Dynasonics®
Ultrasonic Flow Meters

Submerged Doppler Open Channel Flow Meter

IS-6000 Meter

DESCRIPTION

For open channel and partially filled pipe flow measurement, IS-6000 flow meter measures flow velocity and level to determine the flow rate and total volume passing through. Available with submerged pulse Doppler sensor, the IS-6000 is a versatile meter that eliminates the need for weirs or flumes.

BENEFITS

- Flow rate and total for open channel or partially filled pipe
- Eliminate construction and maintenance of weirs and flumes
- Eliminate recalibration based on seasonal flows
- Program remotely with smartphone or laptop
- Upload data logs through Ethernet or WiFi

FEATURES

- Flow velocity profiling with multiple measurement points
- Low profile submerged sensor
- Bidirectional flow measurements
- Data logging with time/date stamp
- Meter setup using WiFi with webserver
- Modbus RTU and Modbus TCP Ethernet
- Rugged, aluminum enclosure for a long service life in harsh environments

APPLICATIONS

- Wastewater treatment influent, in-plant and effluent
- Industrial discharge
- Aqueduct measurement

OPERATION

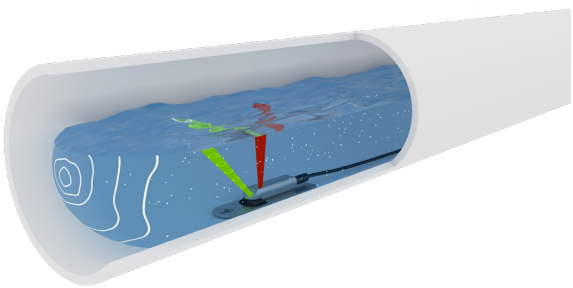
Area-velocity flow meters calculate the flow rate by multiplying the cross sectional area and the velocity of the fluid. The cross sectional area is determined by selecting the shape and size of the channel and measuring the height of the water level. The velocity of the water is measured by a submerged Doppler sensor.

Set up the IS-6000 meter from a smartphone or laptop and connecting to the WiFi built into the meter. By using a standard web browser, there is no need to install an app or software. If a physical connection is preferred, the IS-6000 meter can be setup through the Ethernet LAN port. Built in security helps protect against unauthorized access for both WiFi and Ethernet LAN.

Area Velocity Sensor

The Area Velocity Sensor consists of two sensors—a pulse Doppler (green beam) and a level sensor (red beam). The low profile sensor transmits ultrasonic pulses into the flow, which are echoed back from particles in the medium. Using pulse coherent Doppler, the velocity is measured at different levels to determine the velocity profile of flow, resulting in a more accurate reading. An additional benefit of pulsed Doppler is that it eliminates the need for on-site calibration and recalibration based on seasonal flows.

The combination velocity and level sensor makes installation easier. For pipes or channels with significant sediment buildup, the sensor can be mounted up the pipe or channel wall and a separate level sensor can be used to measure the height of the water level.



Badger Meter

HYB-DS-03134-EN-03 (March 2021)

Product Data Sheet

SPECIFICATIONS

Transmitter

Display	LC-Display, 4 lines, 20 characters
Keyboard	4 keys
Enclosure	IP 66; Aluminum; wall mounted indoor use only or environmental enclosure
Operating Temperature	-4…140° F (-20…60° C)
Storage Temperature	-4…158° F (-20…70° C)
Maximum Humidity	90% (non-condensing)
Maximum Operating Altitude	AC device: 2000 m above sea level
Power Supply	100…240V AC, ±10% 47…63Hz or 10…36V DC, ±15%, 5% residual ripple
Power Consumption	AC: max. 40 VA, typically: 30VA DC: max. 30 W, typically: 8 W
Operating Conditions	Protection class I Overvoltage category I Pollution degree 2
Outputs Analog	Four 4…20 mA active channels, load <550 Ohms
Outputs Digital	Four relays 60V DC 1A or 30V AC 1A 200 Hz max.; normally open or normally closed Two pulse/frequency outputs; 24V DC
Inputs Analog	Four 4…20 mA input channels; 1 channel reserved for level
Inputs Digital	Two inputs 30V DC max.
Communication	Modbus RTU 485; Modbus TCP Ethernet 10/100 Mbps RJ45
Programming Port	Webserver using standard web browser via WiFi or Ethernet; English, French, German, Spanish, Polish, Czech, Russian or Japanese languages
Data Logging	16 GB Micro SD card; 12 months of storage; file transfer through web browser
Channel/Pipe Shapes	Round radius, U-shape, rectangular, trapezoid, egg-shape, custom channel
CE Compliance	Low Voltage Directive, 2014/35/EU, EMC 2014/30/EU, Radio Equipment Directive 2014/53/EU, RoHS 2 2011/65/EU, 2015/863/EU
Certification Option	cCSAus general area indoor use: CAN/CSA-C22.2 No. 61010-1-12, UPD1:2015, UPD2:2016, AMD1:2018; UL 61010-1 Third Edition (2012), AMD1:2018

Area Velocity Sensors

Sensor	Integrated Doppler ultrasonic velocity and water level with temperature measurement
Measuring Principle	Velocity: pulse coherent
Water level	Ultrasonic travel time Medium Wastewater ≥ 50 ppm
Frequency	1 MHz
Beam Angle	45°
Number of Cells	Max. 32 cells
Operating Temperature	5…122° F (-15…50° C)
Velocity Range	Velocity: ± 16.5 ft/s (± 5.0 m/s) Min. detectable flow velocity ± 0.13 ft/s (± 0.04 m/s) depending on size and amount of particles
Velocity Accuracy	±2% of reading full scale in the range 5.0…16.5 ft/s and -5.0…-16.5 ft/s (1.5…5.0 m/s and -5.0…-1.5 m/s) ±0.1 ft/s in the range -5.0…5.0 ft/s (± 0.03 m/s in the range -1.5…1.5 m/s)
Water Level Range	1.6…51 in. (0.04…1.3 m) Expandable via external 4…20 mA sensor
Water Level Accuracy	± 0.26 in. (± 0.0065 m)
Temperature Accuracy	± 0.5 K for 4…57°C; Linearized range: 0…60° C Overall range: -60…150° C
Flow Accuracy	Typically ± 2% of reading
Material	Stainless steel (main unit, base plate) PEEK (Piezo Oscillator cover lid)
Protection Class	IP 68
Dimensions	7.1 x 1.6 x 0.9 in. (LxWxH) 180 x 40 x 22 mm (LxWxH) (incl. base / mounting plate)
Cable Length	32…262 ft (10…80 m)
Cable Outer Jacket	Polyethylene; Diameter Ø 0.4 ± 0.012 inn (10.00 ± 0.3 mm)
Cable Operating Temperature Range	-4…158° F (-20…70° C)

Level Sensors

Sensor Identifier	**DL10**	**DL24**	**ULM**
Measuring Range	49 in. (1.25 m)	9.8 ft (3.0 m)	7.9 in…19.6 ft. (0.2…6.0 m)
Accuracy	0.125 in. (3 mm)	± 0.2% of range	± 0.15% of range
Frequency	80 kHz	—	—
Dead Band	2 in. (50 mm)	2 in. (50 mm)	—
Beam Width	2 in. (50 mm)	2 in. (50 mm)	—
Beam Angle	—	—	14°
Mounting	1 in. NPT or 1 in. G	1 in. NPT or 1 in. G	1-1/2 in. G
Temperature	20…140° F (-7…60° C)	20…140° F (-7…60° C)	
Ingress Protection	Type 6P	Type 6P	Type 67
Cables	Polyurethane	Polyurethane	PVC, Polyurethane

TRANSMITTER DIMENSIONS

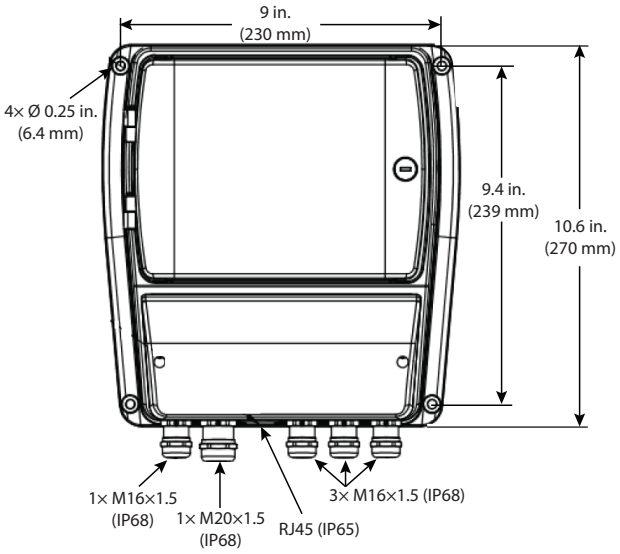


Figure 1: Front view

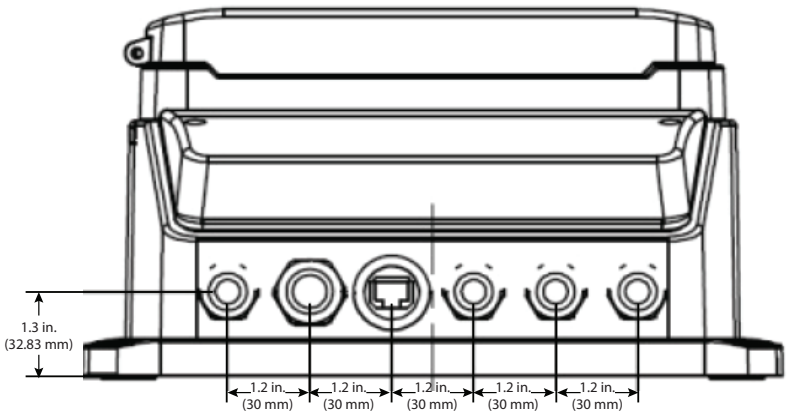


Figure 2: Bottom view with cable glands

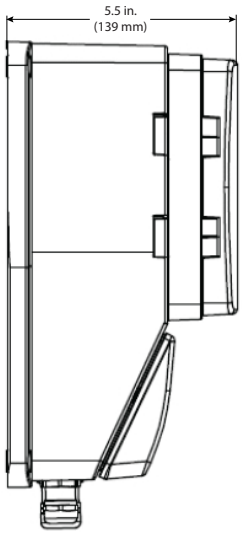


Figure 3: Side view

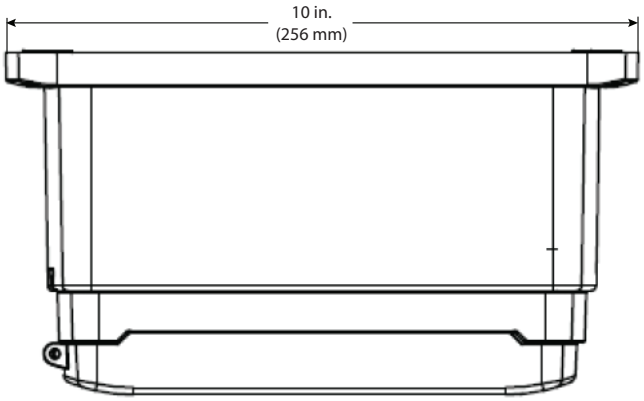


Figure 4: Top view

PART NUMBER CONSTRUCTION

Dynasonics IS-6000 Area Velocity Meter with Integrated Level

	DKV		-		-		-		-		-		-		-		-	
Product Type																		
Area Velocity Open Channel Flow Meter	DKV																	
Certifications																		
CE General Safety		C																
cCSAus General Area		G																
Transmitter Type																		
Pulse Doppler, 100…240V AC				DR														
Pulse Doppler, 9…36V DC				DF														
Communication																		
Standard						S												
Sensor Connection Type																		
Standard								S										
Sensor Type																		
Area Velocity Sensor										S								
Sensor Cable [1]																		
Standard Sensor Cable, 33 ft (10 m)												AG						
Standard Sensor Cable, 50 ft (15 m)												AK						
Standard Sensor Cable, 65 ft (20 m)												AP						
Standard Sensor Cable, 100 ft (30 m)												BW						
Calibration																		
Standard Calibration with Test Report														S				
Reserved																		
None																XX		
Reserved																		
None																	WW	
Sensor Mounting																		
Standard Base Plate																		S

[1] **Additional cable lengths and level options available. Contact factory for ordering information.**

THIS PAGE INTENTIONALLY BLANK

THIS PAGE INTENTIONALLY BLANK

Control. Manage. Optimize.

www.badgermeter.com