Dynasonics®
Ultrasonic Flow Meters

Portable Non-Invasive Ultrasonic Flow Meter

DXN-5P

DESCRIPTION

The Dynasonics DXN-5P Portable Non-Invasive Ultrasonic Flow Meter assists with diagnosing equipment issues. Easy to install by clamping onto the outside of the pipe, the DXN-5P meter measures flow using ultrasonic sensors. The automatic selection of the best method to measure flow of clean liquids or liquids with gases or suspended solids identifies potential entrained air, which can damage pumps, valves and other equipment.

When used with RTD temperature sensors, the DXN-5P meter measures thermal energy or mass flow.

BENEFITS

By clamping onto the outside of pipes, the meter is well suited for temporary flow measurements:

- Ideal to verify existing inline flow meters
- Identify unwanted air trapped in pipes that may reduce efficiency or damage equipment
- Reduce installation cost and effort by using non-invasive technology across a variety of applications
- Avoid process interruption while pipe integrity remains intact
- Record flow and other readings over time to establish baselines and profile usage

FEATURES

- Transit time and Doppler bi-directional flow measurement
- Battery, 12/24V DC or main powered
- Data log up to 8 parameters with time/date stamp
- Configure and troubleshoot over Bluetooth with SoloCUE mobile app
- Large, easy-to-read graphical display and physical buttons for harsh working environments
- Factory calibrated according to traceable standards

APPLICATIONS

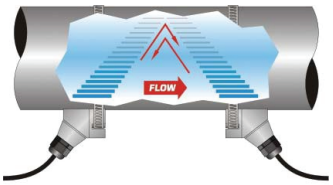
The DXN-5P meter is available with a variety of sensors that permit the user to select a meter with features suitable to meet particular application requirements.

- A flow meter for water delivery, sewage, cooling water, water-glycol mixtures, alcohols and chemicals
- A heating/cooling energy flow meter used in conjunction with dual clamp-on RTDs for temperature measurement—ideal for hydronic process and HVAC applications

OPERATION

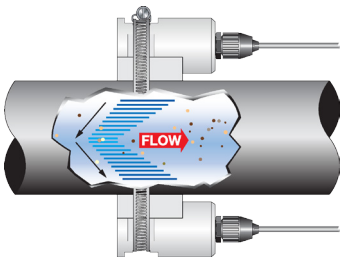
A hybrid ultrasonic flow meter automatically switches the flow reading between transit time and Doppler based on the fluid conditions. Monitoring both the transit time signal and the Doppler signal can help with diagnosing whether air, sand or debris is in the pipe.

Transit time measures the time difference between the travel time of an ultrasound wave going *with* the fluid flow and *against* the fluid flow. The time difference is used to calculate the velocity of the fluid traveling in a closed-pipe system. The transducers used in transit time measurements operate alternately as transmitters and receivers. Transit time measurements are bi-directional and are most effective for fluids that have low concentrations of suspended solids and are sonically conductive.



Equipped with thermal energy capabilities, the DXN-5P meter measures the rate and quantity of heat delivered or removed from devices such as heat exchangers. By measuring the volumetric flow rate of the heat exchanger liquid, the temperature at the inlet pipe and the temperature at the outlet pipe, the energy usage can be calculated.

Doppler method measures flow by reading the frequency shift reflected from particles or gas bubbles in the fluid. For example, the faster particles are moving towards the transducers, the higher the frequency of the reflected ultrasonic wave. Doppler measurements are bi-directional and are most effective for fluids that have suspended solids or gases.



Both transit time and Doppler methods calculate the flow rate from the velocity and inner diameter of the pipe.

Badger Meter

HYB-DS-04740-EN-01 (June 2025)

Product Data Sheet

SPECIFICATIONS

System

Liquid Types	Most clean liquids or liquids containing suspended solids or gas bubbles	
Flow Accuracy	Medium Pipes (RZ)	±0.5% ±0.025 ft/s (0.008 m/s) of reading
	Large Pipes (LZ)	±0.5% ±0.049 ft/s (0.015 m/s) of reading
	Small Pipes (UZ)	1 in. (25 mm) and larger = ±1% ±0.03 ft/s (0.009 m/s) of reading 3/4 in. (20 mm) and smaller = ±1% of full scale
	Doppler	±2% of full scale
Velocity	Transit Time Medium and Large Pipes	Up to 40 ft/s, depending on pipe and fluid
	Transit Time Small Pipes	Up to 20 ft/s, depending on pipe and fluid
	Doppler	Up to 30 ft/s, depending on pipe and fluid
Straight Run Requirements	10 diameters upstream, 5 diameters downstream from single elbow	
Certification and Compliance	General Safety cCSAus; CE, Pollution Degree 2, CE compliance to Low Voltage Directive, 2014/35/EU; UKCA, Pollution Degree 2, UKCA compliance to Low Voltage Statutory Instrument 2016/1101	

Handheld

Battery	Rechargeable, 16 hours operation typical, field replaceable	
Power Options	24V DC	9…28V DC, 22 W
	AC Power Adapter	100…240V AC ±10%, 50…60 Hz, installation category II
Display	Keypad	4-button navigation, keypad with tactile feedback; polyester film
	Display	128 × 64 pixel LED backlit graphical display; adjustable brightness and timeout; polycarbonate window
	Flow rate/total	8-digit
Construction	Aluminum construction, stainless steel fasteners Weight: 4.2 lb (1.9 kg)	
Environmental Ratings	Ingress Protection	IP65
	Pollution Degree	2
	Altitude Restriction	Up to 2000 m (6561 ft)
	Ambient Temperature Range	–4…131° F (–20…55° C) normal operation; –4…104° F (–20…40° C) during battery charging
	Storage Temperature Range	–4…95° F (–20…35° C) one year of storage for battery life –4…122° F (–20…50° C) one month of storage for battery life
	Humidity	0…85%, non-condensing
Configuration	Via optional keypad or SoloCUE configuration app; SoloCUE available on DVD or download	
Units (Field-Selectable)	Velocity	feet/second, meters/second
	Volumetric total	US Gallons, Million Gallons, Imperial Gallons, Million Imperial Gallons, Acre-Feet, Liters, Hectoliters, Cubic Meters, Cubic Feet, Oil Barrels (42 gallons), Fluid Barrels (31.5 gallons), Imperial Fluid Barrels (36 imperial gallons), Pounds (Kilograms) and custom units
	Flow rate	Acre Feet/Day, Liters/Second, Liters/Minute, Liters/Hour, Cubic Meters/Second, Cubic Meters/Minute, Cubic Meters/Hour, Cubic Feet/Minute, Cubic Feet/Minute, Cubic Feet/Hour, Gallons/Second, Gallons/Minute, Gallons/Hour, Million Gallons/Day, Imperial Gallons/Second, Imperial Gallons/Minute, Imperial Gallons/Hour, Million Imperial Gallons/Day, Oil Barrels/Day, Fluid Barrels/Day, Imperial Fluid Barrels/Day and custom units
	Energy total (energy meters)	British Thermal Unit (Btu), Thousand Btu, Millions Btu, Kilocalories, Mega calories, Kilowatt-hour, Megawatt hour, Kilojoules, Mega joules, Ton-hour (Refrigeration)
	Heat/cooling rate (energy meters)	Btu/hour, Thousand Btu/hour, Millions Btu/hour, Ton (Refrigeration), Watts, Kilowatts, Megawatts, Kilojoules/hour, Mega joules/hour, Kilocalories/hour, Mega calories/hour
	Temperature (energy meters)	Fahrenheit, Celsius, Kelvin
Inputs	RTD Input	3-wire or 4-wire Pt100/Pt1000 RTD; Range of –50…200° C; Clamp-on resistor kits available
Ports	Programming	USB Type-C® connector for connection to a device with SoloCUE Flow Device Manager for Windows; Bluetooth for connection to a mobile device with SoloCUE Flow Device Manager app for Android, iPhone or iPad
Data Logging	Number of points	Up to 8 parameters per record. Selectable 1 second to 1 day Transfer logs via SoloCUE for Windows
	Real Time Clock	Backed up with a CR2032 coin battery
	Memory	8 GB (10,000 records is approximately 1 MB)
Alarms	Records 100 previous alarms, warnings or errors	
Languages	English, French, German, Italian, Spanish	

Transducers

Model	Construction	Pipe/Tubing Sizes and Materials [1, 2]	Flow Rate Max. GPM (LPM)
UZ Adjustable small pipe	CPVC, Ultem®, and anodized aluminum track system; Nickel-plated brass connector with Teflon insulation; PVC cable jacket, –40…194° F (–40…90° C)	0.5…2 in. (12…50 mm)	190 (720)
RZ Standard pipe	PBT glass filled, Ultem; PVC cable jacket; –40…250° F (–40…121° C)	2.5…12 in. (DN65…DN300)	4000 (15,000)
LZ Large pipe	CPVC, Ultem, Nylon cord grip PVC cable jacket; –40…194° F (–40…90° C)	8…48 in. (DN200…DN1200) [3, 4]	33,000 (125,000)
DT94 Doppler	CPVC, Ultem, Nylon; PVC cable jacket; –40…194° F (–40…90° C)	1…39 in. (25…990 mm)	44,000 (165,000)

[1] Recommendations based on unlined, new pipes with water. Recommended pipe or tubing sizes vary with pipe conditions and fluid.
[2] PVC, CPVC, HDPE, PTFE, PDVF, stainless steel, ductile iron, aluminum, brass naval, carbon steel copper.
[3] Large pipe transducers are recommended for 8…12 in. pipes if normal velocity is expected to be greater than 12 ft/s (3.6 m/s).
[4] Consult factory for larger pipe sizes.

RTD Kits

Part Number	Description	Installation	RTD Type	Construction	Temperature Range
70360-001	RTD pair; 20 ft (6 m) cable	Pipe clamp, surface mount	Pt 1000, Class A ± (0.15 + 0.002*| t |) with t as temperature °C	Aluminum body, silicone cable jacket	–58…356° F (–50…180° C)

Clamp-on RTD kits include heat sink compound and silicone stretch tape.

Pipe Wall Thickness Gauge

Part Number	Description
DWT-2	Handheld with ultrasonic sensor for steel, cast iron and PVC

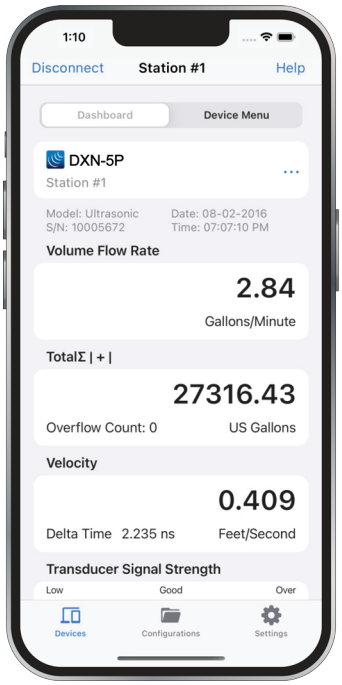
SoloCUE® Flow Device Manager App

The flow meter may be programmed through the keypad or SoloCUE Flow Device Manager app for Windows, Android, iPhone or iPad. The app provides a rich set of tools and information to aid in faster equipment setup and flow system diagnosis.

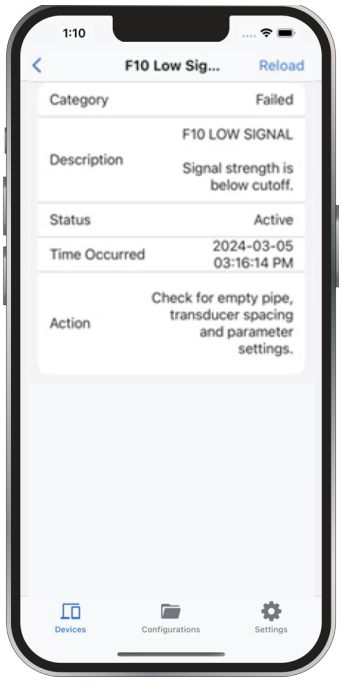
SoloCUE App	Used to configure, calibrate and troubleshoot flow meters
Operating System	Windows® 8, 10 and 11; Android 14 and later; iPhone or iPad 16 and later
Languages	English, Spanish, German, French, Portuguese, Italian, Norwegian, Swedish, Polish, Korean
USB Cable	70361-001 | USB Type-C connector to A connector, shielded, supported by SoloCUE for Windows
Bluetooth	Supported by SoloCUE for Android, iPhone or iPad, Bluetooth 4.2 and later

Benefits

- Use the live dashboard with readings and health information in a single view to know the status of your nearby instrumentation
- Eliminate scrolling through the menu keypad on field instrumentation when programming multiple parameters
- View alarm descriptions and possible corrective actions without having to find a manual
- Save a backup file of your settings and download the parameters to other devices or store for future reference



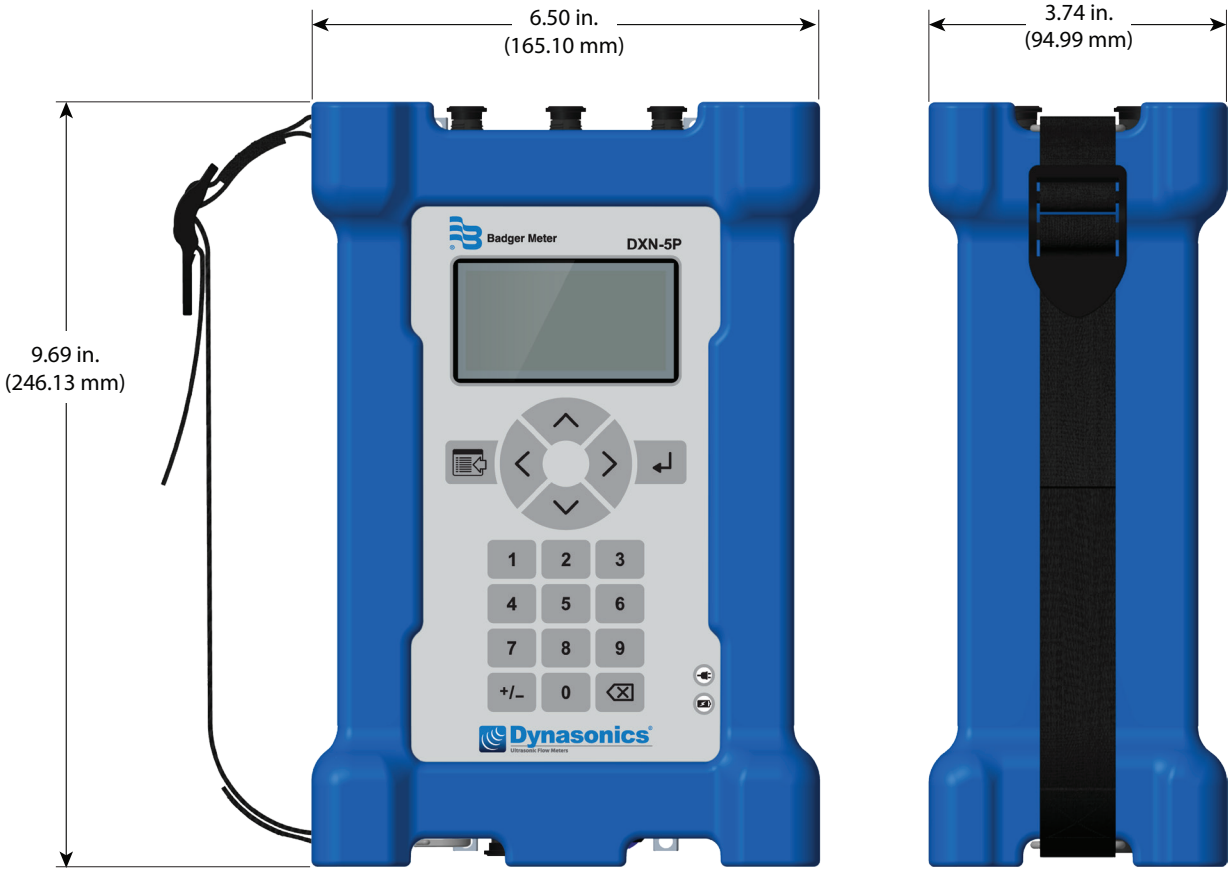
Dashboard with Readings



Alarm Description

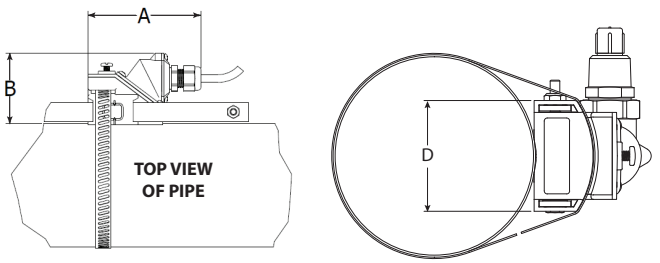
DIMENSIONS

Handheld

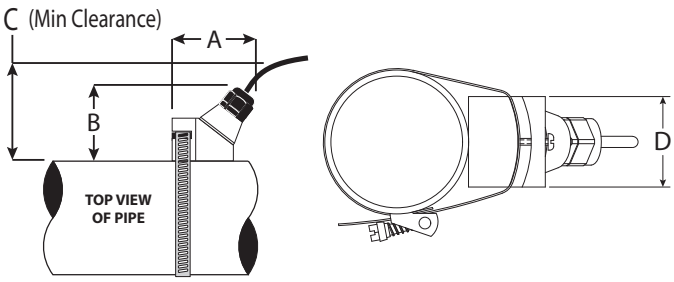


Transducers

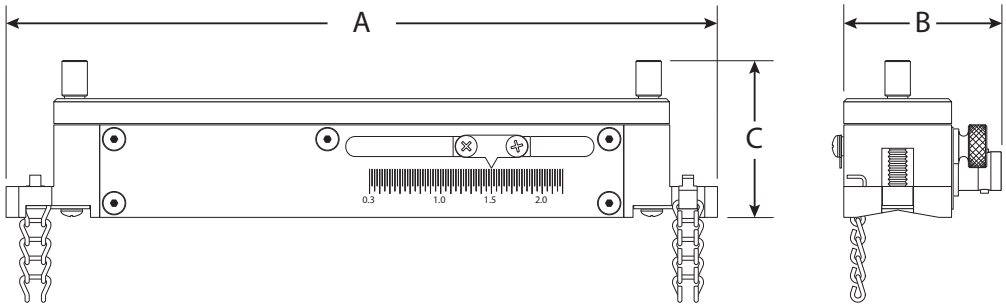
RZ
Pipes Larger than 2 in. (50 mm)



LZ
Pipes Larger than 8 in. (200 mm)

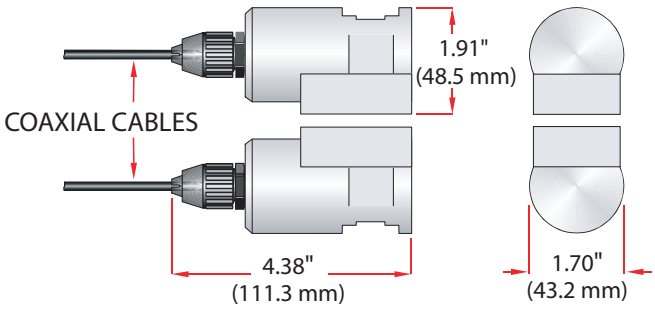


UZ
Adjustable Small Pipe



	RZ	LZ	UZ
A	3.75 in. (95 mm)	3.40 in. (86.4 mm)	7 in. (178 mm)
B	2.35 in. (60 mm)	2.94 in. (74.7 mm)	1.6 in. (42 mm)
C	—	3.20 in. (81.3 mm)	1.5 in. (39 mm)
D	2.19 in. (56 mm)	2.50 in. (63.5 mm)	—

DT94 Doppler



PART NUMBER CONSTRUCTION

Part Number Construction for DXN-5P Meter Kits

D5-G - [ ][ ] - [ ][ ] - [ ][ ][ ]

Sensor Kits	
Basic	B2
Transit Time	T2
Hybrid	H2
All Flow	U2
Energy	E2
Full	F2
Cables	
20 ft Cables	AD
Handheld	
Hybrid Transit Time/Doppler Flow Measurement, Bluetooth	S
Hybrid Transit Time/Doppler Flow Measurement, No Bluetooth	P
Power Cord	
North American	A
European	E
Japanese	J
United Kingdom	U
Australian	Z
Options	
Wall Thickness Gauge, Tape Measure Metric	1
Wall Thickness Gauge, Tape Measure Inches	2
Tape Measure Metric	M
Tape Measure Inches	K
Documentation	
English	E
Case & Accessories	
DXN-5P Shoulder Strap and Outer Carrying Case	D

DXN-5P SENSOR KITS

Item	Basic	Transit Time	Hybrid	All Flow	Energy	Full
Part Number Option	**B2**	**T2**	**H2**	**U2**	**E2**	**F2**
Small Pipe Transit Time Transducer, 2 in. (50 mm) and smaller	•	•	•	•	•	•
Medium Pipe Transit Time Transducer, 2-1/2…12 in. (65…300 mm)	•	•	•	•	•	•
Large Pipe Transit Time Transducer		•		•		•
Doppler Transducer			•	•	•	•
Clamp-on RTD Kit with Heat Sink Compound, Tape					•	•
Cables, Mounting Straps, Acoustic Couplant	•	•	•	•	•	•

Soft-Sided Carry Case with Strap Includes:

- Universal AC Power Converter, 95…264V AC, 50/60 Hz
- 12V DC Vehicle Power Adapter
- Luggage Tag, Non-Scratch Screen Wipe
- USB-C Programming Cable
- Cables, couplant and mounting straps

Control. Manage. Optimize.

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