

## Turbo-Bar Water Meter Series

Heavy duty and designed to handle high flow rates, the Turbo-Bar- $\epsilon$ /M Magnetic Drive Water Meter with Electronic Register (Turbo-Bar- $\epsilon$ ) or Magnetic Register (Turbo-Bar-M), covers a very wide flow range, and is particularly suited to industrial, waterworks, water distribution, water monitoring, and Irrigation applications. Based on the Woltman principle, the helical blades of the turbine rotate around the axis of flow, the Turbo-Bar- $\epsilon$ /M is a long-life product, easy to maintain at low cost.

## Turbo-Bar- $\epsilon$

### Woltman Water Meter with Electronic Register

#### Features and Benefits

- Digital display (LCD, 4-8 digits) of Flow Rate and Volume
- Electronically improves metering sensitivity
- Reduces reverse flow from accumulated volume
- Programmable Measuring units and Pulse rate
- Battery lifespan – 10 years
- Integrated two pulse outputs option
- Can easily upgrade any Standard meter
- Dry, IP68; NEMA 6P Sealed Register



## Turbo-Bar-M

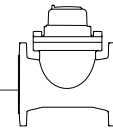
### Woltman Water Meter with Magnetic Register

#### Features and Benefits

- Magnetic drive
- Dry, IP68; NEMA 6P Sealed Register
- "Reed switch" sensor allow one or two pulse outputs option
- Easy maintenance
- ID 2004/22/EEC Approved, according to OIML R49, EN14154 (sizes 40 - 300 mm).



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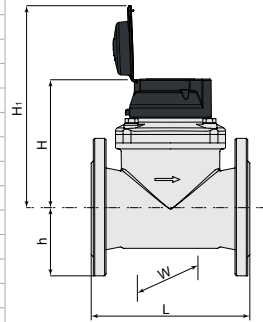


### Technical data

- **Body, Cover:** Ductile Iron
- **Coating:** Polyester Green
- **End Connections - Flanged:** ISO PN16, ANSI Class 150
- **Pressure Rating:** ISO PN16
- **Operating Temperature:** water up to 50°C / 122°

### Dimensions and Weights

	Unit	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN400	DN500
		1½"	2"(*)	2½"	3"	4"	5"	6"	8"	10"	12"	16"	20"
L, length	mm	260	200	200	225	250	250	300	350	450	500	500	500
	inch	10.24	12.20	7.87	8.86	9.84	9.84	11.81	13.78	17.72	19.69	19.69	19.69
H, Height	mm	268	252	262	272	281	295	343	370	489	511	646	742
	inch	10.55	9.72	10.31	10.71	11.06	11.61	13.50	14.57	19.25	20.12	25.43	29.21
H1, Height	mm	343	350	360	370	379	393	441	468	587	609	744	840
	inch	13.50	13.58	14.17	14.57	14.92	15.47	17.36	18.43	23.11	23.98	29.29	33.07
h, Flange type	mm	68	75	85	95	104	118	135	162	194	216	304	355
	inch	2.68	2.76	3.35	3.74	4.09	4.65	5.31	6.38	7.64	8.50	11.97	13.98
h, Grooved type	mm	-	-	-	56	60	71	95	-	-	-	-	-
	inch	-	-	-	2.20	2.36	2.80	3.74	-	-	-	-	-
W, Flange type	mm	160	170	190	200	230	250	285	340	395	445	600	700
	inch	6.30	6.30	7.48	7.87	9.06	9.84	11.22	13.39	15.55	17.52	23.62	27.56
Weight	kg	13	12	14	16	19	20	39	52	105	120	187	256
	lbs	28.7	26.5	0.6	0.6	0.7	0.8	1.5	2.0	4.1	4.7	7.4	10.1

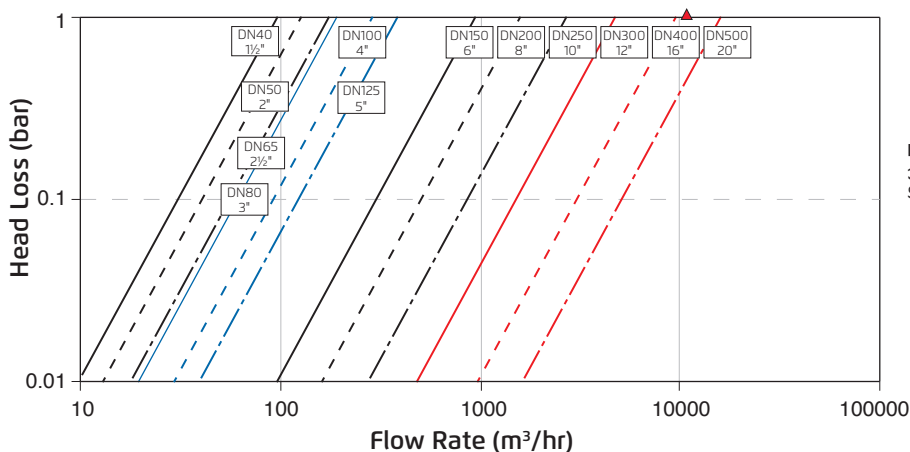


\* 2" ANSI or BSTD have different dimensions comparing to DN50 ISO16

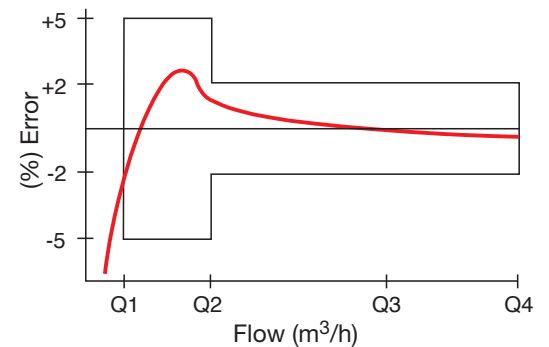
### Metrological Data

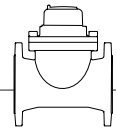
	Unit	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN400	DN500	
		1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"	16"	20"	
Qmin - Minimum flow	m <sup>3</sup> /h	0.5	0.5	0.8	1.3	2	2	3.1	5	7.9	12.5	32	50	
Accuracy ±5%	gpm	2.2	2.2	3.5	5.7	8.8	8.8	13.6	22.0	34.8	55.0	141	220	
Qt - Transitional flow	m <sup>3</sup> /h	0.8	0.8	1.3	2	2	3.2	5	8	12.6	20	51	80	
Accuracy ±2%	gpm	3.5	3.5	5.7	8.8	8.8	14.1	22.0	35.2	55.5	88.1	224.5	352.2	
Qn - Permanent flow, Accuracy ±2%	m <sup>3</sup> /h	25	40	63	63	100	160	250	400	630	1,000	1,600	2,500	
	gpm	110	176	277	277	440	704	1,101	1,761	2,774	4,403	7,045	11,007	
Qmax - Peak flow, short time Accuracy ±2%	m <sup>3</sup> /h	31	50	79	79	125	200	313	500	788	1,250	2,000	3,125	
	gpm	136	220	348	348	550	881	1,378	2,201	3,469	5,504	8,806	13,759	
Qt/Qmin	---	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
Qn/Qmin	---	50	80	80	50	50	80	80	80	80	80	50	50	
Kv, CV =Q/Δp	m <sup>3</sup> /h	95	125	170	190	280	380	950	1,580	2,688	4,700	9,500	15,000	
	gpm	110	144	196	219	323	439	1,097	1,825	3,105	5,429	10,973	17,325	
Min reading unit	---	1					10					100		
Max register capacity	---	99,999.999 - 999,999.99					9,999,999.9 - 99,999,999							

### Flow Curve

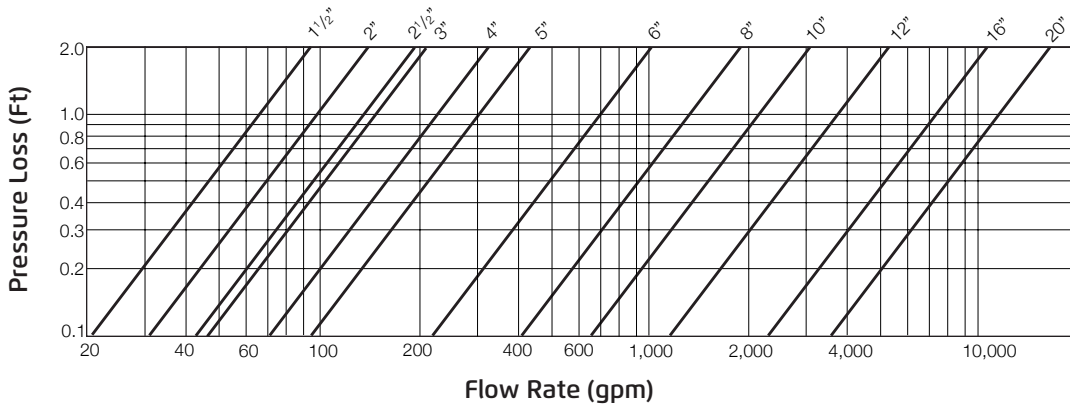


### Accuracy Curve





### Flow Curve



### Data Output Options

Water system management requires reliable data acquisition. BERMAD Turbo-Bar-E/M provides accurate data meeting all common pulse output specifications.

#### Electronic Register

Output Type
Programmable dual open collector pulse output Data

Cable Characteristic		
	Wire	Function
Output Cable	White	Pulse Out 1
	Red	Pulse Out 2
	Black	GND/COMMON

Output Characteristics		
Cable Length - supplied	1.5	meter
Maximum Cable Length	50	meter
Maximum Applied Voltage	35	Vdc



Turbo-Bar-E Register

#### Magnetic Register

Output Type
Dry contact output

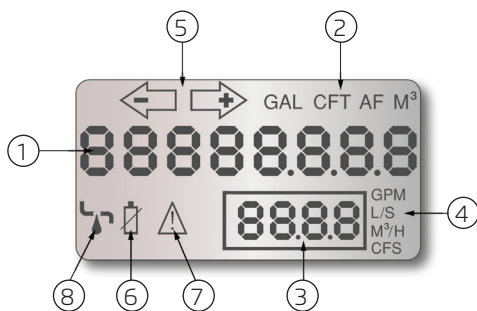
Cable Characteristic		
	Wire	Function
Output Cable	Red	Pulse Out 2
	Black	GND/COMMON

Output Characteristics		
Cable Length - supplied	1.5	meter
Maximum Cable Length	50	meter
Maximum Applied Voltage	24	AC/DC Max
Switch Current	0.01	A max

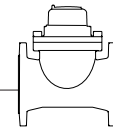


Turbo-Bar-M Register

### E-Register Display



1. Volume
2. Volume units
3. Flow Rate
4. Flow Rate units
5. Volume direction
6. Battery level indication
7. General warning
8. Leakage alert



### Pulse Output Option - Electronic Register

Cubic meter Pulse Output Electronic transmission								
Model	Size		Dry contact Reed Switch					Dual pulse output
			Pulse for Each 1					
	In	mm	10 liter *	liter 100	1.0 M <sup>3</sup>	10 m <sup>3</sup>	100 m <sup>3</sup>	
Turbo-BAR-E	1½"-2½"	40-65	S4	S3	S2			S34,S23
	3-10"	80-250		S3	S2	S1		S23, S12
	12"	300			S2	S1	S8	S12, S81

\* 10 liter pulse works fine up to 600m<sup>3</sup>/h

Gallon Pulse Output Electronic transmission								
Model	Size		Dry contact Reed Switch					Dual pulse output
			Pulse for Each 1					
	In	mm	1 gal	10 gal	100 gal	1,000 gal	10,000 gal	
Turbo-BAR-E	1½"-2½"	40-65	S4	S3	S2			S34,S23
	3-10"	80-250		S3	S2	S1		S23, S12
	12"	300			S2	S1	S8	S12, S81

### Pulse Output Option - Magnetic Register

Cubic meter Pulse Output Magnetic transmission							
Models	Size		Dry contact Reed Switch				Dual pulse output
			Pulse for Each 1				
	In	mm	100 liter	1 m <sup>3</sup>	10 m <sup>3</sup>	100 m <sup>3</sup>	
Turbo-BAR-M	1½"-5"	40-125	S3	S2			S23
	6"-8"	150-200		S2	S1		S12
	10"-12"	250-300			S1	S8	S81

Gallon Pulse Output Magnetic transmission							
Model	Size		Dry contact Reed Switch				Dual pulse output
			Pulse for Each 1				
	In	mm	10 gal	100 gal	1,000 gal	10,000 gal	
Turbo-BAR-M	1½"-5"	40-125	S3	S2			S23
	6"-8"	150-200		S2	S1		S12
	10"-12"	250-300			S1	S8	S81

### Installation Recommendation

- The water meter can be installed in any orientation without interfering with metrological performance.
- The arrow on water meter body must be in the same direction with the flow.
- To avoid turbulence that may interfere with accurate measurement, 5 diameters upstream from the water meter.
- Prior to installation, flush the line to remove debris.
- The Turbo-Bar-E/M must be filled with water to operate.

