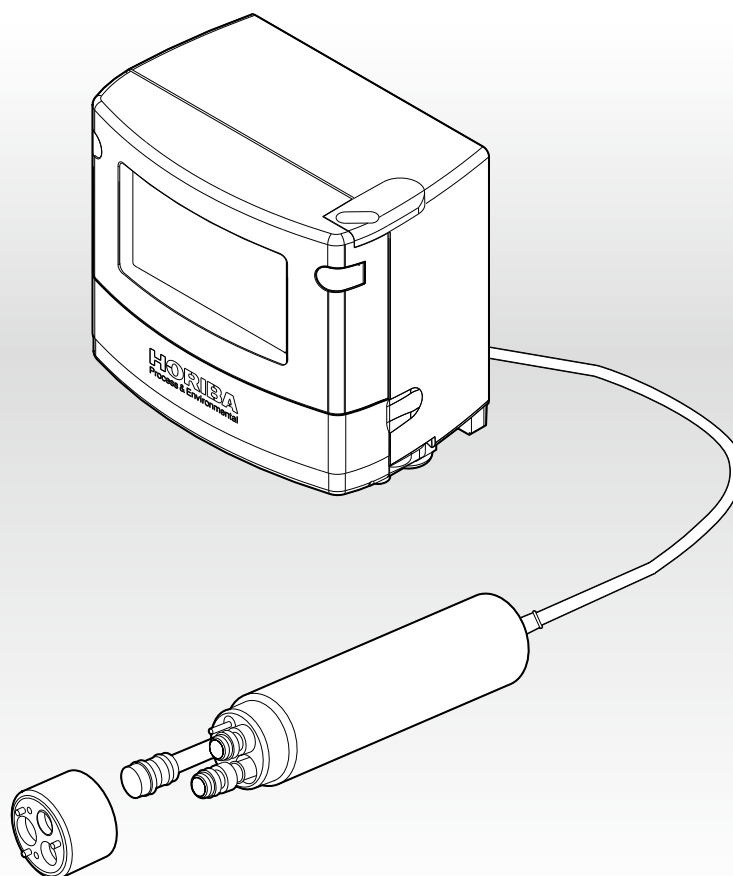


H-1 Series Ammonia Nitrogen Meter (4-Wire Type)

HC-200NH

Engineering Sheet



Uses: Control and management of air flow during aeration of biological reaction tanks, etc.

Measuring principle: Ion electrode method

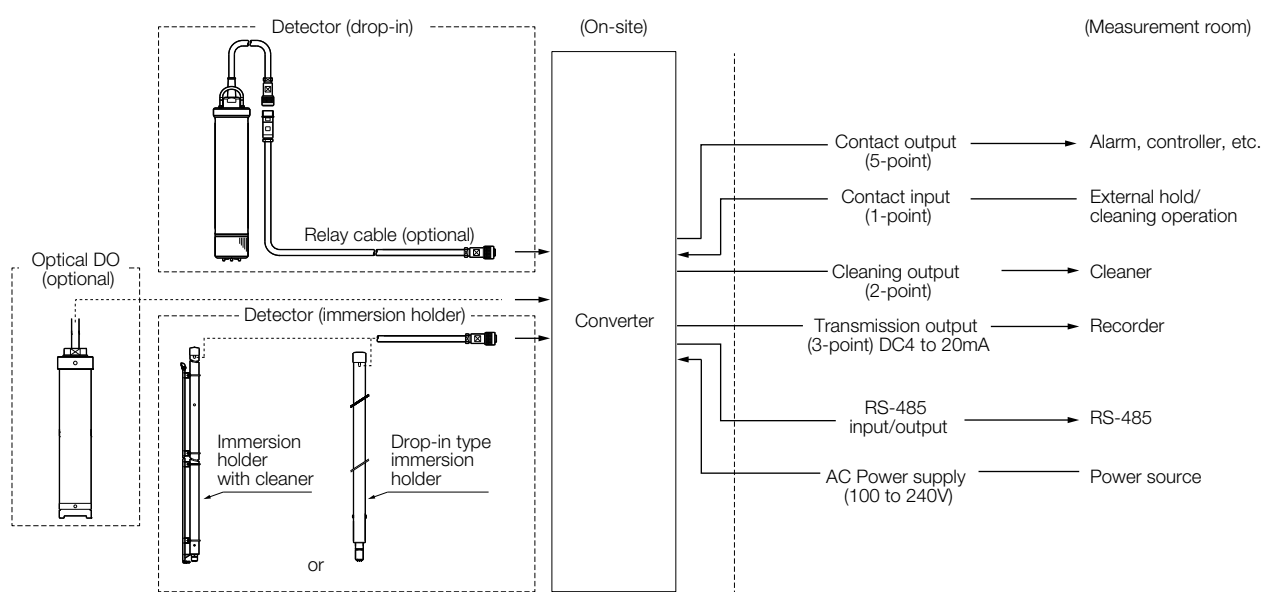
Contents

Overview	3
System Configuration	3
Features	3
Names of Parts/Configuration	4
Measuring Principle	6
Ammonium Ion Chip	6
Reference Chip	6
Combination	7
Immersion Type	7
Immersion (Drop-in Type)	8
Immersion Type Ultrasonic Cleaning Unit	9
Immersion Type Jet Cleaner	10
Main Specifications	11
External Dimensions	16
Wiring	22
Installation	25
Converter	25
Immersion Type	26
Immersion (Drop-in Type)	27
Immersion Type Ultrasonic Cleaning Unit	28
Immersion Type Jet Cleaner	29

Overview

This product can be used to measure ammonia nitrogen by connecting the ammonia nitrogen sensor. Dissolved oxygen can be measured at the same time by connecting the optional dissolved oxygen (DO) sensor. An optional ultrasonic cleaning unit and water jet cleaner are also available. Select between the two according to the nature of the sample. An extensive range of self-check functions makes it possible to check for abnormalities in the sensors and the product itself.

System Configuration



Features

Features of the Converter

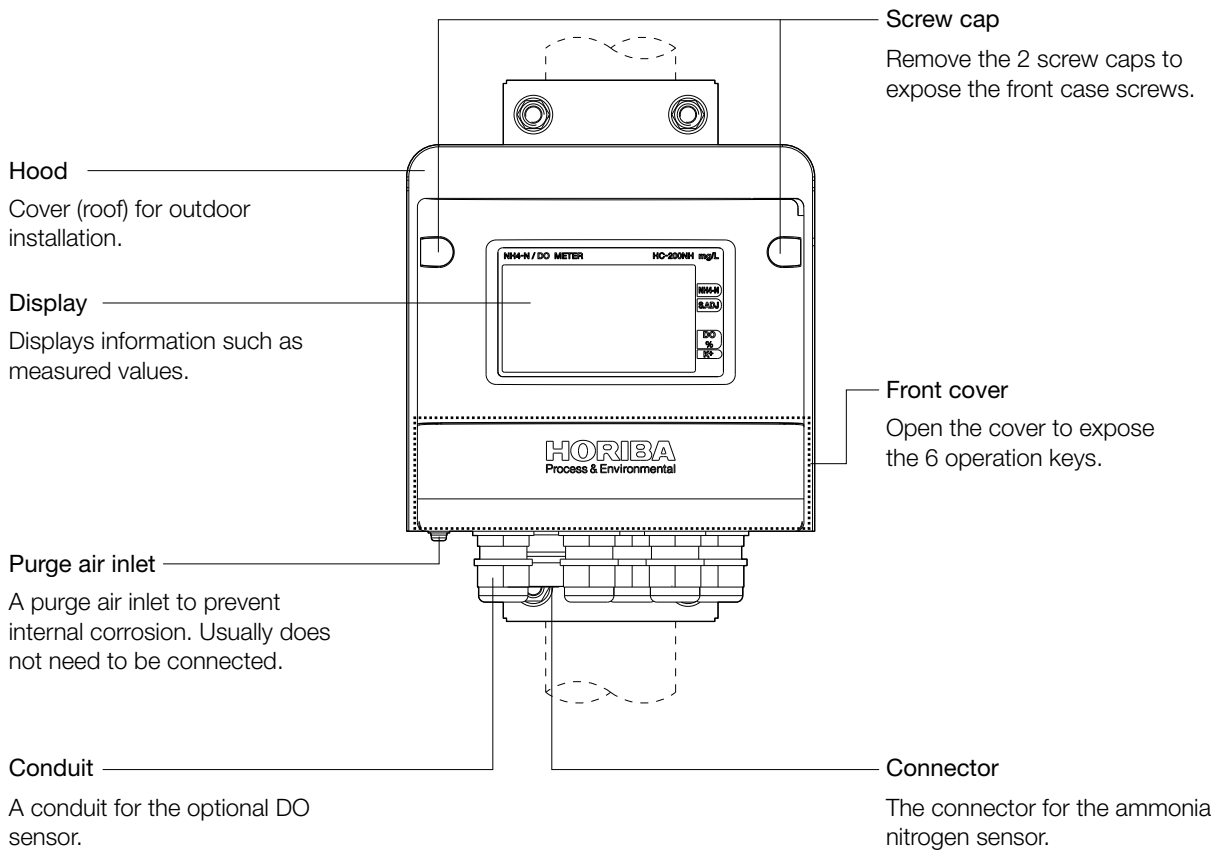
- Outdoor installation type (splash-proof construction equivalent to IP65)
- Selectable simultaneous temperature display
- All operations can be performed from front screen keys
- Full range of maintenance functions (self-check capabilities)
- Range settings for transmission output
- Memory backup
- Easy to read display (150% larger than conventional display)
- Improved key operability through the use of embossed sheets
- Substantial status display utilizing icons
- Sensor chip deterioration diagnosis function
- Sample adjustment function reduces maintenance work

Features of the Detector

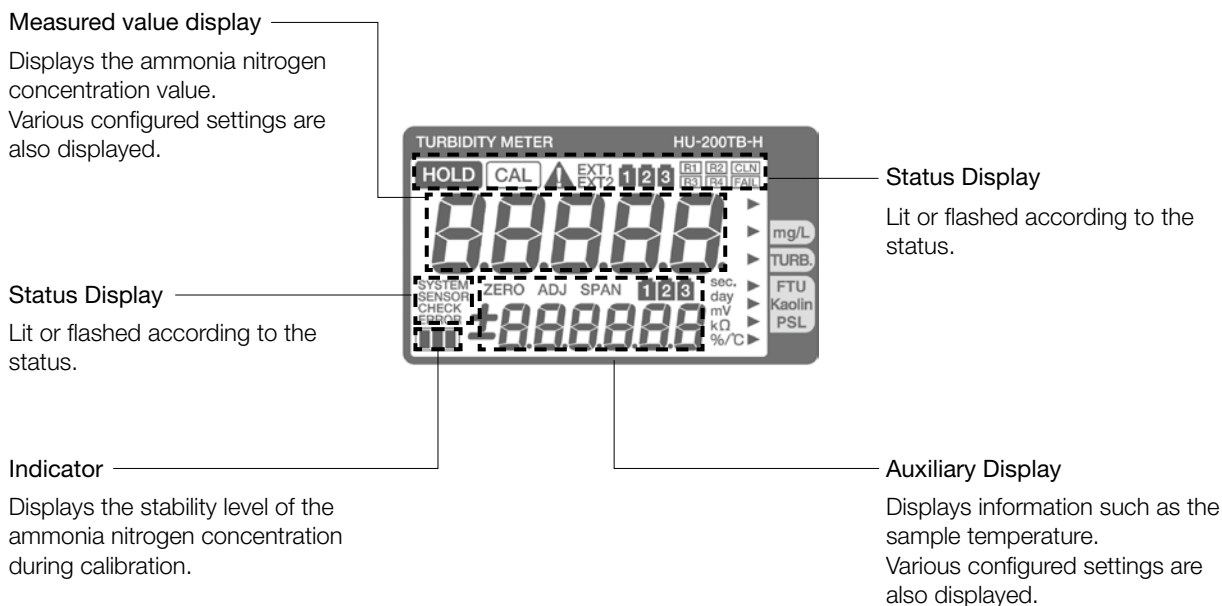
- Sensor structure with greater resistance to soiling
- Internal solution optimized for safe measurements
- Ultrasonic cleaning to prevent soiling
- Chip can be replaced without tools

Names of Parts/Configuration

Front of Converter

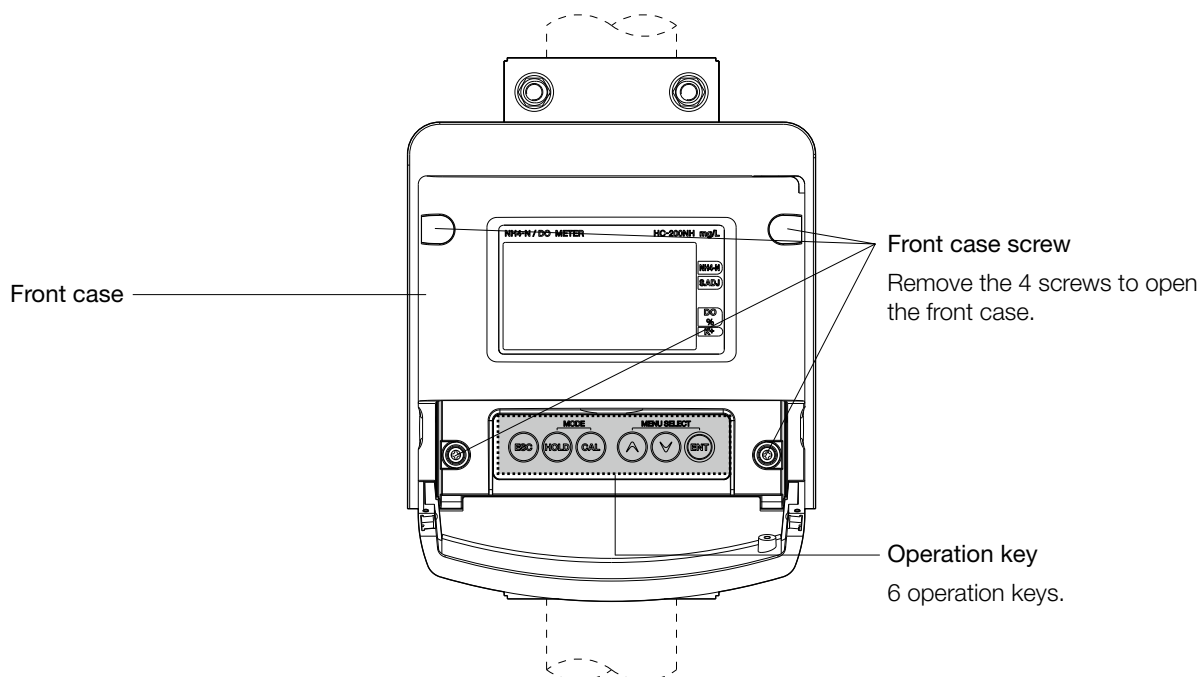


Display

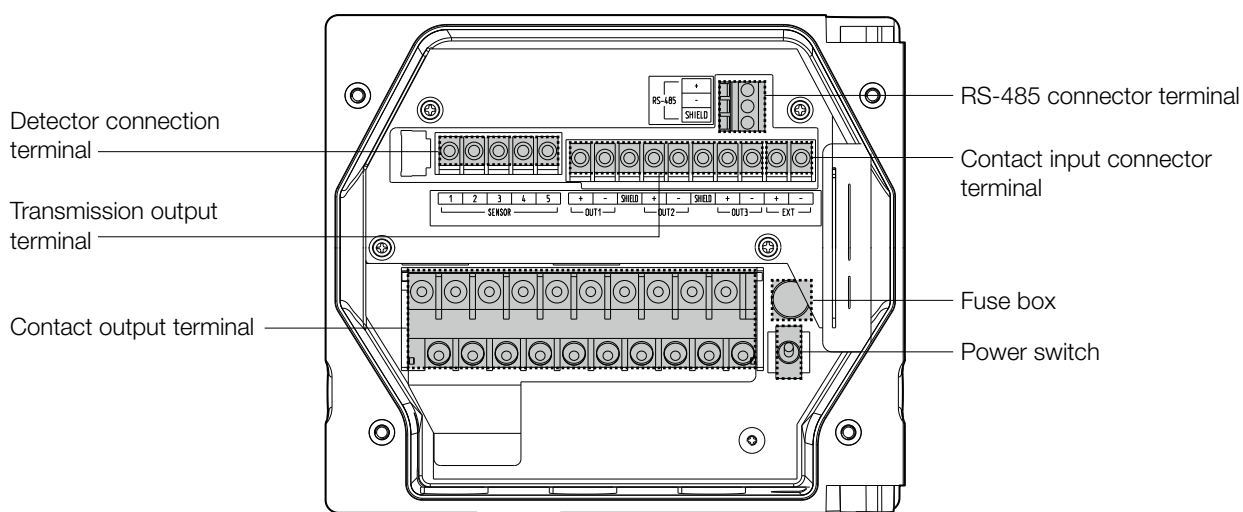


Names of Parts/Configuration

Front of Converter (when front cover is open)



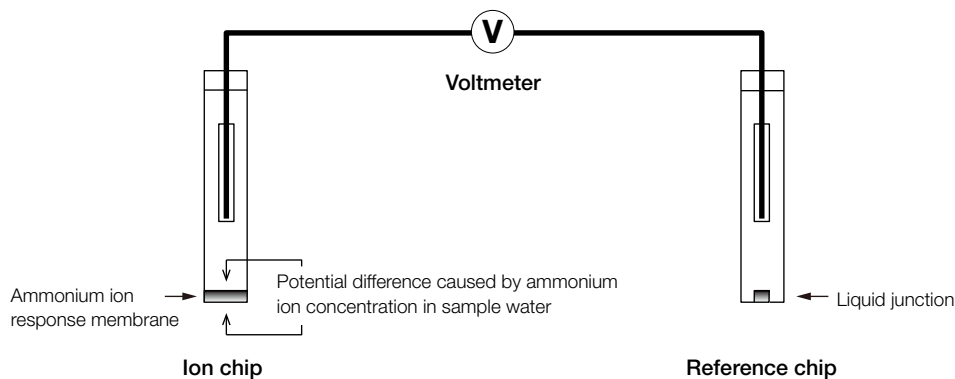
Front of Converter (when front case is open)



Measuring Principle

This device measures with the ion electrode method, using a film type ion electrode.

The electromotive force generated between the ion chip and the reference chip is measured and then converted to a concentration value. The ion chip has a special film that reacts with the target ions. When it is immersed in the sample solution, electromotive force is generated according to the difference in ion concentration between the sample solution and the internal solution. Meanwhile, the reference electrode indicates a fixed electric potential regardless of the ion concentration. The HC-200NH uses a potassium ion chip to correct the concentration, as potassium ions obstruct ammonium ions.

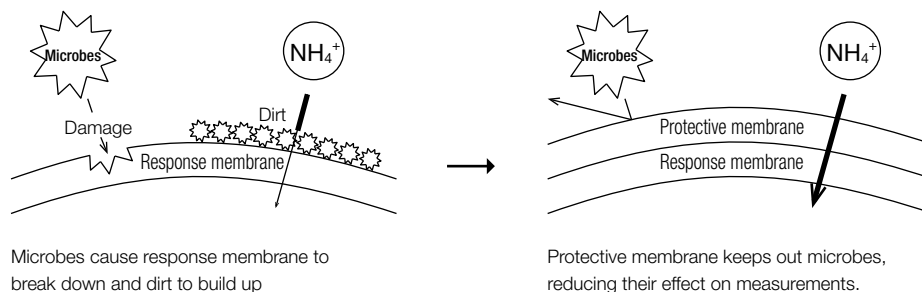


Ammonium Ion Chip

The ammonium ion chip has a double-layered membrane structure consisting of a response membrane and a protective membrane.

Microbes in biological reaction tanks break down a component in response membranes (reversible solution) and form a biofilm. This causes the ion chip to deteriorate, resulting in problems such as delayed response.

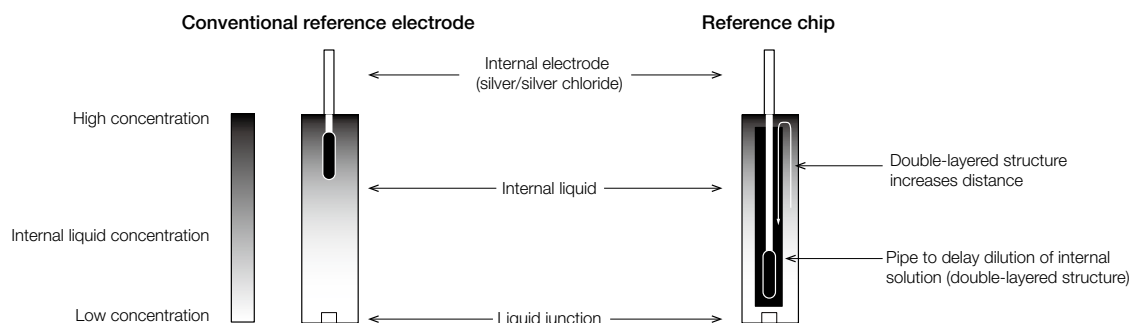
The protective membrane protects the response membrane from microbes, reducing their effect on the response membrane.



Reference Chip

When the ion diffusion speed is the same, the internal solution concentration becomes lower further from the liquid junction (the area of contact with the sample solution).

Changes in the internal solution concentration increase fluctuations in potential, with the result that stable measurements cannot be taken. In theory, the double-layered structure of the reference electrode makes it possible to maintain a high internal solution concentration near the internal electrode for longer because this structure increases the reference electrode's length. This keeps potential fluctuations within 1mV per month, enabling long-term stability. (Patent pending.)



Combination Immersion Type

Below are combinations suitable for the specifications of products such as the converter and detector.
See "Main Specifications" (P11-15) for details.

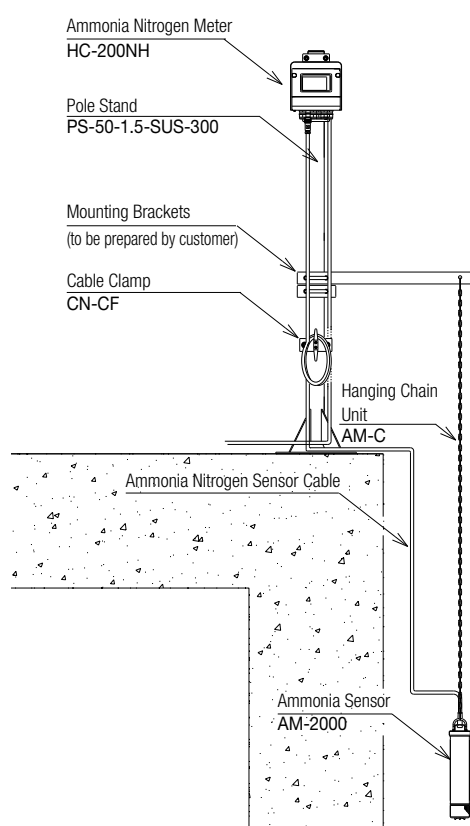
Ammonia Nitrogen Meter	HC-200NH
Ammonia Sensor ^{*1} ^{*2}	AM-2000
Chip ^{*3}	Ammonium Ion Chip (7691) Potassium Ion Chip (7692) Reference Chip (7211)
Relay Cable ^{*4}	AM-10M
Hanging Chain Unit	AM-C
Cable Clamp	CN-CF
Pole Stand	PS-50-1.5-SUS-300
Calibration Solution	L-NH-1 L-NH-10 L-NH-100 AM-B
Consumable	7691 7692 7211 C-7211

^{*1} Ammonium ion chip (7691), potassium ion chip (7692) and reference chip (7211) sold separately.

^{*2} The lead length of the ammonia sensor is 10m. If this needs to be extended, use the extension cable (AM-10M). Up to 20m.

^{*3} All three chips are required for measurement.

^{*4} The cable length is 10m.



Combination Immersion (Drop-in Type)

Below are combinations suitable for the specifications of products such as the converter and detector.
See "Main Specifications" (P11-15) for details.

Ammonia Nitrogen Meter	HC-200NH
Ammonia Sensor ^{*1 *2}	AM-2000
Chip ^{*3}	Ammonium Ion Chip (7691) Potassium Ion Chip (7692) Reference Chip (7211)
Relay Cable ^{*4}	AM-10M
Immersion Holder (Drop-in Type) ^{*5}	NH-16P-2.0 NH-16S-2.0 NH-16P-2.5 NH-16S-2.5 NH-16P-3.0 NH-16S-3.0 NH-16P-3.5 NH-16S-3.5 NH-16P-4.0 NH-16S-4.0
Mounting Brackets	MH-120
Hanging Chain Unit	AM-C
Cable Clamp	CN-CF
Pole Stand	PS-50-1.5-SUS-300
Calibration Solution	L-NH-1 L-NH-10 L-NH-100 AM-B
Consumable	7691 7692 7211 C-7211

^{*1} Ammonium ion chip (7691), potassium ion chip (7692) and reference chip (7211) sold separately.

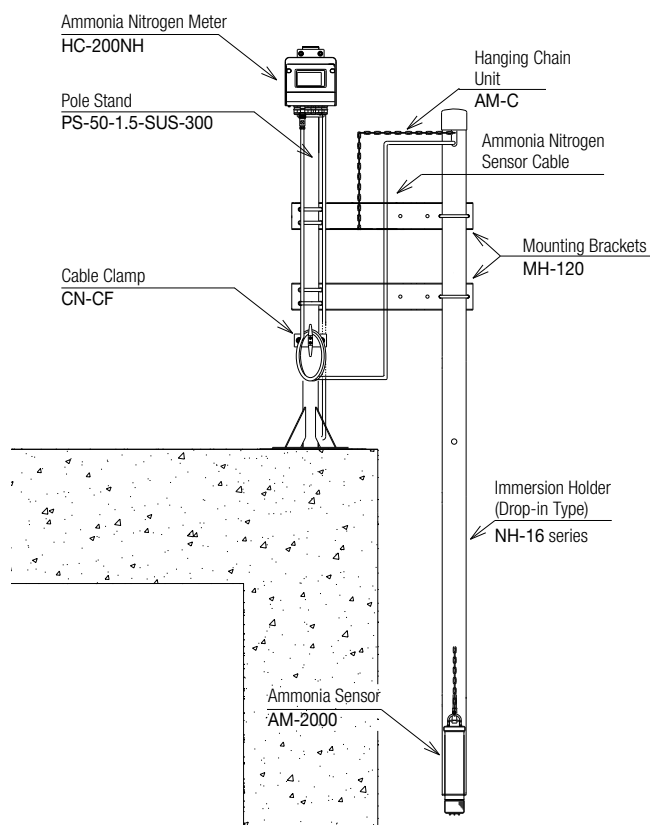
^{*2} The lead length of the ammonia sensor is 10m. If this needs to be extended, use the extension cable (AM-10M). Up to 20m.

^{*3} All three chips are required for measurement.

^{*4} The cable length is 10m.

^{*5} The material used for the NH-16P series is PVC. (Check the specifications and exterior figure for details.)

The material used for the NH-16S series is SUS316. (Check the specifications and exterior figure for details.)



Combination Immersion Type Ultrasonic Cleaning Unit

Below are combinations suitable for the specifications of products such as the converter and detector.
See "Main Specifications" (P11-15) for details.

Ammonia Nitrogen Meter	HC-200NH
Ammonia Sensor ^{*1} ^{*2}	AM-2000
Chip ^{*3}	Ammonium Ion Chip (7691) Potassium Ion Chip (7692) Reference Chip (7211)
Relay Cable ^{*4}	AM-10M
Immersion Holder (Drop-in Type) ^{*5}	JH-16A-2.0 JH-16A-2.5 JH-16A-3.0 JH-16A-3.5 JH-16A-4.0
Ultrasound Oscillator	US-2S
Mounting Brackets	MH-120
Hanging Chain Unit	AM-C
Cable Clamp	CN-CF
Pole Stand	PS-50-1.5-SUS-300
Calibration Solution	L-NH-1 L-NH-10 L-NH-100 AM-B
Consumable	7691 7692 7211 C-7211

^{*1} Ammonium ion chip (7691), potassium ion chip (7692) and reference chip (7211) sold separately.

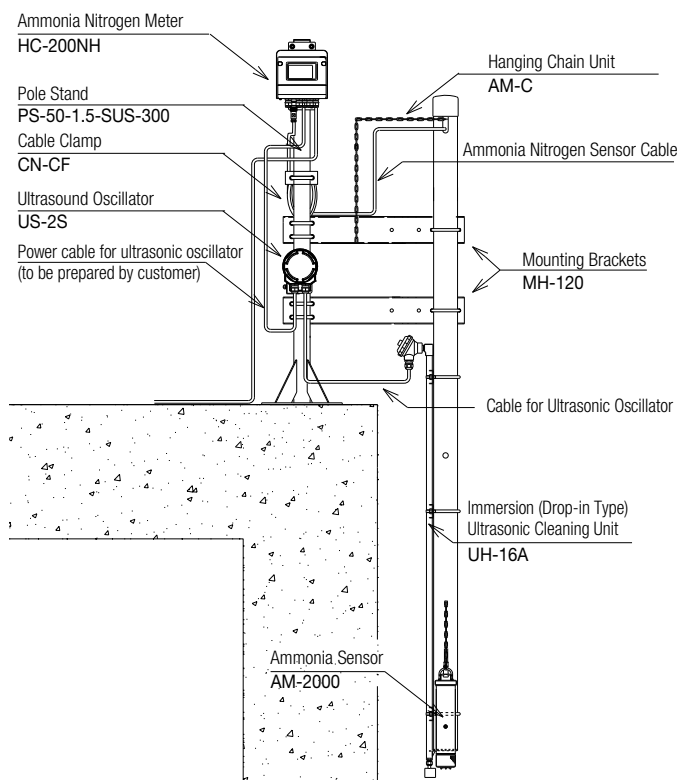
^{*2} The lead length of the ammonia sensor is 10m. If this needs to be extended, use the extension cable (AM-10M). Up to 20m.

^{*3} All three chips are required for measurement.

^{*4} The cable length is 10m.

^{*5} The ultrasonic cleaning unit (UH-16A Series) includes the NH-16S Series immersion (drop-in type) holder.

The material used for the NH-16S series is SUS316. (Check the specifications and exterior figure for details.)



Combination Immersion Type Jet Cleaner

Below are combinations suitable for the specifications of products such as the converter and detector.
See "Main Specifications" (P11-15) for details.

Ammonia Nitrogen Meter		HC-200NH	
Ammonia Sensor*1 *2		AM-2000	
Chip*3		Ammonium Ion Chip (7691) Potassium Ion Chip (7692) Reference Chip (7211)	
Relay Cable*4		AM-10M	
Immersion Holder (Drop-in Type)*5		JH-16A-2.0 JH-16A-2.5 JH-16A-3.0 JH-16A-3.5 JH-16A-4.0	
Air Pump Unit	APU-20-N-N-A1 APN-20-S-0-A1	Solenoid Valve*6	SVU-A-A1-S SVU-A-A2-S
Mounting Brackets		MH-120	
Hanging Chain Unit		AM-C	
Cable Clamp		CN-CF	
Pole Stand		PS-50-1.5-SUS-300	
Calibration Solution		L-NH-1 L-NH-10 L-NH-100 AM-B	
Consumable		7691 7692 7211 C-7211	

^{*1} Ammonium ion chip (7691), potassium ion chip (7692) and reference chip (7211) sold separately.

^{*2} The lead length of the ammonia sensor is 10m. If this needs to be extended, use the extension cable (AM-10M). Up to 20m.

^{*3} All three chips are required for measurement.

^{*4} The cable length is 10m.

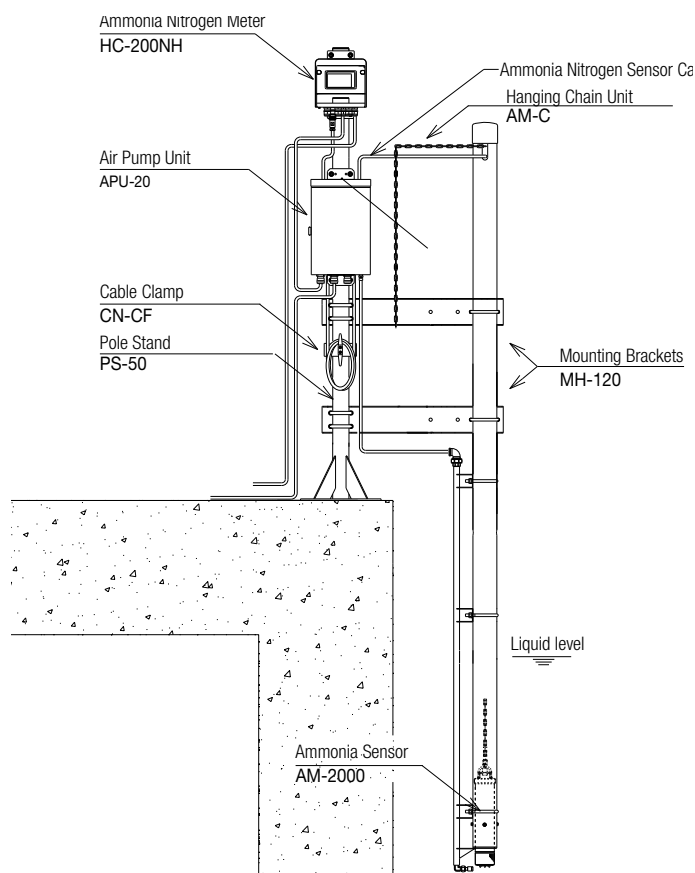
^{*5} The ultrasonic cleaning unit (UH-16A Series) includes the NH-16S Series immersion (drop-in type) holder.

The material used for the NH-16S series is SUS316. (Check the specifications and exterior figure for details.)

^{*6} Select the air pump unit (APU-20 Series) if there is no water source or air source.

The solenoid valve (SVU-A Series) is not required if the air pump unit (APU-20 Series) is selected.

Select the solenoid valve (SVU-A Series) if there is a water source or air source.
The air pump unit (APU-20 Series) is not required.



Main Specifications

Specifications of HC-200NH Ammonia Nitrogen Meter

Product name	Industrial Ammonia Nitrogen Meter		
Converter type	HC-200NH		
Sensor name/model	Industrial Ammonia Nitrogen Sensor/AM-2000		
Chip name/model	*1: Ammonium ion chip/7691, potassium ion chip/7692, reference chip/7211		
Uses	Biological reaction tanks		
Measurable range	Concentration		0 to 1000 mg/L (displayed range: 0 to 2000 mg/L) Configurable range 1000 (2000), 100.0 (200.0), 10.00 (20.00) mg/L Default setting: 10.00 (20.00) mg/L
	Temperature		0 to 40°C (displayed range: -10 to 110°C)
Display resolution	Concentration		0.01mg/L: 0.00 to 10.00 mg/L 0.1mg/L : 0.0 to 100.0 mg/L 1mg/L : 0 to 1000 mg/L
	Temperature		0.1°C
Performance	Concentration	Repeatability	The higher of 3 % of the reading \pm 1 digit or 0.2 mg/L \pm 1digit (for reference solution)
	Temperature	Repeatability	\pm 0.3°C (equivalent input)
		Linearity	\pm 0.3°C (equivalent input)
Temperature compensation	Temperature element		Platinum resistor: 1k Ω (0°C)
	Temperature measurement range		0 to 40°C
	Temperature calibration function		Calibration of one comparison point with reference thermometer
Potassium ion concentration compensation	Compensation range		Compensation range: Potassium ion concentration no greater than 10 times the ammonium ion concentration and no greater than 1,000ppm.
	Compensation error		\pm 20% (reading)
Calibration	Calibration method, number of calibrations		Reference solution calibration, 2 points
	Reference solution type		Select from 1-10 mg/L and 10-100 mg/L
	Added functions		Automatic detection of improper calibration (asymmetry potential, sensitivity, stability) Calibration history (asymmetry potential, sensitivity)
Adjustment	Adjustment method, number of adjustments		Calibration with manual analysis (1 point), calibration curve input function (linear expression)
	Added functions		Adjustment history (days since last adjustment, adjustment factor)
Self-check	Calibration errors		Asymmetry potential abnormality, sensitivity abnormality, response time abnormality, outside temperature calibration range
	Sensor diagnosis error		Ion chip deterioration, reference electrode impedance error, short circuit of temperature sensor, disconnection of temperature sensor, outside temperature measurement range, sensor communication error
	Sensor check error		CPU errors, ADC errors, memory errors
Transmission output (*1)	Number of output points		3 (the negative terminals of each transmission output are internally connected and have the same electrical potential.)
	Output type		DC 4 to 20mA input/output insulation type
	Load resistance		Maximum 900 Ω
	Linearity		Within \pm 0.08mA (output only)
	Repeatability		Within \pm 0.02mA (output only)
	Output range	Output	Select one of the following 3 items •Ammonia nitrogen concentration: Desired setting can be configured within the measurable range •Dissolved oxygen concentration: Desired setting can be configured within the measurable range •Ammonia nitrogen meter temperature: Desired setting can be configured between -10°C and 110°C •Dissolved oxygen meter temperature: Desired setting can be configured between -10°C and 110°C
	Error output		Burnout capability can be selected (3.8mA or 21mA)
	Hold capability		Select a setting from last value hold or arbitrary value hold
Contact output (*1)	Number of output points		5
	Output type		No-voltage contact output
	R1, R2	Contact type	Relay contact SPST (1a)
		Contact capacity	AC 250V 3A, DC 30V 3A (resistance load)
		Contact capability	Select from upper limit alarm, lower limit alarm, transmission output hold and cleaning output (opened at alarm operation, closed usually, closed at power-off)
		Description of alarm	•Setting range: Within displayed range •Delay time: 0 to 600 seconds
	FAIL	Contact type	Relay contact SPDT (1c)
		Contact capacity	AC 250V 3A, DC 30V 3A (resistance load)
		Contact capability	•Outside measurement range and self-check output abnormality warning settings can be configured •Delay time: 0 to 600 seconds
	R3	Contact type	Relay contact SPST (1a)
		Contact capacity	DC 30V 1A (resistance load)
		Contact capability	Ion chip deterioration notification
	R4	Contact type	Relay contact SPST (1a)
		Contact capacity	DC 30V 1A (resistance load)
		Contact capability	Ion chip life warning

Main Specifications

Specifications of HC-200NH Ammonia Nitrogen Meter (Continued)

Cleaning output (*1)	Number of output points		2
	Output type		Voltage contact output (voltage output of connected power source)
	Contact type		Relay contact, SPDT (1a)
	Output capacity		Voltage: Power source voltage, current: 0.5A (resistance load)
	Uses		Operation of solenoid valve for cleaning
	Settings	Cycle	0.1 to 168.0 hours
		Cleaning time	2 to 600 seconds
		Hold time	2 to 600 seconds
	Timer accuracy		Monthly error margin less than 2 minutes
Description of cleaning operation		•Operate internal timer •Operate both internal timer and external contact input •Enable internal timer only during external contact input •Select one of these functions as the cleaning trigger operation (in which the cleaning sequence starts when the external contact input is on for more than 2 seconds). •Output settings are common to the two points (cannot be configured individually)	
Contact input (*1)	Number of input points		1
	Contact type		No-voltage a contact for open collector
	Conditions		ON resistance: Maximum 100Ω Open-circuit voltage: DC 24V Short-circuit current: Maximum DC 12mA
	Contact capability		Can be selected from external cleaning operation input and transmission output hold input
Operating temperature range			-20 to 55°C (no freezing)
Operating humidity range			Relative humidity of 5-90% (no condensation)
Storage temperature			-25 to 65°C
Power source	Rated power source voltage		100 to 240V AC, 50/60Hz
	Power consumption		28VA (when operating at max AC240V)
Applicable standards	CE marking	EMC directives EN61326-1 (*2)	
		Emissions: Class A	
		Immunity: Industrial electromagnetic environment	
		Low voltage directives EN61010-1	
FCC rules		Part 15, Class A	
Structure	Installation		Outdoor installation type
	Installation method		50A pole or wall mounting
	Protection class		IP65
	Material of case		Aluminum alloy (epoxy-modified melamine resin painting)
	Material of mounting brackets		SUS304
	Material of cover		SUS304 (epoxy-modified melamine resin painting)
	Material of display window		Polycarbonate
	Display element		Reflective monochrome LCD
External dimensions		180 (W) x 155 (H) x 115 (D) (not including mounting brackets)	
Mass		Main unit: approx. 3.5 kg, cover and mounting brackets: approx. 1 kg	

*1 Although an arrester (firing potential 400 V) is installed for transmission output, contact input and communication, install the optimum surge absorber for conditions such as the surrounding environment, instrument installation conditions and externally connected equipment.

*2 If the sensor cable, transmission cable and/or contact input cable are extended to longer than 30m, the surge test in the EMC directives of the CE marking is not applied.

Specifications of AM-2000 Ammonia Nitrogen Sensor

Product name		Industrial Ammonia Nitrogen Sensor
Model		AM-2000
Measurable range	Ammonia nitrogen	0 to 1000 mg/L
	Temperature	0 to 40 °C (no freezing)
Material		SUS316, FKM, PVC
External dimensions		ø58 X L280
Mass		Approx. 2.7kg (including 10m cable)
Combination holder		Immersion holder (drop-in type)
Combination cleaner		Ultrasonic, air jet

Main Specifications

Specifications of Ammonium Ion Chip

Product name	Ammonium Ion Chip
Model	7691
Measurable range	Concentration: 0 to 1000mg/L, temperature: 0 to 40°C
Calibration cycle	When replacing sensor (although this may vary depending on the sample solution and installation environment)
Adjustment cycle	Approximate adjustment cycle 1 month (although this may vary depending on the sample solution and installation environment)
Maintenance and management method	Calibration, adjustment and cleaning Approximate adjustment and cleaning cycle 1 month (although this may vary depending on the sample solution and installation environment)
Storage period	Up to 6 months after purchase
Storage temperature	Refrigerate (10°C or below. Do not freeze.)
Storage environment	Relative humidity of 5-90%
Reference measurement method	Gas electrode method, absorptiometric method, ion chromatography method
Material	PVC
Mass	Approx. 15.0g

Specifications of Potassium Ion Chip

Product name	Potassium Ion Chip
Model	7692
Measurable range	Concentration: 0 to 1000mg/L, temperature: 0 to 40°C
Calibration cycle	When replacing sensor (although this may vary depending on the sample solution and installation environment)
Adjustment cycle	Approximate adjustment cycle 1 month (although this may vary depending on the sample solution and installation environment)
Maintenance and management method	Calibration, adjustment and cleaning Approximate adjustment and cleaning cycle 1 month (although this may vary depending on the sample solution and installation environment)
Storage period	Up to 6 months after purchase
Storage temperature	Refrigerate (10°C or below. Do not freeze.)
Storage environment	Relative humidity of 5-90%
Material	PVC
Mass	Approx. 15.0g

Specifications of Reference Chip

Product name	Reference Chip
Model	7211
Storage period	Up to 6 months after purchase
Storage temperature	-10 to 45°C
Storage environment	Relative humidity of 5-90%
Material	PVC
Mass	Approx. 25.0g

Specifications of Immersion (Drop-in Type) Ultrasonic Cleaning Unit

Product name	Immersion Type Ultrasonic Cleaning Unit for Ammonia Sensor (*1)
Model	UH-16A
Cleaning method	Continuous ultrasound emission method
Control method	Burst oscillation method through oscillation timing control
Oscillation frequency	Approx. 70 kHz
Combination oscillator	US-2S
Measured liquid temperature (*2)	-5 to 50 °C (no freezing)
Measured liquid pressure	Atmospheric pressure
Flow velocity of measured liquid	Less than 2m/sec
Material of wetted part	SUS316 (not including detector and sensor)
Mass	Nominal length 2.0m: Approx. 12kg Nominal length 3.0m: Approx. 16kg Nominal length 4.0m: Approx. 20kg
Accessories	Ultrasonic cleaning unit cable 10m

*1 A separate oscillator (US-2S) is required in order to use this cleaner.

*2 The usage temperature range varies depending on the combination of the sensor and chips. Check the specified temperatures of the products.

This product does not include the detector or sensor.

Main Specifications

Specifications of Ultrasonic Oscillator

Product name	Ultrasound oscillator
Model	US-2S
Power source voltage	AC100 to 240V 50/60Hz
Allowable voltage fluctuation range	90-110% of power source voltage
Power consumption	10 VA
Control method	Burst method through oscillation timing control
Oscillation frequency	Approx. 68 to 72kHz sweep
Ambient temperature	-5 to 50°C
Ambient humidity	5 to 90% RH (no condensation)
Mass	Approx. 2.0kg
Protection class	IP54 (IEC60529, JIS C0920) (Category 2)
Material	AC4C
Surface	Epoxy-modified melamine resin painting (Mansell 10PB5/1)

Specifications of Immersion (Drop-in Type) Jet Cleaning Unit

Product name	Immersion (Drop-in Type) Jet Cleaning Unit for Ammonia Sensor
Model	JH-16A
Cleaning method	Intermittent air jet cleaning
Measured liquid temperature	-5 to 50 °C (no freezing)
Measured liquid pressure	Atmospheric pressure
Flow velocity of measured liquid	Less than 2m/sec
Cleaning output	0.05 to 0.2MPa
Diameter of connection port for cleaning	Rc1/2
Material of wetted part	SUS316, FKM (not including detector and sensor)
Mass	Nominal length 2.0m: Approx. 12.0 kg Nominal length 3.0m: Approx. 16.0 kg Nominal length 4.0m: Approx. 20.0 kg

*1: The usage temperature range varies depending on the combination of the sensor and chips. Check the specified temperatures of the products.

This product does not include the detector or sensor.

Specifications of Air Pump Unit

Product name	Air Pump Unit	
Model	APU-20-N-N-A1	APU-20-S-O-A1
Material	SPCC	SUS304
Surface	Polyurethane coating, color: DICG-262	None
Discharge pressure	0.2MPa	0.2MPa
Discharge volume	15L/min (50Hz) 18L/min (60Hz)	15L/min (50Hz) 18L/min (60Hz)
Connector diameter	Fitting for ø6/ø8 rigid tube	Fitting for ø6/ø8 rigid tube
Power source	AC100V 50/60Hz	AC100V 50/60Hz
Power source capacity	Approx. 80VA	Approx. 80VA
External dimensions (mm)	223(W)×395(H)×210(D) (excluding mounting brackets)	223(W)×395(H)×210(D) (excluding mounting brackets)
Mass	Approx. 12kg	Approx. 12kg
Ambient temperature	0 to 40°C	0 to 40°C
Ambient humidity	5 to 90% RH (no condensation)	5 to 90% RH (no condensation)
Structure	Rainproof: JISC0920, equivalent to protection class 3	Rainproof: JISC0920, equivalent to protection class 3

Main Specifications

Specifications of Solenoid Valve

Product name	Solenoid Valve	
Model	SVU-A-A1-S	SVU-A-A2-S
Fluid	Water or air	Water or air
Power source	AC100V 50Hz/6.7W, 60Hz/5.7W	AC200V 50Hz/6.7W, 60Hz/5.7W
Fluid temperature	-10 to 60°C (however, cannot be frozen)	-10 to 60°C (however, cannot be frozen)
Ambient temperature	-20 to 60°C	-20 to 60°C
Ambient humidity	5 to 90% RH (no condensation)	5 to 90% RH (no condensation)
Orifice diameter	ø15	ø15
Material of wetted part	Body -: SCS13 Seal: NBR	Body -: SCS13 Seal: NBR

- Be sure to flush pipes before connecting them to the solenoid valve. Entry of foreign matter may cause abnormal operation.
- Clean the strainer regularly.
- Use a heat-insulated pipe if there is a risk of freezing.
- Remove the water from the solenoid valve if it will not be used for a long time. Otherwise, problems such as rust may occur, resulting in abnormal operation.

Specifications of Immersion Holder (Drop-in Type)

Product name	Specifications of Immersion Holder (Drop-in Type)	
Model	NH-16P	NH-16S
Liquid contact material (*1)	PVC	SUS316, PVC
Ambient temperature	-5 to 50°C (no freezing)	-5 to 50°C (no freezing)
Measurement conditions	Pressure	Atmospheric pressure
	Temperature (*2)	-5 to 50°C (no freezing)
	Flow velocity	2m/sec
Mass	Nominal length 2.0m: Approx. 4.1kg (NH-16P-2.0)	Nominal length 2.0m: Approx. 8.7kg (NH-16S-2.0)
	Nominal length 2.5m: Approx. 5.1kg (NH-16P-2.5)	Nominal length 2.5m: Approx. 10.9kg (NH-16S-2.5)
	Nominal length 3.0m: Approx. 6.1kg (NH-16P-3.0)	Nominal length 3.0m: Approx. 13.1kg (NH-16S-3.0)
	Nominal length 3.5m: Approx. 7.1kg (NH-16P-3.5)	Nominal length 3.5m: Approx. 15.3kg (NH-16S-3.5)
	Nominal length 4.0m: Approx. 8.1kg (NH-16P-4.0)	Nominal length 4.0m: Approx. 17.5kg (NH-16S-4.0)

*1 If the nature of the measurement sample or its suitability for use in direct sunlight presents issues, use the SUS immersion holder (NH-16S).

*2 The usage temperature range varies depending on the combination of the sensor and chips. Check the specified temperatures of each product.

Specifications of Mounting Brackets

Product name	Mounting Brackets
Model	MH-120
Material	SUS304
Mass	Approx. 1.6kg (2 mounting arms)

Specifications of Cable Clamp

Product name	Cable Clamp
Model	CN-CF
Material	SUS304
Mass	Approx. 0.4kg

Specifications of Relay Cable

Product name	Relay cable
Model	AM-10M
Material	Light PVC (cable section)
Length	10m

- Use if the lead length (10m) of the ammonia sensor (AM-2000) is too short. Up to 20m.

Specifications of Hanging Chain Unit

Product name	Hanging Chain Unit
Model	CN-CF
Material	SUS304
Length	7m

Specifications of Pole Stand

Product name	Pole stand
Model	PS-50-1.5-SUS-300
Material	SUS304
Length	1.5m

Specifications of Calibration Solution

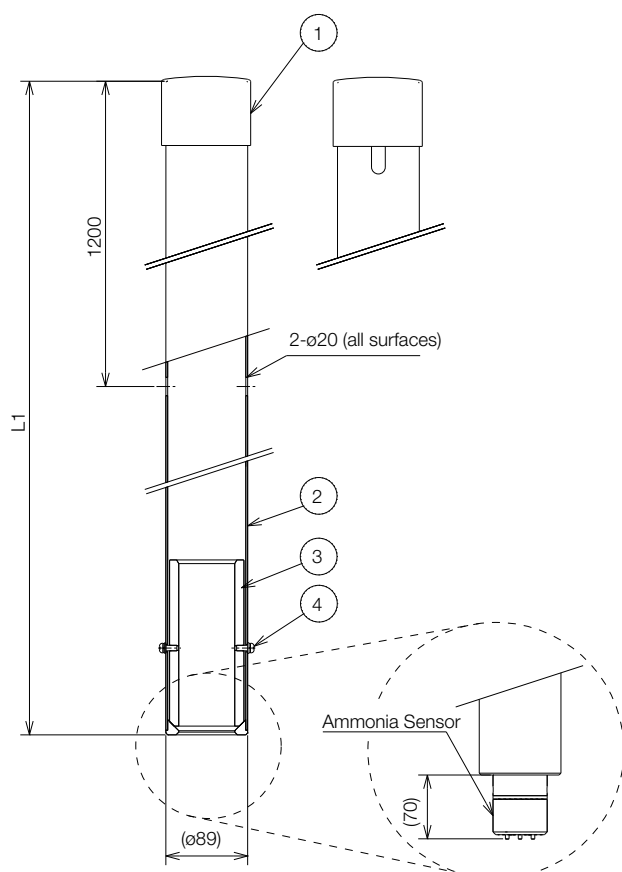
Product name	Calibration Solution
L-NH-1	Ammonia concentration 1mg/L, approx. 500ml per bottle
L-NH-10	Ammonia concentration 10mg/L, approx. 500ml per bottle
L-NH-100	Ammonia concentration 100mg/L, approx. 500ml per bottle
AM-B	Contains 2 calibration bottles

Specifications of Consumable

Product name	Consumable
C-7211	Junction cap for reference chip

External Dimensions

Immersion Holder (Drop-in Type) (NH-16P/NH-16S)



NH-16P

No	Parts Name	Notes
1	Cap	PVC
2	Guide pipe	PVC
3	Adapter	PVC
4	Screw	SUS316

NH-16S

No	Parts Name	Notes
1	Cap	PVC
2	Guide pipe	SUS316
3	Adapter	PVC
4	Screw	SUS316

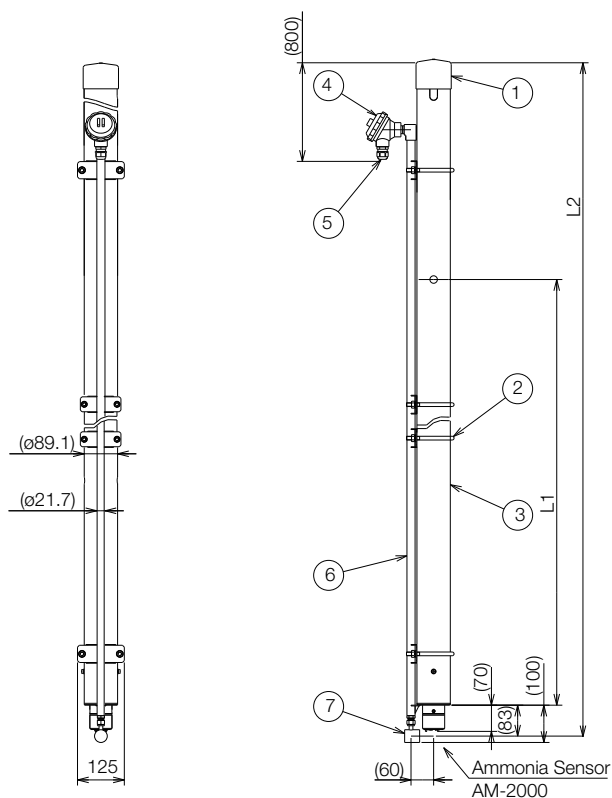
L1 (NH-16P)

Name	L1 (mm)
NH-16P-2.0	1800
NH-16P-2.5	2300
NH-16P-3.0	2800
NH-16P-3.5	3300
NH-16P-4.0	3800

L1 (NH-16S)

Name	L1 (mm)
NH-16S-2.0	1800
NH-16S-2.5	2300
NH-16S-3.0	2800
NH-16S-3.5	3300
NH-16S-4.0	3800

Immersion (Drop-in Type) Ultrasonic Cleaning Unit (UH-16A)

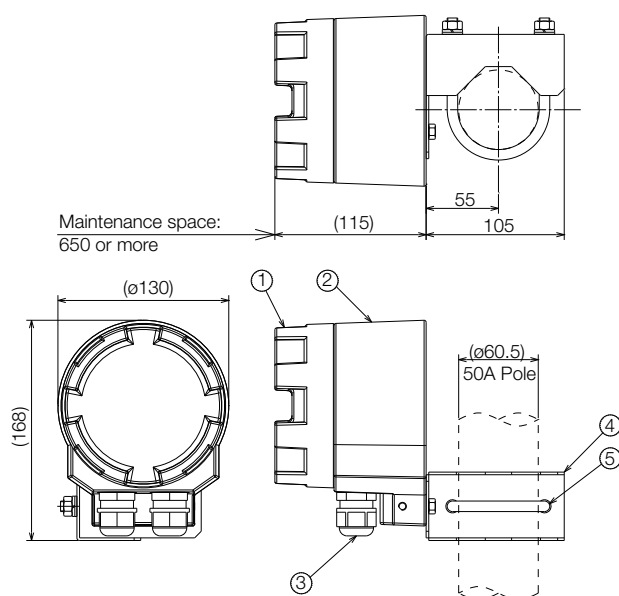


No	Parts Name	Notes
1	Cap	PVC
2	U-bolt	SUS316
3	Guide pipe	SUS316
4	Terminal box	AL
5	Cable gland	Screw Size G1/2 O.Dø7 to ø12 cable
6	Oscillator holder	SUS316
7	Ultrasound oscillator	SUS316

Name	L1 (mm)	L2 (mm)
UH-16A-2.0	600	1800
UH-16A-2.5	1100	2300
UH-16A-3.0	1600	2800
UH-16A-3.5	2100	3300
UH-16A-4.0	2600	3800

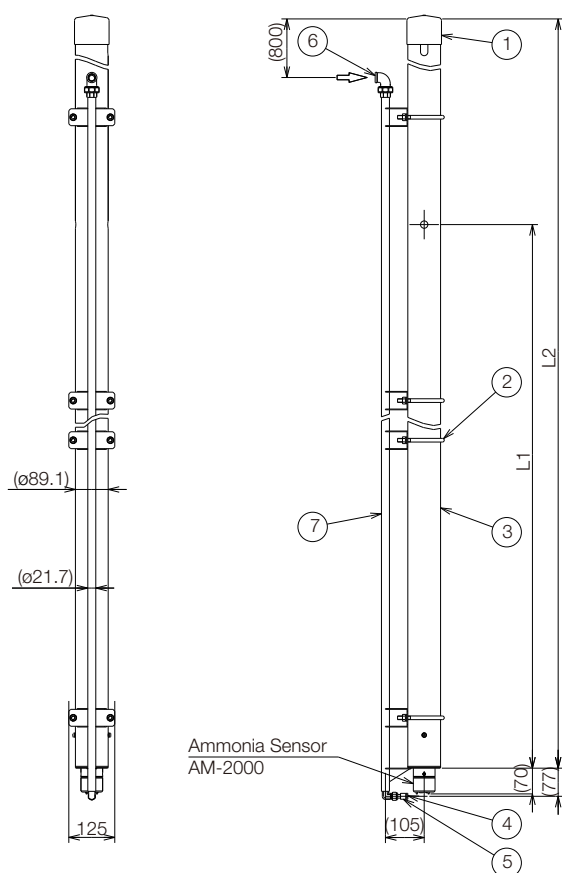
External Dimensions

Ultrasound Oscillator (US-2S)



No	Parts Name	Notes
1	Ultrasound cover	AC4C
2	Ultrasound case	AC4C
3	Conduit	O.Dø7 to ø12 cable
4	Mounting brackets	SUS304
5	U-bolt	SUS304 M8

Immersion (Drop-in Type) Jet Cleaning Unit (JH-16A)

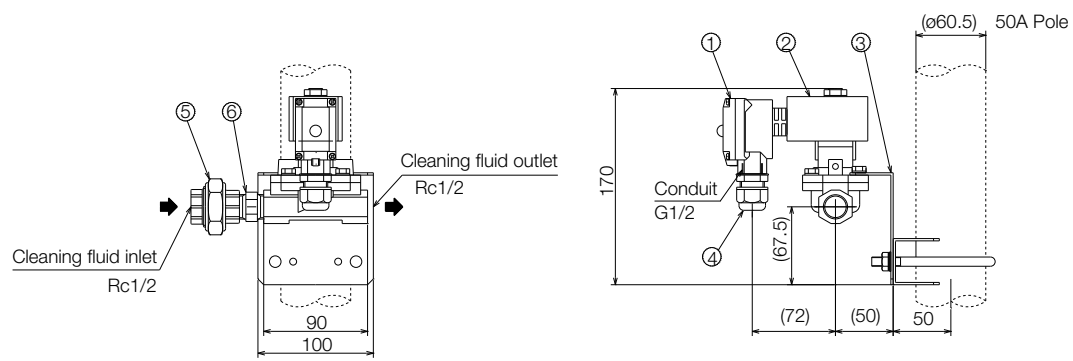


No	Parts Name	Notes
1	Cap	PVC
2	U-bolt	SUS316
3	Guide pipe	SUS316
4	Nozzle	SUS316
5	Nozzle holder	SUS316
6	Water/Air Port	SUS316, Rc1/2
7	Nozzle holder pipe	SUS316

Name	L1 (mm)	L2 (mm)
JH-16A-2.0	600	1800
JH-16A-2.5	1100	2300
JH-16A-3.0	1600	2800
JH-16A-3.5	2100	3300
JH-16A-4.0	2600	3800

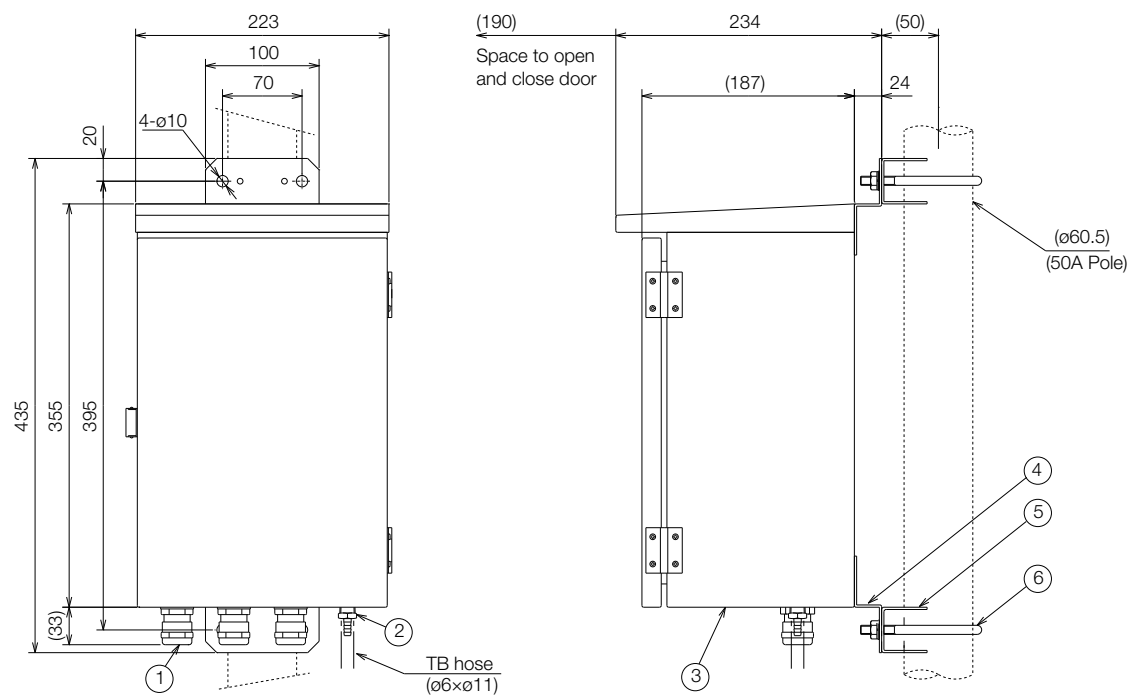
External Dimensions

Solenoid Valve (SVU-A-A1-S/SVU-A-A2-S)



No	Parts Name	Notes
1	Terminal box	
2	Solenoid valve	
3	Mounting brackets	SUS304
4	Cable gland	ø7 to ø11.5
5	Union	
6	Strainer	

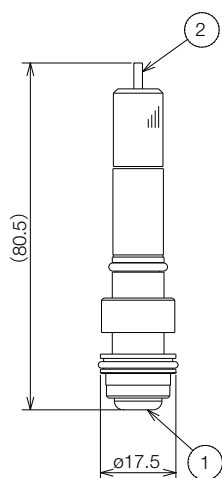
Air Pump Unit (APU-20)



No	Parts Name	Notes
1	Cable gland	PVC
2	Air outlet	For ø6
3	Box	SPCC (APU-20-N-N-A1) SUS304 (APU-20-S-O-A1)
4	Bracket	
5	Fastening washer	SUS304
6	U-bolt	SUS304 M8

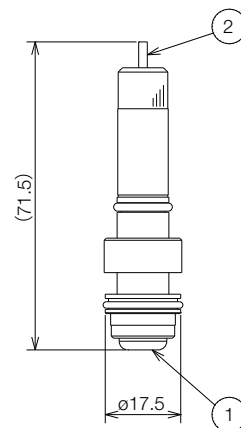
External Dimensions

Ammonium Ion Chip (7691)



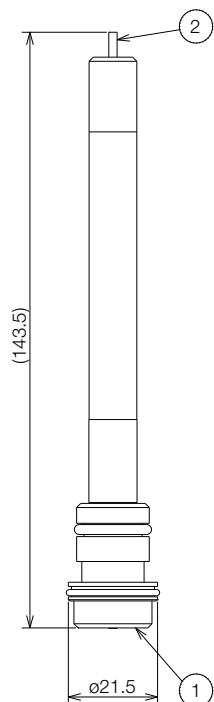
No	Parts Name	Notes
1	Ammonia response membrane	PVC
2	Connector	

Potassium Ion Chip (7692)



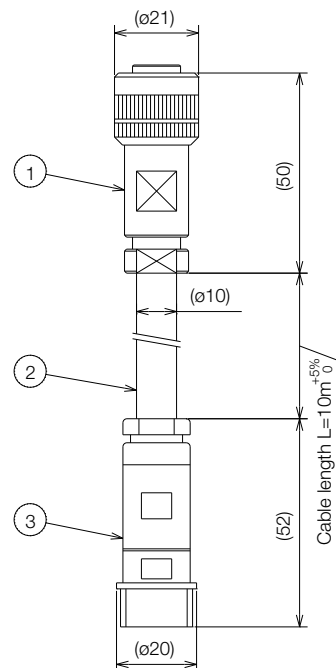
No	Parts Name	Notes
1	Potassium response membrane	PVC
2	Connector	

Reference Chip (7211)



No	Parts Name	Notes
1	Reference sensor cap	FKM
2	Connector	

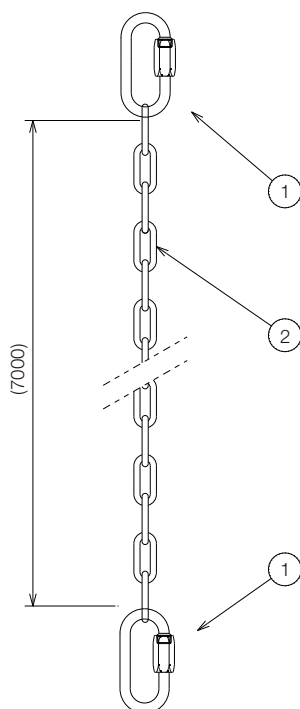
Relay Cable (AM-10M)



No	Parts Name	Notes
1	Connector	
2	Cable	Soft PVC
3	Connector	

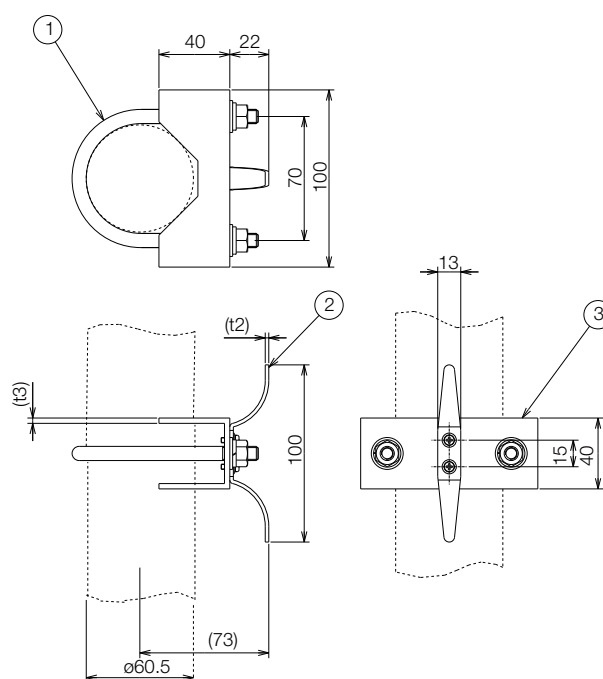
External Dimensions

Hanging Chain Unit (AM-C)



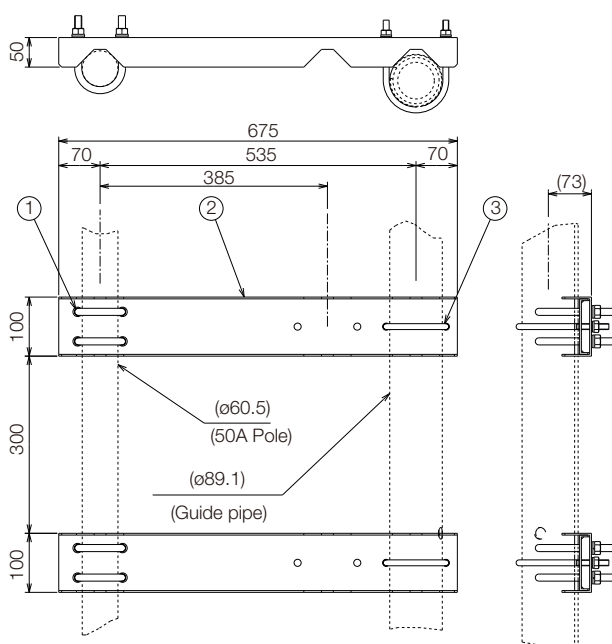
No	Parts Name	Notes
1	Ring catch	SUS304
2	Chain	SUS304

Cable Clamp (CN-CF)



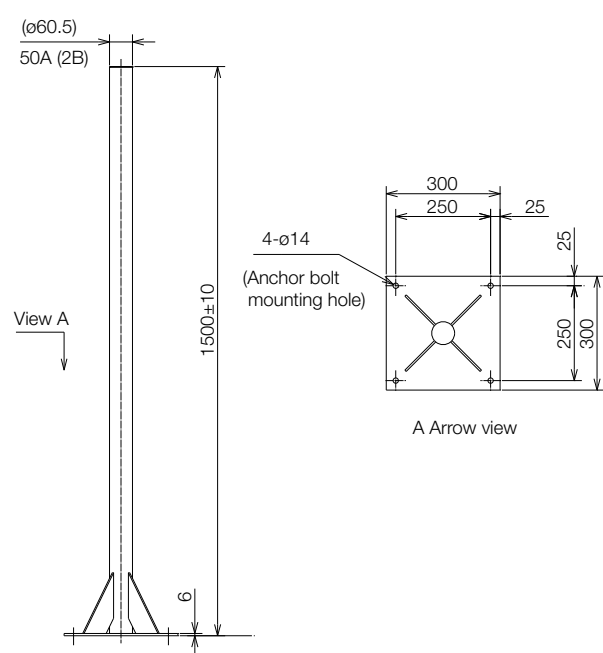
No	Parts Name	Notes
1	U-bolt	SUS304 M8
2	Hook	SUS304
3	Mounting brackets	SUS304

Mounting Brackets (MH-120)

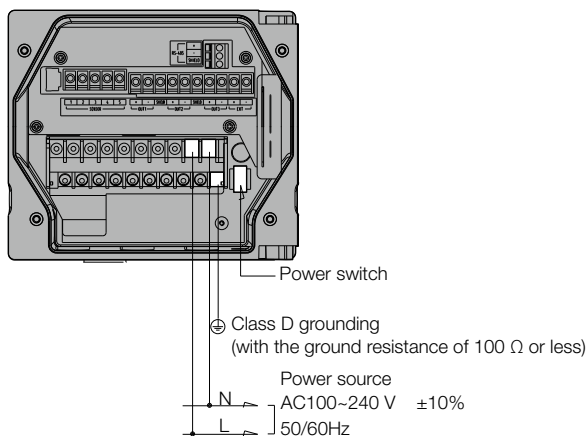


No	Parts Name	Notes
1	U-bolt	SUS304, M12
2	Mounting Arms	SUS304
3	U-bolt	SUS304, M10

Pole Stand (PS-50-1.5-SUS-300)



Power Source



- The power source of this equipment is a free power source with a rated voltage of AC100-240 V.
- This instrument has a power switch.
- The power supply terminal screws are M4 screws.
- The wire size is 0.75 to 5.5 mm² (AWG18-10).
- Install a circuit breaker or circuit protector near this product and ensure that the power source can be turned on and off.
- Check the voltage of the power source, as operating at a voltage outside the rated range causes malfunction. Also, check that the range of fluctuations in supply voltage does not exceed ±10%.
- Install arresters if there is a risk of thunder damage.
- For safety reasons, be sure to ground the earth terminal (class D grounding).
- Ground separately from electrical equipment such as the motor.

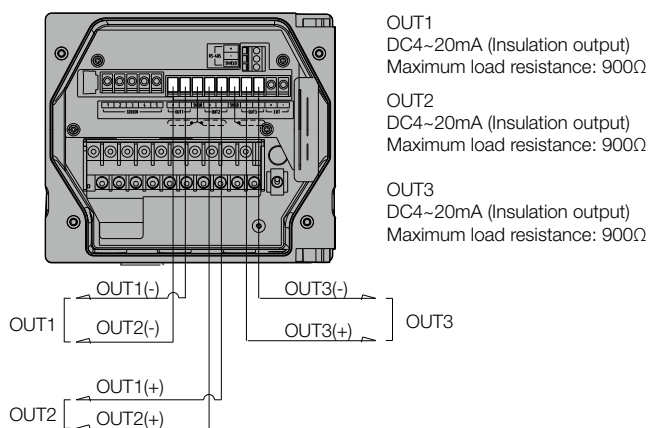
Specifications of Terminal Block

Crimping	Wire size	Torque
MAX8 MAX4.7 For M4	5.5mm ² /MAX (AWG10)	1.2 to 1.8 N·m

**Annotation*

The terminal block screws have a structure that stops them from coming off.
When mounting the terminal, turn the screws until they lift. (Screw-lifting structure)

Transmission Output



- Three transmission outputs are included.
A DC 4 - 20 mA signal compatible with each item is output.
- The transmission output terminal screws are M3.5 screws.
- The wire size is 2mm² (AWG14) max.
- Use a shielded cable for the transmission output cable.
- Install arresters on the output side and receiving instrument side of the instrument if there is a risk of thunder damage.
- The maximum load resistance of the transmission output is 900 Ω.
- The OUT1 (-), OUT2 (-) and OUT3 (-) negative terminals of the transmission output are internally connected and have the same electrical potential.

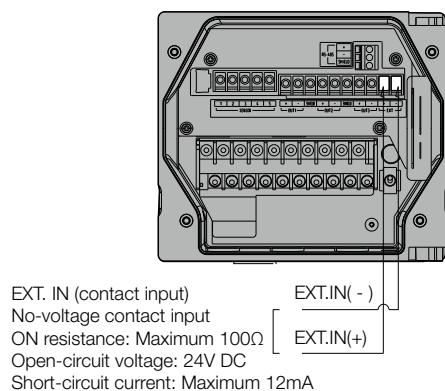
Specifications of Terminal Block

Crimping	Wire size	Torque
MAX6.2 MAX3.6 For M3.5	2mm ² /MAX (AWG14)	0.8 to 1.2 N·m

**Annotation*

The terminal block screws have a structure that stops them from coming off.
When mounting the terminal, turn the screws until they lift. (Screw-lifting structure)

Contact Input



- One contact input is included.
The cleaner can be operated by an external signal.
- The contact input terminal screws are M3.5 screws.
- The wire size is 2mm² (AWG14) max.
- Install arresters on the output side and receiving instrument side of the instrument if there is a risk of thunder damage.
- Set the resistance of the contact input to a maximum of less than 100Ω.

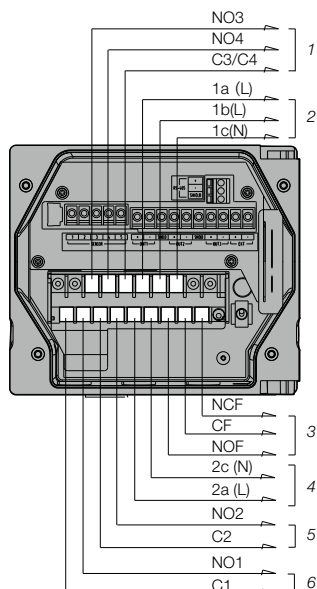
Specifications of Terminal Block

Crimping	Wire size	Torque
MAX6.2 MAX3.6 For M3.5	2mm ² /MAX (AWG14)	0.8 to 1.2 N·m

**Annotation*

The terminal block screws have a structure that stops them from coming off.
When mounting the terminal, turn the screws until they lift. (Screw-lifting structure)

Contact Output



- 1: R3, R4
No-voltage contact output
Contact capacity (load resistance)
DC 30V,3A
- 2: CLN (AC) (cleaning output)
Voltage contact output
Contact capacity (load resistance)
AC 250V,3A
- 3: FAIL (abnormality alarm output)
No-voltage contact output
Contact capacity (load resistance)
AC 250V,3A/DC 30V,3A
- 4: CLN (AC) (cleaning output)
Voltage contact output
Contact capacity (resistance load)
AC 250V,3A/DC 30V,3A
- 5: R2 (control output)
No-voltage contact output
Contact capacity (resistance load)
AC 250V,3A/DC 30V,3A
- 6: R1 (control output)
No-voltage contact output
Contact capacity (resistance load)
AC 250V,3A/DC 30V,3A

- Five contact outputs are included. (of which one is fail (abnormality alarm output))
- The terminal screws are M4 screws.
- The wire size is 0.75 to 5.5mm² (AWG18 to 10) max.
- Use a varistor or noise killer if noise occurs in the load.
- The contact capacity is less than AC 250V and 3A or DC 30V and 3 A.
- The only voltage output is the CLN output. The voltage of the connected power source is output. All other output is no-voltage contact output.
- The NO and NC arrangement is reversed only in the case of fail output. For normal (non-fail) output, the CF-NOF contact is open and the CF-NCF contact is shorted. The C-NOF contact is shorted when the power is off.
- If connecting a load higher than the contact capacity or an inductive load (such as a motor or pump), be sure to connect the load through a power relay with a rating higher than that of the load.
- Take care when connecting a load, as the CF-NCF contact of FAIL is shorted when the power source of the instrument is off.

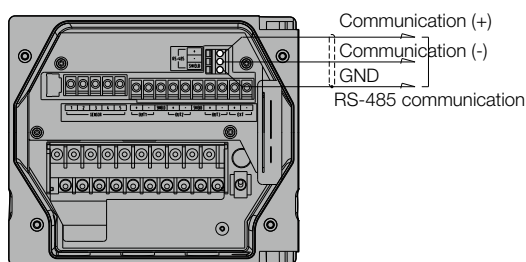
Specifications of Terminal Block

Crimping	Wire size	Torque
	5.5mm ² /MAX (AWG10)	1.2 to 1.8 N·m

*Annotation

The terminal block screws have a structure that stops them from coming off. When mounting the terminal, turn the screws until they lift. (Screw-lifting structure)

RS-485



- This instrument includes the RS-485 communication terminal. Up to 32 terminals can be connected including the host computer.
- The wire size is 0.14-2.5mm² (AWG 26-14).
- Use a twist pair shielded cable for the communication output cable.
- The maximum cable length of the communication cable is 500 m.
- Provide termination resistance (Rt: 120 Ω) for the instrument that is the terminus of the RS-485 communication line.

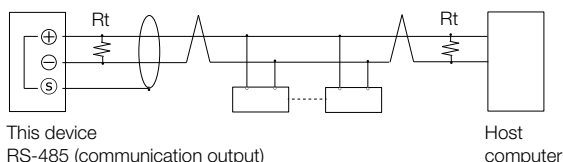
Specifications of Terminal Block

Crimping	Wire	Torque
	0.14 to 2.5mm ² (AWG 26 to 14) Single or stranded	0.5 to 0.6 N·m

*Annotation

The terminal block screws have a structure that stops them from coming off. When mounting the terminal, turn the screws until they lift. (Screw-lifting structure)

Example of External Communication Connection

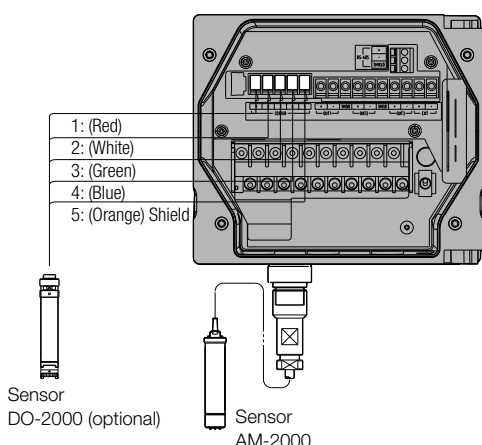


This device

RS-485 (communication output)

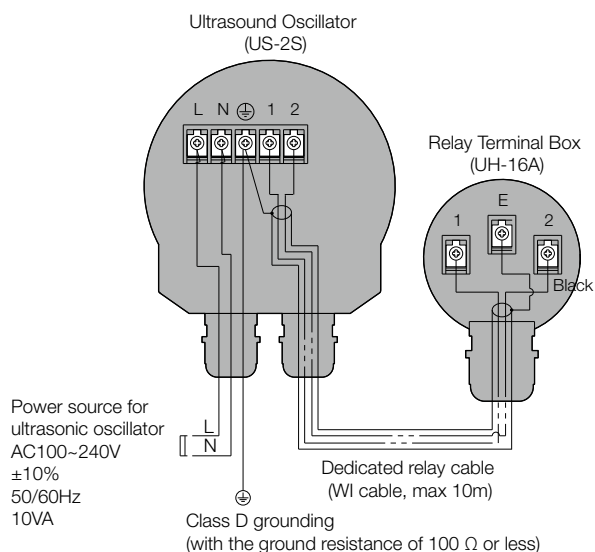
Host computer

Sensor



- One ammonia sensor can be connected.
- It is also possible to connect an optical DO sensor (DO-2000) (optional).
- The sensor cable is a high-insulation cable. Do not wire the sensor cable or relay cable near equipment that supplies induction to parts such as the motor or the power cable of this equipment.

Ultrasound Cleaner (UH-16A + US-2S)



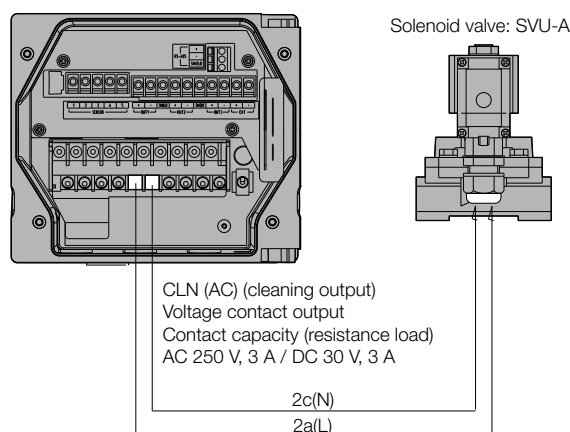
Power source

- The conduit cable diameter is 7mm to 12mm.
- Use a twist pair shielded cable for the communication output cable.
- To prevent electric shock, always be sure to ground (class D grounding: with the ground resistance of 100 Ω or less) protective grounding terminals.

Between ultrasonic oscillator and relay terminal box

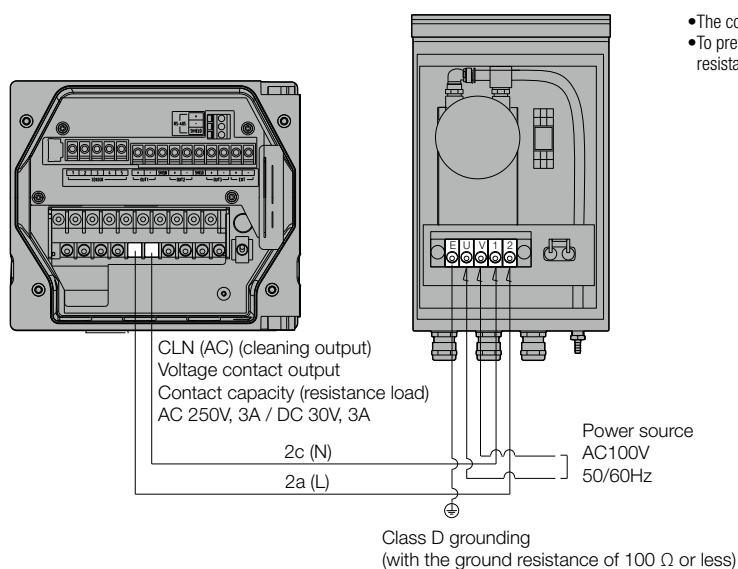
- Use the dedicated relay cable (WI).

Solenoid Valve (SVU-A + HC-200NH)



- The conduit cable diameter is 7 mm to 11.5 mm.
- To prevent electric shock, always be sure to ground (class D grounding: with the ground resistance of 100 Ω or less) protective grounding terminals.

Air Pump Unit (APU-20 + HC-200NH)



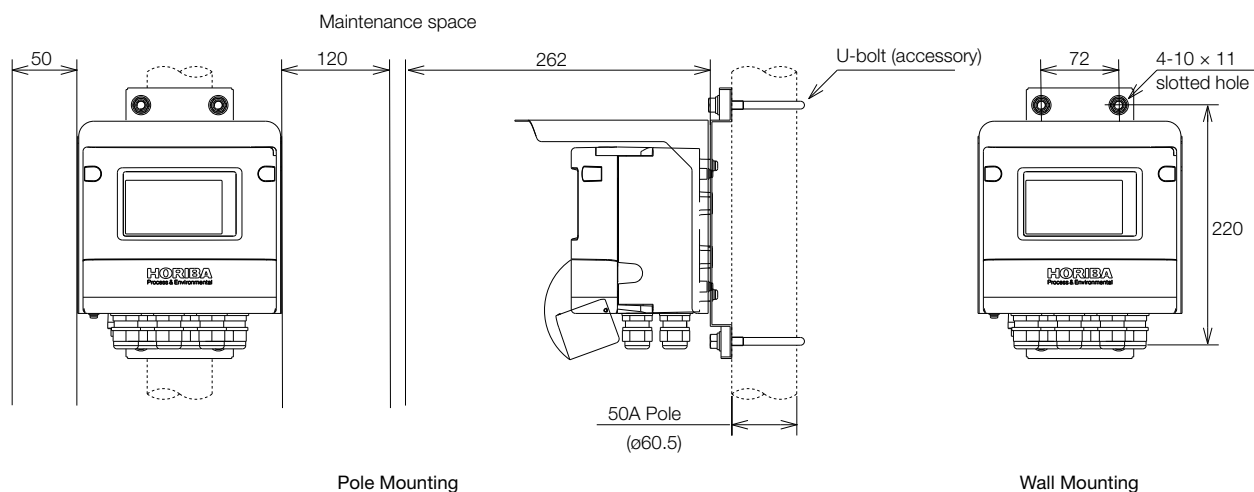
- The conduit cable diameter is 7 mm to 12 mm.
- To prevent electric shock, always be sure to ground (class D grounding: with the ground resistance of 100 Ω or less) protective grounding terminals.

Installation Converter

This instrument can be mounted on a pole (50A) or wall.

Installation

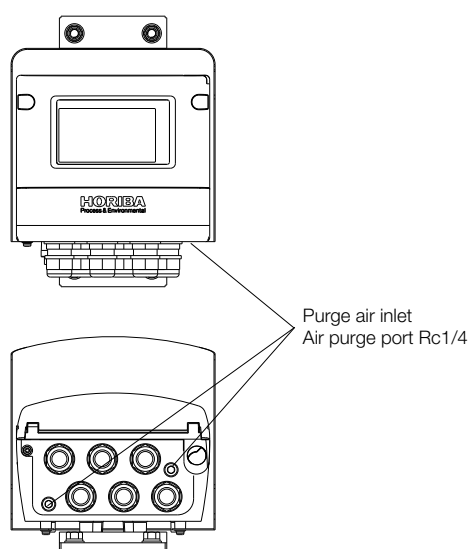
Ensure there is sufficient space around the instrument for maintenance. The same amount of maintenance space as for pole mounting is required, even when mounting on a wall.



Air Purge

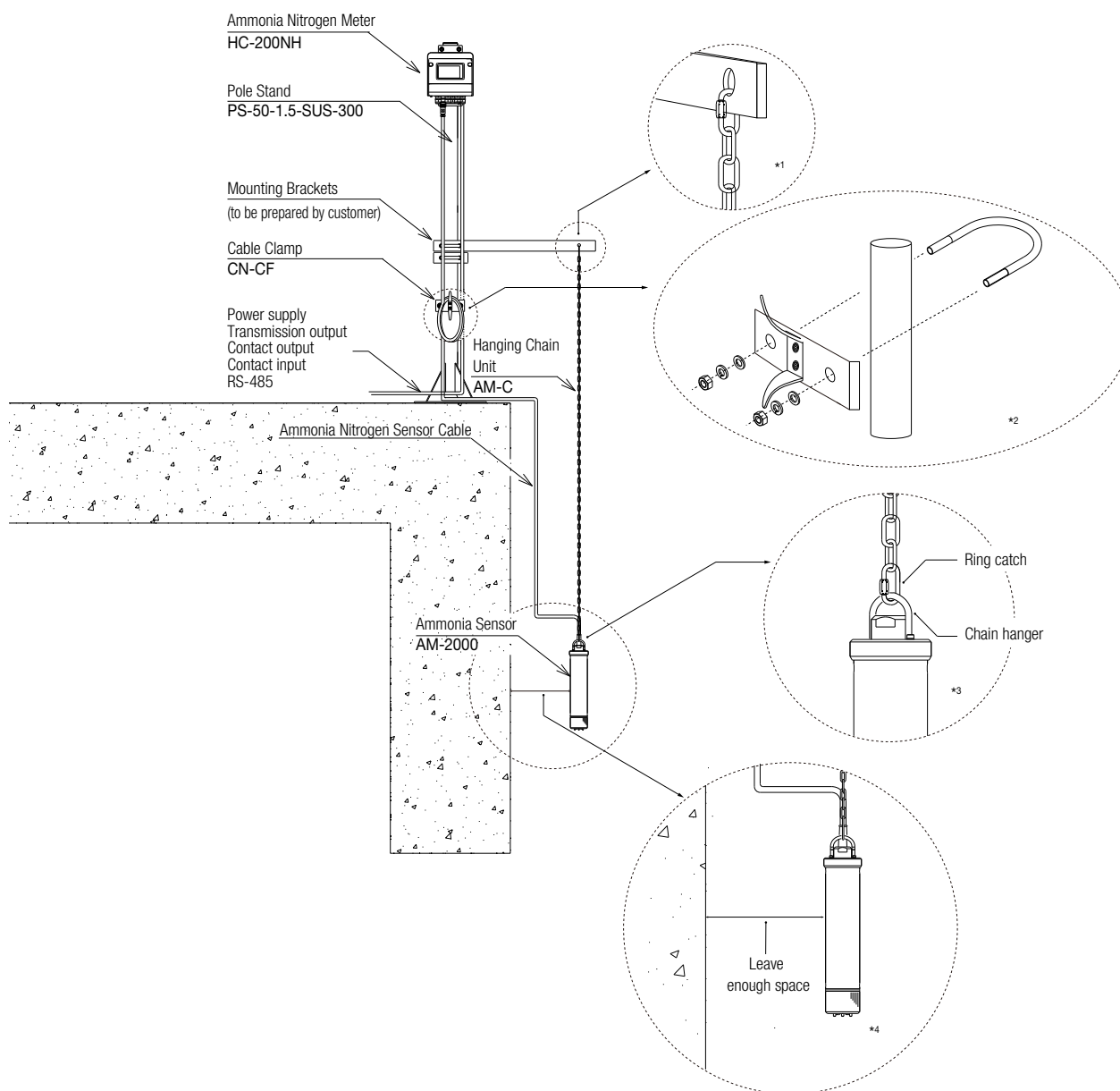
There is a purge air inlet to prevent internal corrosion.

If using in an environment with corrosive gas, instrumentation air is constantly passed through the instrument, preventing the corrosive gas from entering the instrument.



Installation Immersion Type

Below is an example installation of the converter (HC-200NH), ammonia sensor (AM-2000), hanging chain unit (AM-C), cable clamp (CN-CF) and pole stand (PS-50-1.5-SUS-300).



*1 Secure the hanging chain unit with the mounting brackets. (The securing method used here is an example.)

*2 Mount the cable clamp to the pole stand with the included U-bolt. (This is used to wind excess ammonia nitrogen sensor cable.)

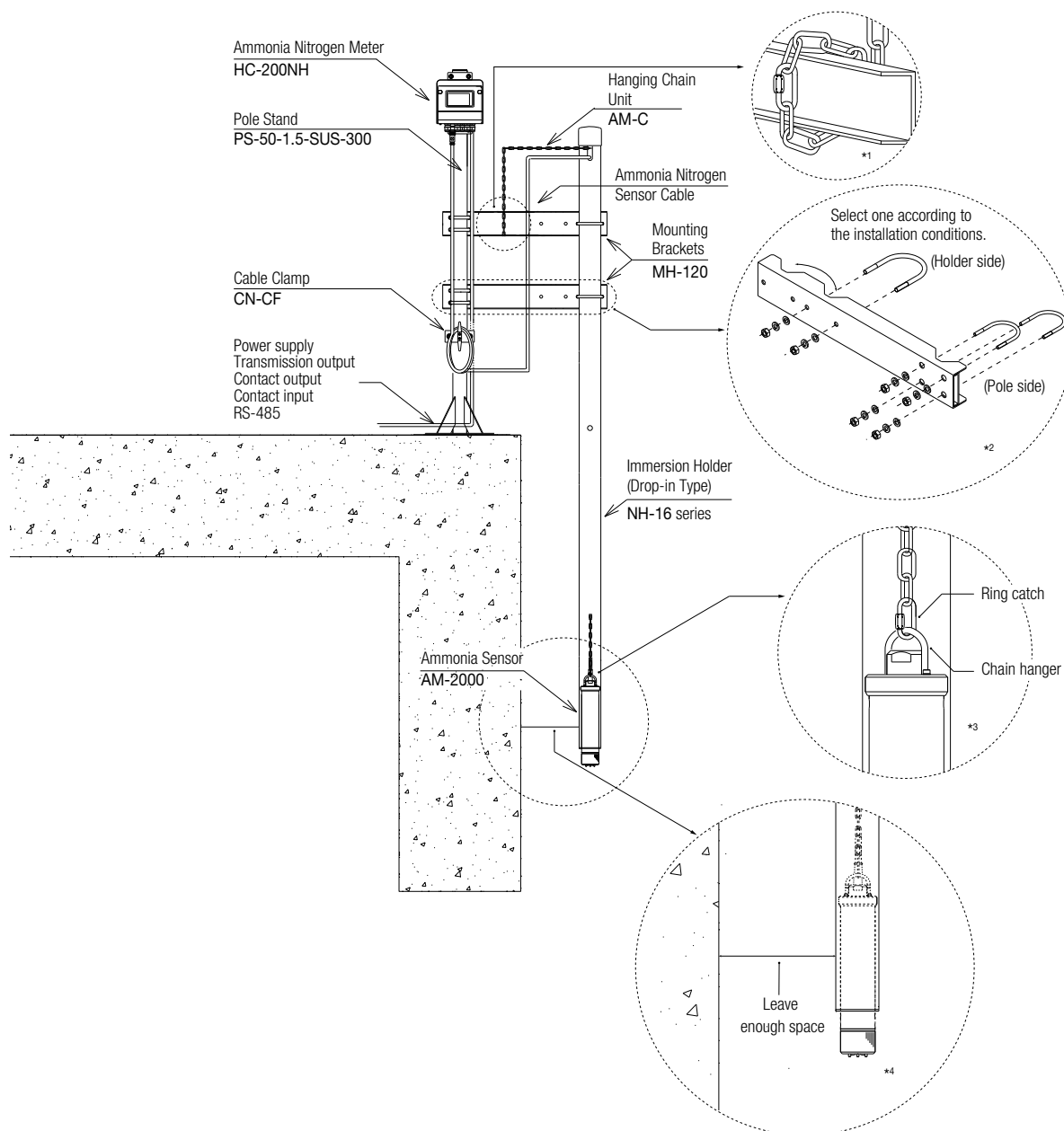
*3 Secure the ring catch of the hanging chain unit to the chain hanger of the ammonia sensor.

*4 Leave enough distance so that the flow in the tank does not cause contact with the wall or any obstructions.

- See page 25 for information on installing the converter.

Installation Immersion (Drop-in Type)

Below is an example installation of the converter (HC-200NH), ammonia sensor (AM-2000), immersion holder (drop-in type) (NH-16 Series), mounting brackets (MH-120), hanging chain unit (AM-C), cable clamp (CN-CF) and pole stand (PS-50-1.5-SUS-300).

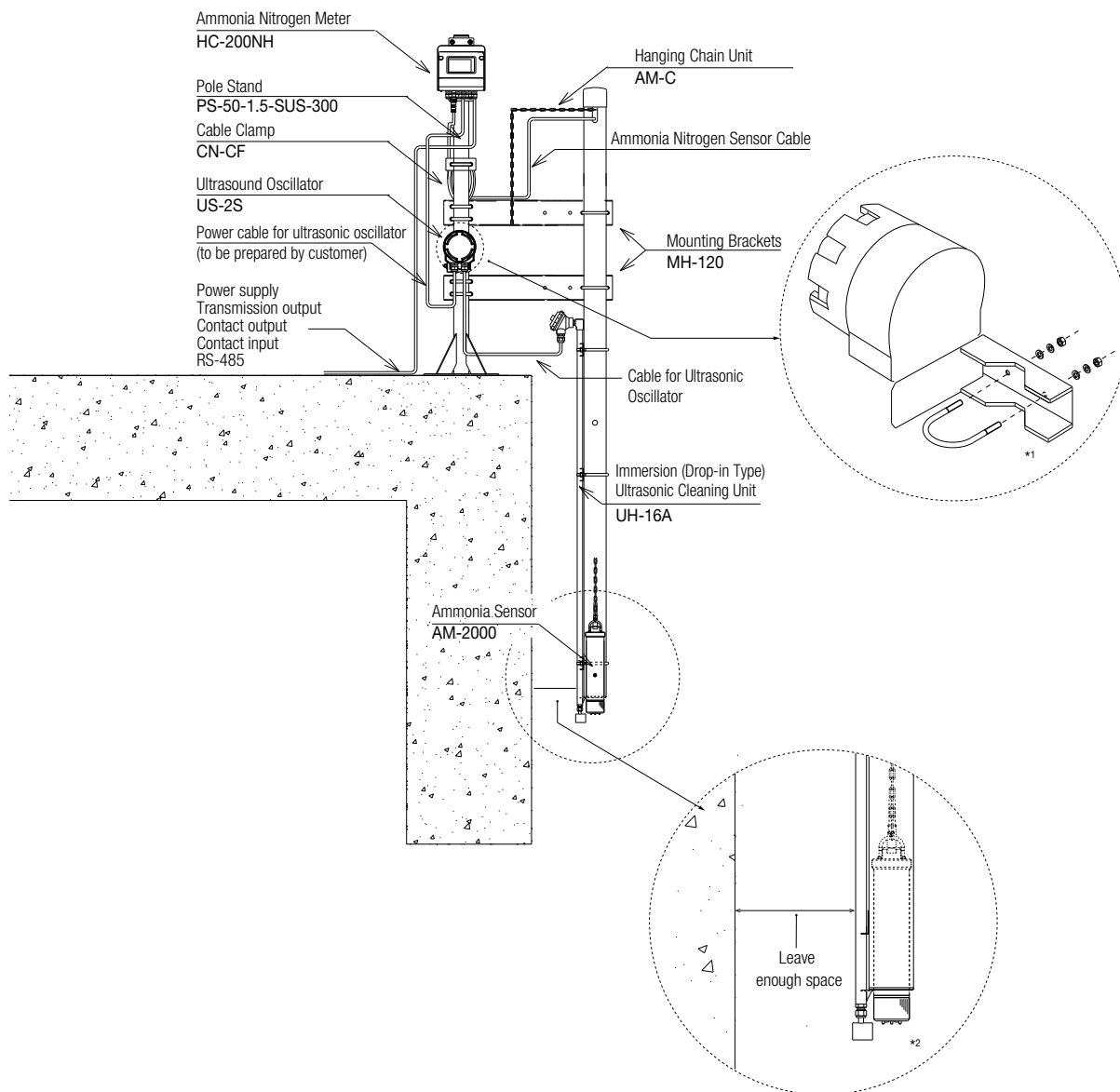


- *1 Secure the hanging chain unit with the mounting brackets. (The securing method used here is an example.)
- *2 Mount the mounting brackets to the pole stand with the included U-bolt. Secure the immersion holder (drop-in type) using the included U-bolt. (The immersion holder can be attached in one of two places. Select one according to the installation conditions.)
- *3 Secure the ring catch of the hanging chain unit to the chain hanger of the ammonia sensor.
- *4 Leave enough distance so that the flow in the tank does not cause contact with the wall or any obstructions.

- See page 25 for information on installing the converter.
- See page 26 for information on installing the cable clamp.

Installation Immersion Type Ultrasonic Cleaning Unit

Below is an example installation of the converter (HC-200NH), ammonia sensor (AM-2000), ultrasonic cleaning unit (UH-16A), ultrasonic oscillator (US-2S), mounting brackets (MH-120), hanging chain unit (AM-C), cable clamp (CN-CF) and pole stand (PS-50-1.5-SUS-300).



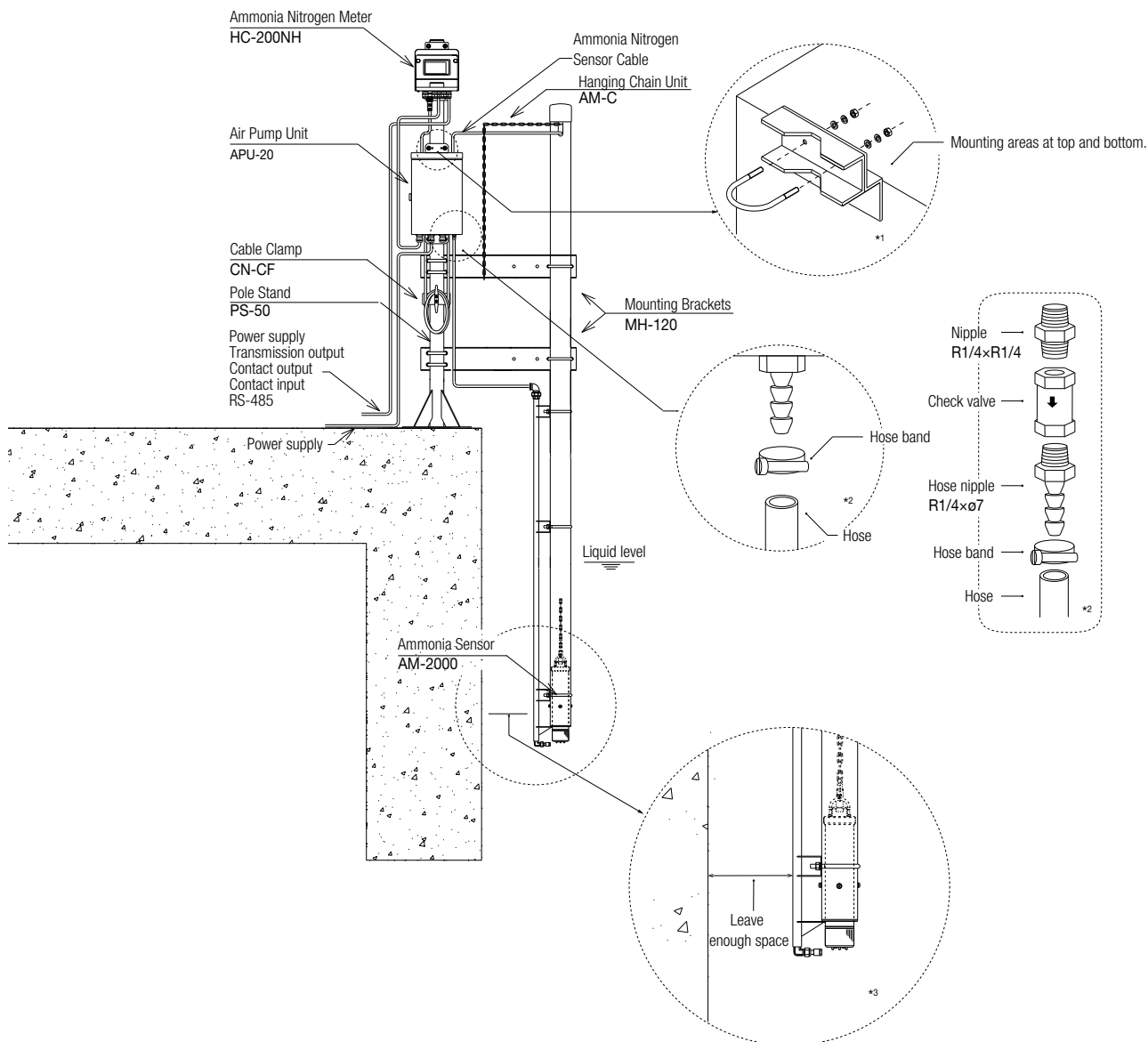
*1 Secure the ultrasonic oscillator (US-2S) to the pole stand, etc. (The securing method used here is an example.)

*2 Leave enough distance so that the flow in the tank does not cause contact with the wall or any obstructions.

- See page 25 for information on installing the converter.
See page 26 for information on installing the cable clamp.
See page 27 for information on installing the hanging chain unit and mounting brackets.

Installation Immersion Type Jet Cleaner

Below is an example installation of the converter (HC-200NH), ammonia sensor (AM-2000), jet cleaner (JH-16A), air pump unit (APU-20), mounting brackets (MH-120), hanging chain unit (AM-C), cable clamp (CN-CF) and pole stand (PS-50-1.5-SUS-300 or PS-50-1.7-SUS-300).



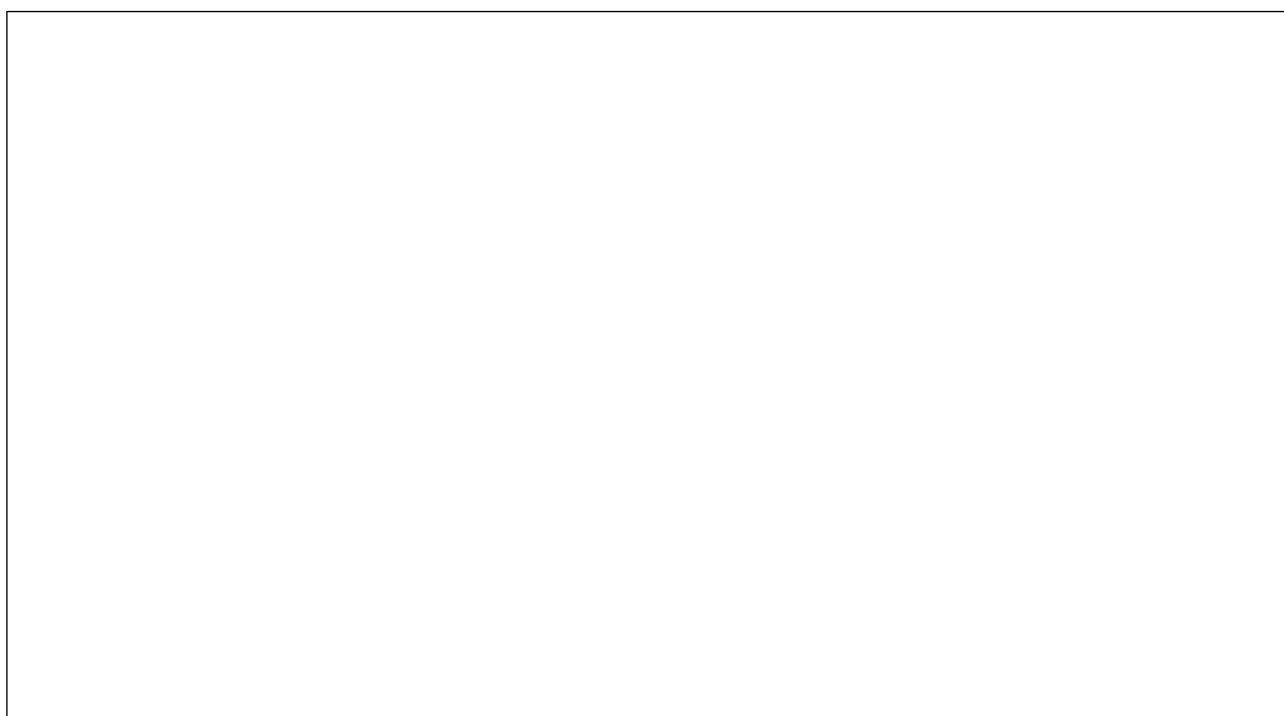
*1 Secure the air pump unit to the pole stand.

*2 Insert the hose (ø6×ø11mm) into the cleaning air outlet of the air pump unit and secure with the hose nipple. Install the check valve (to be prepared by customer) between the air pump unit and hose if necessary. (The hose and hose nipple are supplied with the air pump unit.)

*3 Leave enough distance so that the flow in the tank does not cause contact with the wall or any obstructions.

- See page 25 for information on installing the converter.
See page 26 for information on installing the cable clamp.
See page 27 for information on installing the hanging chain unit and mounting brackets.

The specifications in this engineering sheet are current as of July 2017.
Please note that these specifications may be changed for improvement purposes, etc. without prior notice.
Please contact HORIBA for final confirmation of information such as specifications.



H-1 Series Ammonia Nitrogen Meter (4-Wire Type)

HC-200NH

Engineering Sheet

Uses: Control and management of air flow during aeration of biological reaction tanks, etc.
Measuring principle: Ion electrode method

H-1 Series Ammonia Nitrogen Meter (4-Wire Type)

HC-200NH

Engineering Sheet

Uses: Control and management of air flow during aeration of biological reaction tanks, etc.

Measuring principle: Ion electrode method