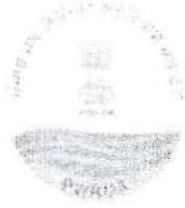


I/44113/2023

ਪੰਜਾਬ ਜਲ ਨਿਯੰਤਰਣ ਤੇ ਵਿਕਾਸ ਅਥਾਰਟੀ  
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### PUBLIC NOTICE

The Punjab Water Regulation and Development Authority has approved the specifications for Digital Water Flow Meters (with telemetry and without telemetry) and Mechanical Water Flow Meters to be installed by various Water Users as provided in the Punjab Groundwater Extraction and Conservation Directions, 2023. These specifications are placed at Annexure A.

2. A unit shall install the required water meters at each of its extraction structure within three months of the date of Permission. However, to pay Groundwater charges based on actual consumption, it is advised that the units may install water meters of required specifications immediately.

  
Executive Engineer.

No.72245/PWRDA-SECY0MISC/9/2021-O/o SECY-PWRDA/1/44113/2023  
Dated: 02.02.2023

ANNEXURE-A

A. SPECIFICATION FOR ELECTROMAGNETIC OR ULTRASONIC (DIGITAL) WATER METERS

I.	<b>Metering Technology:</b>	Electromagnetic or Ultrasonic
II.	<b>Communication Type:</b>	LAN (for internet connectivity) or LoRa WAN and/or Cellular (GPRS / 3G / 4G/ 5G)
III.	<b>Power Source:</b>	<p>a. Meter and Pump/Motor should have same power source. Power source of Pump and Meter shall be interlocked in such a way that Pump/Motor shuts off if power to the meter is disconnected.</p> <p>b. Metering data shall be stored in the meter even if telemetry system is temporarily off due to power failure due to any reason. Under such scenario the Telemetry system shall be capable of recovering all such data.</p>
IV.	<b>Sealing:</b>	Meter and telemetry system shall have proper mechanical and electronic sealing (through software) arrangement. Any attempt to open the meter or system enclosure should physically damage the tag.
V.	<b>Compliance:</b>	Meter shall preferably comply to ISO 4064 Standards and shall have IP 68 ingress protection.
VI.	<b>Metrological Specification:</b>	<p>a. Turndown ratio of 10 or above</p> <p>b. Technology: electromagnetic or ultrasonic</p>
VII.	<b>Size:</b>	<p>a. DN 40 - Flow range: 0.5 lps to 5 lps</p> <p>b. DN 100 - Flow range: 3 to 30 lps</p> <p>c. DN 150 - Flow range: 13 to 130 lps</p>
VIII.	<b>Material of Construction:</b>	Construction material shall preferably comply to ISO 4064.

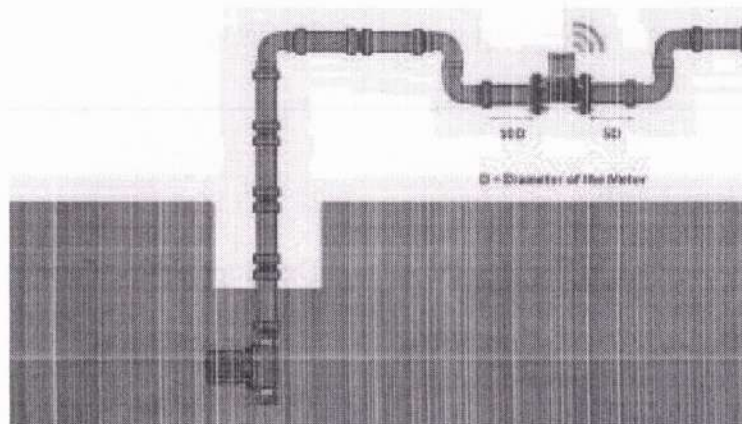
IX.	<b>Accuracy:</b>	Meter shall be of accuracy better than $\pm 2\%$ for the operating flow range (from 10 % to 100 % of maximum flow rate).
X.	<b>Markings on the Body of the Meter:</b>	<ul style="list-style-type: none"> <li>a. Make/Brand, Size / Nominal Dia.</li> <li>b. Sl. No. / Year of Manufacture, Metrological specifications etc.</li> <li>c. Model Number and Certification of Calibration agency.</li> </ul>
XI.	<b>Meter indicator:</b>	<p>Digital indicator shall be designed in such a way that if the protective glass is broken for a reason or another, the indicator cannot be removed from its place. The protective cover of the indicator shall be made of sturdy glass/PP/PC.</p> <ul style="list-style-type: none"> <li>a. It shall be of straight reading type.</li> <li>b. No. of digits and verification scale interval shall be as per provisions under ISO 4064 to meet the required accuracy.</li> <li>c. Indicative range shall be as detailed below:</li> </ul> <div style="text-align: center;"> <p><math>Q_3</math> <b>Indicating range</b> (minimum values)</p> <p><math>\frac{m^3}{h} m^3</math></p> <p><math>Q_3 \leq 6.3 \ 9 \ 999</math></p> <p><math>6.3 &lt; Q_3 \leq 63 \ 99 \ 999</math></p> <p><math>63 &lt; Q_3 \leq 630 \ 999 \ 999</math></p> <p><math>630 &lt; Q_3 \leq 6 \ 300 \ 9 \ 999 \ 999</math></p> </div> <p><i>Note: <math>Q_3</math> is the Highest flow rate within the rated operating conditions at which the meter is to operate within the maximum permissible errors</i></p> <ul style="list-style-type: none"> <li>d. Totalizer shall be made of suitable material required to maintain IP 68 protection class.</li> <li>e. There shall be no multiplication factors on reading display, only the exact reading of Volume extracted shall be displayed.</li> </ul>
XII.	<b>Parameters to monitor:</b>	<p>Meter shall record and transmit the following parameters to a secure cloud:</p> <ul style="list-style-type: none"> <li>a. Timestamp</li> <li>b. Cumulative Volume</li> <li>c. Meter serial number</li> <li>d. Device last calibration date (This should be a Colored coded intimation, The date shall be displayed in Red if certificate is expired.)</li> <li>e. Tubewell ID (as provided by PWRDA)</li> </ul>

XIII.	<b>Telemetry System:</b>	<p>a. AMR/AMI system should have the facility to detect and communicate any abnormalities, i.e. high consumption, tampering, malfunction etc. along with necessary alarms.</p> <p>b. System will communicate in real time for battery and tamper alarms, in order to provide relevant monitoring and management data for operational purposes.</p> <p>c. Battery shall be replaceable without any data loss. d. Meters should report an alarm to the server as and when tampered.</p> <p>e. All Water Meter readings should be time stamped. f. Meter should have the capability to detect and record reverse flow separately.</p> <p>g. Meter should be capable of to, Zero (No) Flow, High Flow.</p> <p>h. AMR/AMI should operate even in electrically noisy environments with electromagnetic interference. The</p>
		<p>AMR/AMI should function even in the presence of high voltage power lines.</p> <p>i. Communication shall be encrypted to avoid tampering. j. Meter should be configurable either using the DTU or from the server.</p> <p>k. Loss of communication should be indicated in the server on real time basis.</p> <p>l. Telemetry system should be capable of storing at least 2 years of data of each Meter.</p> <p>m. In case telemetry is non-functional because of power cut or weak cellular signals, the meter should be able to store the data and transmit to the cloud as soon as the telemetry system is live.</p> <p>n. This data shall also be used for retrieval in case of any dispute between meter data and online data.</p> <p>o. In case a meter is replaced the Telemetry system should be able to co-relate the readings of the new and old meters.</p> <p>p. Telemetry system shall have an appropriate power backup of at least 30 Hours. Battery usage has to be indicated at the server.</p>
XIV.	<b>Cloud:</b>	Communication / telemetry data should be directly captured in a secure cloud.
XV.	<b>Transmission frequency:</b>	<p>a. Data should be transmitted on real time basis by Meters .</p> <p>b. All data transmitted to the Authority shall be date and time stamped.</p>

<p>XVI.</p>	<p><b>Data acquisition:</b></p>	<p>a. Meter should be equipped with complete AMR / AMI system along with Data Management software. The Data Management Software must be capable of running on a standard PC.</p> <p>b. Data Management Software should be cloud based and should have web portal access so that PWRDA can view customer data through browser.</p> <p>c. In addition to above, Data Management Software will be installed on Server placed in Central Data Base/Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal. Consumer, engineer and manager screens shall be available separately.</p> <p>d. Data Collection Unit shall be capable of taking data from meter, pump etc. and should be posted in Data Management Software.</p>
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XVII.	<b>Data Management Software:</b>	<p>a. Web based Data Management Software must be capable of running on Windows XP Professional, Windows Vista, Windows 7 and / or the latest version of Windows Operating System or other Operating Systems such as HP Unix, Linux, Solaris, etc.</p> <p>b. Data Management Software should be cloud base and should have web portal access so that PWRDA can view customer data through browser. In addition to above, Data Management Software will be installed on Server placed in Central Data Base / Control Room, and the software may have option for individual customer to view their meter consumption data through Web portal.</p> <p>c. Data Management Software shall provide database backup/restore functions and must have real-time data access. The software should be web-enabled and alerts to be provided through email and/or SMS to the user as well as PWRDA.</p> <p>d. Data Management Software shall post the reading from the communication infrastructure on to appropriate accounts within the Database.</p> <p>e. Data Management Software should be able to display all kind of data on screen at any time.</p> <p>f. Data Management Software should have capability to add additional customer information and create customizable data fields.</p> <p>g. Telemetry software shall be compatible with the Online Metering and Billing applications of PWRDA.</p>
XVIII.	<b>Real-time data to PWRDA:</b>	<p>Un-tampered data from the secure cloud shall be sent to Punjab Water Regulation and Development Authority (PWRDA) real-time data management platform once it is ready. Proper cyber security measures shall be taken in the secure cloud.</p>
XIX.	<b>Installation of meter:</b>	<p>a. Location: The meter shall be installed at the bore-well pump discharge line before any branching and preferably as shown in Figure 1.</p> <p>b. Bypassing: There shall be no bypassing of pipe prior to the installed flow meter.</p> <p>c. Full flow: Installation of meter shall ensure that pipe shall have full water at all times. Sufficient upstream and downstream straight length shall be provided for meter (Refer to Figure 1.)</p> <p>d. Meter performance shall not get affected by external magnetic field, as specified in ISO 4064.</p> <p>e. Meters must be able to retain their accuracy, when installed in either horizontal and/or vertical planes.</p>

XX.	<b>Lab Testing / calibration:</b>	<ul style="list-style-type: none"> <li>a. Meter shall have valid model approval certificate (not more than 3 years old as on date of installation of Meter) from Fluid Control Research Institute(FCRI) / National Physical Laboratory (NPL).</li> <li>b. Each meter shall be calibrated by equipment's certified by National Accreditation Board for Testing and Calibration Laboratories (NABL) or from any laboratory accredited by NABL as specified below: <ul style="list-style-type: none"> <li>i. Meters installed in units permitted to extract groundwater from 750 cubic meter per month to 1500 cubic meter per month, shall be calibrated before completion of 2 years of installation and every 2 years thereafter.</li> <li>ii. Meters installed in units permitted to extract groundwater more than 1500 cubic meter per month, shall be calibrated before completion of one year of installation and every subsequent year thereafter.</li> </ul> </li> <li>c. Calibration reports for the entire life cycle of meter should be readily available on data management software.</li> </ul>
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**Figure. 1**

Installation position of tamper proof flow meter with telemetry at ground water abstraction structures.

**B. SPECIFICATION FOR TAMPER PROOF MAGNETIC TYPE MECHANICAL WATER METERS.**

I.	<b>Metering Technology :</b>	Multijet Water Meter of Class B as per IS 779 : 1994
II.	<b>Testing/Calibration :</b>	a. Testing of meters shall be in accordance with provisions of IS 6784 :1996 Second Revision  b. Meter manufacturer shall submit to user the latest test certificate of the specific meter model (not more than 3 years old), from Fluid Control Research Institute (FCRI) / National Physical Laboratory (NPL).  c. Each meter shall be calibrated by equipment's certified by National Accreditation Board for Testing and Calibration Laboratories (NABL) or from any laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL).
III.	<b>Installation of meter:</b>	Meter installation shall be in accordance with provisions of IS 779 : 1994.

**Abbreviations Used:**

- i. PWRDA : Punjab Water Regulation and Development Authority
- ii. GPRS : General Packet Radio Services
- iii. UPS : Uninterruptible Power Supply
- iv. AMR : Automatic meter reading
- v. AMI : Advanced Metering Infrastructure
- vi. FCRI : Fluid Control Research Institute
- vii. NPL : National Physical Laboratory
- viii. NABL : National Accreditation Board for Testing and Calibration Laboratories
- ix. DTU : Database Transaction Unit
- x. PP Glass : Polypropylene Glass
- xi. PC Glass : Poly Carbonate Glass