Register Output Versions

ARAD
Water Measuring Technologies

Water Works

The constantly growing penetration of automation and computerized data processing into water usage, in agriculture, industry and urban water supply systems and any other field where more is required than just the traditional mechanical register of water meters, creates a high demand for measuring instruments which are able to provide information about the flow. Arad Water Meters equipped with output devices combine the high reliability of the hermetically sealed, magnetically driven register with a wide variety of output options.
All existing Arad Water Meters with magnetic registers can be easily upgraded to include output.

- **Application Examples**

1. **Remote Reading**
   In combination with a remote reading system, or computerized data acquisition system, it is possible to collect and process water usage data in multi-apartment houses, in places with no access, or wherever it is required to bring all data to one point.

2. **Flowrate Measuring**
   With the appropriate type of output it is possible to obtain on-line information about the flowrate which can be displayed, stored or both.

3. **Flowrate Control**
   With the appropriate type of output and additional control device it is possible to perform various functions like the operation of valves, pumps or alarm signals according to various preset levels of flowrate.

4. **Bi-directional Flow Measurement**
   With the appropriate output and an additional module it is possible to distinguish between flow directions, to measure and record flow rates and volumes passed in each direction.

5. **Batching**
   Feeding output to a batching controller enables pre-setting and delivering of accurate volumes of water in irrigation systems, industrial process etc.

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- **Transducer Types - Description & Specifications**

1. Reed Switch (EV) Sensor

A magnet activates this sensor. It acts as a "Dry Contact" and does not consume electric power. This is the most suitable sensor for "VOLUME" related functions and in such applications its operating life is practically unlimited (ca. 108 cycles).

Electrical specifications:

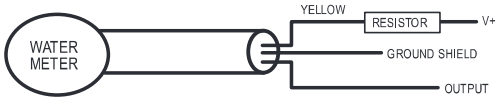
a. Max. contact current - 50 mA
b. Max. contact voltage - 48 V

2. Photo-Diode (EF) Sensor

This sensor combines an IR light source and a light sensitive diode in one package. Signals are created by letting the light pass through, or reflected from a rotating element in the register in an interrupted mode. It requires a constant supply of power.

Electrical specifications:

a. Current supplies - 20•30 mA through a resistor (see following table for values).
   Lead color code - yellow.
b. Output - open collector.
   Max. Load - 2 mA.
   Lead color code - transparent.
c. Circuit diagram:



d. Recommended resistor values table:

VOLTAGE (V+)	RESISTOR VALUES	
	Ω	W
5	180	0.25
6	220	0.25
9	330	0.25
12	470	0.5
24	1000	1

NOTE: Correct polarity of the leads should be checked carefully to prevent damage of the sensor.

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- **Registers Types**

1. VOLUME OUTPUT- Reed Switch

1.1 SINGLE VOLUME OUTPUT

A 3-pointer register with magnet installed on one of them.
Output de□nition: "Volume output". Output type: EV.
The reed switch sensor is installed in sealed transparent plastic cover that can be mounted on the register in any one of 3 positions facing the pointer with the magnet.
3 values of output are thus available in 1:10:100 ratios.

1.2 IP 68 SINGLE VOLUME OUTPUT

A 3-pointer register with a magnet installed on one of them.
Output de□nition: "Volume output". Output type: EV.
The IP68 configuration is a sealed structure that can be mounted on the register shroud in a WSTsb Bayonet configuration in any of 3 positions facing the pointer with the magnet. 3 values of output are thus available in 1:10:100 ratios.
Once assembled the IP68 configuration is fixed and sealed on the needed output.
IP68 standard means that the assembly is totally protected against dust and protected against long periods of immersion under pressure.

1.3 DOUBLE OUTPUT

A 3-pointer register with magnet installed on one of them.
Output de□nition: "volume output". Output type: EV-D.
The output device contains 2 reed switches.
All the components are sealed within a plastic module.
A unique feature of this unit is the immunity from conditions that might create false pulses due to back and forth fluctuations of standing water in pipe line containing air pockets, or where mechanical vibrations of the pipe exist.

2. VOLUME OUTPUT- Photo Diode

A 3-pointer register with a serrated wheel on the first pointer shaft for activating a photo-diode sensor.
Output de□nition: "Volume output". Output type: EF-P.
The serrated wheel has 10 "teeth" creating 10 signals per revolution, each signal represents 1/10 the full-scale value at this position in the register.

3. VOLUME OUTPUT- Optical Encoder (OE)

A 3-pointer register with a reflective half coated wheel on the first pointer shaft for activating a sensor.
Output de□nition: "Volume output". Output type: Open Drain.
The reflective wheel has a golden coloured coating on half of its area- creating one pulse per revolution output in a forward flow; there's no output in a reverse flow.
Each pulse presents one full-scale value at this position in the register.

4. FLOWRATE OUTPUT- Photo Diode

A 3-pointer register with a serrated wheel mounted on the central shaft of the register for activating a photo-diode sensor.
Output definition: "Flowrate output". Output type: EF.
The sensor is installed and sealed within a transparent plastic cover. The high number of "teeth" and the relatively high speed of the central shaft create a rapid stream of signals in frequency proportional to the rate of flow. Sent to the suitable electronic units these signals are translated into flowrate values that can be expressed in any desirable units.

5. Electronic Register- ER

Electronic Register with no moving parts and LCD display. Flexible data format including flow direction, flow rate and volumes. Volume diplay is programmable- forward/ reverse/ total.
AMR and cellular network ready. IP68

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General Remarks Concerning the Various Types of Electrical Outputs

1. All the sensors are mounted on the register in a non-invasive mode.
2. All "Volume outputs" sensors of types EV and EV-D may be installed or replaced without disassembling the register.

Water Meter		Available Pulse Value & Sensor Type								
Model	Size	Lit.				m^3				
		0.1	1	10	100	1	10	100	1000	10000
Multi-Jet M	15mm-32mm	EF, ER	EV, ER	EV, ER	EV, ER	ER	ER	ER	ER	ER
	40mm-50mm	ER	EF, ER	EV, ER	EV, ER	EV, ER	ER	ER	ER	ER
Gladiator	15mm and 20mm	ER	EV, OE, ER	EV, ER	EV, ER	ER	ER	ER	ER	ER
Positive Displacement P	15mm and 20mm	ER	EV, ER	EV, ER	EV, ER	ER	ER	ER	ER	ER
Multi-Jet Q	15mm	ER	EV, ER	EV, ER	EV, ER	ER	ER	ER	ER	ER
Woltman WMR WSTsb	50mm-80mm		EF, ER	EV, OE, ER	EV, ER	EV, ER	ER	ER	ER	ER
	100mm		ER	EF, ER	EV, OE, ER	EV, ER	EV, ER	ER	ER	ER
	150mm		EF	EV, OE, ER	EV, ER	EV, ER	ER	ER	ER	ER
	200mm			ER	EF, ER	EV, OE, ER	EV, ER	EV, ER	ER	ER
	250mm-300mm			ER	ER	ER	ER	ER	ER	ER
Irrigation meter IRT	80mm-100mm			EF, ER	EV, ER	EV, ER	EV, ER	ER	ER	ER
	150mm-250mm				EF, ER	EV, ER	EV, ER	EV, ER	ER	ER
Hydrometer BM/ BMA	40mm-80mm	ER	EF, ER	EV, ER	EV, ER	EV, ER	ER	ER	ER	ER
	100mm-150mm		ER	EF, ER	EV, ER	EV, ER	EV, ER	ER	ER	ER
	200mm			EF, ER	EV, ER	EV, ER	ER	ER	ER	ER
Dose-O-Mat KB/ KBA/ KBJ/ KBJA	40mm-100mm				EV	EV				
	150mm-200mm					EV	EV			
Fertilizer Meter Dishnon SF	15mm	EV	EV	EV	EV					

ER= Electronic register
EV= Reed Switch
EF= Photodiode on pointer
OE= Optical Encoder

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