K

TURBINE FLOW METER

NITTOSEIKO
Taking new steps forward together

INSTRUCTION MANUAL

MNT10151 25.07

Contents

Thank you for purchasing a turbine flow meter “K” of our make this time. This instruction manual explains various cautions necessary for operating this flow meter. The user is kindly requested to read through this manual so that this flow meter may be used correctly and in safety for a long period of time.
For any inquiry about this flow meter or order of spare parts, please let us know the type and the serial No. indicated on the nameplate without fail.

SAFETY PRECAUTIONS

For safe and correct use of flow meter

In this instruction manual, the following symbol marks are used for safe and correct use of the flow meter:

⚠ : Indicates general contents of handling precautions.

⚠ **Warning** : Indicates contents the neglect of which in the handling may eventually lead to death or serious injury.

⚠ **Caution** : Indicates contents the neglect of which in the handling may eventually lead to injury or production of material damages.

⚠ If a modification, etc. of this product is made by the user regardless of our position, it may spoil the guarantee of safety or prevent demonstration of prescribed function by the instrument. In case there is any need of such modification, please contact either the dealer from whom you purchased your instrument or the nearest branch office of our company.

⚠ Warning

On the measured liquid

Use your flow meter for the liquids indicated on the nameplate & delivery specification sheet.

- Use for any liquid other than the specified ones may cause injury or material damage with splashing of liquid by leakage due to corrosion from inside the flow meter.
- For a specified liquid ordered simply as "X solution" or with a chemical symbol only, no guarantee of corrosion resistance can be provided for our product. Check well the corrosion resistance of the material used for this product against the liquid concerned.

Use within the specified pressure & temperature range.

- Any use in excess of those pressure or temperature may cause injury or material damage with splashing of broken pieces or liquid resulting from destruction of the flow meter body or measuring unit.

Use a flow meter approved for high-pressure gas service or of certified explosionproof construction type.

- For a service dealing with high-pressure gas liquid or inflammable gas liquid, use a flow meter approved for high-pressure gas service or of certified explosionproof construction type, intrinsically safe explosionproof construction type, etc.
  Use of a model with general construction may cause explosion or fire, eventually leading to injury of persons or material damage.

Take protective measures against burning.

- When using a high-temperature liquid (40˚C or over), the main body and the radiating fins get very hot, presenting a risk of burning. Be sure to take protective measures against burning,

On maintenance & inspection

Release internal pressure, and fully remove the residual liquid.

- If the service liquid is a harmful or corrosive material, it may cause injury or material damage at the time of inspection by disassembling of the flow meter.

⚠ Caution

On the piping

Provide a bypass piping.

・There is a risk of material damage due to breaking of some internal component parts of the flowmeter produced with flushing in the early period of operation or discharge of air from inside the piping.

Install in a place protected against vibrations or displacement of piping.

・If you install the piping in a place with a lot of vibrations or a risk of displacement of piping, it may lead to destruction of the flow meter body, causing injury or material damage with splashing of broken pieces or liquid.

Install the piping in a place not subject to any impact pressure.

・If a valve for instantly closing the piping is installed in an immediate vicinity on the upstream or downstream side of the flow meter, it may lead to destruction of the flow meter body by impact pressure due to water hammer, etc., causing injury or material damage with splashing of broken pieces or liquid.

Install a strainer also on the downstream side.

・To avoid inflow and mixing into process liquid of broken pieces of internal component parts, install a strainer also on the downstream side as required. Mixing of broken pieces in the process liquid may cause material damage.

On the control system (case of a type with transmitter)

Supplement a control output function other than this instrument.

・There is a risk of loss of safety and/or process specifications due to operating error or interruption of control signal. When using this instrument on an important process line, it is recommended to supplement another control function to the system so as to avoid danger or material damage due to operating error.

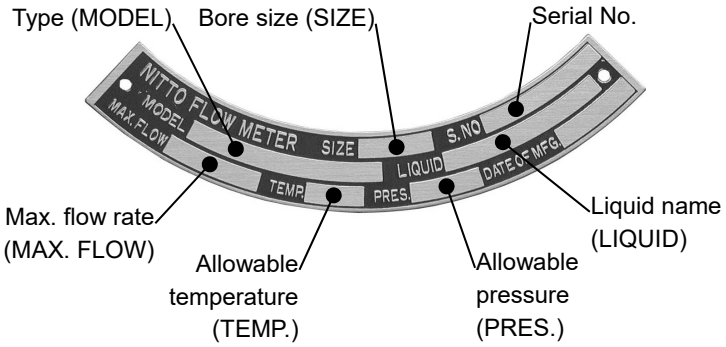
⚠ General handling precautions

※ Verification of type and specifications

This instrument is assembled, adjusted and delivered individually according to its specifications. Please check the type and specifications on the nameplate attached to the counter section, etc. to make sure that the specifications are conformable to your order. (The shape and place of mounting of the nameplate varies depending on the type of instrument.)

[Mounting position of nameplate]

[Contents of indication on nameplate]



※ Precautions regarding execution of heat preservation work

For any liquid of properties freezing or solidifying in the piping or liquid requiring liquid temperature preservation, etc., execute heat preservation work for the flow meter, the strainer and the piping.

(Precautions to take about execution of work)

- Check for leak of liquid before starting the heat preservation work.
- For the flowmeter and the strainer, execute in a way to allow easy maintenance & inspection and disassembling. In the execution, avoid putting a cover on the portion of specifications or cautions such as nameplate, caution plate, etc.
- Avoid executing heat preservation for the counter of the flow meter. However, under environments in which the ambient temperature comes in the range of -30 ~ -10˚C, perform heat preservation for the purpose of heat insulation.

※ Precautions regarding outdoor installation

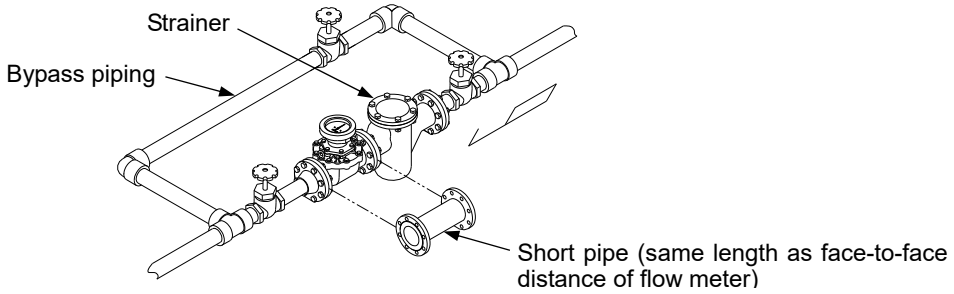
In case you install the flow meter in a place where the counter section is exposed to rain water or direct sunshine, provide a guard for protection against rain or sunshine. Take protective measures against salt damage, especially for use in a place where salt damage is feared.

※ Precautions regarding wire connection (case of a type with transmitter)

- Cut off power supply for protection against electric shock before starting a wiring work. For the wiring, also refer to the instruction manual and wiring diagram of the converter-receiver.
- The flowmeter is provided with one same model No. in combination with the converter-receiver of our make. Check the matching before the wiring, and connect at one same number.
- To avoid induction trouble, install the wires away from other high-voltage cables or high-voltage circuits. Especially, install the signal line and the power line, etc. individually away from each other, and adopt a single-point grounding for the grounding.

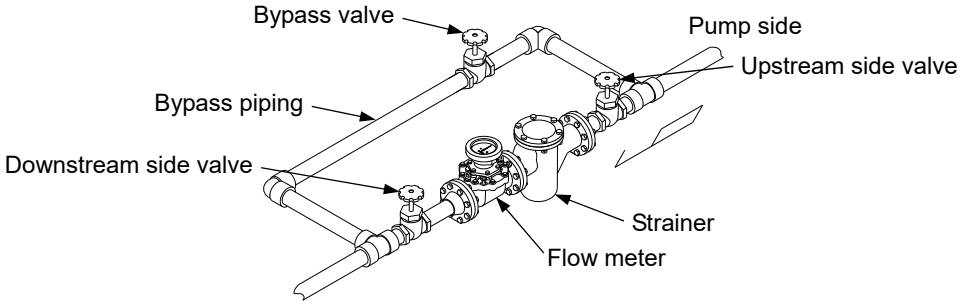
※ Execution of flushing

Remove the flow meter and, after installing a short pipe of the same length as the face-to-face distance of the flow meter, perform flushing, to remove dust, weld refuse, etc. due to piping work completely. After that, clean the strainer element, and install the flow meter normally.



※ Liquid introducing procedure at start of operation

In the early part of operation, the air inside the piping is discharged at high speed, and there may be cases where the internal rotor, etc. is damaged with a high-speed operation. To prevent such accident, open the respective valves little by little and discharge air sufficiently.



[Valve opening/closing procedure]

① Upstream & downstream side valves ⇒ Fully close.
② Bypass valve ⇒ Fully open.
③ Introduce liquid.
④ Upstream side valve ⇒ Open slightly.
⑤ Downstream side valve ⇒ Open slightly.
⑥ Bypass valve ⇒ Turn slowly to fully closed position.
⑦ Upstream & downstream side valves ⇒ Open slowly up to a proper flow rate in the specified flow rate range.

After that, check for any leak in various parts and check for any unusual noise or vibrations of the flow meter.

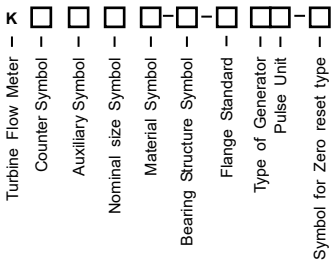
※ Precautions regarding storage

- Packing style for storage: Pack and store in the state of packing same as or close to that in which the product was delivered from us.
- Place of storage: Place of normal temperature and humidity protected against rain water.
- Storage of flow meter after use: Wash the inside of the liquid end sufficiently well, dry with air purge, etc. and cover the entire instrument for storage.

1. Outline

This flow meter is an axial-flow impeller type flow meter excellent in durability and easiness of maintenance proven by numerous results. It is widely used for the water controls in every industry, such as water control of water supply source, various plants, air conditioning in the building, etc.

2. Type symbols



●: Standard ○: Manufacturable ×: Non-manufacturable

Type	Specification code	Specifications	050	075	100	125	150	200	250	300	350
K		Turbine Flow Meter	●	●	●	●	●	●	●	●	●
Counter symbol	A	Direct-read totalizing type	●	●	●	●	●	●	●	●	●
	C	With unit pulse generator	○	○	○	○	○	○	○	○	○
	H	For DA conversion	○	○	○	○	○	○	○	○	○
	Z	With zero resetting	○	○	○	○	○	○	○	○	○
	I	With direct-reading instantaneous flow indicator	○	○	○	○	○	○	○	○	○
Auxiliary symbol		Standard	●	●	●	●	●	●	●	●	●
	X	Pressure-resistant explosion proof type	○	○	○	○	○	○	○	○	○
	F	With cooling fin	○	○	○	○	○	○	○	○	○
Nominal size symbol	050	Nominal size 50 mm	●								
	075	Nominal size 75 mm		●							
	100	Nominal size 100mm			●						
	125	Nominal size 125mm				●					
	150	Nominal size 150mm					●				
	200	Nominal size 200mm						●			
	250	Nominal size 250mm							●		
	300	Nominal size 300mm								●	
	350	Nominal size 350mm									●
Material symbol	FB	Body: FC200 Inner case: CAC406 Impeller: plastic/SUS304L Allowable pressure: 1MPa or less	●	●	●	●	●	●	●	●	●
	DB	Body: FCD450 Inner case: CAC406 Impeller: plastic/SUS304L Allowable pressure: 2MPa or less	○	○	○	○	○	○	○	○	○
	F7	Body: FC200 Inner case: SUS304 Impeller: plastic/SUS304L Allowable pressure: 1MPa or less	○	○	○	○	○	○	○	○	○
	D7	Body: FCD450 Inner case: SUS304 Impeller: plastic/SUS304L Allowable pressure: 2MPa or less	○	○	○	○	○	○	○	○	○
	S7	Body: SCS13 Inner case: SUS304 Impeller: plastic/SUS304L Allowable pressure: 2MPa or less	○	○	○	○	○	○	○	○	○
	S2	Body: SCS14 Inner case: SUS316 Impeller: plastic/SUS316L Allowable pressure: 2MPa or less	○	○	○	○	○	○	○	○	○
		1) Plastic impeller : 80 ℃ or less SUS impeller : 80 ～ 150 ℃ 2) FC200 : Cast iron CAC406 : Cast bronze SCS13, SCS14 : Stainless steel casting FCD450 : Ductile cast iron									
Bearing structure symbol	T	For nominal size 50 ～ 150mm	●	●	●	●	●	×	×	×	×
		For nominal size 200 ～ 350mm	×	×	×	×	×	●	●	●	●
Flange standard		JIS 10K	●	●	●	●	●	●	●	●	●
	20	JIS 20K	○	○	○	○	○	○	○	○	○
	A1	ANSI class 150	○	○	○	○	○	○	○	○	○
	A3	ANSI class 300	○	○	○	○	○	○	○	○	○
Type of generator		Without pulse output	●	●	●	●	●	●	●	●	●
	R	Read switch (contact) pulse	○	○	○	○	○	○	○	○	○
	M	High frequency (no-contact) pulse	○	○	○	○	○	○	○	○	○
Output pulse unit Note) The pulse units available for output are restricted depending on pointer specifications and type of generator (R,M)		Without pulse output	●	●	●	●	●	●	●	●	●
	4	1 L/P	○	○	○	○	○	○	○	×	×
	5	10 L/P	○	○	○	○	○	○	○	○	○
	6	100 L/P	○	○	○	○	○	○	○	○	○
	7	1,000 L/P	○	○	○	○	○	○	○	○	○
	8	10,000 L/P	○	○	○	○	○	○	○	○	○
Symbol for zero reset type	Z06	With zero resettable type (Only in case of chosing Z at counting symbol)	○	○	○	○	○	○	○	○	○

Note 1) Omit symbol if the column of specification code is blank.

Note 2) When you selected the counter symbol "H", select "Without pulse output" for both type of generator and pulse unit.

3. Installation procedure

3. 1 Caution for installation place

Please install this flow meter to the place which satisfies with following condition.

(1) Place subject to little vibrations.
(2) Place not freeze.
(3) Place with little dust.
(4) Place with little moisture.
(5) Place with little corrosive gas.
(6) Place not subject to any violent fluid pulsations.
(7) Place with little electromagnetic noise.
(8) Place easy to inspect.
(9) Place protected against direct sunshine.
(10) Batch pumps such as plunger type, diaphragm type, etc. are liable to produce pulsations in the fluid, eventually leading to damage to rotor or instrumental error. Install an air chamber or accumulator to eliminate pulsations completely.

3. 2 Caution before install

Flushing:
Before installing the flow meter, completely remove dust, welding refuse, etc. produced with piping work.

3. 3 Precaution to take at start of operation

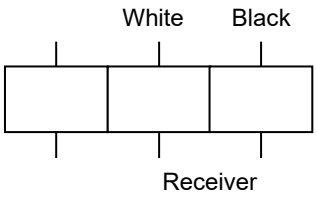
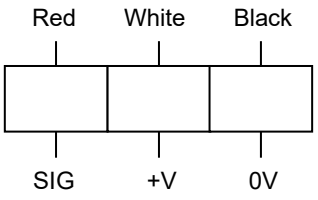
At the start of operation, the air in the piping is discharged at high speed. Open the valve slowly to avoid damage due to high-speed operation to the rotor inside.

3. 4 Piping procedure

(1) Install the piping in a way not to apply any piping pressure to the flow meter.
(2) Install on the outlet side of the pump.
(3) Fit the arrow mark given on the lateral face of the flow meter to the direction of inlet of the fluid.
(4) As for mounting posture, mount in the posture specified at the time of placing of order or the posture indicated in the delivery specification sheet.
(5) When using the flow meter at a tank head, give a head larger than pressure loss of the flow meter.
(6) When using a liquid packing, etc., take care to prevent the liquid packing, etc. from protruding into the pipe.
(7) Do not wind any thermal insulation materials around the cooling fin of the flow meter. (Only for high temperature type)

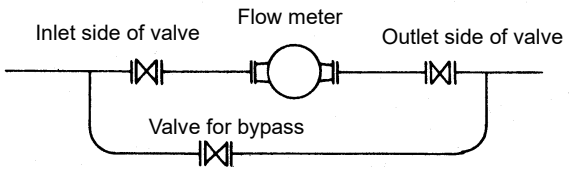
3. 5 Wiring procedure

A flow meter with pulse generator shall be connected according to the instructions given on the following table.

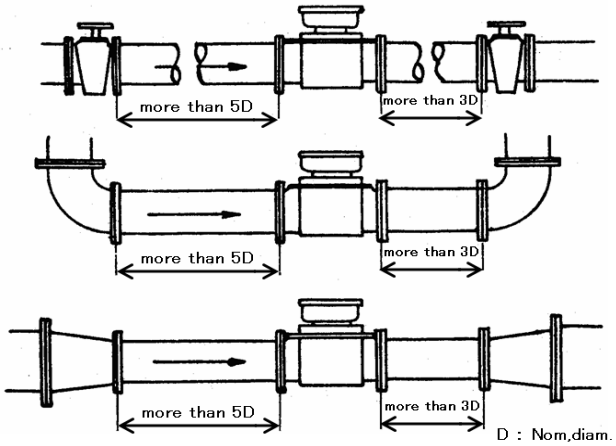
Type of generator	Read switch pulse	High frequency pulse DA conversion pulse
Terminal layout drawing (Standard : Cable color) (High temperature : Terminal block)		

3. 6 Installation example

Install a bypass piping as indicated below in case it is difficult to stop the liquid, considering cleaning by disassembling of the flow meter.



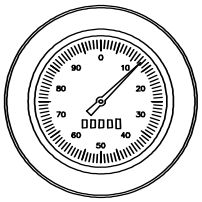
⚠ Caution : Pumps, valves, bends, taper pipe should be fitted on the outside of the straight portion of which length is 5 times or more of nominal size at the inlet side and 3 times or more of nominal size at the outlet side as following illustration. However, if water jet occurs when pump is half-opened, longer straight portion is necessary. When the flow passage is changed suddenly, pulsing flow will occur at that point. Because impeller receives abnormal force from pulsing flow, not only flow meter cannot measure appropriately, but also there is bad influence for durability of the flow meter. Please install the straight portion which is longer than recommended.



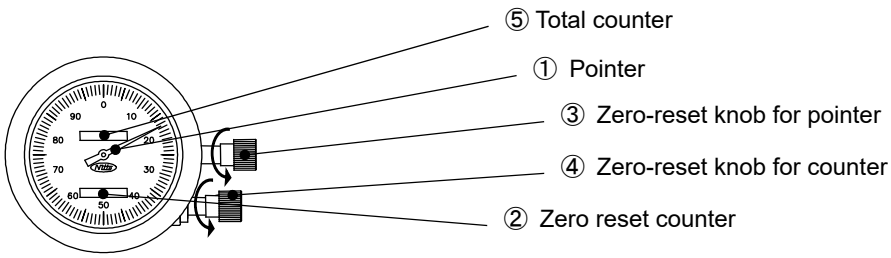
4. Function and Operation

4. 1 Indication

●Totalizing type・・・・・・・・・・・・The pointer turns clockwise according to the measured flow rate, to count the integrated value.



●Totalizing zero-reset type・・・・・Provided with 2 counters, one continuously totaling the flow rate and the other resettable to zero together with the pointer.



（1） Resetting the pointer to zero
Turn the ③ zero-reset knob for pointer to the left while pushing it in gently, adjust the pointer to zero position and stop it there.

（2） Resetting the zero-reset counter to zero
Turn the ④ zero-reset knob for counter to the left, adjust the counter to “00000” and stop it there.

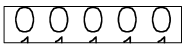
⚠ Caution : a. Do not make any zero resetting operation during a measurement of flow rate. Be sure to make this operation while the counter is at stop.
b. The total counter ⑤ cannot be reset to zero

Caution for zero resettable counter

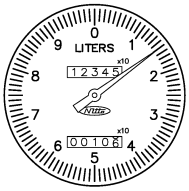
After reset to zero, 1st digit does not count up because of backlash of the counter, even though pointer turns 1 revolution.

In this case, please note following points.

(a) To reduce the gap of numbers, please turn the zero reset knob till the head of "1" can be seen like below figure when reset to zero and please release the knob.

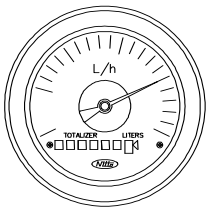


(b) It is liable to misread after pointer pass the "0" of scale plate. Sample for reading is shown in below.



Value: 1061.5L

●Instantaneous flow indicator・・・It shows measured flow rate by pointer.
Proportionate to flow amount, value of total counter increases.



4．2 Output function

●Read switch pulse generator

Output no-voltage contact signal proportionate to flow rate

Type	Output signal	Max. voltage	Max. current	Switch capacity	Contact resistance	Max. generated pulse
DRR-5	No-voltage contact pulse	AC・DC200V	1A	25W	0.06Ω	5P/sec
MR506	No-voltage contact pulse	DC50V	250mA	15W	0.1Ω	5P/sec

●High frequency pulse generator

●DA conversion pulse generator

Output voltage no-contact signal proportionate to flow rate

Output signal: Voltage no-contact pulse

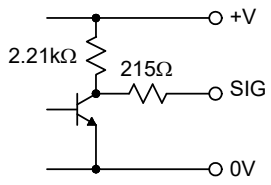
Approximate rectangular wave

H: 17V or over (10 kΩ load)
(+V = DC24V)
H: 8V or over (10 kΩ load)
(+V = DC12V)

L: 0.5V or under (10 kΩ load)

Output resistance: Approx. 2.4kΩ

Output circuit



Max. generated pulse: 110P/sec
Power source: DC6 ～ 26.4V
Power consumption: 23 mA or under (+V = DC24V)
17 mA or under (+V = DC12V)

5. Maintenance and inspection

Case	Reason	Treatment
Totalizing counter does not work though the liquid passes.	No rise of inlet side pressure. Open bypass valve.	Check the piping system.
	No rotation of impeller due to dust, scale, etc. in the inner casing. No turning of impeller due to freezing of measuring liquid.	Disassemble and clean the parts or inspect them for damage.
	Miss engaged the gears of the counting unit. Loose set screw of gears in the counting unit. Galling of shaft and bearing in the counting unit. Damage of the transfer mechanism parts of the counting unit.	Cleaning, lubrication, or replace parts.
	Exceed guaranteed range of liquid temperature or pressure.	Use within the range indicated on the nameplate
Excessively large totalized volume of flow meter against actual liquid volume. (Accuracy on pulse side)	Mixing of air in the liquid.	Eliminate air by air separator and so on.
	Empty piping before and after the flow meter.	Take protective measures against penetration of air into the piping.
Excessively small totalized volume of flow meter against actual liquid volume. (Accuracy on minus side)	Wear or damage of the measuring parts. Adherence of dust or scale in the measuring portion.	Disassemble and inspect the measuring unit according to the disassembling procedure of flow meter. Clean or replace parts.
	Rotation of the counting unit is heavy.	Cleaning, lubrication, or replace parts.
Disagreement between totalized value of flow rate in the counting unit and value of output pulse in the generator unit. Unusual waveform of output signals.	Failure or damage of transmission gears.	Cleaning, lubrication, or replace parts.
	Failure of connection to the totalizer, converter, etc.	Repair failure portion of the connection.
	Failure of pulse generator.	Replace pulse generator.

6. Disassembling procedure

⚠ Caution : In case there is any trouble during use of the flow meter, disassemble the flow meter by the following procedure (see disassembly drawing).
Please disassemble after prevent water pressure to the flow meter.

(1) Remove the head cover bolts (19), and separate the body and counter unit from each other.

(2) For disassembling counter unit, remove the bolts fastening the glass ring, separate glass ring and dial case each other, and extract the (push-in) pointer.
And, loosen 2 screws and remove the scale plate (11), and the dial base plate fastening screw will come into sight. Loosen this screw and take out the entire inner gears. Check if the gears turn lightly.

(3) For disassembling the body, remove the bolts for main body (17), and separate body (1) and body cover (5).
When it is hard to remove body cover (5) from main body (1), fasten jack bolts (18).
Bring up the body cover (5) and inner casing set (3) also can be removed.
Check if the impeller in the inner casing set turn smoothly.

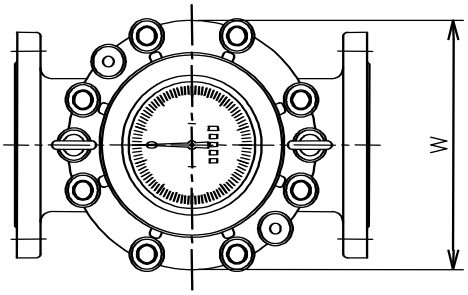
(4) In case the impeller does not turn lightly, wear of bearing, etc. is suspected. Replace any defective parts.
When replace worm gear set (3-4), please do it after disassemble inner case and remove impeller set (3-1).
Worm gear set (3-4) is fixed with 2 screws. Please loosen both screws.

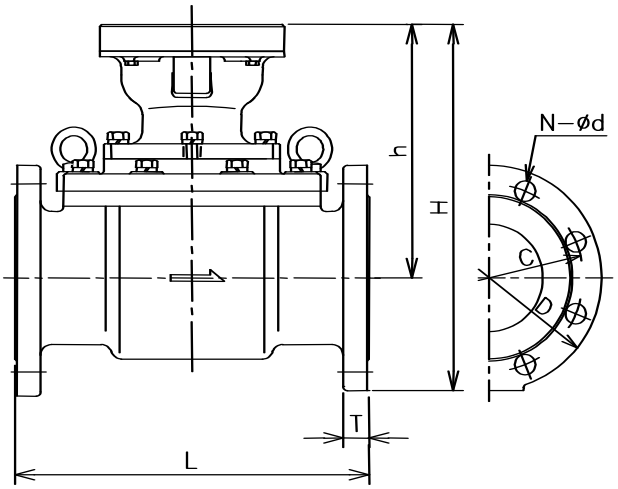
(5) Drive gear set (3-5) is fixed with 2 screws to inner casing set (3). Remove these screws for disassembling. Check drive gears, etc. turn lightly and gears transmit smoothly. If these parts do not turn, wear of bearing, etc. is suspected. Replace any defective parts.

(6) The reassembling shall be made carefully in the order opposite to that of disassembling. Apply a very small amount of lubricating oil to the bearing (counting unit). Tighten well the fasting screw and bolts.

Notice: Depending on the model and specification, procedure is difference. Please refer to the disassembling drawing.

7． External dimension





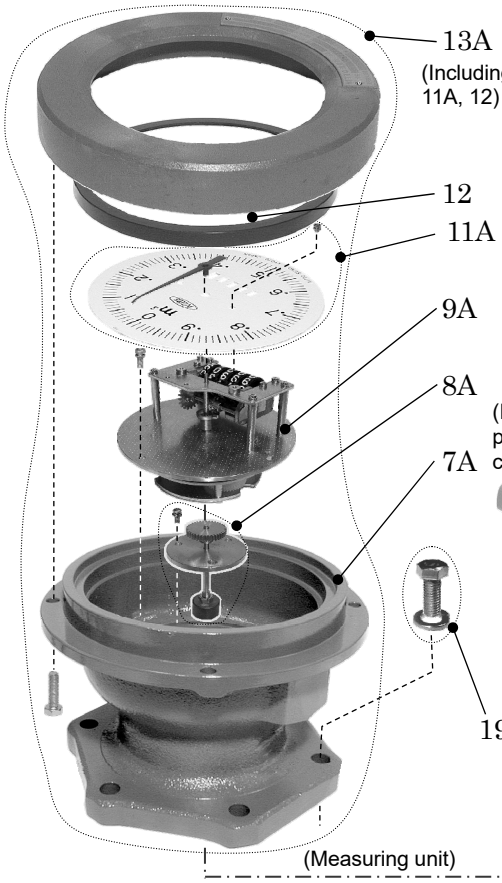
Nominal size symbol	Nominal Size	Flange Standard	L	H	h	W	D	C	T	n	d
050	50A	JIS 10K	250	291	213	192	155	120	20	4	19
075	80A		300	316	223	226	185	150	22	8	19
100	100A		330	341	236	236	210	175	24	8	19
125	125A		350	385	260	264	250	210	24	8	23
150	150A		400	412	272	310	280	240	26	8	23
200	200A		480	465	300	392	330	290	26	12	23
250	250A		560	520	320	462	400	355	30	12	25
300	300A		660	568	345	552	445	400	32	16	25
350	350A		700	590	345	552	490	445	34	16	25

Notice: 1) Dimension will be changed depending on the model and specification.
2) This table of dimensions indicate the case of FB. The dimension may be changed depending on the material

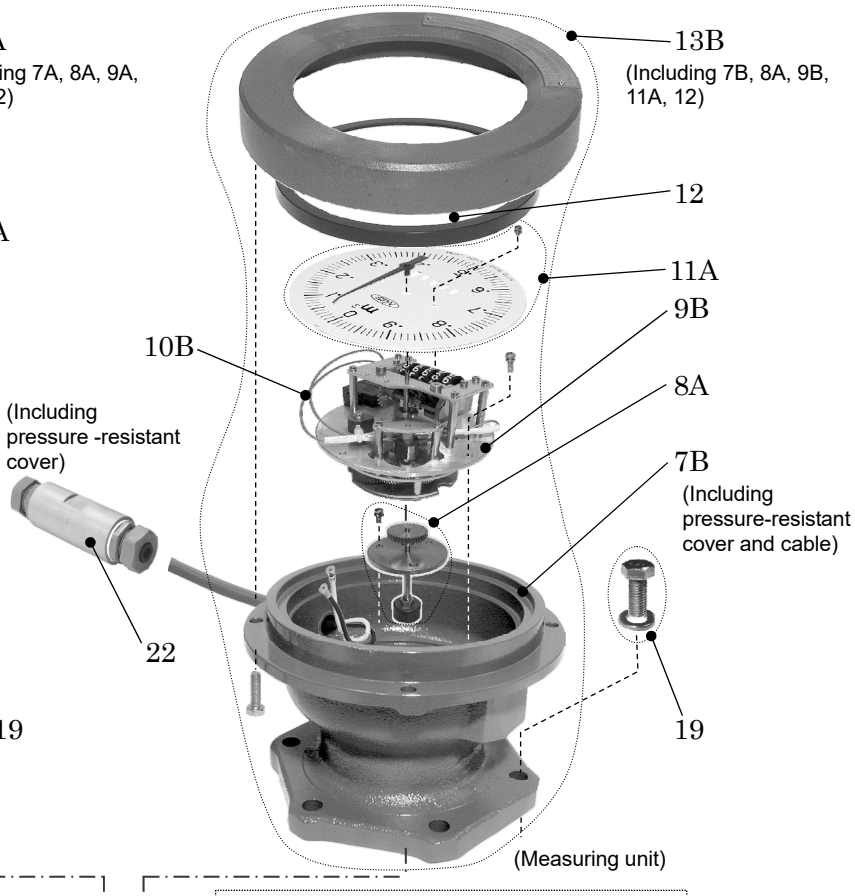
8. Disassembly drawing

Counter unit (A) (Standard specifications field totalization & transmission, Direct-read instant indicator)

Field totalization type (Type A : Standard specifications)

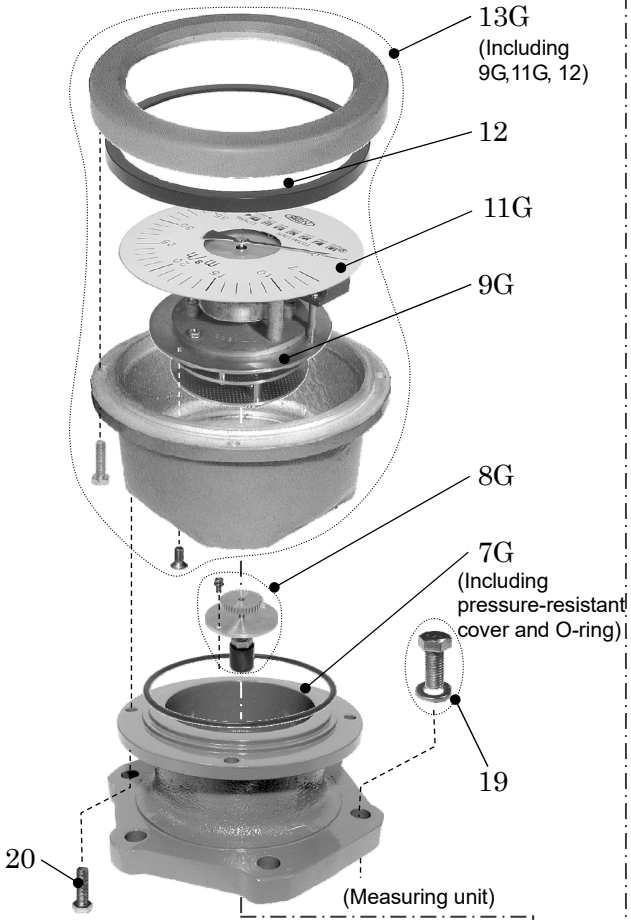


Transmission type (Type C or H : Standard specifications)



Note) In the case of transmission type, the dial set structure is varied depending on the type of transmission.

Direct-read instant indicator type (Type I)

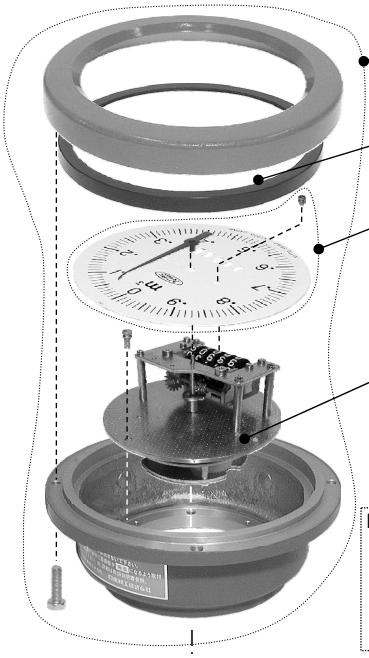


Note) Set screws are not included.
Please instruct separately if necessary.

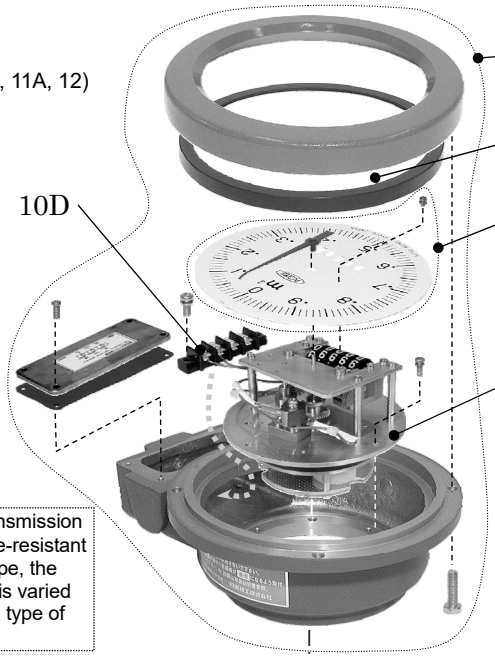
To [Cooling fins & measuring unit] (Measuring unit - Direct connection to body cover only)

Counter unit (B) (High temperature specifications field totalization & transmission, Pressure-resistant explosionproof, Zero-reset)

Field totalization type (Type A : High temperature specifications)

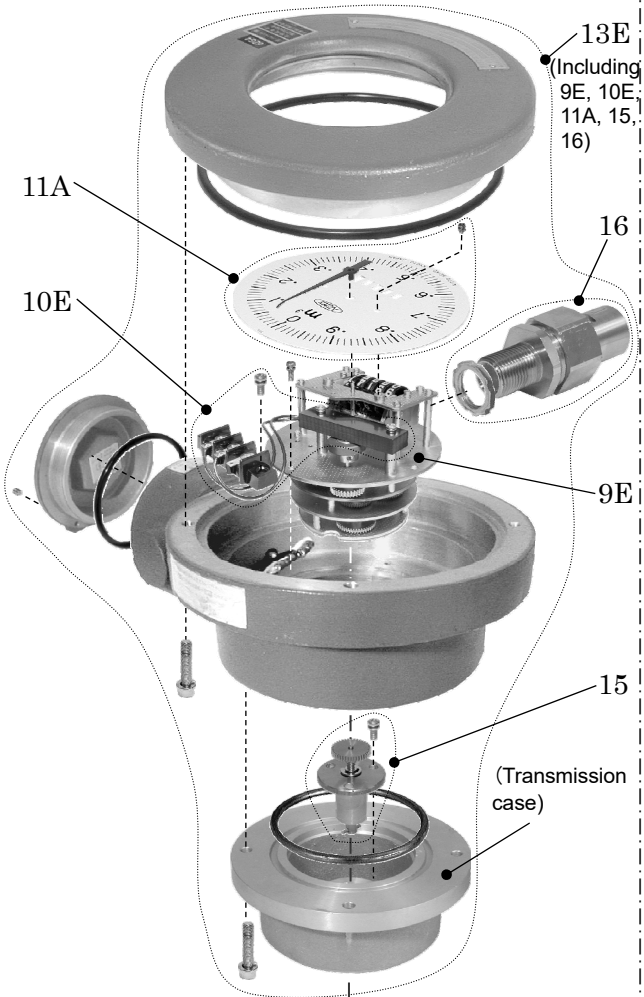


Transmission type (Type C or H : High temperature specifications)

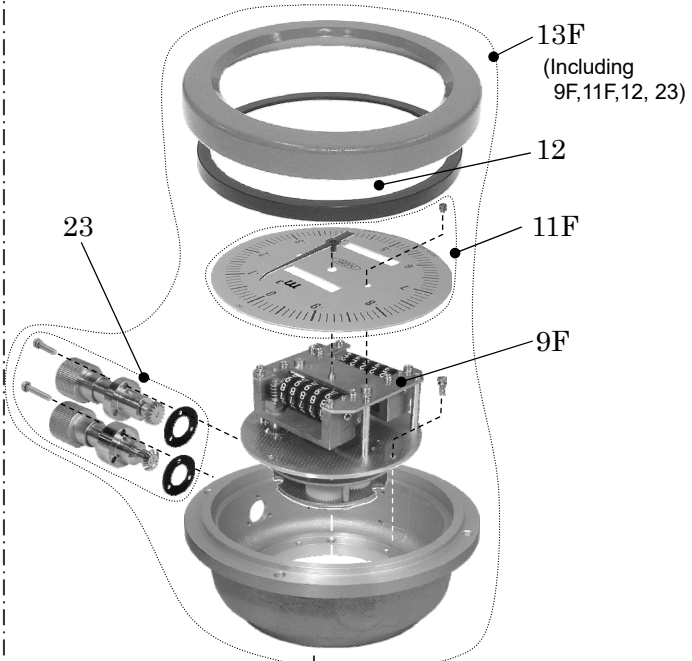


Note) In the case of transmission type and pressure-resistant explosionproof type, the dial set structure is varied depending on the type of transmission.

Pressure-resistant explosionproof type (Type CX or HX)



Zero-reset type (Type Z)



Note) Set screws are not included.
Please instruct separately if necessary.

To [Cooling fins & measuring unit]

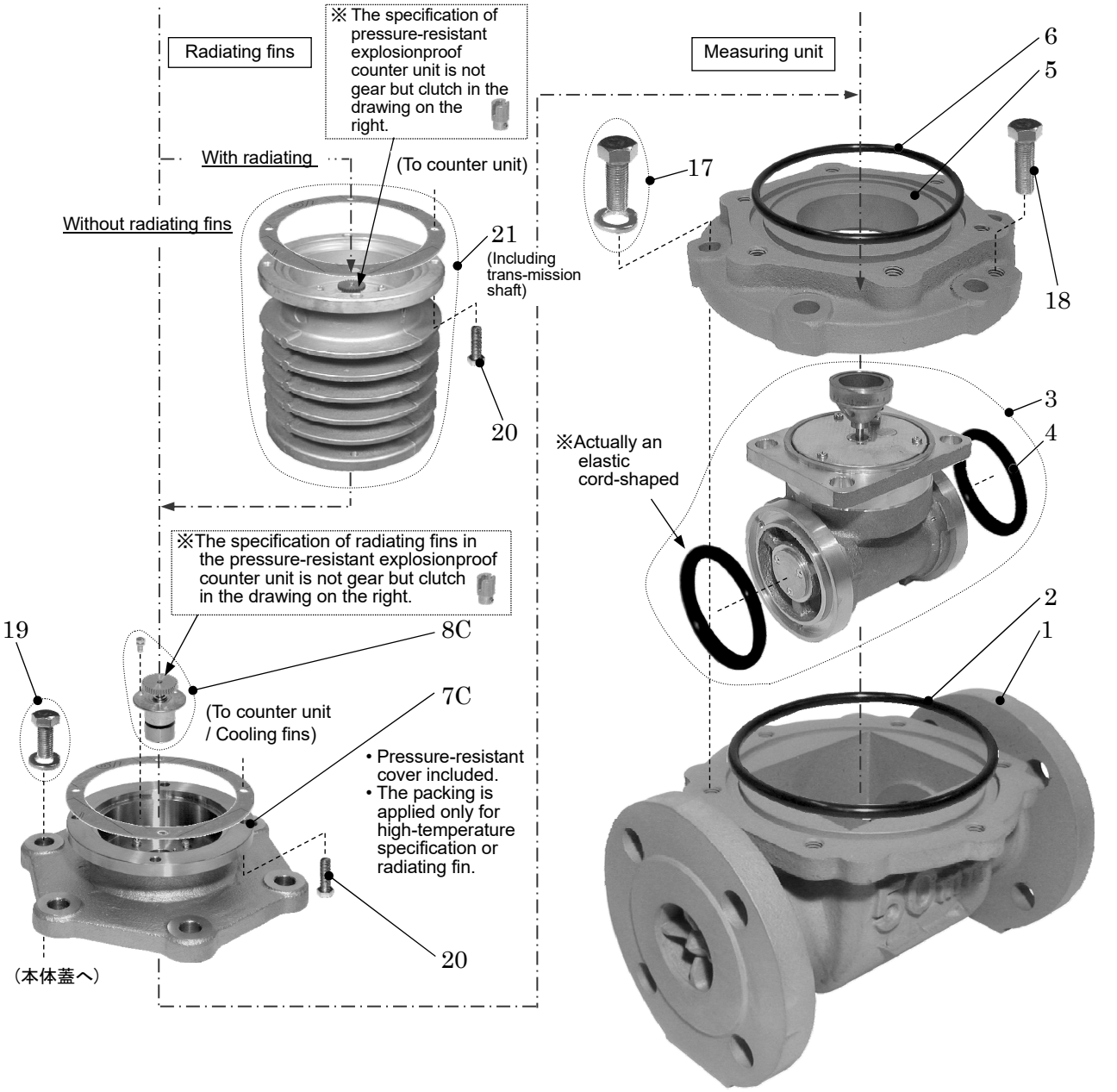
Cooling fins & **Measuring unit**

From counter unit -B

From counter unit -A

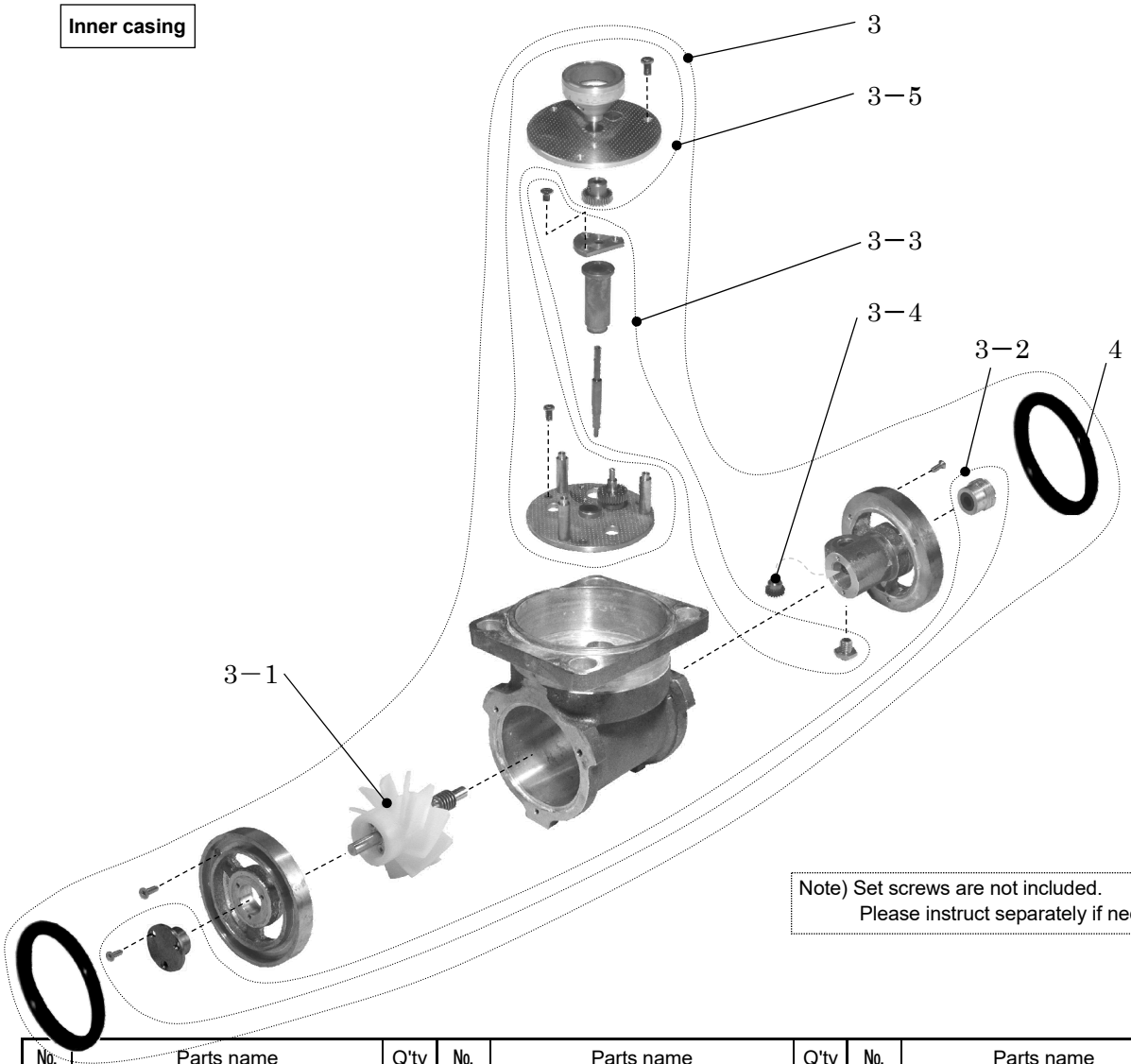
High temperature specifications field totalization & transmission, Pressure-resistant explosionproof, Zero-reset)

Standard specifications field totalization & transmission, Direct-read instant indicator



Note) Set screws are not included.
Please instruct separately if necessary.

Inner casing



Note) Set screws are not included.
Please instruct separately if necessary.

No.	Parts name	Q'ty	No.	Parts name	Q'ty	No.	Parts name	Q'ty
1	Meter body	1	8C	Upper magnet set Type A･C･H (High temperature specifications)･CX･HX･Z	1	13B	Counter unit set Type C･H (Standard specifications) (Including 7B,8A,9B,10B,11A,12)	1
2	Meter body O-ring packing	1	8G	Upper magnet set Type I	1	13C	Counter unit set Type A (High temperature specifications) (Including 9A,11A,12)	1
3	Inner casing set (Inner casing O-ring packings)	1	9A	Register set Type A	1	13D	Counter unit set Type C･H (High temperature specifications) (Including 9D,10D,11A,12)	1
3-1	Impeller set	1	9B	Register set Type C･H (Standard specifications)	1	13E	Counter unit set　Type CX･HX (Including 9E,10E,11A,15,16)	1
3-2	Front and Rear sleeve bearing set	1	9D	Register set Type C･H (High temperature specifications)	1	13F	Counter unit set　Type Z (Including 9F,11F,12,23)	1
3-3	Vertical shaft set	1	9E	Register set Type CX･HX	1	13G	Counter unit set　Type I (Including 7G,8G,9G,11G,12)	1
3-4	Worm gear set	1	9F	Register set Type Z	1	14	Transmission cable	1
3-5	Drive gear set	1	9G	Register set Type I	1	15	Coupling gear set	1
4	Inner casing O-ring packings	2	10B	Sensor set Type C･H (Standard specifications)	1	16	Pressure-resistant packing type metal fixture	1
5	Body cover	1	10D	Sensor set Type C･H (High temperature specifications)	1	17	Bolts for main body	6～
6	Body cover O-ring packing	1	10E	Sensor set Type CX･HX	1	18	Jack bolts	2
7A	Head cover set (Including pressure-resistant cover) Type A (Standard specifications)	1	11A	Dial (Including needle)	1	19	Head cover bolts	6
7B	Head cover set (Including pressure-resistant cover and cable) Type C･H (Standard specifications)	1	11F	Dial (Including needle) Type Z	1	20	Dial part bolts	4
7C	Head cover set (Including pressure-resistant cover) Type A･C･H (High temperature specifications)･CX･HX･Z	1	11G	Dial Type I	1	21	Cooling fins set (Including trans-mission shaft)	1
7G	Head cover set (Including pressure-resistant cover and O-ring) Type I	1	12	Glass set Type other than CX･HX	1	22	Intermediary joint case	1
8A	Upper magnet set Type A･C･H (Standard specifications)	1	13A	Counter unit set Type A (Standard specifications) (Including 7A,8A,9A,11A,12)	1	23	Knob set Type Z	1

Product warranty

The products and specifications described in this document are subject to change (including specification change and production termination) without notice for product improvement. When you consider using or ordering the product described in this document, please contact us as appropriate to confirm that the information described in this document is the latest.

This product is manufactured and inspected under the appropriate quality control as an industrial instrument, and delivered. However, failure may occur due to an unexpected cause. When this product is used for process control that may cause serious problems in terms of safety, safety can be achieved by duplicating the control system, such as adding equipment that performs the same function in addition to this product. Acceptance inspection will be conducted promptly for the purchased product, and with regard to the handling before or during the acceptance inspection of this product, please give due consideration to management and maintenance.

Warranty period

The warranty period for this product is one year after delivery.

The warranty period shall start from the date of the form (delivery note, installation commission confirmation, receipt).

Scope of warranty

If a failure or defect is found in our product during this warranty period due to our responsibility, we will provide replacement products, or replace or repair the defect part free of charge.

However, if any failure or damage falls under any of the following articles, this warranty does not apply.

1. **When it originates in the specification and the standard specified you, your handling method, etc.**
2. **In the case where the change in structure, performance, specifications, etc which carried out after purchase or delivery, and in which we are not involved.**
3. **When it is due to a phenomenon that cannot be foreseen by the technology that has been put into practical use on or before the time of purchase or contract.**
4. **When used out of range of conditions and environment described in catalogs and specifications.**
5. **In case where this product is used incorporated into your device and the damage could be avoided by the device function which should have in general concept.**
6. **Due to natural disasters or force majeure**
7. **Consumables such as batteries and relays, and optional items such as cables.**

In addition, the warranty mentioned here is limited to the warranty of the product purchased or delivered, and the damage caused by the failure of this product or damage is excluded.

NITTOSEIKO CO.,LTD.

Control System Division Global Sales Section
Website: https://global.nittoseiko.com/

【Website】 【Inquiry Form】