

HH5 Variable Area Flow meter

General Information

HH5 series variable area flowmeter is a kind of measuring meter which the flow rate is changing along with the area and is widely used in the process control of industrial automation. It has the merit of little volume, broad measuring range and convenience for use. It can be used to measure liquid, gas and vapor flow especially fits for the flow rate measurement of low flow velocity and little flow rate.

HH5 series variable area flow meter has mechanical indication type and transmitter type with a pointer LCD displaying instantaneous/accumulated flow rate, upper-limit and lower-limit alarm output, accumulative pulse output, batch control, standard two-wire 4-20mA current output, ect. Additionally, this instrument employs advanced microprocessing central chip and high quality industrialized components of Motorola corporation to ensure the good performances of flowmeters in all applicational fields. For many years variable area flow meters are well received by many industries such as petrochemical, steel and iron, electric power, metallurgy, light industry, food, pharmacy and water processing



Theory

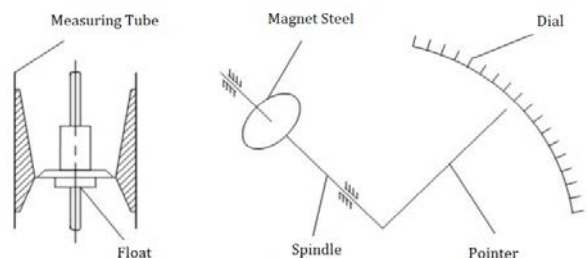
The HH5 series flow meter consists essentially of three basic parts:

- Metering tube
- Tapered float
- Indicator

The flow rate determines the position of the float, the meter float is in dynamic balance, when the difference between the weight of the float and the weight of the displaced fluid

equals the upward pressure resulting from the fluid velocity through the meter. The annular area between the tapered float and the tube increases until the upward and downward forces are in dynamic balance.

Since the position of the float in the metering tube cannot be seen, an indicator is required, this indicator employs a magnetic coupling where a magnet follows the position of the float. The float encase an AlNICO-transmitting magnet with two follower magnets arranged in parallel on the indicator shaft.



Features

- Firm work, little maintenance and long life
- Low requirements to straight pipe part
- Broader ratio of flow rate 10:1

- Two-wire LCD indicator; Instant/accumulated display of flow rate is available; backlight option.
- Single axis and sensitive display
- Rotation of non-contact magnetic coupling
- Can be applied to hazardous occasions such as flammable and explosive ones
- All-metal structure, fit for high temperature, high pressure and mediums with strong erosion.
- power supply such as two-wire system, battery, alternating current option
- Multi-parameters calibration function
- Function of date recovery, date copy and power-off protection

Technical Data

Measuring range	Water (20°C) 6- 150000 l/h ,Air (20°C , 0.1013 Mpa) 0.05-4000m ³ /h
Ratio of spans	Standard type 10 : 1,option 20 : 1
Accuracy	Standard type class 1.5,option 1.0
Pressure Class	DN15-DN50:4.0Mpa; DN80 -DN200 1.6Mpa; Tri-clamp pressure rating :1.6 Mpa Special type: DN15-DN50 25Mpa; DN80 -DN200 16Mpa;
Pressure loss	7kPa-70kPa
Medium Temperature	Standard-80°C ~ + 200°C; PTFE : 0°C ~ 85°C;High temperature type : at most 300°C
Ambient temperature	LCD display:-30°C ~+85°C; Mechanical Pointer type:-40°C ~ +120°C
Medium viscosity	DN 15 : $\eta < 5\text{mPa.s}$ (H15.1-H15.3); $\eta < 30\text{mPa.s}$ (H15.4-H15.8) DN 25 : $\eta < 250\text{mPa.s}$; DN 50-DN 150 : $\eta < 300\text{mPa.s}$
Connection forms	DIN 2510 standard flange or others upon request
Cable interface	M20 × 1.5,Option PG11,1/2"NPT
Power Supply	24VDC, (10.8~36VDC);220 VAC (85~265VAC);Battery:3.6@4AH,NI-MH battery
Output	2 wire 4~20mA ; Pulse output: min interval 50ms Alarm: Max100Ma@30VDC, Internal impedance 100 Ω
LCD Display	Instant Flow display Range: 0-50000; Totalized Flow display Range: 0-99999999
Protection Level	IP65
Explosion-Proof	Intrinsically safe :Exia IICT6; Explosion separation type:Exd II CT6

Model Selection

Item	Code	Description
Flow Direction	HH50	Low in and Top out direction; vertical mounting
	HH 51	Top in and low out; vertical mounting
	HH 52	Side in and side out; Side-Side mounting
	HH 53	Low in and Top horizontally out; Bottom-side mounting
	HH 54	Low in and Top out ; Screw mounting
	HH 56R	Right in and left out ;horizontal mounting
	HH 56L	Left in and right out ; horizontal mounting
Tube Diameter	15	DN15
	25	DN25
	50	DN50

	80	DN80
	100	DN100
	150	DN150
	200	DN200
Medium	L	Liquid
	G	Gas
Indicator	M1	Local indication, mechanical pointer displaying instant flow rate
	M2	Power supply type square shell body, mechanical pointer displays instant flow, LCD display of instant/accumulated flow rate, Intrinsically safe :Exia IICT6
	M3	Power supply type round shell body, mechanical pointer indicates, LCD display of instant/accumulated flow rate, Explosion separation type: Exd II CT6
Power Supply	A	No power supply, Only for M1 indicator
	B	220VAC 50Hz power supply, 4-20mA signal output, back light allowed
	C	Battery power supply, no signal output
	D	24VDC two wire power supply, 4-20mA signal output, no back light
Alarm or Pulse Output	K1	No alarm or pulse output
	K2	Upper-limit alarm or one-way pulse output
	K3	Lower-limit alarm or one-way pulse output
	K4	Upper-limit or Lower-limit alarm or two-way pulse output
Explosion-proof	X	non-explosion-proof
	1	Intrinsically safe :Exia IICT6, square shell body
	d	Explosion separation type: Exd II CT6, round shell body
Wetted Parts Material	R0	SS316
	R1	SS304
	Rp	PTFE
	Ti	Titanium alloy
	RL	316L
Process connection	FL	Flange
	LW	Thread connection
	Tri	Tri-clamp
Accessory *	X	None
	T	Clamped type(only HH-51, HH-52, HH-53R, HH-53L)
	Z	Damping type
	G	High temperature type
	Y	High pressure type

Accessory * Detailed Description

Code	Description	Note
T	Clamped type	For thermal insulation or cooling purpose
Z	Damping type	For gas measurement or used with unstable inlet pressure
G	High temperature type	Temperature over 120°C
Y	High pressure type	Pressure over standard rating, Standard pressure rating: DN15-DN50:4.0Mpa; DN80 -DN200 1.6Mpa;

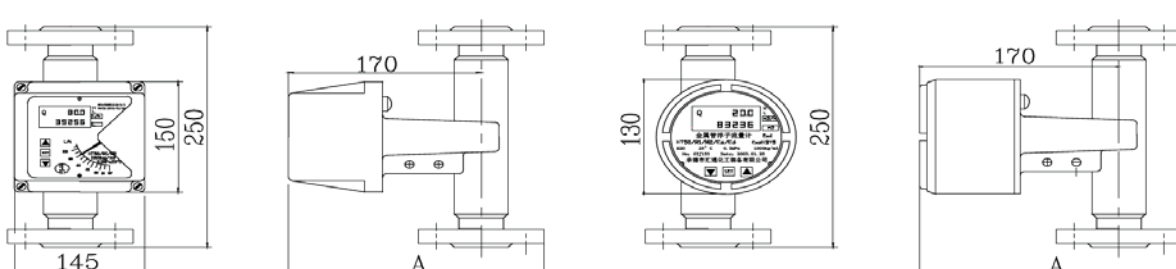
		Tri-clamp connection pressure rating :1.6 Mpa
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Flow range

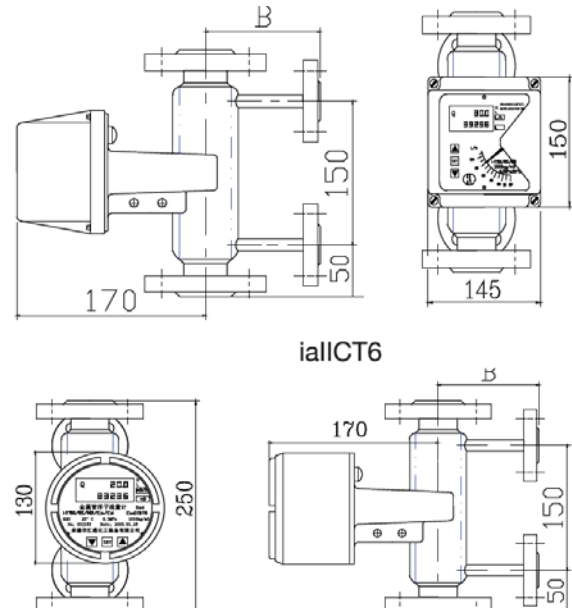
Water (L/h)				Air (m ³ /h)	HH50 Max Pressure los	
Diameter	Float No.	Material R0,R1,Ti,RL	Material PTFE	@0.1013MPa 20°C	Water (Kpa)	Air (Kpa)
15	H15.1	1.6~16		0.05~0.5	2.0	7.0
	H15.2	2.5~25	1.6~16	0.07~0.7	2.3	7.2
	H15.3	4.0~40	2.5~25	0.11~1.1	2.5	7.3
	H15.4	6.3~63	4.0~40	0.18~1.8	2.5	7.5
	H15.5	10~100	6.3~63	0.28~2.8	2.5	7.8
	H15.6	16~160	10~100	0.48~4.8	2.6	8.0
	H15.7	25~250	16~160	0.7~7	2.7	10.0
	H15.8	40~400	25~250	1.0~10	2.9	10.8
	H15.9	63~630	40~400	1.6~16	3.4	14
25	H25.1	63~630	40~400	1.6~16	4.0	7.0
	H25.2	100~1000	63~630	3.0~30	4.1	8.0
	H25.3	160~1600	100~1000	4.5~45	4.4	12.0
	H25.4	250~2500	160~1600	7.0~70	5.2	19.0
	H25.5	400~4000	250~2500	11~110	7.0	25.0
	H25.6	630~6300	400~4000	18~180	12.5	33.0
50	H50.1	630~6300	400~4000	18~180	4.7	8.0
	H50.2	1000~10000	630~6300	25~250	5.1	15.0
	H50.3	1600~16000	1000~10000	40~400	6.2	22.0
	H50.4	2500~25000	1600~16000	100~1000	8.0	35.0
80	H80.1	2500~25000	1600~16000	100~1000	5.3	15.0
	H80.2	4000~40000	2500~25000	120~1200	7.8	22.0
100	H105.1	6300~63000	4000~40000	180~1800	11.4	35.0
	H105.2	10000~100000	6300~63000	300~3000	16.7	
150	H155.1	15000~150000	10000~100000	400~4000	17.0	

Dimension & Weight

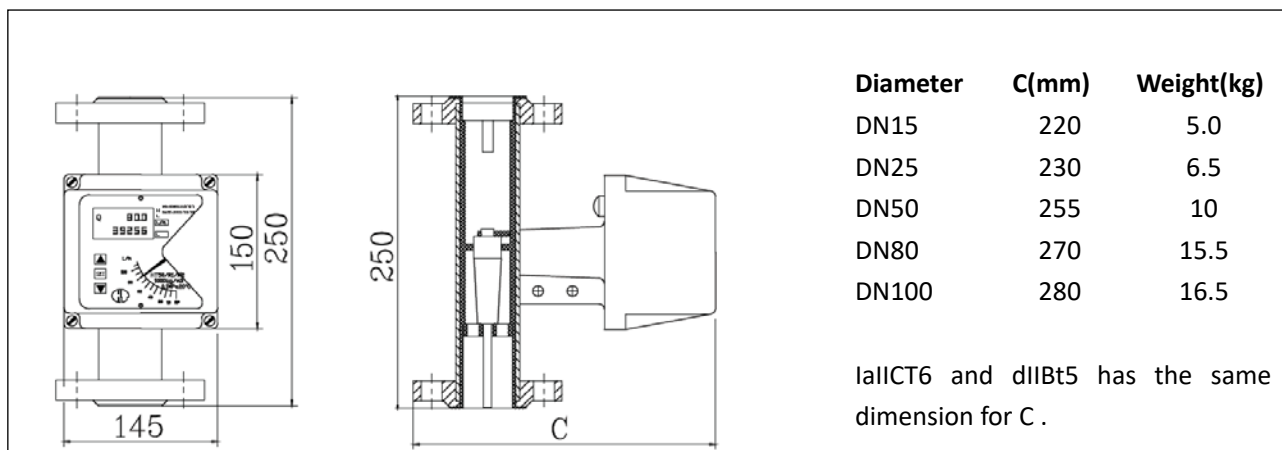
HH50 Low in and Top out direction; vertical mounting

						
	iaIICT6				dIIBt5	
Diameter	DN15	DN25	DN50	DN80	DN100	DN150
A (mm)	220	230	255	270	280	320
Weight(kg)	5.0	6.5	10	15.5	17	35

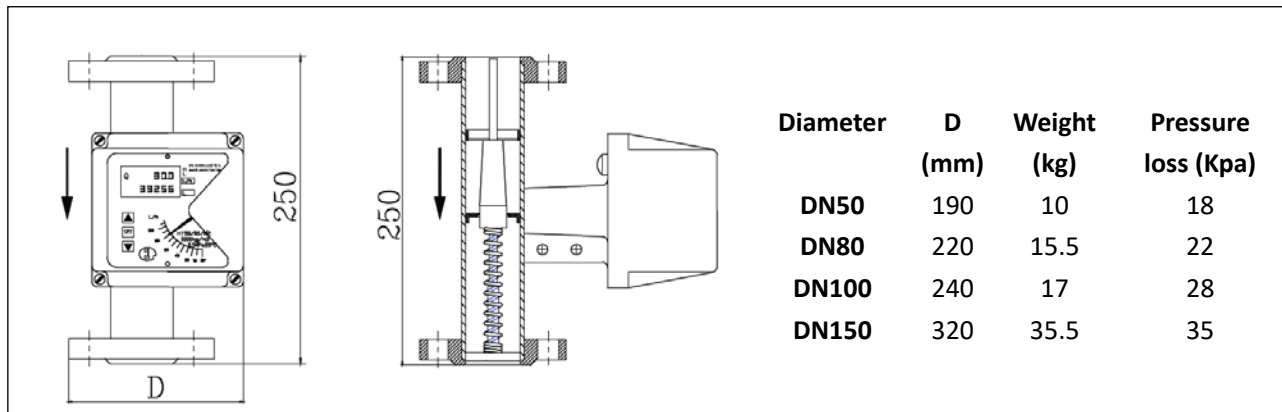
HH50/T Low in and Top out direction; vertical mounting with Clamped

					
	iaIICT6			dIIBT5	
Diameter	B(mm)	Weight(kg)			
DN15	100	7.5			
DN25	110	10			
DN50	120	13			
DN80	140	19			
DN100	150	21			
DN150	180	38			

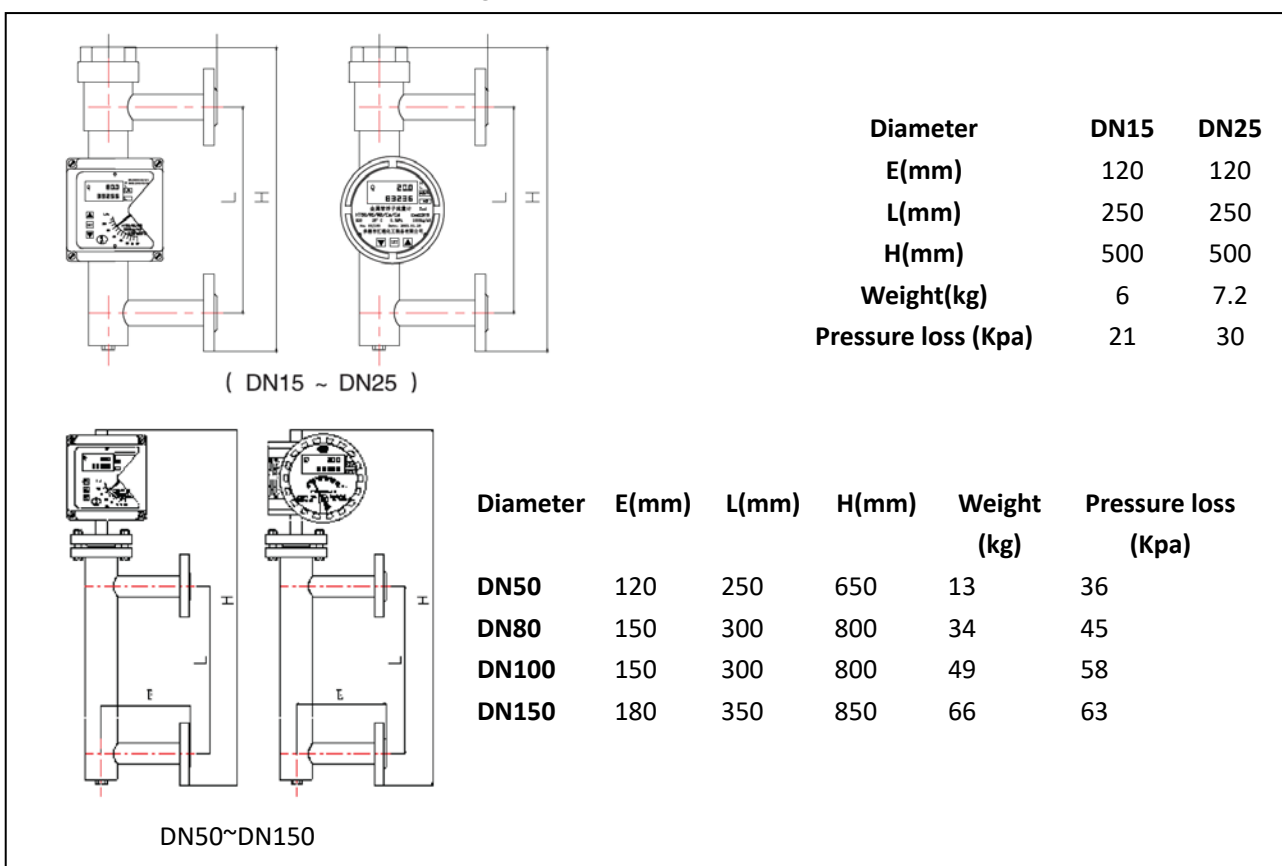
HH50/PTFE liner : Low in and Top out direction; vertical mounting with PTFE wet part material



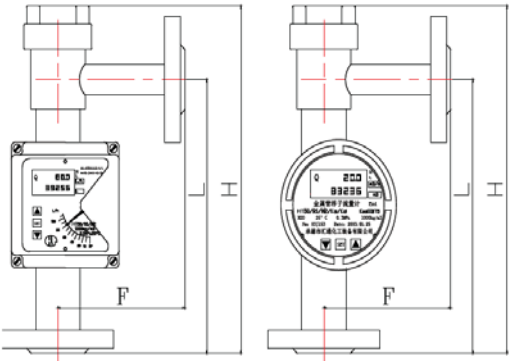
HH51: Top in and low out; vertical mounting

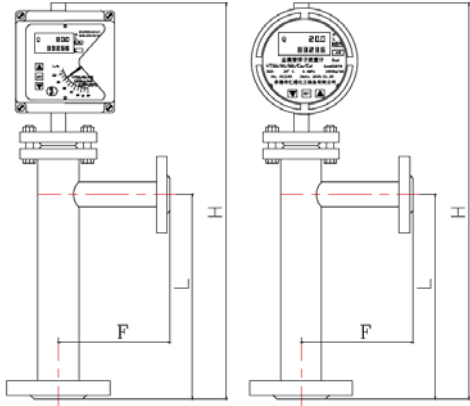


HH52: Side in and side out; Side-Side mounting

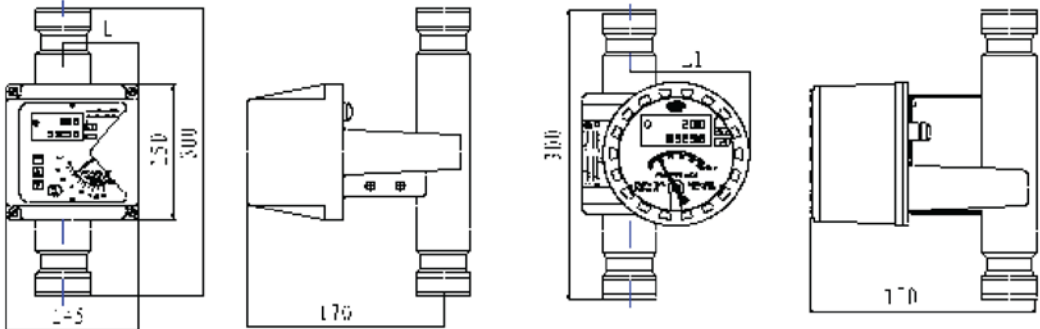


HH53: Low in and Top horizontally out; Bottom-side mounting

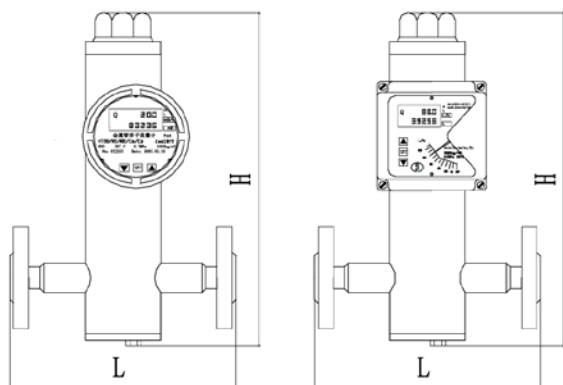
		Diameter	DN15	DN25
		F(mm)	120	120
		L(mm)	250	250
		H(mm)	350	350
		Weight(kg)	4.5	7
		Pressure loss (Kpa)	18	22
DN15~DN25				

		Diameter	F (mm)	L (mm)	H (mm)	Weight (kg)	Pressure loss (Kpa)
		DN50	120	250	600	13	28
		DN80	150	250	700	34	35
		DN100	150	250	700	49	45
		DN150	180	300	760	66	58
DN50~DN150							

HH54: Low in and Top out; Screw mounting

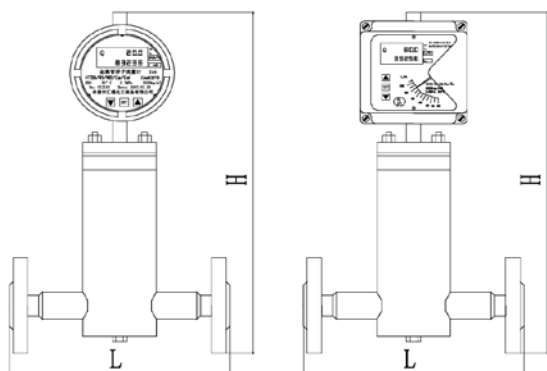
		Diameter	Max operated Press.(bar)	L (mm)	L1 (mm)	Weight(kg)
		DN15	40	80	75	2
		DN25	40	90	85	3.5
		DN50	40	105	100	5
		DN80	25	120	115	7.5
		DN100	25	130	125	10.5

HH56: Horizontal mounting



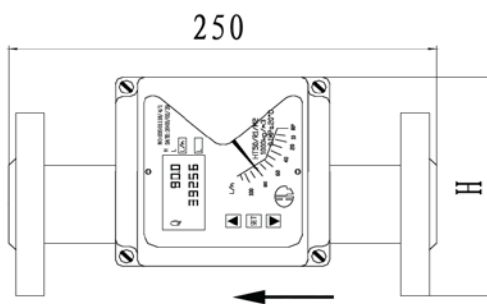
DN15~DN25

Diameter	DN15	DN25
L (mm)	250	250
H(mm)	380	400
Weight(kg)	5.5	9.5
Pressure loss (Kpa)	30	35



DN50

Diameter	DN50
L (mm)	250
H(mm)	480
Weight(kg)	20
Pressure loss (Kpa)	4.2



DN80~DN150

Diameter	DN80	DN100	DN150
H(mm)	220	240	320
Weight(kg)	15.5	17	35.5
Pressure loss (Kpa)	22	28	35