

DOSE-O-MAT I Automatic Metering Valve Model K/KA, KB/KBA

Volume based irrigation device, consisting of a water meter, a volume control dial and a valve all contained in a single unit.

• Description

The Dose-O-Mat line of automatic metering valves provides a reliable and economical solution for a wide variety of irrigation applications. A variety of models and sizes are available to meet virtually any operational requirements and budget. The desired quantity is set using the volume control dial, according to local crop and soil. It automatically closes the valve once the pre-set quantity of water has passed through the unit.

Dose-O-Mat units of sizes 1 1/2" and larger, contain hydraulic valves and may be installed either as single points of control or in groups that are operated in sequence.

Operation is extremely simple, it does not require neither skilled labor nor intensive training

• Available Sizes

K/KB - Globe type: 3/4", 1", 1 1/2", 2", 3"

KA/KBA - Angle type: 2", 3"

Features:

- Negligible head loss
- Simple maintenance
- Field replaceable measuring unit
- Hermetically sealed register with glass lens
- Bearings are constantly flushed during operation to eliminate deposit of solids
- Optional electrical output: EV (Volume) or EF (Rate of Flow)
- Compatible with Dialog automatic reading system

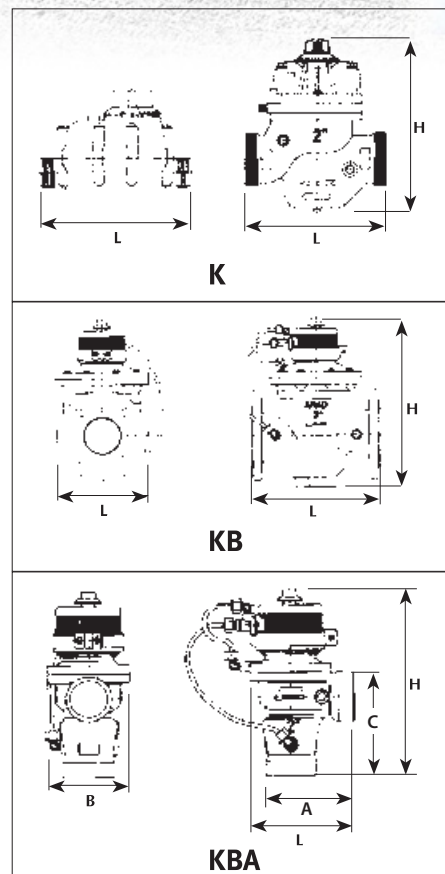


Technical Specifications:

Maximum Working Temperature	60°C
Body	K 3/4" - 1" plastic All other models - cast iron
Connection	K 3/4" - 3/4" BSPT male thread K 1" - 1 BSPT male thread K/KB 1 1/2" - 1 1/2" male thread with coupling K/KB 2" - 2" male thread with coupling - Internal thread BSPT or NPT KB 3" - Cast-iron flanges meeting BS 10, ISO, AWWA, JIS10.

Dimensions

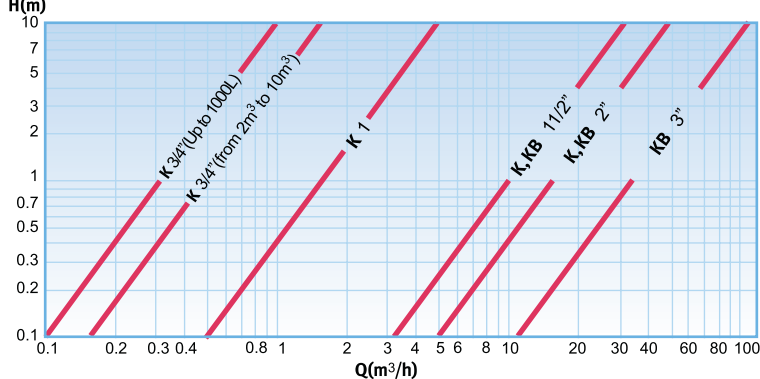
Model		K				KA	KB			KBA	
Nominal size	(mm)	20	25	40	50	50	40	50	80	50	80
	(inch)	¾	1	1½	2	2	1½	2	3	2	3
L - Length without couplings (mm)		130	200	160	190	158	160	190	285	190	240
H - Height (mm)		86	115	203	235	265	203	235	350	290	364
A - (mm)		-	-	-	-	96	-	-	-	97	140
C - (mm)		-	-	-	-	122	-	-	-	122	140
B - Width (mm)		102	90	126	126	126	126	126	200	126	205
Weight (kg)		0.3	0.5	2.3	4.4	4	2.9	4.7	30	4.5	19
Weight with couplings (kg)		-	-	3.3	5.8	5.4	3.9	6.1	-	-	-



Performance data

Model	Nominal Size (inch)	Maximum Working Pressure (bar)	Minimum Working Pressure (bar)	Qmax Maximum Flow Rate (m³/h)	Qmin Minimum Flow Rate (m³/h)	Regulated Flow Rate
K/KA	¾"	10	0.5	1.5	0.08	±2%
	1"	8	0.5	5	0.5	
	1½"	10	1	15	1.5	
	2"	10	1	30	2	
KB/KBA	1½"	10	1.3	15	1.5	
	2"	10	1.3	30	2	
	3"	10	1.5	65	3	

Head Loss Curve



Standard Scales

Model \ Scale	Scale												
	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³	m³
K ¾"- Giron	•												
K 1"	•	•	•			•							
K 1½"		•	•	•		•	•	•					
K/KA 2"			•		•		•	•	•				
KB 1½"			•		•		•	•					
KB/KBA 2"			•		•		•	•	•	•	•		
KB/KBA 3"			•		•		•	•	•	•	•		

* Other scales upon request.

Installation Requirements

- The meter should be installed in horizontal position

DOSE-O-MAT I Automatic Metering Valve Model KBJ/KBJA

Volume based irrigation device, consisting of a water meter, a volume control dial and a double chamber valve contained in a single unit.

• Description

The Dose-O-Mat line of automatic metering valves provides a reliable and economical solution for a wide variety of irrigation applications.

A variety of models and sizes are available to meet virtually any operational requirements and budget.

The desired quantity is set using the volume control dial, according to local crop and soil. It automatically closes the double chambered valve once the pre-set quantity of water has passed through the unit.

Dose-O-Mat units that are 1 1/2" and larger contain a hydraulic double chamber valve and may be installed either as single points of control or in groups that operate in sequence.

Operation is extremely simple, it does not require neither skilled labor nor intensive training



• Available Sizes

KBJ - Globe type: 1 1/2", 2", 3", 4", 6", 8"

KBJA - Angle type: 2", 3", 4", 6", 8"

Features:

- Simple to operate and maintain - just set it & forget about it.
- High accuracy
- Rugged, heavy-duty construction
- Immune to fluctuations in line pressure
- Low loss of head
- Up to 30% saving compared to time based irrigation
- Wide variety of flow and pressure regulation options
- Wide variety of models & sizes - suitable for virtually all irrigation applications
- Can function together with other units as part of an automatic, sequential irrigation system

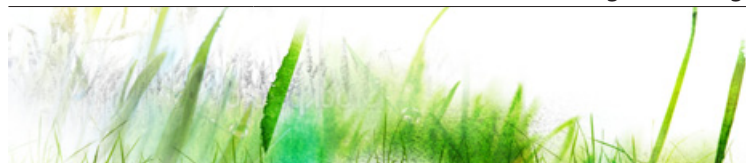
Technical Specifications:

Maximum Working Pressure	16 bar
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Maximum Working Temperature	60°C
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Body	Cast iron body
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Connection	KBJ 1 1/2" - 1 1/2" BSP male thread with coupling. KBJ/KBJA 2" - 2" BSP male thread with coupling - Internal thread 2" BSPT or 2" NPT KBJ/ KBJA 3" - 8" - Cast iron flanges meeting BS 10, ISO, AWWA, JIS1
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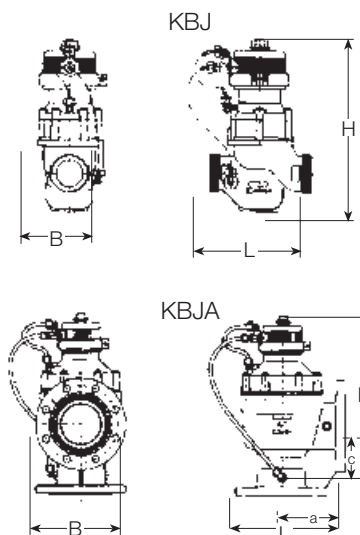


Dimensions

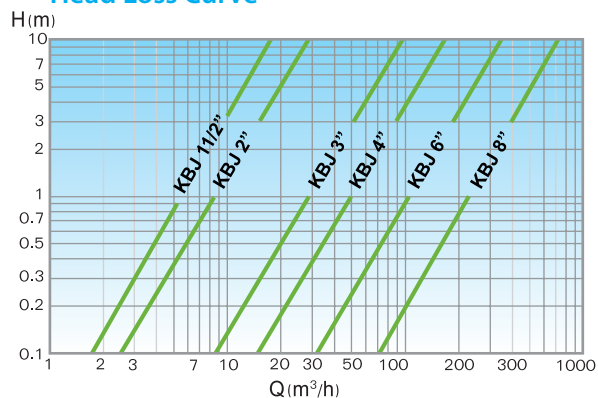
Model		KBJ						KBJA				
Nominal size	(mm)	40	50	80	100	150	200	50	80	100	150	200
	(inch)	½1	2	3	4	6	8	2	3	4	6	8
L - Length without couplings (mm)		160	190	270	320	500	600	158	243	277	440	525
H - Height (mm)		262	330	350	360	645	770	350	430	450	645	675
A - (mm)		-	-	-	-	-	-	96	140	162	250	300
C - (mm)		-	-	-	-	-	-	122	140	176	300	280
B - Width (mm)		120	120	210	210	380	450	120	210	230	380	450
Weight (kg)		2	3.8	21.5	29.5	120	150	3.5	19.5	28.5	111	140
Weight with couplings (kg)		3	5.2	-	-	-	-	4.9	-	-	-	-

Performance data

Model	Nominal Size		Maximum Working Pressure (bar)	Minimum Working Pressure (bar)	Qmax Maximum Flow Rate (m³/h)	Qmin Minimum Flow Rate (m³/h)	Regulated Flow Rate
	inch	mm					
KBJ KBJA	1½	40	16	1	15	1.5	2% ±
	2	50	16	1	30	2	
	3	80	16	1	40	3	
	4	100	16	1	120	4.8	
	6	150	16	1	300	12	
	8	200	16	1	500	22	



Head Loss Curve



Standard Scales

Model	Scale																
	1	3	10	20	25	40	50	100	200	400	1,000	1,600	2,500	4,000	5,000	10,000	25,000
KBJ 1½"					●			●	●								
KBJ/KBAJ 2"								●	●	●							
KBJ/KBAJ 3"										●	●						
KBJ/KBAJ 4"										●	●						
KBJ/KBAJ 6"											●	●			●	●	
KBJ/KBAJ 8"											●				●	●	●

* Other scales upon request.

Installation Requirements

- The meter should be installed in horizontal position

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Plastic Fertilizer Meter Model SF

The SF is a fertilizer & chemical solutions meter with electrical output and a totalizing register.

The impeller is the only moving part, inside the meter, that comes into contact with the liquid.

- **Applications**

- Fertilizing control in automated irrigation systems.
- Industrial applications involving corrosive liquids.

- **Available Sizes**

1/2" (15mm)

- **Features:**

- Mechanical register with totalizer, 3 pointers and leakage detector
- High accuracy
- Corrosion resistant plastic components.
- Small & lightweight. Compatible with Dialog automatic reading system

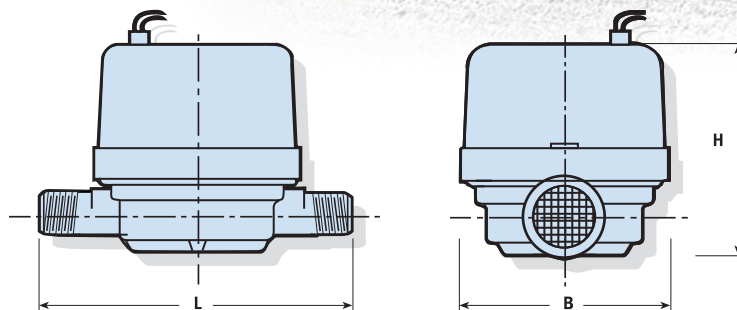
- **Technical Specifications**

Maximum Working Pressure	5 bar
Maximum Working Temperature	50°C
Body	PPS
Connection	3/4" BSP
Electrical output	0.1, 1, 10, 100 liter/pulse



Dimensions

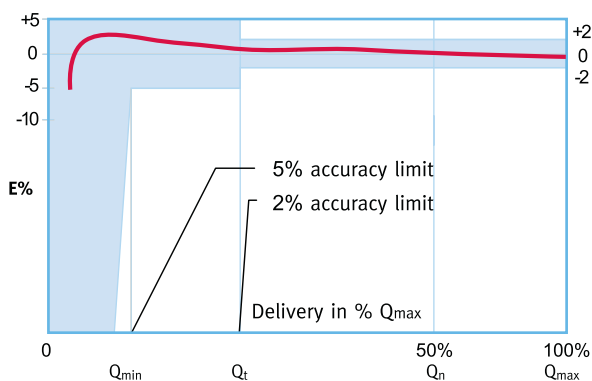
Model		SF
Nominal size	(mm)	15
	(inch)	1/2
L - Length (mm)		110
H - Height (mm)		81
B - Width (mm)		77
Weight (kg)		0.28



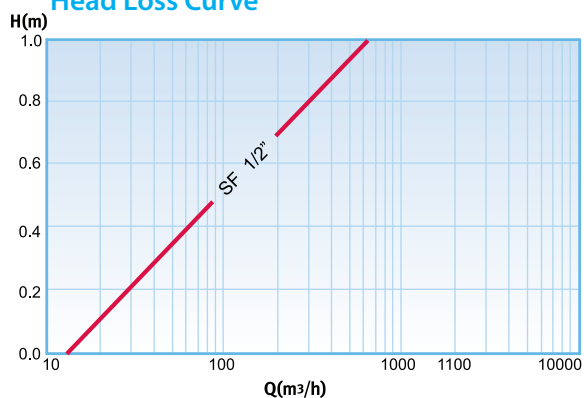
Performance data:

Model SF		Q _{max} Maximum flowrate (l/h)	Q _t Lowest Flowrate Measured between ±2% (l/h)	Q _{min} Lowest Flowrate Measured between ±5% (l/h)	Loss of Head at Maximum flow rate (bar)
Nominal size					
(mm)	(inch)				
15	1/2	750	70	25	0.12

Accuracy Curve



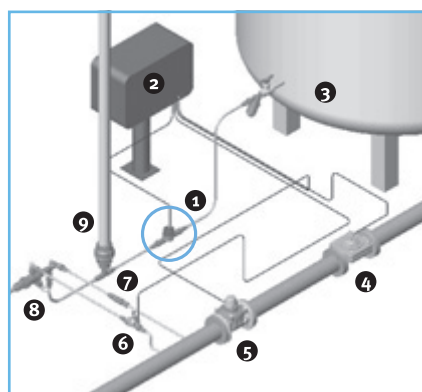
Head Loss Curve



Installation Requirements

- The fertilizer meter should be installed in horizontal position

Installation Scheme



- SF Fertilizer Meter
- Irrigation computer
- Fertilizer tank
- Hydraulic valve
- Water meter
- Hydraulic valve
- Flow limiter valve
- Fertilizer Pump
- 75 mm damping pipe

DISHNON - Fertilizer meter with electrical output Model KD

The DISHNON is a small meter, which is resistant to fertilizer and similar chemicals and which transmits electrical data to automated control systems. The DISHNON contains a small measuring chamber and a magnetic proximity switch made of synthetic polymers and metals capable of withstanding all fertilizer materials currently in common use.

Applications

- Automated irrigation systems
- Automated industrial applications using corrosive liquids

Available Sizes

1/2" (15mm)

Features:

- Compatible with virtually any type of automated control system
- High accuracy
- Dry contact electrical output
- Corrosion resistant plastic and metal components

Technical Specifications:

Maximum Working Pressure	16 bar
Maximum Working Temperature	50°C
Body	Corrosion resistant plastic
Connection	3/4" BSP



Performance data

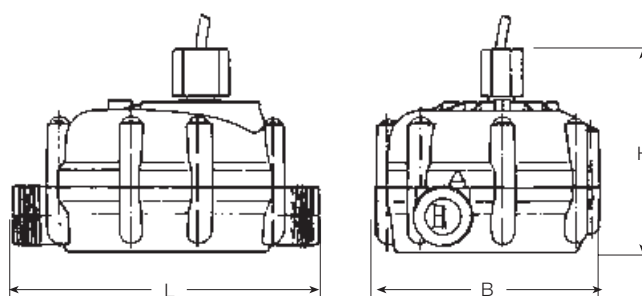
Model	Qmax Maximum flowrate (l/h)	Qmin Minimum flowrate (l/h)
N-KD	750	60
S-KD	500	20

Electrical output data

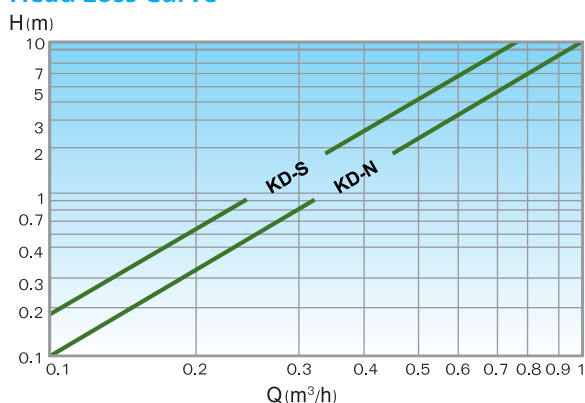
Model	Pulse per unit	V max	I max	Cable Length
N-KD	0.1, 0.25, 1, 10	28V DC	50 mA	1.5 meter
S-KD	0.05			

Dimensions

Model		KD
Nominal size	(mm)	15
	(inch)	½
L - Length (mm)		136
H - Height (mm)		86
B - Width (mm)		100
Weight (kg)		0.3



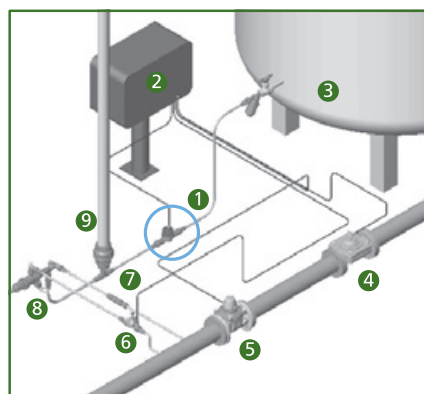
Head Loss Curve



Installation Requirements

- The fertilizer meter should be installed in horizontal position

Installation Scheme



1. KD Fertilizer Meter
2. Irrigation computer
3. Fertilizer tank
4. Hydraulic valve
5. Water meter
6. Hydraulic valve
7. Flow limiter valve
8. Fertilizer Pump
9. 75 mm damping pipe

Plastic Body Liquid Chemical Meter Model PB

The PB is an angle type, plastic body, multi-jet liquid chemical meter.

Applications

- Measuring flow of fertilizer solutions, for agriculture, distilled water, seawater and many other diluted solutions

Available Sizes

- 3/4" - 1" (20 - 25mm)

Features:

- The impeller is corrosion resistant and is the only moving element that comes in contact with the liquid
- Electrical output (EV)

Technical Specifications:

Maximum Working Pressure	10 bar
Maximum Working Temperature	50°C
Body	PVC
Connection	1" BSP
Electrical output	1, 10, 100 liter/pulse

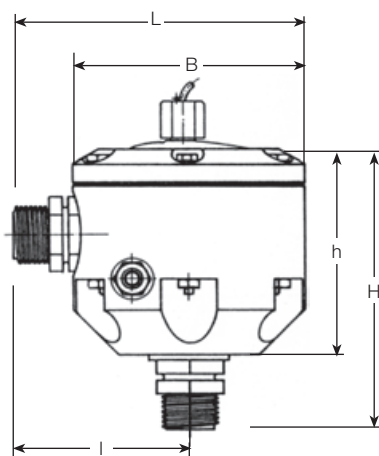


Performance data

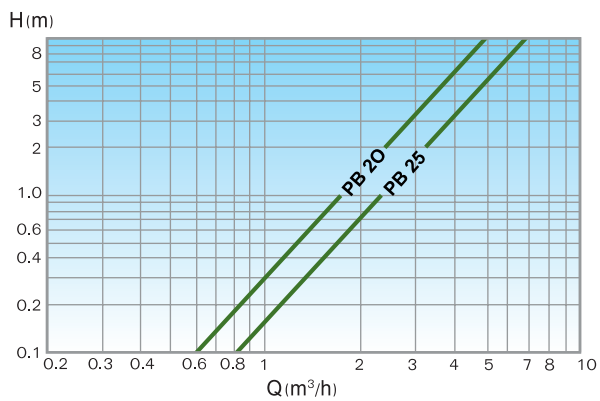
Model PB		Qmax Maximum flowrate (m ³ /h)	Qn Nominal Flowrate (m ³ /h)	Qt Transitional Flowrate (l/h)	Qmin Minimum Flowrate (l/h)	Minimum register capacity (m ³)	Minimum register capacity (Liter)	Accuracy between Qmax & Qt	Accuracy between Qt & Qmin
Nominal Size									
inch	mm								
¾	20	5	2.5	200	50	10 ⁵	0.1	2% ±	5% ±
1	25	10	5	400	100	10 ⁵	0.1		

Dimensions

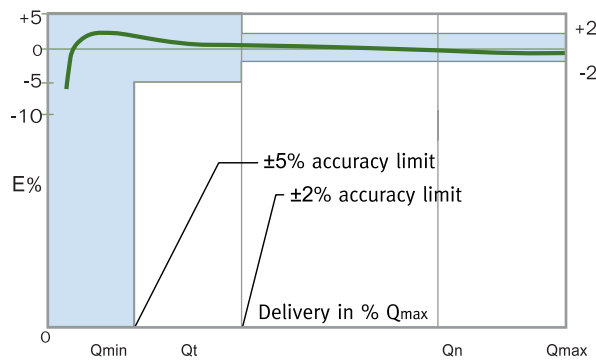
Model	PB		
Nominal size	(mm)	20	25
	(inch)	¾	1
L - Length (mm)	150		
I - Length (mm)	90		
H - Height (mm)	150		
h - Height (mm)	115		
B - Width (mm)	120		
Weight (kg)	0.875		



Head Loss Curve



Accuracy Curve



Installation Requirements

- The meter should be installed with dial face in horizontal position

Pilot Valves

Model PC

Arad Pilot Valves PC work together with BM/BMA series high pressure Hydrometers or with KBJ/KBJA series high pressure metering valves in automated environments requiring pressure regulation. These pilot valves are also compatible with valves and hydrometers from many other manufacturers.

These valves may be used in a variety of control applications. The pressure regulating model is available in normal pressure or low pressure configurations.

The pilot valve body is made of high quality reinforced plastic.

Calibration may be performed by means of an adjusting screw located on the top of the valve.

Applications

The model PC pressure regulating pilot valve is used in pressure reducing and pressure sustaining applications. Two pressure regulating pilot valves may be combined together to form a two stage operation, combining both pressure reducing and pressure sustaining functions in order to prevent excess water flow during pipeline filling.

Technical Specifications:

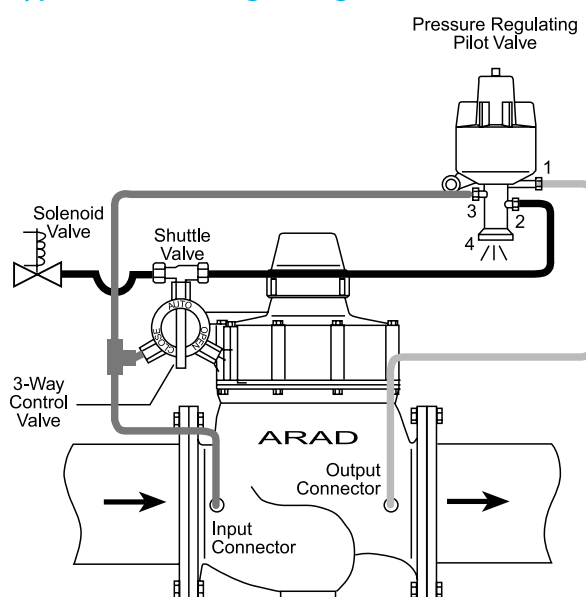
Maximum Working Pressure	10 bar
Maximum Working Temperature	70°C
Pressure regulation accuracy	0.3 bar
Body	Plastic

Sustaining/Reducing Pressures according to Pilot types

Unit Type	Pressures	
	BAR	psi
Blue	0.3-1.4	5-20
Green	1-3	14.5-43.5
Gray	2-8	29-116



Typical Pressure Regulating Environment



Pilot Valves

Model FC

Arad Pilot Valves FC work together with BM/BMA series high pressure Hydrometers or with KBJ/KBJA series high pressure metering valves in automated environments requiring flow regulation. These pilot valves are also compatible with valves and hydrometers from many other manufacturers.

These valves may be used in a variety of control applications. The pilot valve body is made of high quality reinforced plastic. Calibration may be performed by means of an adjusting screw located on the top of the valve.

Applications

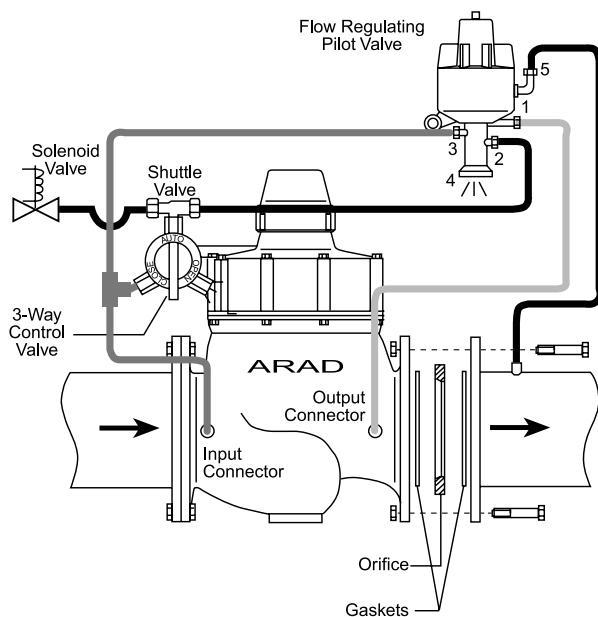
The model FC flow regulating pilot valve is used individually for flow regulating applications or together with a model PC pressure regulating pilot valve in combined flow and pressure regulating applications.

Technical Specifications:

Maximum Working Pressure	10 bar
Maximum Working Temperature	70°C
WP	0.3: 0.6 bar
Regulation Accuracy	±8% of flow rate
Body	Plastic



Typical Pressure Regulating Environment



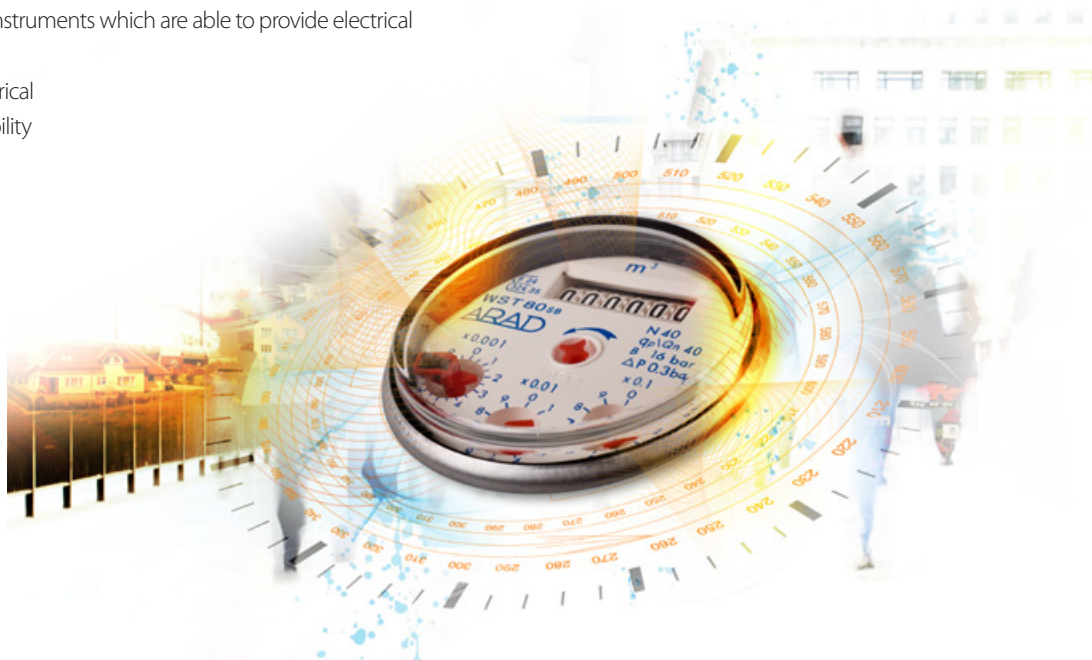
Register output options

Electrical Output Versions

The constantly growing penetration of automation and computerized data processing into water usage, in agriculture, industry, urbanic 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 electrical information about the flow.

Arad Water Meters equipped with electrical output devices combine the high reliability of the hermetically sealed, magnetically driven register with a wide variety of electric output options.

All existing Arad Water Meters with magnetic registers can be easily upgraded to include electrical 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 electrical 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 electrical output and additional electronic 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 electrical output and an additional electronic module it is possible to distinguish between flow directions, to measure and record flow rates and volumes passed in each direction.

5. Batching

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

• 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:

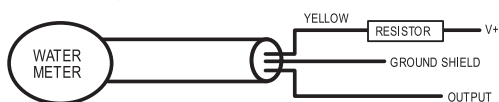
- a. Max. contact current - 50 mA
- b. Max. contact voltage - 48 V

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.

• Registers Types

1. VOLUME OUTPUT- Reed Switch

1.1 SINGLE VOLUME OUTPUT

A 3 pointer register with magnet installed on one of them.

Output definition: "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 definition: "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 definition: "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 definition: "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 definition: "Volume output". **Output type:** Open Drain.

The reflective wheel has a golden 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. Fed into suitable electronic units these signals are translated into flowrate values that can be expressed in any desirable units.



5. DUAL PURPOSE ELECTRONIC- DPE

Electronic register showing rate of flow and accumulated volume. The register has LCD with 6 digits. The register has interchangeable presentation (every 30 seconds) between the rate of flow and volume. Mounted inside stainless steel vacuumed encapsulated cup with glass lens, hermetically sealed IP 68. Can be installed on any Arad meter and hydrometer.

Can be programmed for various units: Flow Rate: GPM, m³/h, liter/sec

Volume: Gallons, Cubic Feet, Acre Feet, m³



6. MULTI PURPOSE ELECTRONIC- MPE

Electronic register showing three interchangeable displays (every 10 seconds) on LCD display (1 display of flow and 2 displays of accumulated volume), with high resolution and EV passive output.

Mounted inside stainless steel vacuumed encapsulated cup with plastic lens, hermetically sealed IP67.

Can be installed on any Arad meter and hydrometer.



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 types of outputs may be installed on all ARAD water meters.
3. 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	1/2" - 1"	EF-P	EV	EV	EV					
	1 1/2" - 2"		EF-P	EV	EV	EV				
Gladiator	1/2" and 3/4"		EV / OE	EV	EV					
Positive Displacement P	1/2" - 3/4"		EV	EV	EV					
Multi-Jet Q	1/2"		EV	EV	EV					
Woltman WMR WT WST WSTsb	2"-3"		EF-P	EV / OE	EV	EV				
	4"-6" option 1			EF-P	EV / OE	EV	EV			
	4"-6" option 2		EF-P	EV / OE	EV	EV				
	8"-12"				EF-P	EV / OE	EV	EV		
Irrigation Meter IRT	3"-8"			EF-P	EV	EV	EV			
	10"				EF-P	EV	EV	EV		
Compound Water Meter M-WT	2" x 1/2"	WT - Look under Woltman M - Look under Multi-jet								
	3" x 3/4"									
	4" x 3/4"									
	6" x 1 1/4"									
Hydrometer BM/BMA	1 1/2" - 3"		EF-P	EV	EV	EV				
	4" - 6"			EF-P	EV	EV	EV			
	8"			EF-P	EV	EV				
DOSE-O-MAT KB/KBA KBJ/KBJA	1 1/2" - 4"				EV	EV				
	6" - 8"					EV	EV			
Fertilizer Meter Dishnon SF	1/2"	EV	EV	EV	EV					

EV - Reed Switch
 EF-P - Photodiode on Pointer
 OE - Optical Encoder

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