

HNF40-B

INTELLIGENT INDUSTRIAL VORTEX FLOW METER

PRODUCT INTRODUCTION

The basic principle of the HNF40-B intelligent industrial grade vortex flowmeter is the Karman vortex street phenomenon. When the medium flows through a triangular vortex generator at a certain speed, two alternating rows of vortices are formed on both sides, which are called Karman vortex streets.

Based on the theory of Karman vortex street, Strauhal proposed that the frequency of Karman vortex street is proportional to the flow velocity of the fluid, and it is sent to the converter through cables for intelligent processing, achieving the display of instantaneous flow rate and accumulated flow rate of the fluid, as well as communication between flow data and control system.



PARAMETERS

Flow type: **Vortex street type**

Output signal: **Analog signal**

Measurement medium: **steam, gas, liquid**

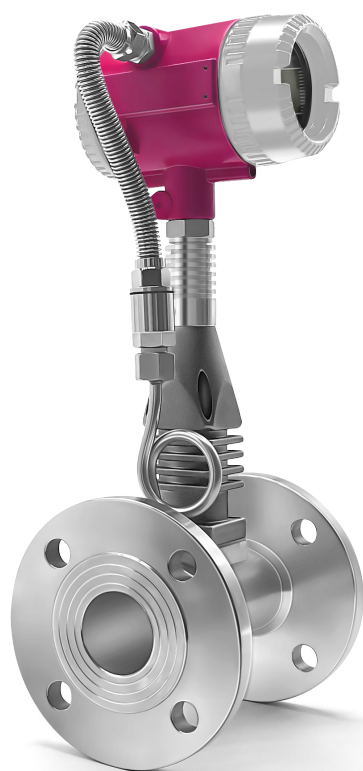
Application scenario: **Flow measurement**

Pipe diameter range:

DN10- DN300. Please refer to the selection table for details

Authentication: 

PRODUCT FEATURES



- ❶ It can measure the volume flow rate and mass flow rate of steam, gas, and liquid.
- ❷ Measurable medium temperature up to +350 °C
- ❸ Can achieve separation of amplifier and sensor (separation distance of 15m).
- ❹ Low pressure loss, wide range, and a range of 10-40 times.
- ❺ No mechanical moving parts, long-term stability, simple structure for easy installation and maintenance.
- ❻ The sensor output is a pulse frequency, which is linear with the actual flow rate of the measured fluid, with zero drift and very stable performance.
- ❼ Widely used for measuring the volumetric and mass flow rates of superheated steam, saturated steam, compressed air, and general gases and liquids.

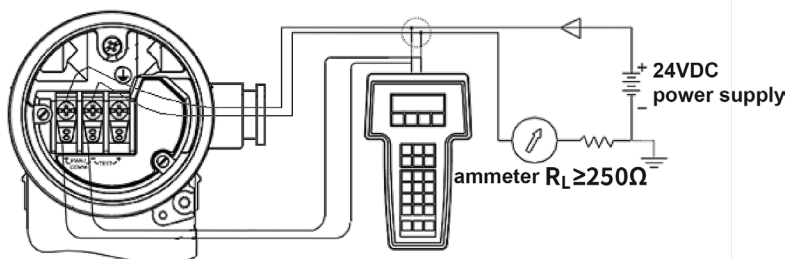
TECHNICAL PARAMETERS

PARAMETER	PARAMETER DESCRIPTION
Flow meter diameter	Standard: Full tube type DN15~DN400
	Insertion type DN200-DN1500
	Small caliber DN6~DN12 (protocol ordering)
Process fluid	Liquid, gas, steam (single-phase medium or medium that can be considered single-phase)
	Saturated steam with a dryness greater than 85% can be considered as a single-phase medium
Process temperature	Standard range: -40~+250°C~350°C
	Extended range (protocol ordering) >+350°C~500°C
Pressure rating	Standard pressure rating ≤ 2.5MPa~4.0MPa
	Extended pressure rating (agreement ordering) >4.0MPa~45MPa
Accuracy	Liquid: ± 0.5% ± 1.0% ± 1.5%
	Gas: ± 0.5% ± 1.0% ± 1.5% ± 2.5%
Range ratio	Standard range ratio 8:1~20:1
	Extended range ratio (protocol ordering) ≥ 30:1

Reynolds number	Standard range $2 \times 10^4 \sim 7 \times 10^6$	
	Expansion range $1 \times 10^4 \sim 7 \times 10^6$	
Velocity of flow	Liquid flow rate range: 0.21-7.6m/s	
	Gas and steam flow velocity range 2~76m/s	
	Expand gas flow rate range <1.98m/s	
Drag coefficient	Full tube type: $C_d \leq 2.4$	
Allow vibration acceleration	0.5g-1.5g	
Straight pipe section	Front straight pipe section $\geq 20D$	
	Rear straight pipe section $\geq 5D$	
Pressure loss	$\Delta P = 1.29 \cdot \rho \cdot V^2$ (Unit: Pa)	
	ρ : Medium density (kg/m ³) V : Medium flow velocity (m/s)	
Minimum pressure of liquid	$P_{min} \geq 2.7 \cdot \Delta P + 1.3 \cdot P_0$, where P_0 liquid gasification pressure (Pa)	
Protection grade	Normal type: IP65	
	Submersible type: IP68	
Explosion proof sign	Intrinsic safety explosion-proof mark: Ex ia IIC T1~T4 Ga	
Environmental condition	Ambient temperature	Non explosion proof locations -40~+55°C
		Explosion proof location -20~+55°C
	Relative humidity	No condensation 5%~90%
	Atmospheric pressure	86~106kPa
Power supply	Pulse: 12VDC~+24VDC	
	Current: +24VDC 4-20mA	
	Battery: 3.6V	
Power consumption	<1w	
Output signal	Frequency/pulse output: 2~3000Hz, low level $\leq 1V$, high level $\geq 5V$	
	Two wire system, 4-20mA output Explosion proof load $\leq 300 \Omega$ Non explosion proof load $\leq 500 \Omega$	

Display	Instantaneous flow, cumulative flow, flow unit, flow percentage, etc
Communication protocol	HART, Modbus RTU (RS485), wireless remote transmission
Electrical interface	M20 * 1.5 internal thread
	1/2 "-14 NPT internal thread
Body and occurrence material	Default 304 stainless steel (order according to other material agreements)

ELECTRICAL CONNECTION



INSTRUCTIONS FOR WIRING TERMINALS

Serial Number	Terminal symbol	Function Description
1	24VDC+	24V power supply access terminal
2	IOUT	4... 20mA current output Hart communication output (optional)

REFERENCE TABLE FOR OPERATING FLOW RANGE

Unit (m³/h)

Nominal diameter	Liquid		Nominal diameter	Gas	
	Standard flow range	Expand traffic range		Standard flow range	Expand traffic range
15	0.2—5	0.1—5	15	4—16	3—20
20	0.35—10	0.2—10	20	5—30	4—40
25	0.55—12	0.3—12	25	8—80	5—90
32	0.9—18	0.5—18	32	10—150	6—200
40	1.5—25	0.9—25	40	14—280	9—310
50	2.5—40	1.5—40	50	20—400	14—490
65	3.5—70	2.5—70	65	35—720	24—840
80	5.5—130	3.5—130	80	55—1100	36—1440
100	8.5—160	5.5—160	100	80—1600	60—2440
125	15—250	8.5—250	125	130—2600	90—3600

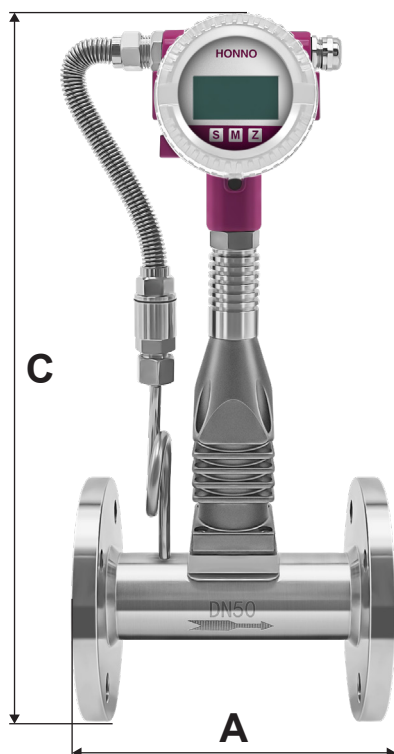
150	20—400	12.5—400	150	190—3800	130—5200
200	34—700	22—700	200	330—6600	220—7700
250	53—1200	35—1200	250	530—10600	350—12400
300	76—1800	50—1800	300	760—15200	500—17800
350	104—3100	69—3100	350	1035—21000	690—24000
400	135—3500	90—3500	400	1350—27000	900—31000

REFERENCE TABLE FOR FLOW RANGE OF INSERTION VORTEX FLOW METER

Unit (m³/h)

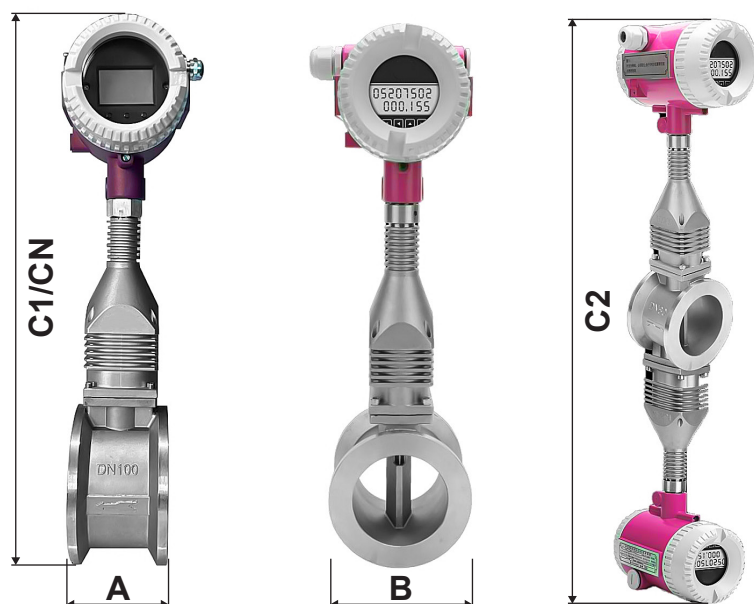
Flow meter diameter	Liquid		Gas		Steam	
	Standard flow range	Expand traffic range	Standard flow range	Expand traffic range	Standard flow range	Expand traffic range
200	60-1050	27-810	400-1200	320-8000	400-4200	320-8400
250	100-1550	52-1800	618-6300	550-11000	618-6300	550-11000
300	150-2100	88-2500	1000-1060	800-18000	1000-1060	8000-18000
350	200-3100	121-3630	1500-15000	1100-26000	1500-15000	1100-26000
400	350-3500	160-4800	1800-11800	1500-34000	1800-18200	1500-34000
450	420-4200	200-6000	2100-21100	2000-40000	2100-21100	2000-40000
500	500-5200	247-7500	2500-25200	2400-18000	2500-25200	2400-48000
600	700-7200	360-10800	3560-35600	2500-59000	3560-35600	2500-59000
700	830-8400	485-14600	4850-48500	3460-69000	4850-48500	3460-69000
800	1000-20000	640-19200	6300-63000	45000-91000	6380-63800	4500-91000
900	1370-138000	810-24300	8020-80300	5720-114000	8020-80300	5720-114000
1000	1700-170000	990-29000	9900-99000	7060-141200	9800-99000	7060-141200
1200	2500-250000	1400-410000	14200-1420000	10180-2410000	14200-1420000	10180-2410000
1500	3800-380000	2300-690000	22200-1250000	15900-3750000	22200-1250000	15900-3750000

FLANGE FLOWMETER **DIMENSION**



Flowmeter caliber	length	Bolt hole Center distance	Ambient temperature flowmeter Overall height	High temperature flowmeter Overall height	Bolt Specifications	Bolt quantity
DN	A	B	C1	C2	D	N
15	140	65	400	460	M12	4
20	140	75	400	460	M12	4
25	160	85	410	470	M12	4
32	160	100	430	490	M16	4
40	160	110	440	500	M16	4
50	180	125	450	510	M16	4
65	180	145	470	530	M16	4
80	180	160	490	550	M16	4
100	180	180	500	560	M16	8
125	180	210	540	600	M16	8
150	180	240	560	620	M20	8
200	220	295	630	690	M20	12
250	220	355	680	740	M24	12
300	220	410	730	790	M24	12

CLAMP ON FLOWMETER **DIMENSION**



Flowmeter caliber	length	Outer circle diameter	Ambient temperature flowmeter Overall height		High temperature flowmeter Overall height
DN	A	B	C1	C2	CH
15	68	54	405	460	460
20	68	54	405	460	460
25	68	54	405	460	460
32	78	68	405	460	460
40	80	78	410	470	470
50	82	86	410	470	470
65	84	104	430	490	490
80	84	118	440	500	500
100	90	138	460	520	520
125	90	168	490	550	550
150	100	194	520	580	580
200	100	248	570	630	630
250	115	298	630	690	690
300	130	348	680	740	740

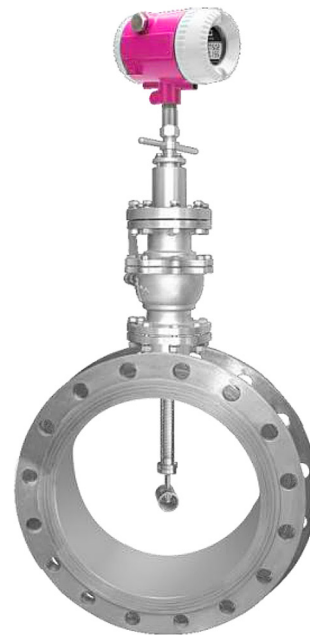
Flange type



Clamp type



Plug-in type



HNF40-B INTELLIGENT INDUSTRIAL VORTEX FLOW SENSOR SELECTION TABLE

NAME	CODE	CODE DESCRIPTION	
HNF40-B		Intelligent industrial grade vortex flow sensor	
Connection method	2	Clamping type	
	3	Flange style	
	4	Insertion type	
	5	Pipe thread	
Type selection	A	liquid	
	B	Gas	
	C	Steam	
Nominal diameter	15	DN15	1. Full tube type: DN15~DN300>DN300 protocol ordering 2. Insertion type: DN200~DN1500>DN1500 protocol ordering
	...	...	
	300	DN300	
	...	...	
	1500	DN1500	
Accuracy	A	0.5%	
	B	1.0%	

Usage environment	W	Non explosion proof type
	F	Split type
	G	Explosion proof type
	B	Intrinsic safety type
Output signal	P	Pulse signal
	M	Current signal 4-20mA
	MH	20mA current signal 4-20mA+HART protocol
	MR	4-20mA current signal+RS485 communication
Power supply	1	24VDC
	2	220V
Product type	P	Universal type
	B	Variable diameter type
	Q	Ball valve insertion type (continuous flow replacement)
	J	Easy insertion type (requires disconnection and replacement)
	S	Universal dual sensor type
	N	Variable diameter dual sensor type
Material	A	304
	B	316
Product type	1	PN10
	2	PN16
	3	PN25
Functional configuration	T	Temperature flow integrated type
	W	Temperature, pressure, and flow integrated type
	R	Wireless remote wireless monitoring type (non explosion proof)
	0	No configuration requirements