding on both the parties. The venue of arbitration will be IPR. Subject to as aforesaid the Arbitration Act, 1940 and the rules thereunder and any

statutory modification thereof for the time being in force shall be deemed to apply to the Arbitration proceedings under this Contract.

28. **Permits and Licences:** The Contractor shall secure and pay for all permits and licence which he may require to comply with in respect of all laws, ordinances and regulations of the Government or Public Authorities in connection with the performance of his obligations under the Contract. The successful contractor shall be responsible for all damages and shall indemnify and save the Purchaser harmless from and against all claims for damages and liability which may arise due to his failure to comply with what is stated above.
29. **Training:** The successful tenderer shall, if required by the Purchaser, provide facilities for the practical training of Purchaser's engineering or technical personnel for their active association on the manufacturing process throughout the manufacturing period of the Contract/stores, number of such personnel to be mutually agreed upon.
30. **Operation/Instruction Manual:** Where operation/instruction manual is essential to enable the Purchaser to put the stores to proper use, the successful tenderer shall furnish such operation/instruction manual along with the stores.
31. **Test Certificate:** Wherever required, test certificates should be sent along with the despatch documents.
32. **Secrecy:**
  - 32.1 All information, drawings, designs and specifications imparted to the bidder/successful contractor shall, at all times, remain the absolute property of the Purchaser, the bidder/successful contractor shall not use them for purposes other than for which they are provided for and shall treat all these documents as confidential. These shall not be reproduced in whole or in part for any other purpose.
  - 32.2 The contractor shall use his best endeavours to ensure that such information are not divulged to third parties except where needed for the performance of the contract by the successful bidder with the prior consent of the Purchaser. In such cases, the successful contractor shall ensure and obtain similar obligation of confidence, from third parties in question.
33. **Indemnity:** The Contractor shall warrant and be deemed to have warranted that all stores supplied against this contract are free and clean of infringement of any Patent, copy right or trade mark and shall at all times indemnify the Purchaser against all claims which may be made in respect of the stores for infringement of any right protected by patent. Registration of design or Trade Mark and shall all risk of accidents of damage which may cause a failure of the supply from whatever cause arising and the entire responsibility for the sufficiency of all the means used by him for the fulfilment of the contract.
34. **Counter terms and conditions of Suppliers:** Where counter terms and conditions printed or cyclostyled conditions have been offered by the supplier, the same shall not be deemed to have been accepted by the Purchaser unless specific written acceptance thereof is obtained.

35. **Installation/commissioning/site works:** Wherever these activities are part of scope of work/specifications, Vendor should carry out the same without any extra cost to IPR.
36. **Free Issue Material (FIM) (If specified in the tender documents):** Successful tenderer will have to furnish in the form a Bank Guarantee or in any other form as called for by the Purchaser towards adequate security for the materials/property provided/issued by the Purchaser as Free Issue Material (FIM) for the due execution of the contract. Successful bidder shall submit Bank Guarantee from a nationalized bank and arrange insurance for the cost of FIM at his expenses.
37. Late/delayed tenders will not be accepted. Incomplete tenders may be rejected at the discretion of IPR.
38. **IPR is not bound to accept the lowest tender. IPR reserves the right to select any vendor at its sole discretion.**
39. **Result of the tenders:** Unsuccessful tenderers will not be informed of the result of their tenders.
40. The Director, IPR reserves the right to accept or reject any quotation/tenders fully or partly without assigning any reason.
41. IPR reserves the right to place order on a single party or to split the order at its sole discretion.

**We agree to the above terms and conditions.**

**Place:**

**Signature of Bidder with seal**

**Date:**

**Note: A copy of our terms and conditions duly signed should accompany your quotation.**

# **Design, Fabrication and Assembly of High Pressure High Temperature Water Circulation System (HPHTWCS)**

Institute for Plasma Research (IPR) requires to design, fabricate and assemble a movable High-Pressure High-Temperature Water Circulation System (HPHTWCS) to be used for supply of pressurized high temperature water to externally connected test mock-ups.

HPHTWCS typically consists of components such as high-pressure water pump with a control unit, corrosion resistant (stainless steel) water tank with built-in heater for heating and storage of water, calorimetric (temperature, pressure and flow rate of water) monitoring & diagnostic sensors, display unit and feedback control system. Some of these components are already available with IPR as listed in Annexure-3. Vendor is expected to arrange for rest of the components. Specifications of the high-pressure pump and schematics for the trolley and the SS tank are given as Annexure-1 & 2 respectively.

## **Scope Of Work:**

*(a) Engineering Design of HPHTWCS that includes trolley, SS tank and the water circulation loop and to assemble various components of high-pressure water circulation loop for pressurized water supply.*

*(b) Fabrication of HPHTWCS that trolley, SS tank and the water circulation system as per engineering design.*

*(c) Assembly and integration of various components on the fabricated trolley.*

*(d) Performance Testing of integrated unit as per desired test procedures.*

## **Technical Specifications:**

It is very important that the following details must be very carefully considered and incorporated while fabricating the HPHTWCS.

- a) Design of trolley should be rigid enough to withstand the necessary torques and forces and be transportable with a suitable arrangement to fix it at its position during its operation with negligible vibrating motion.
- b) The above arrangement is expected to circulate water at high pressures up to 20bar, high temperatures up to 80°C and high flow-rates up to 220LPM through test mock-up tubes having inside diameters in the range 10mm-25mm and length up to 500mm. Design should ensure use of corrosion resistant materials to ensure long life of components under such demanding operating conditions mentioned above.
- c) Design should ensure high efficiency in utilization of electrical energy by minimization of heat losses to atmosphere (in case of water circulation above room temperature) and optimization of pressure-drop in water circuit and valves.

- d) **Suitable interlocking and feedback control** is to be incorporated in the design to ensure safe operation of water pump. For example, water level, temperature interfacing etc.
- e) A schematic layout for assembly of various components on trolley is given in Annexure – 2 for **visualization purpose only**. However, **vendor/fabricator will solely be responsible for optimizing the layout of various components on trolley, engineering design and implementation** of the complete assembly as per relevant standards and practices.
- f) Steerable front wheels and support structure for pump (*NOT* shown explicitly in Annexure–2) are also to be incorporated in the design and provided by the vendor.
- g) Vendor/fabricator has to get the design and drawings of HPHTWCS checked, verified and endorsed by relevant authority at IPR and obtain a written approval for commencement of fabrication of HPHTWCS that may include modification(s) and/or change(s) in design and materials to be used.

**Following table indicates technical details for various components:**

*Note: Recommended units to be used are: (a) Length in “mm”; (b) Temperature in “C”; (c) Pressure in “Bar”; (d) Water Flow Rate in “L/m” (LPM).*

Trolley Base with removable rear wheels	Details as per Annexure-2		
	Material	Mild Steel (MS)	
Pump Foundation Plate with a groove for pump and welded with the trolley base	Dimensions	As per Annexure 2	
	Material	MS	
	Placement	As per Annexure 2	
SS Tank	Dimensions	As per Annexure 2	
	Material	Stainless Steel SS304	
	Inlet port	ID	As per design/pump specification
		OD	
		Placement	as per Annexure 2
	Outlet port	ID	As per design/pump specification
		OD	
		Placement	as per Annexure 2
	Other ports	1 for temperature sensor	
		1 for air filter	
		1 glass window for visual water level checking	
		1 for heating arrangement	
		1 for draining the tank	
Interlocking Arrangement	Water level meter interlocked at 100 litres with the pump for safety of pump		

	Insulation	Against heat loss (for e.g. using glass wool)
	Installation and placement	As per Annexure – 2
Heater	Dimensions	As per manufacturer
	Safety	Shock proof design (for e.g. using SS tube shields)
	Placement	Inside the SS tank
	Temperature range	Up to 80°C
	Controls	Increase/decrease in steps of 2°C or better
	Accuracy in temperature control	± 2°C
	Tube fittings/connecting pipes	Dimensions
Material		SS 304
Insulation		Against heat loss (for e.g. using glass wool)
Valves	Dimensions	ID: 25mm
	Material	SS 304 or better
	Placement	As per Annexure 2
Isolation Valves	Nos.	Four (4)
Non-Return Valve (NRV)	Nos.	One (1)
Valves: Globe Type OR Needle Type	Nos.	One (1)
Pressure Reduction Valve (PRV)	Nos.	One (1)
	Inlet pressure	Up to 25bar
	Outlet pressure	1bar
	Maximum Flow Rate	220LPM
Expansion joints	Dimensions	As per pump specifications
	Material	SS 304 or better
	Placement	As per Annexure 2
Removable protective dust cover with two openable front doors	Material	Galvanized Steel
	Placement	As per dotted line shown in Annexure – 2

### **Safety and Warranty:**

- i) Complete assembly including, but not limited to, high-pressure pump, SS tank trolley, valves, expansion joints etc should meet industrial standards for safety and use.
- ii) The fabricated HPHTWCS and the subsequent assembling must be covered with a comprehensive and unconditional service, support and parts warranty for a period not less than one year. The assembly must also be guaranteed for safety of use for the same period as the service, support and parts warranty.
- iii) A certificate guarantying the assembly for safety of use must be produced at the time of completion of setting up the high-pressure pump, trolley, SS tank etc.
- iv) The trolley has to be fabricated at the vendor/fabricator's premises while the assembly of the movable trolley with high-pressure pump, various diagnostic instruments, etc. must be done inside the premises of IPR. Item nos. mentioned in annexure 3 are available with IPR and are to be assembled with the trolley.

### **Testing and Acceptance Criteria:**

- i) Vendor/fabricator has to submit all the documents including fabrication drawings, catalogs, manuals etc for various parts which includes valves of all types, expansion joints, SS-tank, trolley etc. of the assembly.
- ii) Pre-dispatch inspection shall be carried out by IPR for the trolley and the SS tank for finish and workmanship.
- iii) Assembly and integration of components available with IPR is to be performed after shifting the HPHTWCS to IPR;
- iv) HPHTWCS shall be tested at IPR at its full operational parameters for performance check before final acceptance. A removable connector between points A & B (as shown in Annexure –2) is to be supplied for testing of various parameters viz. pressure, flow and temperature. It is expected to withstand following operation tests without failure:
  - 1) Steady state operation for 24 hours with highest available pressure, temperature and flow-rate of water;
  - 2) Operation for varying pressure in the range 5-20bar and temperature in the range 40-80°C;

## ANNEXURE 1

Specifications of the High-Pressure Centrifugal Pump (Make: GRUNDFOS, Model: CRNCM10-20 A-P-G-V-HQQV) with attached motor (Model MMG132B-2-385F265-E2) available as a single unit with IPR.

<b>Description</b>	<b>Size</b>	<b>Unit</b>
Weight	~ 150	kg
Length	1340	mm
Inlet flange dimensions	Internal diameter: 50 Outer diameter (maximum): 60	mm
Outlet flange dimensions	Internal diameter: 50 Outer diameter (maximum): 60	mm
Base dimensions	250 x 200	mm

Tentative specifications for the SS Tank (To be finalized by fabricator as per their engineering design)

<b>Description</b>	<b>Size</b>	<b>Unit</b>
Water storage capacity	100	litres
Inlet bore (ID)	12	mm
Outlet bore (ID)	12	mm
Ports for diagnostics (Two (2) nos. on top of dish end; One (1) for the heater)	15	mm

### **ANNEXURE 3**

#### **List of components available with IPR (FIM)**

<b><i>Item</i></b>	<b><i>Total Cost</i></b>
High Pressure Pump (Model CRNCM10-20 A-P-G-V-HQQV) with attached motor (Model MMG132B-2-385F265-E2) ( Make: Grundfos)	Rs. Three Lacs Approximately
Control Panel (includes digital temperature indicator, pressure indicator, flow totalizer, etc)	
Differential Pressure Transmitter (Used as a flow meter here; Make: Endress-Hauser)	
Pressure sensor (Make: Wika Tronic)	
Temperature sensor	
Diagnostic pipe (housing flow meter, pressure sensor and temperature sensor mentioned above)	