

## GENERAL

**BNCTURBINE** The TUB series is a liquid turbine flowmeter, as fluid flows through turbine rotor and drives it to rotate, the rotating rotor periodically cuts magnetic field line to generate electric pulse signal, which can be transmitted to output and transferred to the meter to display flow rate or totalizer. It features in high accuracy, good repeatability, simple structure, low pressure loss, convenient maintenance, etc. It is ideal to measure the volume of low-viscosity liquids in closed pipes, such as tap and demineralised water, fuels, liquefied gases, light fuel oil, solvents, pharmaceutical fluids, food etc.

## FEATURES

- Designed for a wide range of liquid applications
- High measuring accuracy, regardless of the mounting position
- 4-20 mA with HART signal and pulse outputs, user selectable
- Abrasion-resistant tungsten carbide rotor shaft and bearings
- Superior materials of construction for high performance in aggressive environments
- Easily cleaned and designed to flushed particulates through the turbine with the medium
- For variable use thanks to different pick-up sensors as well as a variety of connections and sizes

## STANDARD SPECIFICATION

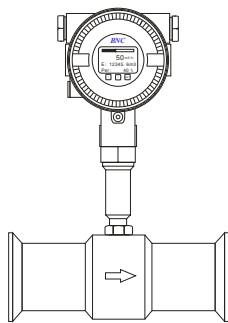
- |                      |  |                         |   |
|----------------------|--|-------------------------|---|
| ● Size               | : 6, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200 mm   | ● Local Display         | : 2 or 3 lines LCD<br>: 6 Digit flowrate<br>: 8 Digit totalizer   |
| ● Measuring Medium   | : Liquid   | ● Operation Temperature | : -20~120 °C  |
| ● Max. Viscosity     | : 1-60 cSt   | ● Ambient Temperature   | : -20~60 °C   |
| ● Measuring Range    | : 0.07-800 m <sup>3</sup> /hr  | ● Current Output        | : 4-20 mA (2 wires)<br>Load : Rohm=(VDC-18) * 50  |
| ● Accuracy           | : +/-1.0% of reading (Standard)<br>: +/-0.5% of reading (Optional)   | ● Pulse Output          | : Scaled Pulse / Unscaled Pulse<br>Load : 1000-5000 Ω   |
| ● Repeatability      | : +/-0.2% of reading   | ● Communication         | : HART (Compatible)<br>: RS485 (MODBUS Protocol)  |
| ● Pressure Drop      | : Max. 290 mbar at 100% Measuring range<br>(Density 1 g/cm <sup>3</sup> , Viscosity 1 cp)  | ● Data Storage          | : Operation parameter and totalizer figures are stored by EEPROM ( >10 years)   |
| ● Unit               | : m <sup>3</sup> /d, m <sup>3</sup> /hr, m <sup>3</sup> /m, m <sup>3</sup> /s, l/hr, l/m, l/s<br>t/d, t/hr, t/m, kg/d, kg/hr, kg/m, kg/s<br>g/hr, g/m, g/s | ● Cable Entry           | : Standard: M20 Option: 1/2" NPTF<br>: Angular Connector DIN EN 175301-803 A  |
| ● Material           | Body : S.S. 304 / S.S. 316<br>Bearing : Tungsten nickel alloy<br>Rotor : S.S. 420 / S.S. 2205<br>Housing : Aluminum Alloy<br>: PA66 (Angular Connector)    | ● Angular Connector     | Ingress Protection : IP65<br>Wire Cross-section : Max. 1.5 mm <sup>2</sup><br>Cable Diameter : 6-8 mm                                 |
| ● Process Connection | : Flange (DN6 - DN200)<br>: Thread (DN6 - DN50)<br>: Tri-Clamp (DN15 - DN80)   | ● Power Supply          | : 18-32 VDC / 18-26 VDC (without display)<br>: Ni-MH Battery (3 years working hours)  |
| ● Max. Pressure      | : Flange: 63 kg/cm <sup>2</sup><br>: Thread: 63 kg/cm <sup>2</sup><br>: Tri-Clamp: 10 kg/cm <sup>2</sup>   | ● Protection Class      | : IP65 (Angular Connector)<br>: IP67 (Aluminum Alloy Housing)<br>: Explosion Proof, Ex d IIC T6<br>: Intrinsically Safe, Ex ia IIC T4 |



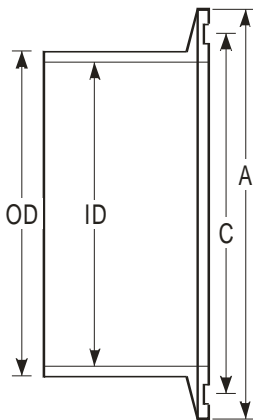
**FLOW RANGE**

Size		Standard Flow Range	Wide Flow Range	Size		Standard Flow Range	Wide Flow Range
mm	Inch			mm	Inch		
DN6	1/4"	0.1-0.6 m <sup>3</sup> /hr	0.07-0.6 m <sup>3</sup> /hr	DN50	2"	4-40 m <sup>3</sup> /hr	2.6-40 m <sup>3</sup> /hr
DN10	3/8"	0.2-1.2 m <sup>3</sup> /hr	0.13-1.2 m <sup>3</sup> /hr	DN65	2-1/2"	7-70 m <sup>3</sup> /hr	4.6-70 m <sup>3</sup> /hr
DN15	1/2"	0.6-6 m <sup>3</sup> /hr	0.4-6 m <sup>3</sup> /hr	DN80	3"	10-100 m <sup>3</sup> /hr	6.5-100 m <sup>3</sup> /hr
DN20	3/4"	0.7-7 m <sup>3</sup> /hr	0.5-7 m <sup>3</sup> /hr	DN100	4"	20-200 m <sup>3</sup> /hr	13-200 m <sup>3</sup> /hr
DN25	1"	1-10 m <sup>3</sup> /hr	0.7-10 m <sup>3</sup> /hr	DN125	5"	25-250 m <sup>3</sup> /hr	17-250 m <sup>3</sup> /hr
DN32	1-1/4"	1.5-15 m <sup>3</sup> /hr	1-15 m <sup>3</sup> /hr	DN150	6"	30-300 m <sup>3</sup> /hr	20-300 m <sup>3</sup> /hr
DN40	1-1/2"	2-20 m <sup>3</sup> /hr	1.3-20 m <sup>3</sup> /hr	DN200	8"	80-800 m <sup>3</sup> /hr	52-800 m <sup>3</sup> /hr

**TRI-CLAMP SPECIFICATIONS**



DN15-DN80



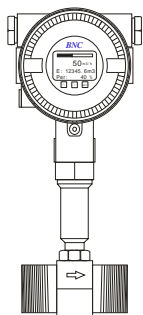
Unit: mm

HAB							
Pipe Size	1"	25	22.1	25.4	A	C	1-1/2"
							2"
ID	2-1/2"	3"	34.8	47.5	60.2	72.9	40
OD	40	50	38.1	50.8	63.5	76.2	65
A	50.4	64.0	50.4	64.0	77.4	91.0	70.6
C	43.6	56.3	43.6	56.3	70.6	83.3	83.3

HDB (DIN 32676)								
Pipe Size	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
	15	20	25	32	40	50	65	80
ID	16.0	20.0	26.0	32.0	38.0	50.0	66.0	81.0
OD	20.0	24.0	30.0	36.0	42.0	54.0	70.0	85.0
A	34.0	34.0	50.5	50.5	50.5	64.0	91.0	106
C	27.5	27.5	43.5	43.5	43.5	56.5	83.5	97.0

HKB (ISO 2852)								
Pipe Size	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
	15	20	25	32	40	50	65	80
ID	17.2	21.3	22.6	31.3	35.6	48.6	60.3	72.9
OD	21.2	25.3	25.6	34.3	38.6	51.6	64.1	76.7
A	34.0	34.0	50.5	50.5	50.5	64.0	77.5	91.0
C	27.5	27.5	43.5	43.5	43.5	56.5	70.5	83.5

**THREAD SPECIFICATIONS**



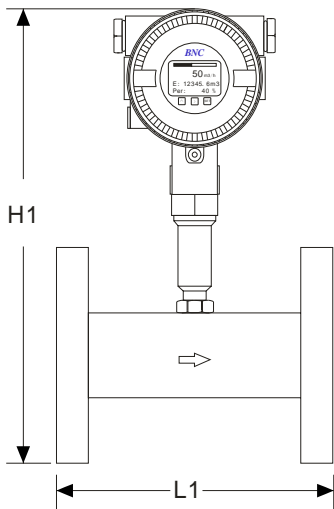
DN6-DN50

Size	Connection
DN6	1/4" 1/2" BSPP
DN10	3/8" 1/2" BSPP
DN15	1/2" 3/4" BSPP
DN20	3/4" 1" BSPP
DN25	1" 1-1/4" BSPP
DN32	1-1/4" 1-1/2" BSPP
DN40	1-1/2" 2" BSPP
DN50	2" 2-1/2" BSPP

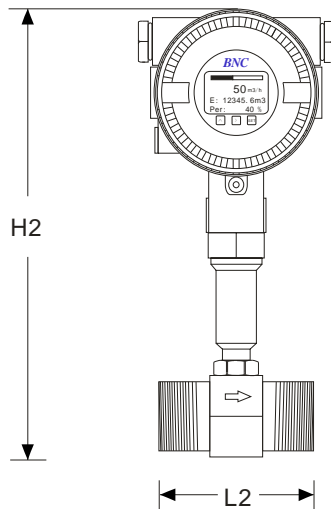
**➤ DIMENSIONS**

Unit: mm

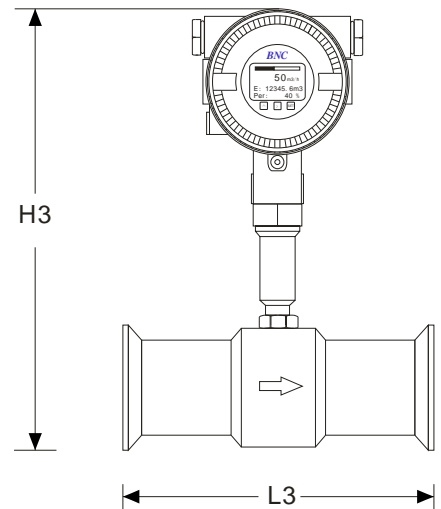
Size		H1	H2	H3	H4	H5	H6	L1	L2	L3
6	1/4"	300	265		215	190		230	50	
10	3/8"	300	265		215	190		350	50	
15	1/2"	300	275	290	215	200	205	75	75	75
20	3/4"	310	275	290	225	200	205	85	85	85
25	1"	315	285	290	230	210	205	100	100	100
32	1-1/4"	330	290	290	245	215	205	140	140	140
40	1-1/2"	340	300	300	255	225	215	140	140	140
50	2"	355	315	315	270	240	230	150	150	150
65	2-1/2"	370		330	285		245	180		180
80	3"	385		345	300		260	200		200
100	4"	405		320	220					
125	5"	430		345	250					
150	6"	465		380	300					
200	8"	515		430	360					



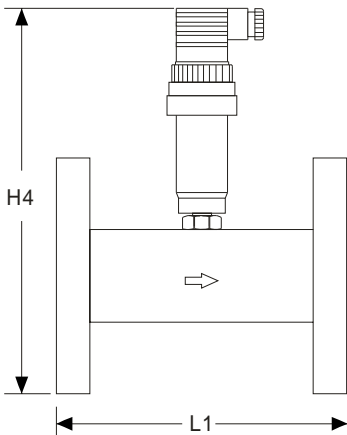
Flange Type



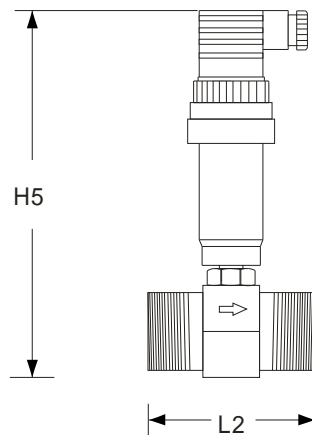
Thread Type



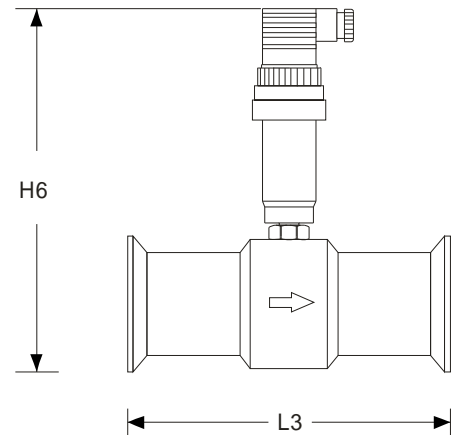
Tri-Clamp Type



Flange Type



Thread Type



Tri-Clamp Type

**MODEL SELECTION GUIDE**

TUB Series												
Example: TUB-F050-4AD-EX-A/PT												
TUB-	X	XXX	-X	X	X	-XX	-X	Description				
Connection	F								Flange Type (DN6-DN200)			
	C								Tri-Clamp Type (DN15-DN80)			
	T								Thread Type (DN6-DN50)			
Size	006-200									006-200 mm (1/4"-8")		
Tube Material			- 4								S.S. 304	
			- 6								S.S. 316	
Process Connection			1								PN10	
			2								PN16	
			3								PN25	
			4								PN40	
			A								ANSI 150 #	
			B								ANSI 300 #	
			C								ANSI 600 #	
			J								JIS 10K	
			K								JIS 20K	
			L								JIS 40K	
			O								Tri-Clamps, HKB (ISO2852)	
			P								Tri-Clamps, HDB (DIN 32676)	
			Q								Tri-Clamps, HAB	
		T								Thread Type (See Page 2: Thread Specifications)		
Function			A								Unscaled Pulse Output (3 wires) (Angular Connector)	
			B								4-20 mA Output (2 wires) (Angular Connector)	
			C								Display + 4-20 mA / Scaled Pulse Output	
			D								Display + Scaled Pulse + RS485 Communication	
			E								Display + 4-20 mA / Scaled Pulse + HART Communication	
			F								Battery Power (Only Display)	
Protection Class			-NN								IP65 (Only Function: A, B) or IP67 (Only Function: C, D, E, F)	
			-IT								Intrinsically Safe, Ex ia IIC T4 (Only Function: C, D, E)	
			EX								Explosion Proof, Ex d IIC T6 (Only Function: C, D, E)	
Option			-N								None	
			-A								Accuracy +/-0.5% of reading	
			-D								Rotor Material: S.S. 2205	
			-WR								Wide Flow Range (See Page 2: Flow Range)	
			-PT								Cable Entry 1/2" NPTF (Only Function: C, D, E, F)	