

Ultrasonic Transit Time Flow Meter NCMB2-F/E series

DESCRIPTION

The *NCMB2-F/E* Series is a non-invasive clamp-on ultrasonic transit time flow meter used to measure volumetric flow rate, total, and heating/cooling energy rates in liquids.

FEATURES:

- Clamp-on transducers
- Pipe sizes 0.5 to 100 inches
- Bi-directional flow
- Install with no process shutdown
- No pressure head loss
- No moving parts to maintain or replace
- Reynolds, sound speed & temp compensation
- Display flow rate, total, temp, BTU
- Data logging stored on 8GB Micro SD Card
- Outputs 4-20mA, Pulse
- Communications Modbus, BACnet & more

TECHNOLOGY:

The NCMB2 ultrasonic transit time flow meter clamps onto the outside of pipes and does not contact the internal liquid. It operates on clean liquids as well as those with small amount of suspended solids or aeration. It utilizes the latest innovations in non-contact flow metering technology to optimize the performance of your flow monitoring, process control, balancing or batching applications.

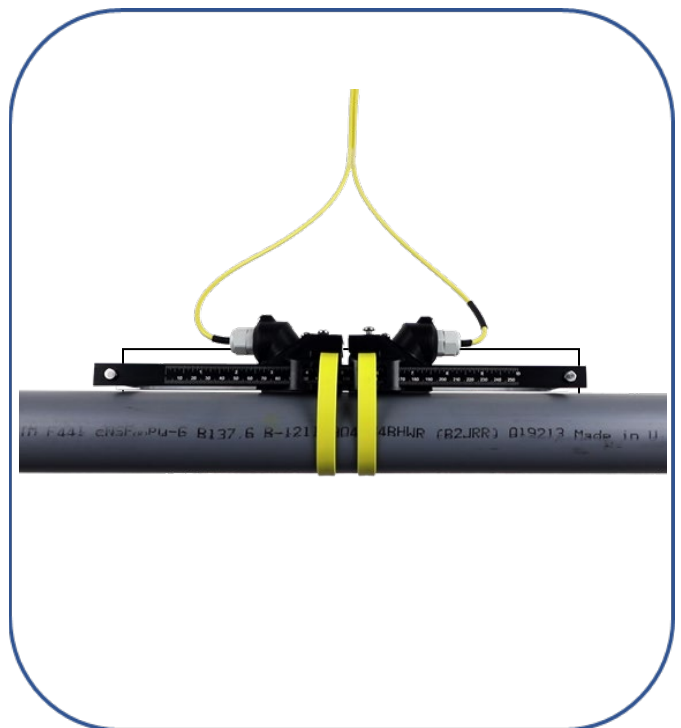
The NCMB2 is available in two versions:

NCMB2-F: Flow Meter model indicates flow rate and total with a pulse, 4-20mA output, Modbus RTU or BACnet MS/TP communications. Other communications options available. Typical applications are water, sewage, cooling water, and chemicals.

NCMB2-E: Energy model indicates flow rate, total, temperature, BTU with a pulse, 4-20mA output, Modbus RTU or BACnet MS/TP communications. Other communications options available. Typical applications are heating/cooling hydronic loops.



NCMB2-F/E Transmitter



NCMTX-C-RZ-AC-WW Transducer

Product Data Sheet

SPECIFICATIONS

System

Liquid Types	Most clean liquids or liquids containing small amounts of suspended solids or gas bubbles	
Flow Accuracy	Medium and Large Pipes	$\pm 0.5\% \pm 0.0049 \text{ ft/s}$ (0.015 m/s)
	Small Pipes	1 in (25 mm) and larger = $\pm 1\% \pm 0.03 \text{ ft/s}$ (0.009 m/s) 3/4 in (20 mm) and smaller = $\pm 1\%$ of full scale
Repeatability	0.2% above 1.5 ft/s	
Velocity	Medium and Large Pipes	Up to 40 ft/s, depending on pipe and fluid
	Small Pipes	Up to 20 ft/s, depending on pipe and fluid
Straight Run Requirements	10 diameters upstream, 5 diameters downstream from single elbow - typically for flow rates of 10 fps (3.048m/s)	
Certification and Compliance	<p>General Safety (all models): cCSAus, CE, Pollution Degree 2, CE compliance to Low Voltage Directive, 2014/35/EU U.S./Canada Hazardous Location transmitter and transducers: CSA-c-us Class I Division 2 Groups ABCD T4 Requires flexible conduit Not available with UZ</p> <p>ATEX/IECEX Hazardous Location transmitters and transducers: II 3 G Ex ec nC ic IIC T4 Gc II 3 D Ex tc IIIC T100 °C Dc Not available with UZ, HZ transducers; flexible conduit, Auxiliary Dry Contact card</p>	

Transmitter

Power Options	24V DC/AC	9...28V DC @ 8 W max or 20...26 AC 47...63 Hz @ 0.5 A max, 2 Amp slow-blow fuse, not field replaceable
	Mains AC	85...264V AC 47...63 Hz @ 24VA max 1 Amp slow-blow fuse, manually field replaceable
Display	Keypad	4-button navigation, keypad with tactile feedback; polyester film
	Display	Flow rate / Total. 128 x 64 pixel LED backlit graphical display; adjustable brightness and timeout; polycarbonate window
Enclosure	NEMA Type 4X, IP67. Aluminum construction; painted; wall, panel or pipe mounting; stainless steel fasteners and mounting hardware; EPDM gasket	
	Ambient Temperature Range	-4...140° F (-20...60° C)
	Storage Temperature Range	-40...176° F (-40...80° C)
	Humidity	0...85%, non-condensing
Configuration	Via optional keypad or configuration software; software available on USB drive or download	
Units - Programable	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

		Flow Meter	Energy Meter
Inputs and Outputs	0/4...20 mA output	One 16-bit, isolated, max 800 Ohms, internal or external power	Two 16-bit, isolated, max 800 Ohms, internal or external power
	Digital input	One 5...30V DC, isolated, externally or internally sourced, reset totalizer or alarm output	
	Digital output	Two selectable pulse, alarm, flow direction, sink isolated open collector, 5...30V DC, max. 50 mA externally or internally sourced	Three selectable pulse, frequency, alarm, flow direction, isolated open collector, 5...30V DC, externally or internally sourced
	RTD (energy only)	None	Two 2-wire, 3-wire or 4-wire Pt100/Pt1000 RTD 12-bit inputs; Range of -40...200° C; Clamp-on resistor kits available
Ports	Programming	USB 2.0 mini B connector for connection to a device with configuration software	
	EIA-485	Modbus RTU command set or BACnet MS/TP; Baud rates 9600, 14400, 19200, 38400, 57600, 76800, 115k; terminating resistor selectable	
	Ethernet	Optional 10/100 Base T RJ45, communication via Modbus TCP/IP or BACnet/IP with webserver	
Data Logging	Number of points	Up to 8 parameters per record. Selectable 1 second to 1 day Transfer logs via memory card	
	Real Time Clock	Backed up with a super capacitor, minimum of 32 days of data retention without power; Requires no servicing	
	MicroSD card slot	8 GB card, included with transmitter	
Alarms	Records 150 previous alarms, warnings or errors		
Languages	English, French, German, Italian, Spanish		
Security	Four levels: Read-only, Operator, Service and Admin; 6-digit passcode number; selectable auto logout		

Transducers

Model	Construction	Pipe/Tubing Sizes	Protection
CA-CT * fixed small pipe	CPVC, Ultem®, Nylon cord grip, PVC cable jacket; -40...194° F (-40...90° C)	0.5...2 in. (12...50 mm)	NEMA 6 / IP67
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)	NEMA 12
NZ standard pipe	PVC, Ultem®, Nylon cord grip, PVC cable jacket; -40...250° F (-40...121° C)	2...36 in (DN50...DN900)	NEMA 6 / IP67
RZ standard pipe	PBT glass filled, Ultem®, Nylon cord grip; PVC cable jacket; , -40...250° F (-40...121° C)	2...36 in (DN50...DN900)	NEMA 6 / IP67
JZ, KZ standard pipe, integrated rail	PBT glass filled, Ultem, Nylon cord grip; PVC cable jacket; -40...250° F (-40...121° C)	2.5...6 in. (DN65...DN150) 2.5...12 in. (DN65...DN300)	NEMA 6 / IP67
WZ standard pipe, submersible	CPVC, Ultem, Nylon cord grip; Polyethylene cable jacket; -40...194° F (-40...90° C)	2...36 in (DN50...DN900)	NEMA 6P / IP68
HZ high temperature	PTFE, Vespel, Nickel-plated brass cord grip; FEP cable jacket; -40...350° F (-40...176° C)	2...36 in (DN50...DN900)	NEMA 6 / IP67
LZ large pipe	CPVC, Ultem, Nylon cord grip PVC cable jacket; -40...194° F (-40...90° C)	8...100 in	NEMA 6 / IP67
YZ large pipe submersible	CPVC, Ultem, Nylon cord grip; Polyethylene cable jacket; -40...194° F (-40...90° C)	8...100 in	NEMA 6P / IP68

+ CA-CT fixed small pipe transducers are pipe size, pipe material specific. Not adjustable.

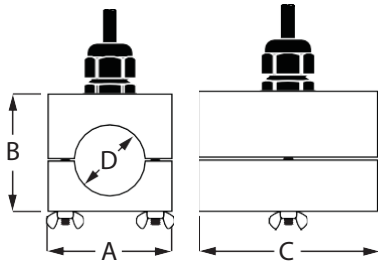
RTD Kits

Part Number	Description	Temp Range
RTD-3B-20	Pair of 3 wire RTD 1000 Ohm RTD with mounting kit and 20 ft of cable.	32...212° F (0...100° C)
RTD-3B-50	Pair of 3 wire RTD 1000 Ohm RTD with mounting kit and 50 ft of cable.	32...212° F (0...100° C)
RTD-3B-100	Pair of 3 wire RTD 1000 Ohm RTD with mounting kit and 100 ft of cable.	32...212° F (0...100° C)

Transducers

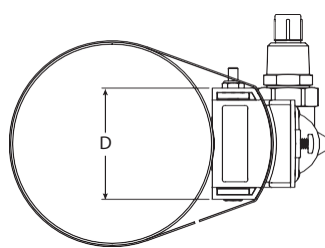
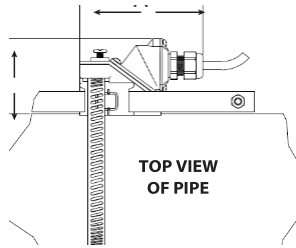
Fixed Small Pipe

Pipes and Tubing 1/2...2 in. (12...50 mm)



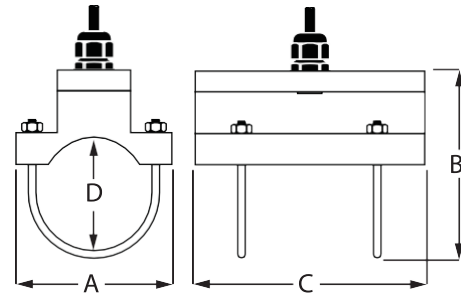
RZ

Pipes 2 in. (50 mm) and Larger



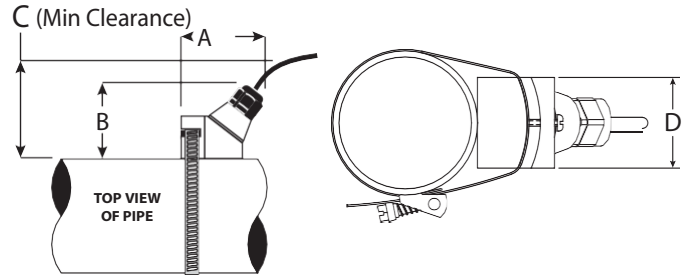
Fixed Small Pipe U-Bolt Connections CF, CL

ANSI/DN and Copper 2 in. (50 mm) Models



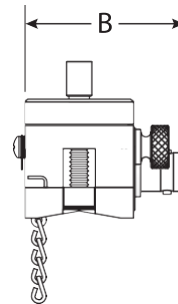
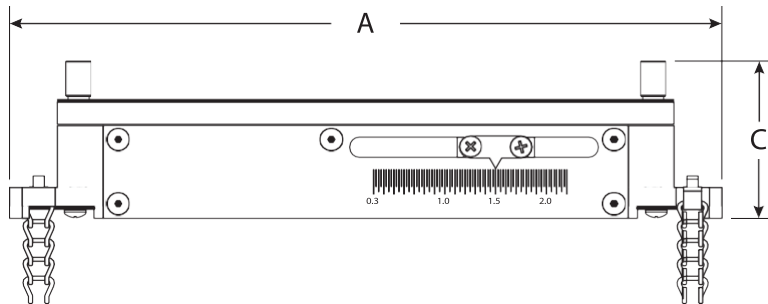
NZ, WZ, HZ, LZ, YZ

Pipes 2 in. (50 mm) and Larger



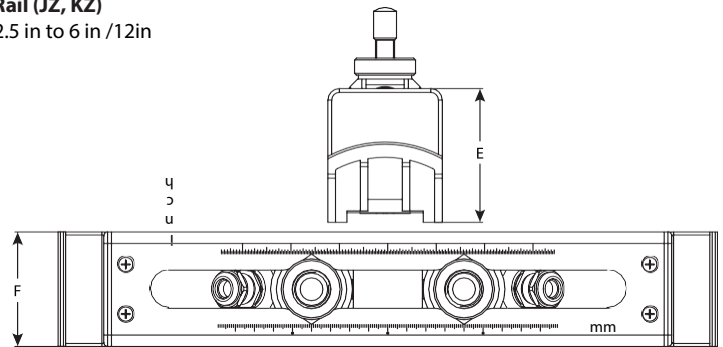
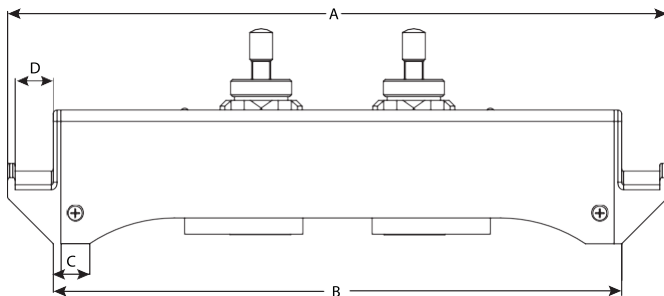
UZ

Adjustable Small Pipe 1/2 in to 2 in



Easy Rail (JZ, KZ)

Adjustable 2.5 in to 6 in /12in



	RZ	NZ, WZ	HZ	LZ, YZ	UZ	JZ	KZ
A	3.75 in. (95 mm)	2.95 in. (74.9 mm)	2.95 in. (74.9 mm)	3.40 in. (86.4 mm)	7 in. (178 mm)	13.62 in. (345.95 mm)	19.92 in. (505.97 mm)
B	2.35 in. (60 mm)	2.75 in. (69.8 mm)	2.75 in. (69.8 mm)	2.94 in. (74.7 mm)	1.6 in. (42 mm)	11.73 in. (297.94 mm)	18.03 in. (457.96 mm)
C	—	3.00 in. (76.2 mm)	3.00 in. (76.2 mm)	3.20 in. (81.3 mm)	1.5 in. (39 mm)	0.75 in. (19.05 mm)	0.75 in. (19.05 mm)
D	2.19 in. (56 mm)	1.70 in. (43.2 mm)	1.71 in. (43.4 mm)	2.50 in. (63.5 mm)	—	0.79 in. (20.06 mm)	0.79 in. (20.06 mm)
E	—	—	—	—	—	2.76 in. (70.10 mm)	2.76 in. (70.10 mm)
F	—	—	—	—	—	2.36 in. (59.94 mm)	2.36 in. (59.94 mm)

TRANSDUCERS ONLY

Ultrasonic Clamp-on Transducers	NCMTX	-		-		-		-	
Certification -CE (Standard)			C						
Small pipe, ½ to 2 in, (13 to 50mm)					UZ				
Medium pipe, 2 to 36 in, (50 to 915mm) – (Standard)					RZ				
Medium pipe Submersible, 2 to 36 in, (50 to 915mm)					WZ				
Medium pipe High Temperature, 2 to 36 in, (50 to 915mm)					HZ				
Large pipe, 8 to 100 in, (203 to 2,540 mm)					LZ				
Large pipe Submersible, 8 to 100 in, (203 to 2,540 mm)					YZ				
Hazardous Location, Class 1, Division 2			B						
Medium pipe, 2 to 36 in, (50 to 915mm)					RZ				
Medium pipe Submersible, 2 to 36 in, (50 to 915mm)					WZ				
Large pipe, 8 to 100 in, (203 to 2,540 mm)					LZ				
Large pipe Submersible, 8 to 100 in, (203 to 2,540 mm)					YZ				
Remote Cable Length (Required)									
15 Feet							AC		
30 Feet							AF		
50 Feet							AK		
75 Feet							AR		
100 Feet							BW		
150 Feet							BK		
200 Feet							DW		
Flex Conduit Length (Optional)									
None									WW
5 Feet									AA
15 Feet									AC
30 Feet									AF
50 feet									AK
75 Feet									AR
100 Feet									BW
150 Feet									BK
200 Feet									DW
Note: Energy meter requires strap on RTDs.									
Pair of 3 wire RTD 1000 Ohm, 20 ft of cable									RTD-3B-20
Pair of 3 wire RTD 1000 Ohm, 50 ft of cable									RTD-3B-50
Pair of 3 wire RTD 1000 Ohm, 100 ft of cable									RTD-3B-100

Product Data sheet NCMB2. rev 8.14.20



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