

ITF-DGWLR-A

DGWLR-PIEZOMETER

Technical Guide



DIGITAL GROUND WATER LEVEL RECORDER

Digital Ground Water Level Recorder



The purpose of this manual is to provide basic operating knowledge of the components of the automated recorder (see Figure 1) used for periodic water level measurement. Much more than just a supplement to the broader water level program, these automated recorders provide a means to India that cannot be discerned from annual level readings. The design of document day-to-day changes and seasonal patterns in the aquifers of these units also allows for remote satellite transmission of collected data, so that aside from installation and occasional maintenance, no additional work is required to obtain these measurements. This manual will primarily discuss the 3 major technical components of the automated recorder— the sensors, loggers & transmitters— for automated water level monitoring.

ITECHFLOW Pvt. Ltd. itself is an OEM and we use the M5100 series pressure transducers from the Micro-fused TM line of MEAS, set a new price performance standard for demanding commercial and heavy industrial applications. This series of piezometer is suitable for measurement of different mediums like liquid or gas pressure, even for difficult media such as contaminated water, stream and mild corrosive fluids.

Applications -

- Industrial water level monitoring.
- Agriculture bores.
- Groundwater elevations.
- Wells.

Range (psi)	Range (bar)
0 to 050	0 to 3.5
0 to 100	0 to 007
0 to 200	0 to 014
0 to 300	0 to 020
0 to 500	0 to 035

An automated groundwater recorder system is composed of six basic parts:

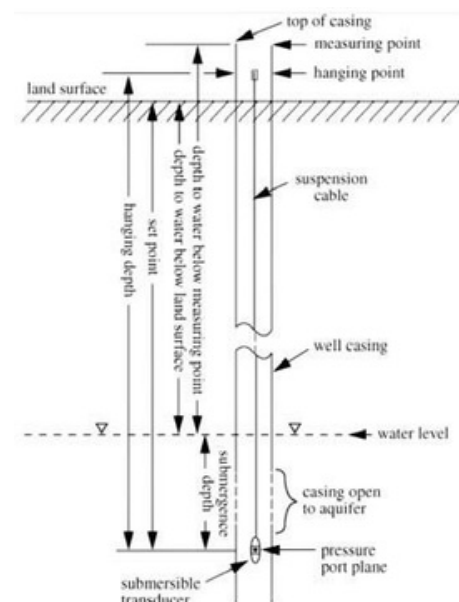
1. The sensor obtains the actual water level measurement. An optical sensor (or encoder—a measurement device that converts mechanical motion into electronic signals) , while a pressure sensor uses water pressure changes to get the data. Typically, older recorders use encoders, and newer ones are outfitted with pressure sensors/transducers.
2. The logger (or data logger) receives the data from the sensor and stores the measurements. This is the main unit that controls the system.
3. The transmitter receives data from the logger at scheduled intervals and transmits the information to a receiving site. Server recorders use the General Packet Radio Services (GPRS) system to relay data.
4. The antenna sends the signal with a moderate-speed data transfer, by using unused time division multiple access (TDMA) channels in, for example, through the GSM system.
5. The power supply of 12 V, 1 Amp DC is supplied to the device as per the input range of the sensor.
6. The shelter protects the recorder from weather, animals, and most human-caused damage.

Features-

- Heavy industrial CE approved pressure sensor.
- 10 V/mEMI protection according to HSE.
- Reverse polarity protection on input.
- Continuous data logging system using USB.
- Short circuit protection on output.
- ± 0.25 % accuracy of the final output.
- ± 1.0 % total error band.
- Compactly designed integration for making more sophisticated handling.
- Working temperature—Console: -20 -70 oC; sensor : -40 to 105 oC.
- We are also providing solar based OEM instrument for remote usage.

Sensor And Its Working

This type of sensor is lowered into the well on a reinforced cable and submerged below the water. Once in place, the initial water pressure reading is synced with the current water level. The unit then monitors the water pressure for changes, and the pressure difference is converted to a change in water level. The entire unit is hermetically sealed to prevent any moisture from getting into the instruments circuitry.



Pressure Transducer

- CECompliance.
- WideTemperatureRange.
- Compact.
- VarietyofPressurePortsandElectrical
- Configurations.



TechnicalSpecifications

PARAMETERS	MIN	MAX	UNITS	NOTES
Accuracy (combined non linearity,hysteresis,and repeatability)	-0.25	0.25	%F.S.	BFSL
Isolation, Body to any Lead	100		MΩ	@500VDC
Dielectric Strength	2		\mA	@500VAC, 1min
Long Term Stability (1 year)	-0.25	0.25	%F.S.	
Compensated Temperature	-20	85	°C	
Operating Temperature	-40 max	+125	°C	Except Cable 105c
Storage Temperature	-40 max	+125	°C	Except cable 105°C
Current Consumption	5	mA	Voltage Output	
Wetted Material	17-4PHor316L StainlessSteelPort, 316L StainlessSteel Snub- ber			
Vibration	±20g, MIL-STD-810C, Procedure514.2, Fig514.2-2,CurveL			

Instruments

ACCESSORIES:

- High air entry filter, Console or cabinet box
- Battery installed.
- Armored cable of IP-67 grade (length as per customers requirement).

PIEZOMETER

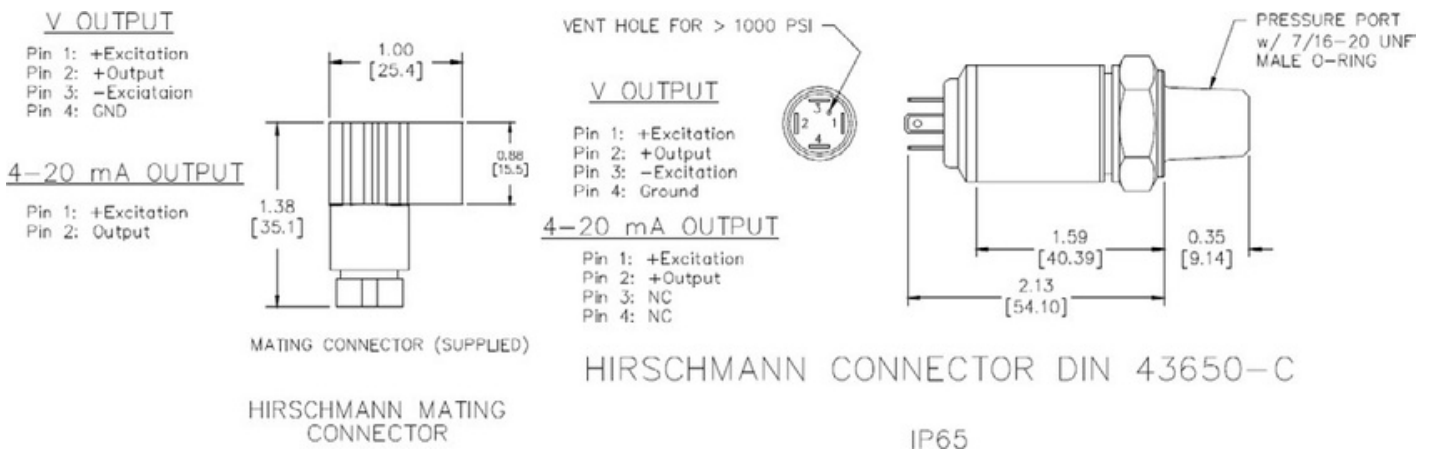
MODEL DGWLR-AT-01:

- Length×Breadth×Height:
- Weight:
- Material: Stainless steel-IP-65.

PERFORMANCE:

- Accuracy $\pm 0.25\% \text{ F.S}$
- Linearity - $< \pm 0.65\% \text{ F.S}$
- Resolution $\pm 0.4\% \text{ F.S}$ (minimum)
- Thermal Drift $\pm 0.5\% \text{ F.S}/^{\circ}\text{C}$

Dimension and Connector of the Transducer



Notes -

Compensated Temperature: The temperature range over which the product will produce an output proportional to pressure within the specified performance limits. **Operating Temperature:** The temperature range over which the product will produce an output proportional to pressure but may not remain within the specified performance limits.

Storage Temperature: The temperature range over which the product can be stored safely in occasions without pressure applied or power input and remains rated performance. Beyond this temperature range may cause permanent damage to the product.

All configurations are built with supply voltage reverse and output short-circuit protections.

Precautions -

- Handle the Sensorhead with care, it may get damaged on strong impact with hard surface or ground.
- Use 1A 12Volts DC adapter to power the instrument, or the one which came along.
- Wind up the extra cable to prevent wear and tear. It may hamper with the sensor's reading.

Installation -

1. Choose a suitable location to mount the console, secure from unauthorized access to prevent tampering with the instrument, not too distant from the borewell and has easy reach to power socket.
2. After finalizing the mounting location, check the availability of power by connecting a 12 volts 1A DC adapter
3. Measure the length of cable to suspend into the borewell from the ground level and tie the cable firmly at the point where it leads into the borewell to avoid slipping.
4. At this step, feed the length of cable measured in the instrument by referring to the Operation Manual section no: 3.2.
5. Next, insert the port at the end of the cable into the socket provided on the instrument body.
6. To confirm that the instrument is set up successfully, power on the instrument and note the reading of the ground water level displayed on the screen. If the displayed reading is less than the value fed at step 4, then the instrument is functioning properly.

INSTRUCTIONS

If preparing a new installation:

1. Check that the well is unobstructed. Clear obstructions.
2. If the well depth is not known, measure the total well depth.
3. If necessary, install an instrument shelter that will protect the transducer and data logger from vandalism and weather.
4. Keep the transducer packaged in its original shipping container until it is installed. Connect the transducer, data logger, power supply, and ancillary equipment. Record the model, serial number, and pressure range of the transducer in the field notebook.
5. Install the pressure transducer by lowering it into the well so that it is submerged below the water surface. Avoid dropping the transducer or permitting sharp contacts with the sides of the well casing. Do not allow the transducer to free fall into the well.
6. The transducers should be installed at a point in the well that will not go dry. Estimate the lowest expected water level, and lower the transducer to the desired depth below the water level.
7. Fasten the cable or suspension system to the well head using tie wraps or a weatherproof strain-relief system. If the vent tube is incorporated in the cable, make sure not to pinch the cable too tightly or the vent tube may be obstructed.
8. Make a permanent mark on the cable at the hanging point so that future slippage, if any, can be determined.



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