

### GENERAL

Capable of maximum 15 years' continuous measurement with an in-house battery, ETM3070 series electromagnetic volume totalizing meter has attained an eco-friendly and reliable high-performance measurement. The measuring tube is Lined with Rilsan® widely used for coatings for the inside of city water pipes, the tube with reduced size has significantly increased the accuracy in the domain of low flow measurement.

This flowmeter is applicable for the vast variety of services in water related industries.

### FEATURES

- ❑ The in-house lithium battery allows maximum 15 years' continuous measurement without changing the battery.
- ❑ The measuring tube made of aluminum die-casting lined with Rilsan® is very resistant to creeping deformation caused by vacuum pressure.
- ❑ Reducing measuring tube size  
The measuring tube with reduced size offers high accuracy in low flow measurement with a short upstream straight runs as short as 3D. (D is pipe diameter.)
- ❑ No earth rings are required with earth electrode equipped as standard.
- ❑ A touch panel system by an infrared sensor allows you to alter the settings without removing the cover of the flowmeter.
- ❑ High accuracy of  $\pm 0.5\%$  of reading.
- ❑ Pulse and status outputs are standardized.
- ❑ Empty flow detection.

### STANDARD SPECIFICATION

- Excitation : Square wave
- Nominal size : 25, 40, 50, 65, 80, 100, 125, 150, 200 mm
- Process connection : Flange
- Installation posture on pipe : Horizontal pipe (Compact type)  
Horizontal and vertical pipe (Separate type)
- Flanges : JIS 10K, equivalent to ASME Class 150, DIN PN10/16
- Measuring range : Flow velocity 0 to 9 m/s at inside pipe
- Body material
  - Measuring tube : Aluminum alloy<sup>\*1</sup>
  - Primary head housing : Carbon steel<sup>\*2</sup>
  - Converter housing : Aluminum alloy<sup>\*2</sup>
  - <sup>\*1</sup> Rilsan® coating [Polyamide resin]
  - <sup>\*2</sup> Anti-corrosive painting [Except wetted part]
- Wetted part material
  - Lining : Rilsan® coating [Polyamide resin]
  - Flange : Size  
25 to 125 mm; Stainless steel (SS316)<sup>\*2</sup>  
150 to 200 mm; Stainless steel (SS304)<sup>\*2</sup>
- O-ring for sealing between Flange and Measuring tube : Silicone rubber
- Electrode : Stainless steel (SS304)
- Earth electrode : Stainless steel (SS304)
- O-ring for sealing of Electrode and Earth electrode : Fluorocarbon rubber
- Grounding : Grounding resistance must be less than 100Ω
- Painting : Siloxane coating
- Color : Grey
- Battery : Exclusively used lithium battery pack  
See "Battery life time" for the duration of measurement.



- Protection class : Compact type, Separate type converter : IP66/67  
Separate type primary head : IP68  
Complying with IEC60529/JIS C0920
- Cable entry for output signal : None as standard  
Option : 1 × G1/2 or 1 × NPT1/2 female thread  
or 1 × M20 watertight gland  
or 1 × G1/2 female thread with a watertight gland  
or 2 × G1/2 female thread  
or 2 × NPT1/2 female thread  
or 2 × M20 watertight glands  
or 2 × G1/2 female thread with water tight glands
- Sensor cable entry (only for separate type) : 1 × G1/2 or 1 × NPT1/2 female thread or 1 × M20 watertight gland
- Exclusive cable for separate type (between primary head and converter) : 2 × 2 cores twisted, with shield, 0.5 mm<sup>2</sup> outside dia. 9 mm, max. length 25 m

### Fluid specification

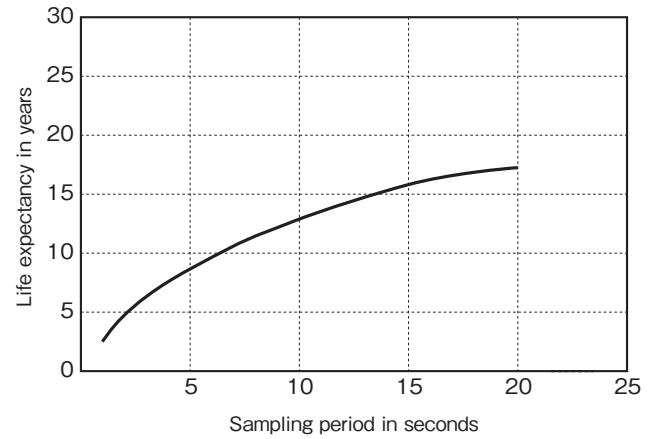
- Measuring fluid : Drinking water, Tap water, Raw water, Irrigation water
- Conductivity : 50  $\mu\text{S}/\text{cm}$  or more
- Measuring range : 0 to 9 m/s Velocity inside pipe
- Pressure : 0 to 1.6 MPa (But to be within the applicable flange limitation)
- Allowable vacuum pressure : 0 kPa abs
- Temperature
  - Fluid : 0 to +70°C
  - Ambient : -20 to +65°C
- Pressure loss : Approximately 8 kPa at velocity 3 m/s of water

**DISPLAY AND OUTPUT SPECIFICATION**

- Display : A series of numerals in 8 digits and remaining power of battery on LCD.  
 Contents : Continuous indication of either totalized volume in m<sup>3</sup> or flow rate in m<sup>3</sup>/h, capable of changeover by manual operation with a touch sensor.  
 The indication of totalized volume is selectable out of direct flow, reverse flow, difference of totalized volume between direct and reverse.
- Sampling period of measurement  
 Setting value : Selectable out of 1, 5, 10, 15 (set as standard), 20 seconds.  
 Note : The battery life time is subject to the sampling period.  
 See " Battery life time." for details.
- Low flow cutoff  
 Setting value : Selectable out of 0, 5, 10 mm/s (set as standard).  
 The standard setting of 10 mm/s cuts off the totalizing counts of the fluctuated flow near zero which occurs frequently at unstable flow during start up or shut down.
- Pulse output  
 Open collector outputs with terminals for 2 outputs  
 Rating : 5 to 24 VDC 10 mA or less (Power consumption is Max. 100 mW)  
 Pulse rate : 0.001 to 10 m3/pulse  
 Max. output frequency : 500 Hz  
 Pulse width : Selectable out of 1, 5, 10, 50, 100 ms
- Status output  
 Open collector outputs with terminals for 2 outputs  
 Rating : 5 to 24 VDC 10 mA or less (Power consumption is Max. 100 mW)  
 Used for equipment failure or remaining power alarm of battery

**Battery life time**

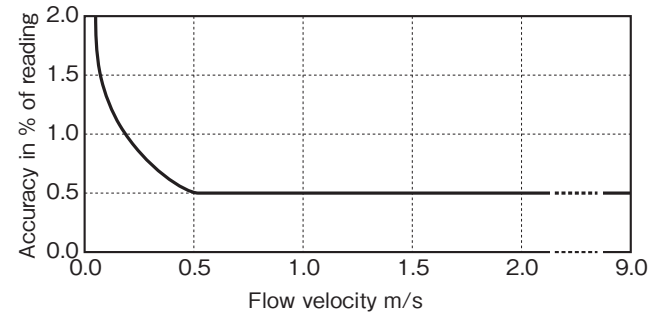
Exclusively used lithium battery pack  
 Ambient temperature : 25°C



Note: At low ambient temperature the performance is decreased.

**Accuracy \*3**

- Display  
 Flow velocity 0.5 m/s or more : ±0.5 % of reading  
 Flow velocity less than 0.5 m/s : ±0.2 % of reading + velocity error ±0.0015 m/s



- \*3 Reference condition  
 Fluid : water  
 Fluid temperature : 20°C  
 Conductivity : 50µS/cm or more  
 Upstream straight runs : 5 D ( D : pipe diameter)

**FLOW RANGE**

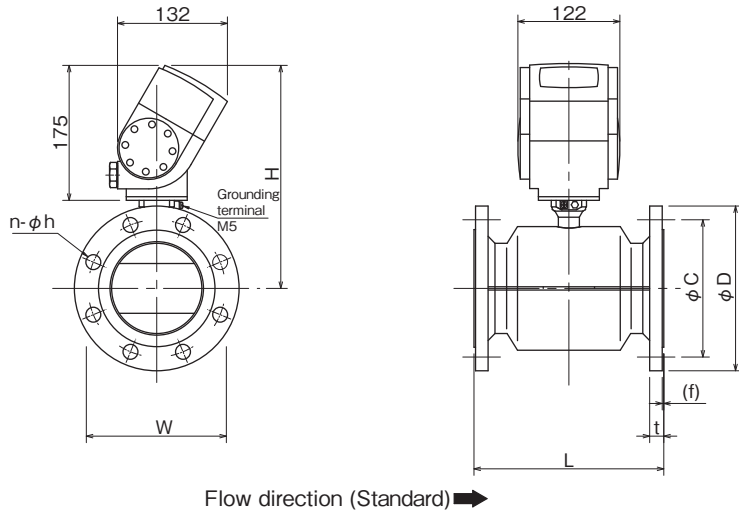
Flow rate unit: m<sup>3</sup>/h

Nominal size (mm)	The lowest limit of flow rate at flow velocity: 0.0225 m/s	The minimum flow rate when accuracy is ±0.5 % of reading.	The maximum flow rate at flow velocity : 9 m/s
25	0.04	0.9	15.9
40	0.10	2.3	40.7
50	0.16	3.6	63.6
65	0.27	6.0	107
80	0.42	9.1	162
100	0.64	14.2	254
125	1.00	22.1	397
150	1.44	31.9	572
200	2.55	56.5	1017

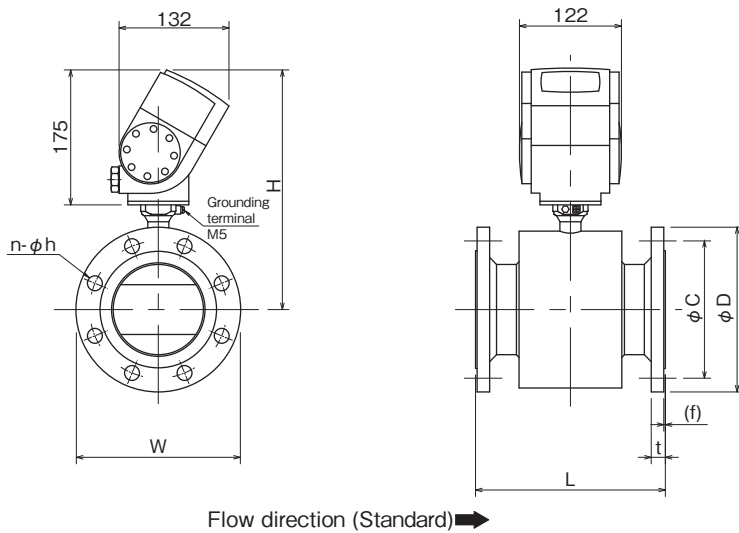
**DIMENSIONS**

- Compact type

Nominal size : 25 to 150 mm



Nominal size : 200 mm



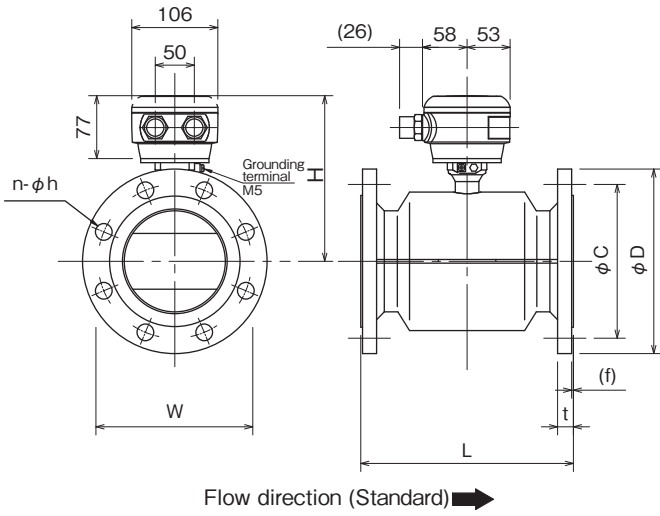
Nominal size (mm)	Dimension (mm)			Connection size (A)	Flange dimension (mm)					Mass*2 (apprx. Kg)
	L	H	W *1		D	C	n-φh	t	(f)	
25	150	259	90	25	125	90	4-19	16	1	5
40	150	266	105	40	140	105	4-19	18	2	6
50	200	278	120	50	155	120	4-19	16	2	13
65	200	282	140	65	175	140	4-19	18	2	11
80	200	284	150	80	185	150	8-19	18	2	17
100	250	302	175	100	210	175	8-19	18	2	17
125	250	316	210	125	250	210	8-23	20	2	21
150	300	332	240	150	280	240	8-23	22	2	29
200	350	362	291	200	330	290	12-23	22	2	36

\*1 Dimension W is the one of the housing (outer cylinder).

\*2 Mass is the one of JIS 10 K flange type.

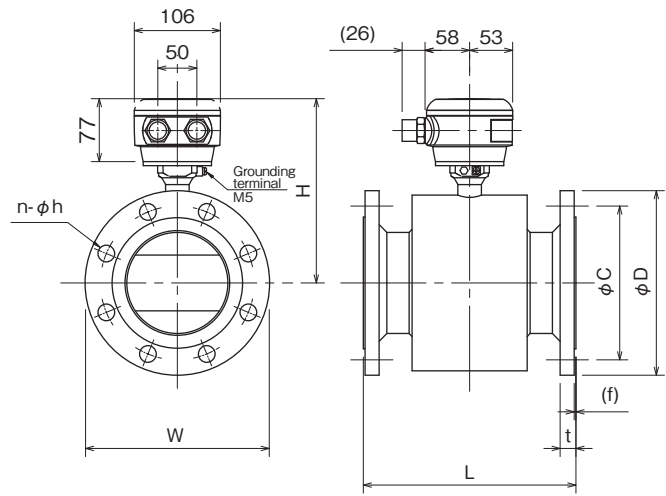
• Separate type (Primary head)

Nominal size : 25 to 150 mm



Flow direction (Standard) →

Nominal size : 200 mm



Flow direction (Standard) →

Nominal size (mm)	Dimension (mm)			Connection size (A)	Flange dimension (mm)					Mass*2 (apprx. Kg)
	L	H	W *1		D	C	n-φh	t	(f)	
25	150	161	90	25	125	90	4-19	16	1	4
40	150	173	105	40	140	105	4-19	18	2	5
50	200	180	120	50	155	120	4-19	16	2	12
65	200	182	140	65	175	140	4-19	18	2	10
80	200	186	150	80	185	150	8-19	18	2	16
100	250	204	175	100	210	175	8-19	18	2	16
125	250	218	210	125	250	210	8-23	20	2	20
150	300	234	240	150	280	240	8-23	22	2	28
200	350	264	291	200	330	290	12-23	22	2	35

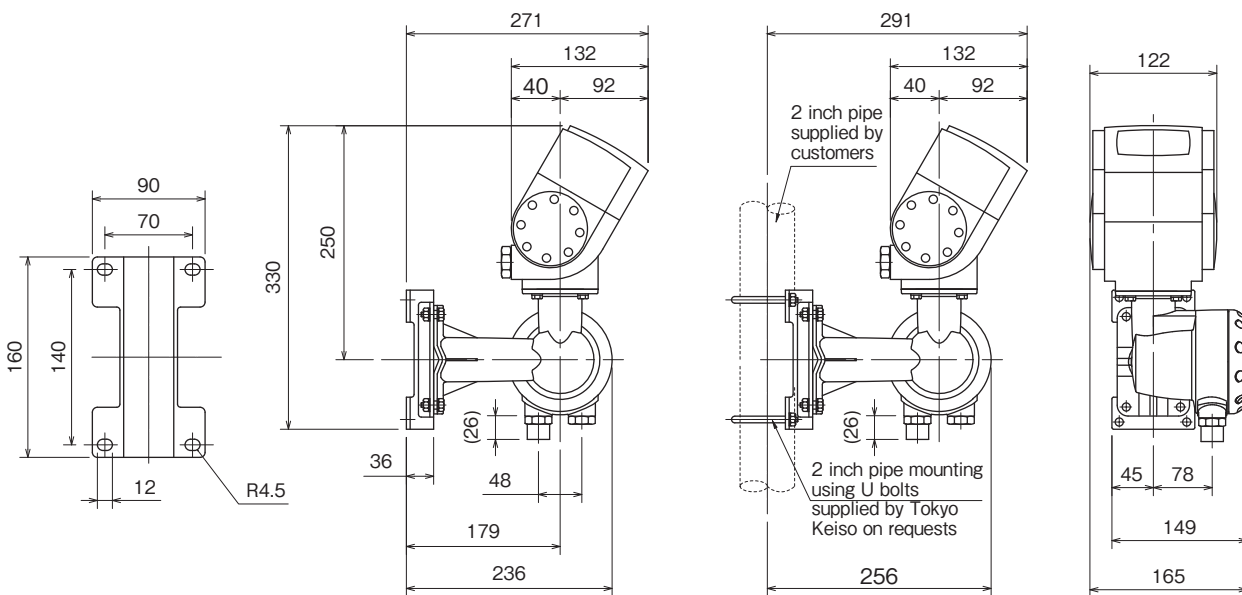
\*1 Dimension W is the one of the housing (outer cylinder).

\*2 Mass is the one of JIS 10 K flange type.

(Converter)

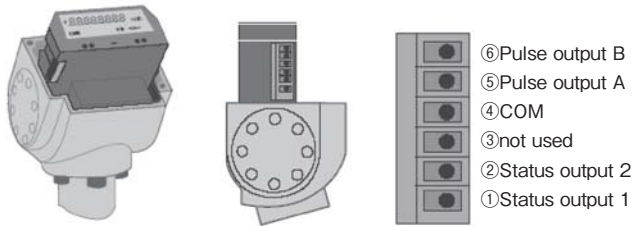
Wall mount (Standard)

2 inch pipe mount (Option)

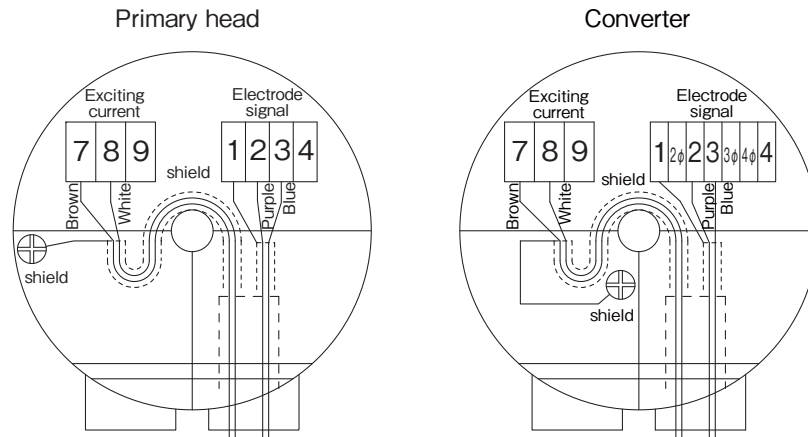


Mass : 3.7 kg

**ELECTRICAL CONNECTION FOR OUTPUT SIGNAL**



**ELECTRICAL CONNECTION BETWEEN PRIMARY HEAD AND CONVERTER**



**MODEL AND SPECIFICATION CODE**

- Model Compact type ; ETM3070C
- Primary head of separate type ; ETS3000F
- Converter of separate type ; ETC070F

Primary head Spec. code	V	N	4	0	0	C	1	1	0	0	0	0	2	0	0	0	0	0	Description	Standard
Primary head code	V	N	0	6														Flange connection type, nominal size : 25, 40, 50, 65, 80, 100, 125, 150 mm	○	
(Fixed code)	V	N	2	6														Flange connection type, nominal size : 200 mm	○	
Nominal size	(Fixed code)		4															Always 4	○	
			4															25 mm	○	
			6															40 mm	○	
			7															50 mm	○	
			8															65 mm	○	
			A															80 mm	○	
			B															100 mm	○	
Flange			2															Equivalent to DIN PN10 Size 200 mm		
			3															Equivalent to DIN PN 16 Size 150 mm or less		
			A															Equivalent to ASME Class 150		
	(Fixed code)		N															Equivalent to JIS 10K	○	
Type/sensor cable entry	(Fixed code)		0															Always 0	○	
			1	7														Compact type/None	○	
			A	8														Separate type/1 × 1/2 NPT female thread		
			B	8														Separate type/1 × G1/2 female thread		
Lining			0															Rilsan® coating [Polyamide resin]	○	
			C	1														Stainless steel (SS304)	○	
Primary head housing/flange material			2															Carbon steel/stainless steel (SS304) : Size 150, 200 mm	○	
			3															Carbon steel/stainless steel (SS316) : Size 125 mm or less	○	
Protection class			0															IP66/67 (JISC0920)	○	
	(Fixed code)		1															IP68 only separate type		
Sensor cable length	(Fixed code)		0															Always 0	○	
			0															None (Compact type)   5 m (Separate type)	○	
			1															10 m (Separate type)		
			2															15 m (Separate type)		
			3															20 m (Separate type)		
Calibration			0															Standard calibration		
			0															Stainless steel (SS304)	○	
Earth electrode material	(Fixed code)		0															Always 02000000	○	
			0															Always 02000000	○	
Special feature	(Blank)																	None	○	
	/Z																	Involved *1	○	

Converter Spec. code	V	N	1	2	4	H	0	2	1	1	2	1	0	0	Description	Standard
Converter code	V	N	1	2											Converter type:ETC070	○
(Fixed code)					4										Always 4	○
Type						7									Compact type	○
						T									Separate type	
(Fixed code)						H	0								Always H 0	○
Sensor cable entry							0								None (Compact type)	○
							3								1 x 1/2 NPT female thread (Separate type)	
							4								1 x G1/2 female thread (Separate type)	
							5								1 x with M20 watertight cable gland (Separate type)	
(Fixed code)							2	1	1	1	2	1	0	0	Always 21112100	○
Special feature														(Blank)	None	○
														/Z	Involved *1	

\*1 Add code "/Z" to a series of above mentioned codes with explanation for the other requirements not mentioned above code table.  
Do not hesitate to consult TOKYO KEISO Co., Ltd. before ordering for such requirements.

## STANDARD ACCESSORIES

- Parameter sheet : 1
- Instruction manual : 1

## OPTION

- Cable entry for output signal
  - 1 × G1/2 female thread [Symbol : 1G]
  - 1 × NPT1/2 female thread [Symbol : 1N]
  - 1 × G1/2 female thread with a watertight gland [Symbol : 1GW]
  - 1 × M20 watertight gland [Symbol : 1M]
  - 2 × G1/2 female thread [Symbol : 2G]
  - 2 × NPT1/2 female thread [Symbol : 2N]
  - 2 × G1/2 female thread with a watertight gland [Symbol : 2GW]
  - 2 × M20 watertight glands [Symbol : 2M]
- Metal fixtures mounting for 2 inch pipe of separate converter  
[Symbol : PM]

## ORDERING INSTRUCTIONS

1. Model and specification codes

Example Model : ETM3070  
 Primary head spec. code  
 : VN0647N0170C130000002000000  
 Converter spec. code  
 : VN1247H0021112100

2. Full scale flow range
3. Optional requirements will be added using above mentioned symbols if required.
4. Fluid name

\* Specification is subject to change without notice.

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