



Drip-proof type design

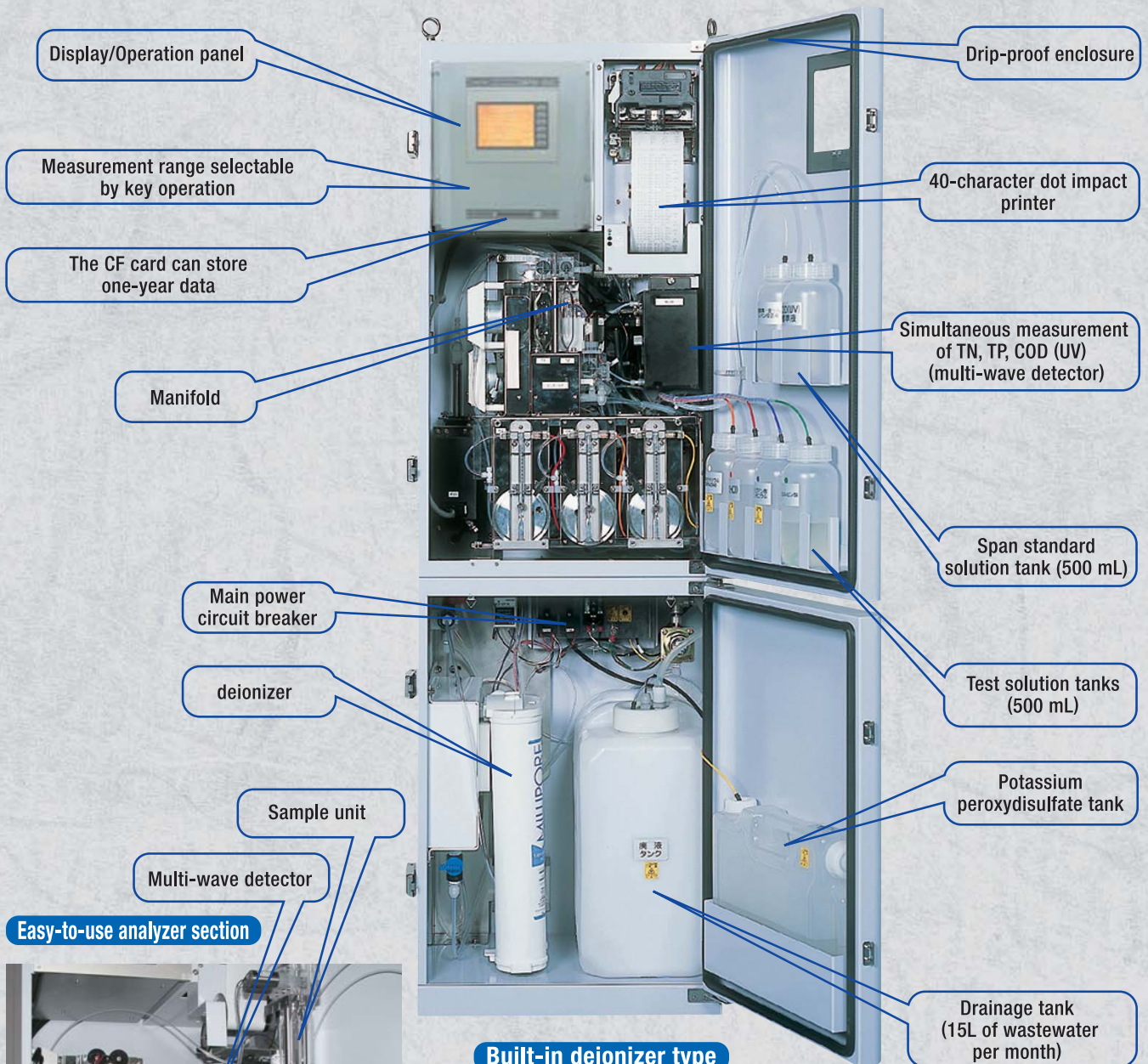
NPW-160

Automatic Total Nitrogen • Total Phosphorous / COD Analyzer

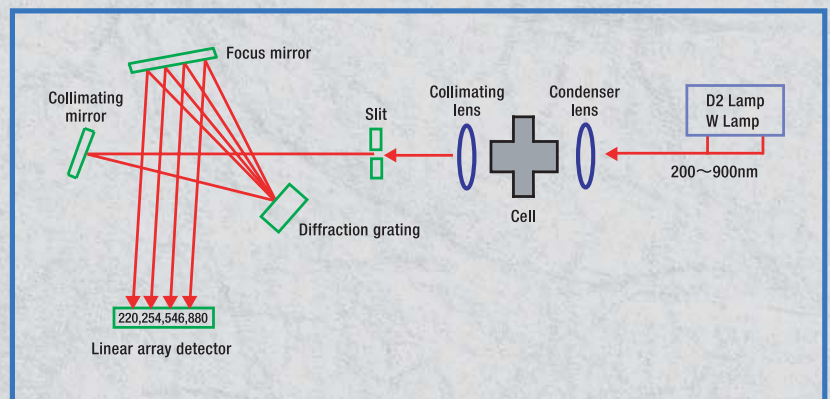


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Construction ... no connections pipes needed on the backside

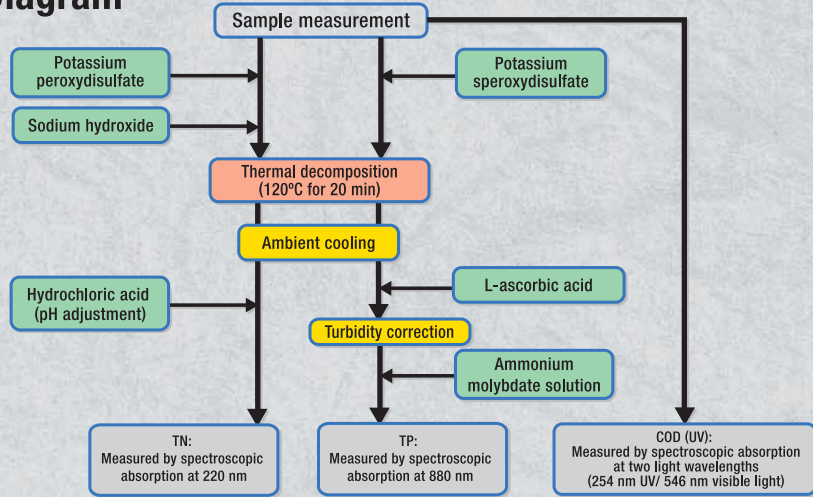


Built-in deionizer type (optional)

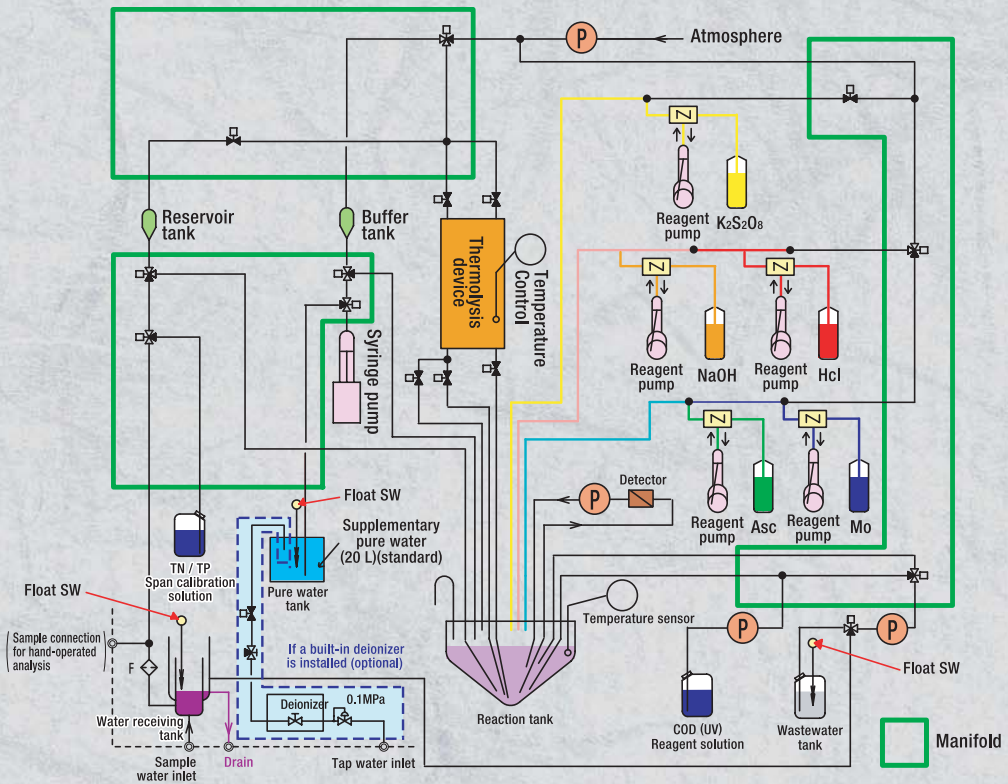


Optical system diagram of the multi-wave detector

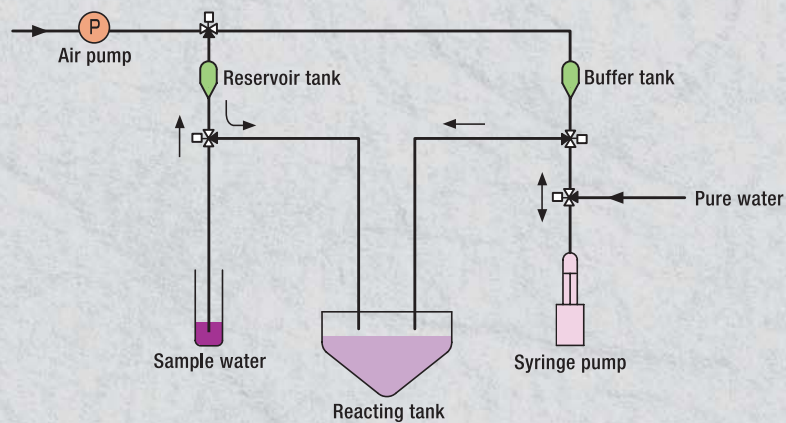
Measurement Flow Diagram



Measurement Diagram



Sample measurement system



Data print sample

Print out sample

02/03/28	HR	CONC.	FLOW	LOAD	
HH:MM		(mg/L)	(m3/h)	(kg/h)	
00:00	TN	28.4	2.69	0.07	
	TP	0.136	2.69	0.00	
	COD	32.9	2.69	0.09	
01:00	TN	25.6	2.55	0.07	
	TP	0.133	2.55	0.00	
	COD	30.5	2.55	0.08	
02:00	TN	28.4	2.69	0.07	
	TP	0.136	2.69	0.00	
	COD	32.9	2.69	0.09	
03:00	TN	25.6	2.55	0.07	
	TP	0.133	2.55	0.00	
	COD	30.5	2.55	0.08	
04:00	TN	28.4	2.69	0.07	
	TP	0.136	2.69	0.00	
	COD	32.9	2.69	0.09	
05:00	TN	25.6	2.55	0.07	
	TP	0.133	2.55	0.00	
	COD	30.5	2.55	0.08	
...	
22:00	TN	28.4	2.69	0.07	
	TP	0.136	2.69	0.00	
	COD	32.9	2.69	0.09	
23:00	TN	25.6	2.55	0.07	
	TP	0.133	2.55	0.00	
	COD	30.5	2.55	0.08	
MAX.		TN	TP	COD	
MIN.		(mg/L)	(mg/L)	(mg/L)	
AVE.		30.2	0.141	35.4	
		24.6	0.128	28.5	
		28.2	0.135	32.3	
FROM		TN-L	TP-L	COD-L	
CONC.		(kg/h)	(kg/h)	(kg/h)	
MAX.		2.69	0.08	0.00	
MIN.		2.37	0.06	0.00	
AVE.		2.52	0.07	0.00	
FROM		FLOW	LOAD		
CONC.		(m3/h)	(kg/d)		
MAX.		28.3	60.5	1.71	
MIN.		TP	0.132	60.5	0.01
AVE.		COD	32.2	60.5	1.95

Daily report print sample:
March 28, 2002

Print sample with load calculation

Daily concentration measurements
maximum value
minimum value
average value

Daily load
maximum value
minimum value
average value

Average daily concentration
Daily accumulated flow
Daily load

CF card, data format (sample)

Date	Time	N measured value	P measured value	COD measured value	Flow rate	N load	P load	COD load
		mg/L	mg/L	mg/L	m3/H	kg	kg	kg
Raw data to calculate load value								
2003.1.1	00:00	2.026	1.047	1.2	156.4	0.32	0.16	0.18
2003.1.1	01:00	2.026	1.047	1.2	156.4	0.32	0.16	0.18
2003.1.1	02:00	1.898	0.945	1.2	156.39	0.3	0.15	0.19
2003.1.1	03:00	1.898	0.945	1.2	156.49	0.3	0.15	0.19
2003.1.1	04:00	1.914	1.004	1.3	156.45	0.3	0.16	0.2
2003.1.1	05:00	1.914	1.004	1.3	156.5	0.3	0.16	0.2
2003.1.1	06:00	1.833	0.996	1.3		0.29	0.16	0.2
2003.1.1	07:00	1.833	0.996	1.3	156.5	0.29	0.16	0.2
2003.1.1	08:00	1.982	1.074	1.2	156.46	0.31	0.17	0.2
2003.1.1	09:00	1.982	1.074	1.2	156.4	0.31	0.17	0.2
2003.1.1	10:00	1.851	1.03	1.1	156.45	0.29	0.16	0.18
2003.1.1	11:00	1.851	1.03	1.1	156.46	0.29	0.16	0.18
2003.1.1	12:00	1.808	1.021	1.3	156.46	0.28	0.16	0.2
2003.1.1	13:00	1.808	1.021	1.3	156.45	0.28	0.16	0.2
2003.1.1	14:00	1.654	0.979	1.3	156.44	0.26	0.15	0.2
2003.1.1	15:00	1.654	0.979	1.3	156.46	0.26	0.15	0.2
2003.1.1	16:00	2.068	0.997	1.3	156.45	0.32	0.16	0.2
2003.1.1	17:00	2.068	0.997	1.3	156.46	0.32	0.16	0.2
2003.1.1	18:00	1.793	0.966	1.3	156.43	0.28	0.15	0.2
2003.1.1	19:00	1.793	0.966	1.3	156.51	0.28	0.15	0.2
2003.1.1	20:00	1.952	1.052	1.3	156.41	0.31	0.16	0.2
2003.1.1	21:00	1.952	1.052	1.3	156.52	0.31	0.16	0.2
2003.1.1	22:00	1.92	0.969	1.3	156.44	0.3	0.15	0.2
2003.1.1	23:00	1.92	0.969	1.3	156.51	0.3	0.15	0.2

Note: The raw data stored on the CF card are in the CSV format (comma separated)

Specifications

Product Name	Automatic Total Nitrogen - Total Phosphorous / COD Analyzer		
Model	NPW-160		
Measurement Items	Measures total nitrogen concentration, total phosphorous concentration, and COD (UV) concentration in the water		
Measurement Method	TN: Decomposition of alkali potassium peroxydisulfate (conforms to autoclave method: heated at 120°C for 30 min) - UV absorption spectroscopy TP: Decomposition of potassium peroxydisulfate (conforms to autoclave method: heated at 120°C for 30 min) - Molybdenum blue (ascorbic acid) absorption spectroscopy COD (UV): Spectroscopic absorption of two light wavelengths (UV 254 nm/visible light 546 nm)		
Measurement Range	TN: From 0 to 2 mg/L to 200 mg/L TP: From 0 to 0.5 mg/L to 20 mg/L COD (UV): From 0 to 0.5 Abs/cm to 2 Abs/cm Consult us for measurement requirements outside this range		
Repeatability	Within ± 3%FS, and ± 5%FS in the case of two-stage dilution		
Measurement Cycle	Selectable to 1 to 6 hours		
Measurement Stream	1 flow path		
Display Method	Digital LCD, 4 character display Touch Screen (LCD)		
Recorder	Internal compact flash memory (stores a years worth of data), automatic scrolling printer		
Calibration Method	Manual calibration via standard solution and automatic calibration function. Automatic zero calibration COD (UV).		
Analog Input Signal	Flow measurement value input DC 4 to 20 mA		
Analog Output Signal	Measured values and load values for TN, TP and COD (UV) Measured values / three variables DC 4 to 20 mA (load resistance 600 (max., insulation type) Load values / three variables		
Contact Input Signal	External measurement start signal, external calibration start signal, no sample water, and flowmeter maintenance in progress signals. Contact capacity: DC 24 V 0.3 A max.		
Contact Output Signal	Measured value alarm (3 items), load alarm (3 items), major malfunction, minor malfunction, maintenance in progress, calibration in progress, power off. Contact capacity: DC 24 V 0.3 A max / AC 125 V 0.1 A max.		
Ambient Temperature / Humidity	2 to 40°C / 85 (RH)% max		
Sample Conditions	Temp.: 2 to 40°C Pressure: 20 to 50 kPa Flow rate: 1 to 3 L/min Sample amount: 45 mL/single measurement (includes washing) 67.5 mL/single measurement if TN/TP/COD (UV) to be measured.		
Sampling	Draw from dedicated water receiving tank An adjustment tank in previous step can be installed (optional)		
Supply Water Conditions	If supply is pure water, it should not contain nitrogen, phosphorous, or organic matter.	IBuilt-in tank type Pure water supply type (optional) Built-in deionizer type (optional) External deionizer type (optional)	Refill frequency: fill into 20L tank every 5-10 days When the COD is measured using TN: 0-200 mg/L, TP: 0-200 mg/L, approximately every 5 days. When the COD is measured using TN: 0-5 mg/L, TP: 0-2 mg/L, approximately every 10 days.. Optional: use of on-site pure water Cartridge replacement frequency: once every 6 to 8 months (varies depending on the quality of tap water) Approximately every 6 months to 1 year: cartridge replacement frequency varies depending on the capacity of the external pure water cartridge and the quality of the tap water
Reagent refill interval	1 month		
Waste Fluid Volum	15 L/month		
Pollutant Integrator Calculation Unit	Equipped		
Power Requirement	AC100V±10V, 50/60Hz		
Power Consumption	500VA(max.), 200VA(average)		
External Dimensions	450(W)×380(D)×1430(H)mm		
Paint Color	Mansel 5PB8/1 Semi-gloss		
Weight	approx. 80 kg		
Construction and Facility Conditions	• Employs non-drip construction (equivalent to International Protection: IP52). • Specify external-use model for outside use. • Ensure installation location is not subject to vibrations or shock, and provide sufficient space for maintenance • Do not install near noise sources such as power equipment. • Avoid direct sunlight. Install with attention to ventilation for use in a corrosive environment.		

Variations (Optional Specifications)



Built-in pure water tank type



Built-in deionizer type

Monthly reagent consumption

	Reagent name	Powder reagents	Prepared reagents
Measuring reagents	Potassium peroxydisulfate (certified reagent)	Approx. 51 g/month	3 L/month
	Sodium hydroxide (certified reagent)	Approx. 29 g/month	500 mL/month
	Hydrochloric acid (special grade chemicals)	Approx. 51 mL/month	500 mL/month
	Ammonium molybdate solution (special grade chemicals)		
	• Ammonium molybdate tetrahydrate (special grade chemicals) • Potassium tartratoantimonate (III) (special grade chemicals) • Sulfuric acid (special grade chemicals)	Approx. 4 g/month Approx. 0.2 g/month Approx. 46 mL/month	Approx. 5 g/month
	L-ascorbic acid (special grade chemicals)	Approx. 5 g/month	500 mL/month
Calibration reagents	Potassium nitrate (special grade chemicals)	Approx. 0.3 g/month	
	Potassium dihydrogen phosphate (special grade chemicals)	Approx. 0.02 g/month	
	Potassium hydrogen phthalate (special grade chemicals)	Approx. 0.04 g/month	
	※ (1) Nitrogen / phosphorus mixed span solution		Approx. 300 mL/month
	※ (2) Phthalic acid span solution		Approx. 60 mL/month

※ (1) N/P calibration solution: 1 calibration (3 measurements) / calculated every two weeks.

※ (2) COD (UV) calibration solution: calculated based on one performance per month; 1 calibration (3 measurements) / performed at monthly intervals

Annual consumable parts (for the model with built-in pure water tank)

Part name, specification	Code	Amount
Transparent 20 mL cylinder assembly	5461210K	1 set
Syringes (set of 5) for the reagent pump	6804420K	2 sets
Tube for the sample fluid pump	125B724	5 pieces
O-ring kit	6804430K	1 set
PFA tube	116D302	5 m
Sleeve (φ3)	117B001	2 pieces
Silicone tube (φ7×10)	116C009	0.5 m
Cassette ribbon	131F083	1 cassette
Printer roll paper	131H404	4 rolls
Pure water cartridge	134G3031	2 cartridges

※The composition may vary depending on the specifications.

Time required for maintenance (estimate)

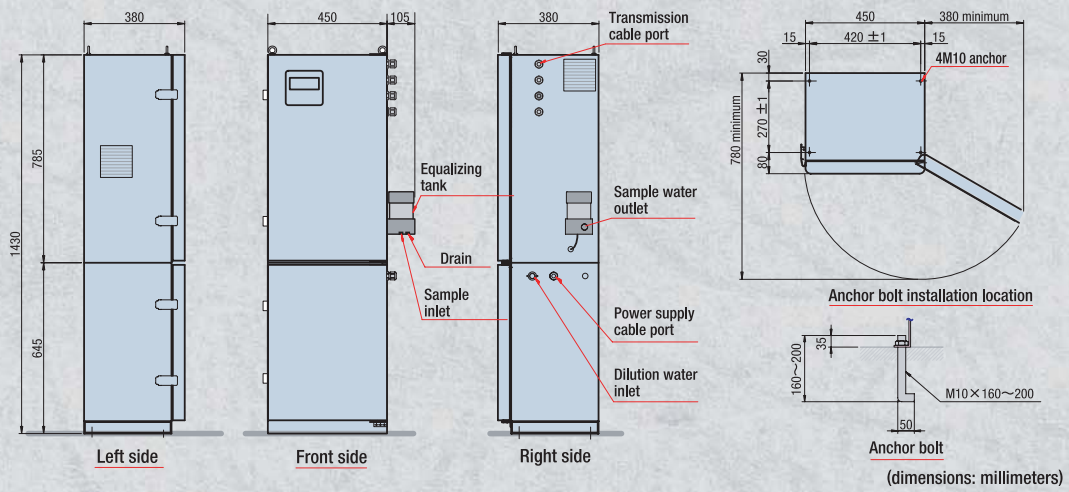
Contents and estimated maintenance time for regular maintenance works

Inspection interval	Maintenance item	Maintenance time (hours)
Yearly inspection	cleaning of manifold, reservoir tank, reagents, tanks, reaction tanks, detector cell, and etc. recording paper roll, replace ink ribbon, replacement of various tubes	4
Inspection every 6 months	cleaning of manifold, reservoir tank, reagents, tanks, reaction tanks, detector cell, and etc. recording paper roll	2
Inspection every 3 months	cleaning of manifold, reservoir tank, reagents, tanks, and etc. recording paper roll	1.5
Monthly inspections	waste fluid disposal, cleaning of the water collection tank, replacement of reagents	0.5

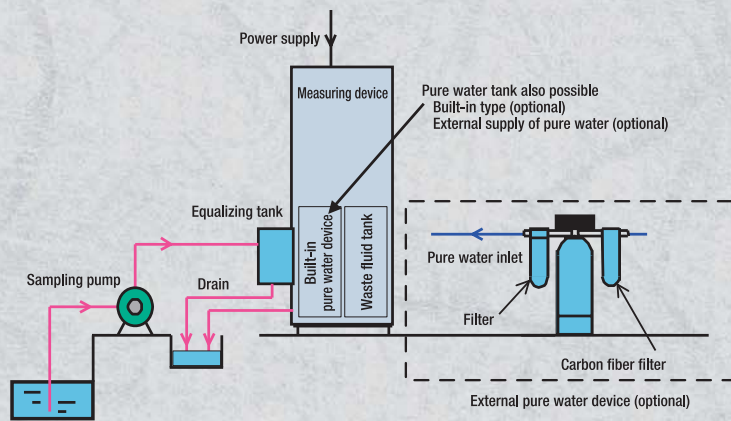
※The estimate of the required time applies when the customer himself performs these maintenances. When the maintenance is performed by technicians of contractors designated by us, different values apply.

External Dimensions

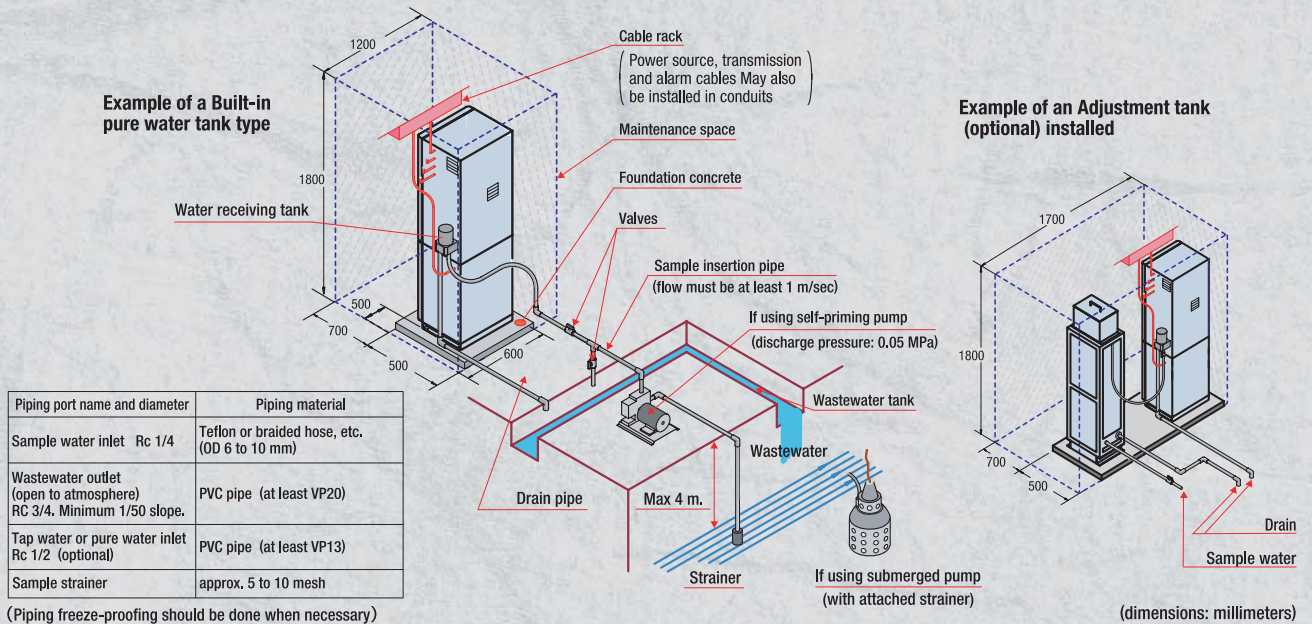
Model NPW-160 Dimensions



Installation diagram



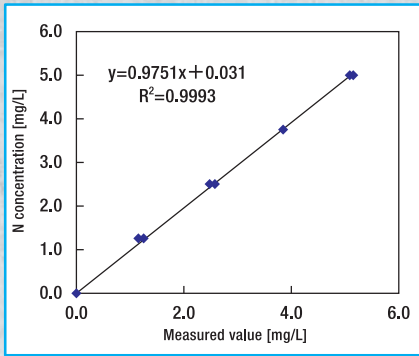
Indoor Installation Diagram



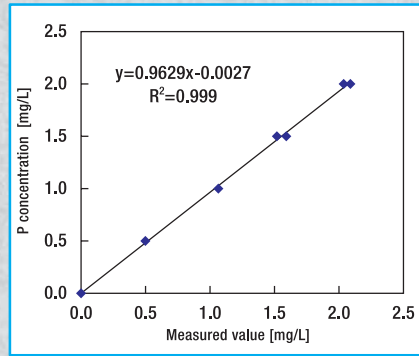
Basic Performance Data

10 mm Cell Linearity

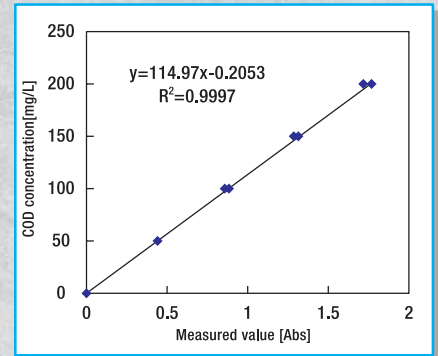
<TN>



<TP>

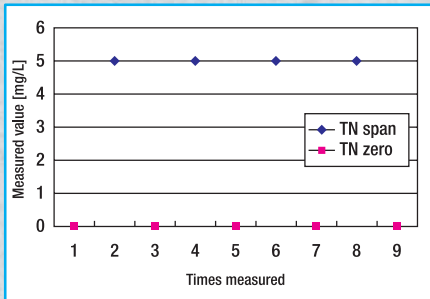


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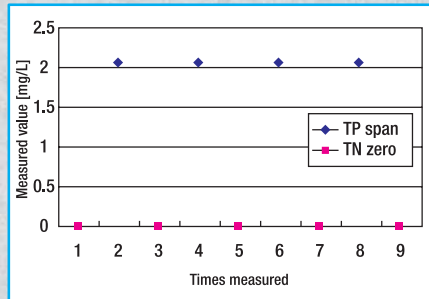


10 mm Cell Repeatability

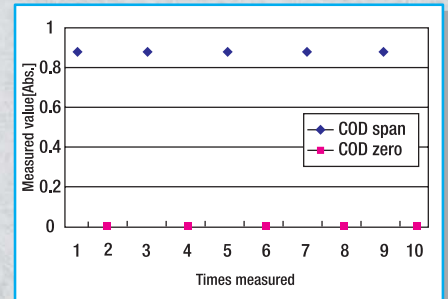
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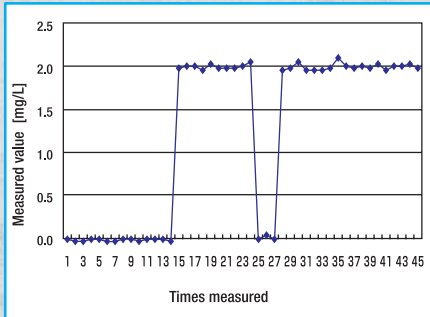


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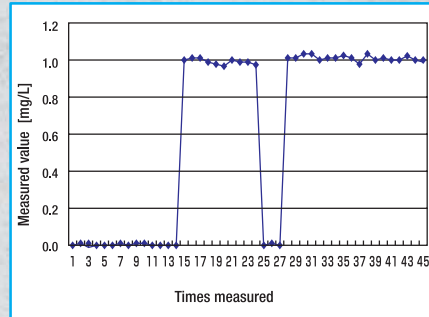


10 mm Cell Zero / Span drift

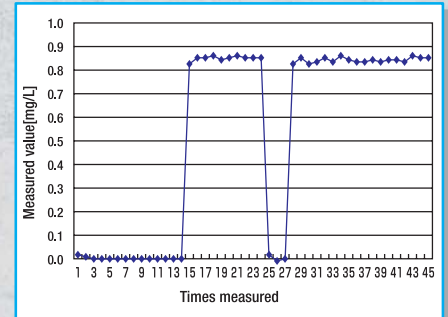
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<TP>

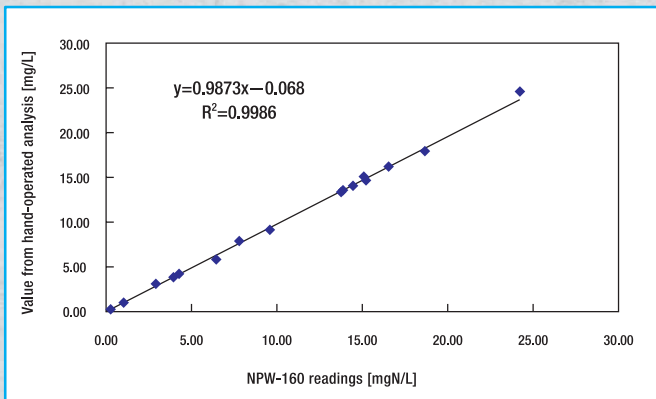


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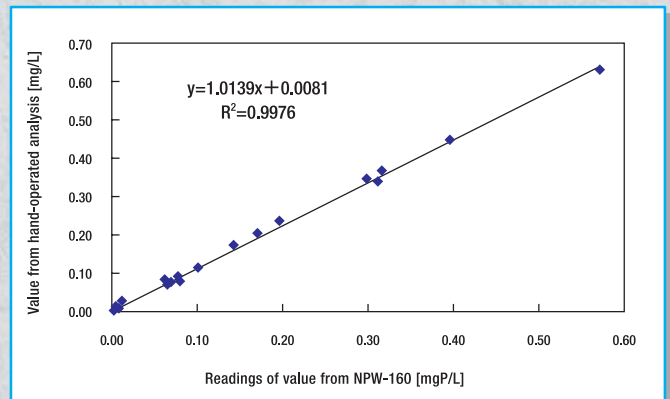


Value from hand-operated analysis vs. value from the NPW-160 type (example of on-site measurement)

<TN>



<TP>





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Carefully read the instruction manual of all products in the catalog, and use them correctly.

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