NAGMAN FLOW LEVEL SYSTEMS & SOLUTIONS

(An Associate of Nagman Instruments Consortium)

CORIOLIS MASS FLOW METER

NAGMASS

MEASURE FLOW & LEVEL WITH CONFIDENCE

INTRODUCTION

Nagmass Series **Coriolis Mass Flow Meters** provide direct mass flow and density measurement for liquids and gases —independent of viscosity, conductivity, or flow profile.

With no moving parts, excellent repeatability, and a wide turn down, Nagmass is built for process control and custody transfer in **Oil & Gas, Chemical & Petrochemical, Pharmaceutical, Food & Beverage, Pulp & Paper, and Energy applications.**

A single meter delivers mass flow, density, temperature, and derived volume flow, with transmitter options that integrate easily with PLC/DCS systems.

WORKING PRINCIPLE

Coriolis Mass Flow Meter employs **two parallel measuring tubes** that are driven to oscillate at their natural frequency. When fluid flows through these vibrating tubes, Coriolis forces induce a slight, measurable phase shift (time lag) between the inlet and outlet sides. Pickoff sensors capture this phase shift, which is directly proportional to mass flow.

At the same time, the instrument tracks the tubes' resonant frequency, which depends on the combined mass of the tubes and the fluid. As fluid density changes, the resonant frequency changes; the meter uses this relationship to calculate fluid density and, if required, derive volume flow.

An integrated temperature sensor provides real-time temperature measurement and compensation to ensure stable, accurate results across operating conditions.

$$\Delta t \propto mass\ flow\ rate$$

$$f \propto density$$

$$volume\ flow\ rate = \frac{mass\ flow\ rate}{density}$$

FEATURES

- High Accuracy & Precision
- Mass Flow & Density Measurement
- Various Solutions Measurable
- Minimal Pressure Loss
- No Straight Run Required

KEY FEATURES

DIGITAL TRANSMITTER FEATURE

- **High Accuracy with DSP Core** - Digital Signal Processing (DSP) improves accuracy and extends turndown ratio.
- **Faster Response** - Higher sampling rate → quicker reaction to flow changes. Ideal for precise tank loading/unloading.
- **Noise & Interference Rejection** - Digital filters remove industrial & spatial electromagnetic noise. Ensures stable & reliable measurements.

MASS FLOW METER FEATURE

- **Direct Mass Flow Measurement** - Measures mass flow directly without conversions → reduces errors.
- **High Accuracy & Repeatability** - Accurate results across a wide turndown range.
- **Handles Diverse Fluids** - Works with normal viscosity, high viscosity, non-Newtonian fluids, slurries, and liquids with traces of gas.
- **Multi-Parameter Output** - Provides mass flow, density, temperature, and consistency in one device.

INDUSTRIES


Chemical & Petrochemical


Oil & Gas


Pharma & Biotech


Food & Beverage


Scientific & Research


Power Generation


Paints & Resins


Paper & Pulp


Water & Waste Water


Mining & Minerals


Automotive


Semiconductors

TECHNICAL SPECIFICATIONS

DN (mm)	3 ~ 300	
Structure	Integrate Type	(-50 ~ +125)°C
	Separate Type	(-50 ~ +200)°C
	High Temperature Separated Type	(-50 ~ +350)°C
	Low Temperature Separated Type	(-200 ~ +125)°C
Sensor	U Series , Micro-Bend, Super Micro-Bend Series	
Flow Tube Material	SS304, SS316L , Hastelloy, PTFE coated SS 316L	
Protection Rating	IP 65, IP 66, IP 67	
Power supply	24V DC	220V AC
Output Interface	RS - 485 / HART	
Nominal Pressure (bar)	16, 25, 40, 63 (up to 250 bar is available for some sizes)	
Signal output	Pulse Output / (4 - 20mA)	
Accuracy	± 0.1% / ± 0.2% / ± 0.5%	
Special Features	Hygienic Type, Cryogenic Type, Insulated Jacket	
Process Connection	Flange (GB/DIN/ANSI....) or Thread (Customized) or Tri-Clover (Hygienic)	
Certification	Test Certificate / NABL Calibration Certificate	

FROM CRYO TO CRUDE - PURE MASS, PRECISE EVERY TIME

MICROBEND SERIES

DN (mm)	Flow Range for Accuracy 0.1% (kg/h)	Flow Range for Accuracy 0.2% (kg/h)	Flow Range for Accuracy 0.5% (kg/h)
3	10-120	8-120	6-120
8	150 – 1,500	75 – 1,500	50 – 2,000
10	150 – 1,500	75 – 1,500	50 – 2,000
15	500 – 5,000	250 – 5,000	180 – 7,200
25	800 – 8,000	400 – 8,000	400 – 16,000
40	3,000 – 30,000	1,500 – 30,000	1,000 – 40,000
50	5,000 – 50,000	2,500 – 50,000	2,000 – 80,000
80	15,000 – 1,50,000	7,500 – 1,50,000	4,500 – 1,80,000
100	30,000 – 3,00,000	15,000 – 3,00,000	10,000 – 4,00,000
150	56,000 – 5,60,000	35,000 – 5,60,000	28,000 – 5,60,000
200	1,10,000 – 11,00,000	70,000 – 11,00,000	50,000 – 11,00,000
250	1,50,000 – 15,00,000	1,20,000 – 15,00,000	75,000 – 15,00,000
300	2,00,000 – 20,00,000	1,50,000 – 20,00,000	1,00,000 – 20,00,000

MICROBEND SERIES FOR GAS

DN (mm)	Max. Flow Range (Kg/h)	Normal Flow Range for Accuracy 0.5% (kg/h)	Stability of Zero Point (kg/h)
8	4 – 800	20 – 800	0.13
10	5 – 1,000	25 – 1,000	0.13
15	15 – 2,000	75 – 3,000	0.38
25	40 – 8,000	200 – 8,000	1.00
40	160 – 32,000	800 – 32,000	4.00
50	250 – 50,000	1250 – 50,000	6.25
80	700 – 1,40,000	3500 – 1,40,000	17.25
100	1,000 – 2,00,000	5,000 – 2,00,000	25.0
150	2,500 – 5,00,000	12,500 – 5,00,000	62.5
200	5,000 – 10,00,000	25,000 – 10,00,000	125
250	7,500 – 15,00,000	37,500 – 15,00,000	188
300	12,500 - 25,00,000	62,500 - 25,00,000	313

ACCURACY

± 0.1%	± 0.2%	± 0.5%
$\pm 0.1\% \pm \left(\frac{\text{Stability of Zero Point}}{\text{Instantaneous Flow}} \text{ X } 100\% \right)$	$\pm 0.2\% \pm \left(\frac{\text{Stability of Zero Point}}{\text{Instantaneous Flow}} \text{ X } 100\% \right)$	$\pm 0.5\% \pm \left(\frac{\text{Stability of Zero Point}}{\text{Instantaneous Flow}} \text{ X } 100\% \right)$

REPEATABILITY

Accuracy	± 0.1%	± 0.2%	± 0.5%
Repeatability	± 0.05%	± 0.1%	± 0.25%

Accuracy is calculated based on the water measurement under the condition of +20°C ~ 25°C and 1-2 bar pressure

MEASUREMENT OF DENSITY

Density Range	(0.2 ~ 0.3) g/cm3
Basic Error	± 0.002 g/cm3 (Affected by the sensor)
Repeatability	± 0.001 g/cm³

MEASUREMENT OF TEMPERATURE

Temperature Range	Integrated Type	(-50 ~ +125) °C
	Separate Type	(-50 ~ +200) °C
	High Temperature Separated Type	(-50 ~ +350) °C
	Low Temperature Separated Type	(-150 ~ +125) °C
Basic Error	< ± 1.0°C	

CURRENT OUTPUT

4 – 20 mA Current Output can be configured to denote the mass flow or volume flow

Output Range	4 ~ 20 mA
Basic Error	0.1% F.S.
Repeatability	± 0.01%/°C
External resistor should be 250 ~ 600Ω	

RS485 OUTPUT

RS485 Output adopts the RTU communication mode which is compatible with MODBUS protocol

HART OUTPUT

Standard HART Protocol is supported.

Note: Only one of RS-485 or HART can be supplied with the instrument. Not both.

FREQUENCY OUTPUT

Active frequency output can be configured to indicate mass flow, volume flow, density or water content.

Output Range	0 ~ 10 kHz
Basic Error	± 0.005%
Repeatability	± 0.001%/°C

AMBIENT VIBRATION

Frequency Range	(10~2000) Hz
Basic Acceleration Amplitude Value	2g
Circulation time	50 times

AMBIENT TEMPERATURE

Working Temperature	(-40 ~ +55)°C
Storage Temperature	(-40 ~ +70)°C

AMBIENT HUMIDITY

Working Humidity	< 90%	+25°C No condensation
Storage Humidity	< 95%	

POWER CONSUMPTION

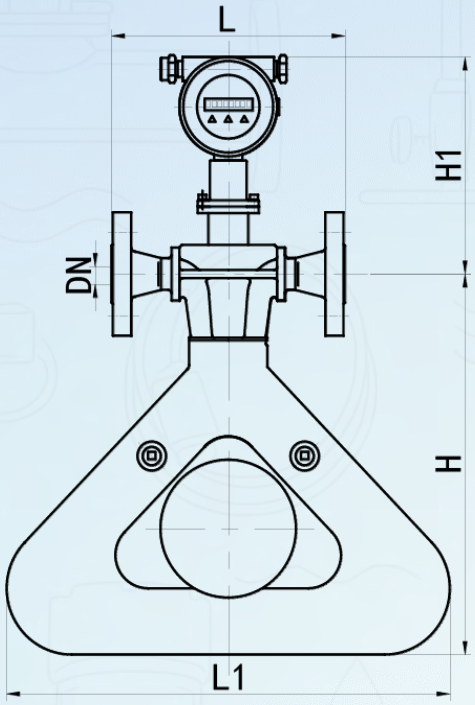
The normal power consumption of the flow meter is 10W, while the max value is 15W.

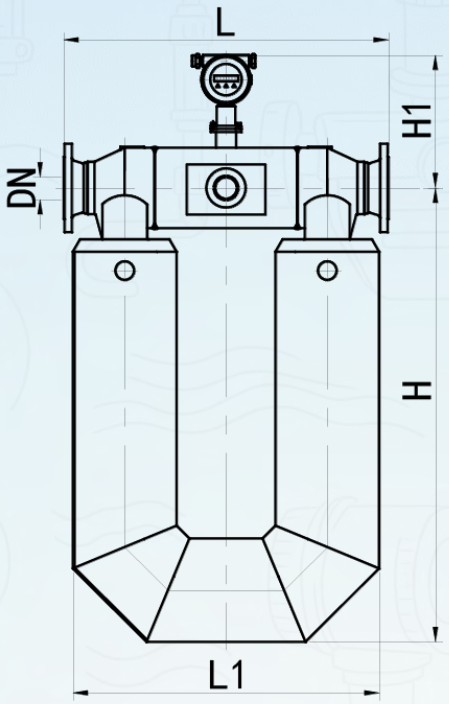
WEIGHT OF INSTRUMENT (KG)

DN(mm)	3	8	10	15	25	40	50	80	100	150	200	250	300
Triangle type & U-type	4	6	6	7	11	26	42	106	217	322	536	960	3450
Micro-bend type	--	5	5	7	12	18	33	86	170	266	412	580	690

*approximate net weight in Kg

OUTLINE DIMENSION FOR TRIANGLE / U-TYPE

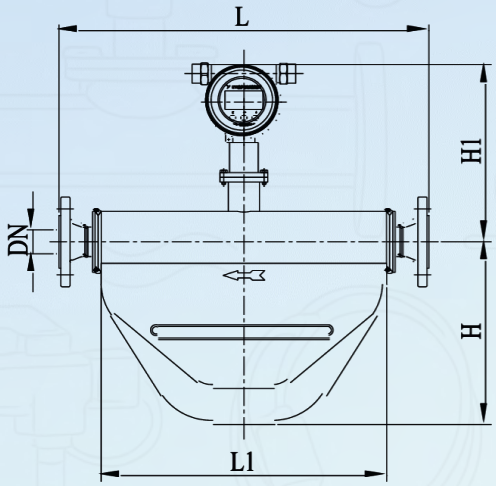


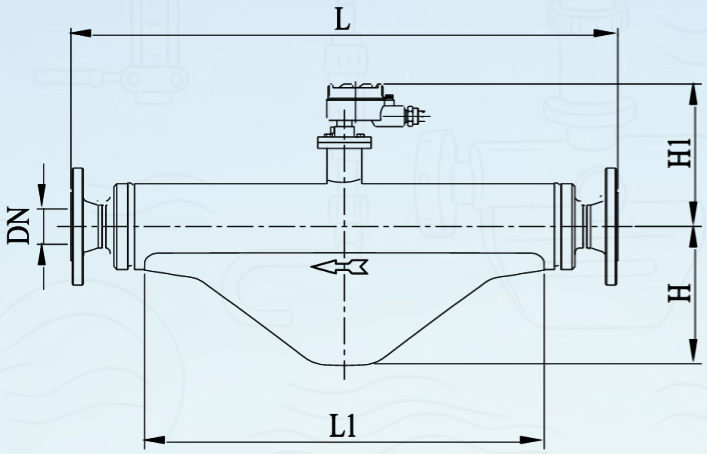


NAGMASS	DN	Pressure (bar)		ΔL (mm)	L1	H	H1	
		≤ 40	≥ 63				Integrated	Separated
003	3	321	345	± 3	260	115	250	170
008	8	150	170		350	290	266	182
010	10	150	170		350	290	266	182
015	15	180	194		340	320	285	200
025	25	200	248		450	428	285	200
040	40	520	547	± 4	450	660	277	192
050	50	558	588		522	748	288	202
080	80	780	808		705	1030	326	242
100	100	920	948		853	1140	356	272
150	150	1100	1140	± 5	1050	1526	386	302
200	200	1364	1410		1160	1655	434	350
300	300	2030	2080		1750	2140	456	371

*all dimensions are in mm

OUTLINE DIMENSION FOR MICRO BEND-TYPE





NAGMASS	DN	Pressure (bar)		ΔL (mm)	L1	H	H1	
		≤ 40	≥ 63				Integrated	Separated
008	8	424	484	± 3	302	154	270	185
010	10	424	484		302	154	270	185
015	15	400	414		280	191	298	213
025	25	500	536	± 4	360	258	302	218
040	40	600	634		460	306	315	230
050	50	800	828		640	410	325	240
080	80	900	928		700	495	350	265
100	100	1130	1156	± 5	860	665	370	285
150	150	1450	1490		1200	905	400	316
200	200	1800	1845		1450	1175	426	342
250	250	1966	2006		1530	1300	468	383

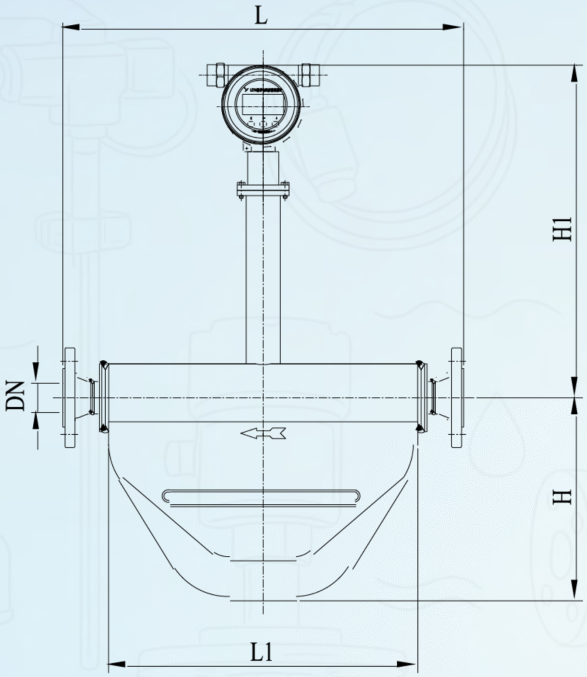
OUTLINE DIMENSION FOR SUPER MICRO-BEND TYPE

NAGMASS	DN	Pressure (bar)		ΔL (mm)	L1	H	H1	
		≤ 40	≥ 63				Integrated	Separated
050	50	800	834	± 4	588	200	330	250
080	80	935	973		730	200	355	270
100	100	1130	1182	± 5	870	275	370	290
150	150	1370	1410		1070	378	400	330

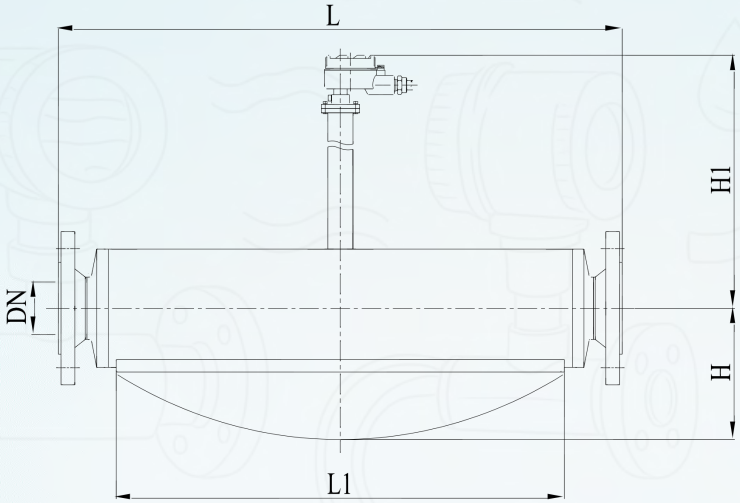
*all dimensions are in mm

NAGMASS - CRYOGENIC MODEL

The **Cryogenic mass flow meter** is designed for measuring liquid industrial gases, such as **liquid argon, liquid oxygen, and liquefied natural gas (LNG)**. Capable of accurately measuring ultra-low temperature media, it operates reliably in environments as cold as **-196°C**, with a precision of up to **±0.2%.**



MICRO-BEND



SUPER MICRO-BEND

NAGMASS	DN	L GB/T 9115-2010 (bar)		ΔL (mm)	L1	H	H1	
		< 40	≥ 63				Integrated	Separated
010 M	10	424	484	± 3	302	154	570	550
015 M	15	400	414		280	191	598	578
025 M	25	500	536		360	258	602	583
040 M	40	600	634	± 4	460	306	615	595
050 M	50	800	828		640	410	625	605
080 M	80	900	928		700	495	650	630
100 M	100	1130	1156		860	665	670	650
050 S	50	800	834		538	200	630	605
080 S	80	935	973		730	200	655	605

*M denotes Micro-Bend
S denotes Super-Micro Bend

FLOW METER ORDERING INFORMATION

1	2	3	4	5	6	7	8	9	Details
DN	Medium	Structure	Sensor	Working Voltage	Output Comm	Nominal Pressure	Accuracy	Connection	
003									3mm
008									8mm
010									10mm
015									15mm
025									25mm
040									40mm
050									50mm
080									80mm
100									100mm
150									150mm
200									200mm
250									250mm
300									300mm
	L								To Measure Liquid
	G								To Measure Gas
		1							Integrate -50 ~ 125 °C
		2							Separated -50 ~ 200 °C
		3							High Temp. separated -50~350 °C
		4							Low Temp. Separated - -200~125 °C
			U						U-Type Sensor
			M						Microbend type Sensor
			S						Super Microbend
				D					DC24V
				A					AC220V
					R				RS485
					H				HART
						16			16 bar
						25			25 bar
						40			40 bar
						64			64 bar
						100			100 bar
						160			160 bar (for DN 15~25)
						250			250 bar (for DN 15~25)
							X		± 0.1%
							Y		± 0.2%
							Z		± 0.5%
								F	Flange Connection
								T	Thread Connection (Up to DN - 25)
								W	Hygenic
								C	Custom
								J	Insulated Jacket

Example:

NAGMASS 080L2MDR16YF means:

Coriolis Mass Flow Meter, DN80, to measure Liquid, Separated type, Micro-Bend type Sensor, DC24V as the power supply, RS485 output communication, nominal pressure of 16 bar, accuracy ±0.2% with flange connection

EXPLORE MORE POSSIBILITIES

ELECTRO MAGNETIC FLOW METER

12+ Models

ULTRASONIC FLOW METER

ULTRASONIC FLOW METER PRO

TURBINE FLOW METER

VORTEX FLOW METER

THERMAL MASS FLOW METER

POSITIVE DISPLACEMENT FLOW METER

NAGMAN FLOW-LEVEL SYSTEMS AND SOLUTIONS LLP

MANUFACTURER & EXPORTER OF FLOW, WATER AND GAS METER CALIBRATION TEST BENCHES & MOBILE SKIDS LEVEL METER TEST & CALIBRATION RIG / SYSTEMS (WET & DRY)
TYPE-TEST BENCH (SERVICES), CUSTOM CALIBRATION SOLUTIONS
INDUSTRIAL FLOW METERS AND LEVEL TRANSMITTERS

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SCAN FOR WEBSITE

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