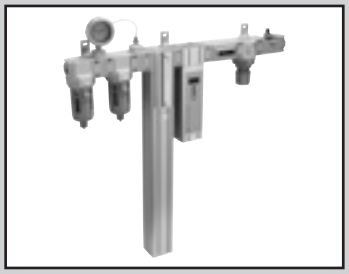


Nitrogen gas extraction unit system

NSU-FP1 Series

Easily and stably supplying nitrogen gas.

- Nitrogen gas is obtained just by piping to a pneumatic source.
- All-in-one design with superior installation performance.

Specifications

Item				NSU-3S	NSU-3L	NSU-4S	NSU-4F	NSU-4L	NSU-4G	NSU-4H
Range of working conditions	Working fluid			Compressed air						
	Inlet air pressure		MPa	0.4 to 1.0(*1)						
	Proof pressure		MPa	1.5						
	Inlet air temperature		°C	5 to 50						
	Relative humidity of inlet air		RH	50%						
	Ambient temperature		°C	5 to 50						
Rating	Inlet air pressure dew point		°C	10						
	Inlet air pressure		MPa	0.7						
	Inlet air temperature		°C	25						
	Ambient temperature		°C	25						
Rating Flow rate	Outlet nitrogen gas flow rate L/min(ANR) (*2)	Nitrogen concentration (%) or higher	99.9	1.9	5.6	11.0	20.9	30.6	31.9	49.0
			99	5.0	15.5	28.2	53.6	66.9	81.8	107.0
			97	8.9	28.7	49.9	94.8	118.1	159.7	189.0
			95	14.0	39.8	65.3	124.1	169.2	222.0	270.7
			90	27.0	78.1	137.3	260.9	313.5(*4)	(*5)	
	Inlet air flow rate L/min(ANR)		99.9	17.3	50.9	100.0	190.0	278.2	290.0	445.5
			99	20.9	64.6	117.5	223.3	278.8	340.8	445.8
			97	24.1	77.6	134.9	256.2	319.2	431.6	510.8
			95	31.2	88.5	145.2	275.8	376.0	493.3	601.6
			90	60.0	173.6	305.1	579.7	696.7(*4)	(*5)	
Air filter		Filtration rating	μm	5						
Oil mist filter		Oil removal	mg/m^3	0.01Less than or equal to (0.1 or less after oil saturation) * Primary oil content $30mg/m^3$ when , 21°C.						
Regulator		Set pressure range	MPa	0.05 to 0.85						
Oxygen monitor				Refer to page 329 for the specifications.						
Flow rate sensor				Refer to page 309 for the specifications.						
Needle valve		Flow characteristics		Refer to page 298.						
Standard accessories				Pressure gauge/differential pressure gauge/bracket						

*1: The inlet air pressure when NS-QFS-E is assembled is 0.4 to 0.75MPa.
*2: When the membrane unit size "H" is selected and the inlet temperature is 50 °C, use the outlet flow rate with a nitrogen gas concentration of 99.9% at 39 L / min or less. Contact CKD when working beyond the specified range.
*3: Refer to the outlet nitrogen gas flow rate and the needle valve flow characteristics to confirm that the value is within the working range. Contact CKD when working outside the specified range.
*4: When the "L" sized membrane unit is selected and the outlet nitrogen gas with a concentration of 90% is used, the inlet air temperature should be 40 °C or less. Please contact CKD if you intend to use the product above 40 °C.
*5: When the "G" and "H" membrane sized units are selected, please contact us if you want to use the outlet nitrogen gas with a concentration of 90%.

Selection guide

The temperature and inlet air pressure affect the outlet nitrogen gas flow and should be corrected if they differ from the ratings in the specification section.

STEP 1 Confirm the working conditions Outlet nitrogen gas flow rate [L/min (ANR)] Outlet nitrogen gas pressure [MPa] Inlet air pressure [MPa] Inlet air temperature [°C]

STEP 2 Confirm the compensation coefficient for outlet nitrogen gas flow rate affected by inlet air temperature.

(1) Temperature - Gas flow rate compensation coefficient

Temperature(°C)	Outlet nitrogen gas concentration				
	99.9%	99%	97%	95%	90%
5	0.64	0.79	0.79	0.75	0.78
10	0.73	0.84	0.84	0.81	0.84
25	1	1	1	1	1
35	0.97	1.05	1.04	1.07	1.07
40	0.95	1.08	1.06	1.11	1.11
50	0.9	1.09	1.11	1.15	1.2

STEP 3 Confirm the compensation coefficient for outlet nitrogen gas flow rate affected by inlet air pressure.

(2) Pressure - Gas flow rate compensation coefficient

Pressure(MPa)						
0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.4	0.65	0.75	1	1.07	1.2	1.3

STEP 4 **Find the appropriate body size and membrane unit size based on the rated outlet nitrogen gas flow rate of each model.**

Rated outlet nitrogen gas flow rate × (1) Temperature gas flow rate correction coefficient × (2) Pressure gas flow rate correction coefficient = Corrected purified nitrogen gas flow rate

Select the body size and membrane unit size in which the corrected purified nitrogen gas flow rate meets the required gas flow rate

STEP 5 Select the required needle valve according to the outlet nitrogen gas flow rate.

Using the outlet nitrogen gas flow rate and the outlet nitrogen gas pressure confirmed in STEP 1, select a needle valve based on the needle valve flow rate characteristics (Page 298)

STEP 6 **Select the model from STEP4 and STEP5.**

STEP 7 Confirm the compensation coefficient of inlet air flow rate affected by inlet air temperature.

(3) Temperature - Air flow rate compensation coefficient

Temperature(°C)	Outlet nitrogen gas concentration				
	99.9%	99%	97%	95%	90%
5	0.73	0.68	0.75	0.69	0.76
10	0.8	0.76	0.81	0.77	0.82
25	1	1	1	1	1
35	1.21	1.17	1.11	1.13	1.11
40	1.32	1.25	1.17	1.2	1.16
50	2.05	1.38	1.31	1.31	1.3

STEP 8 Confirm the compensation coefficient for inlet air flow rate affected by inlet air pressure.

(4) Pressure - Air flow rate compensation coefficient

Pressure(MPa)						
0.4	0.5	0.6	0.7	0.8	0.9	1.0
0.61	0.79	0.91	1	1.07	1.2	1.3

STEP 9 **Find the inlet air flow rate from the rated outlet nitrogen gas flow rate of each model.**

Inlet air flow rate of the model selected in STEP5 × (3) temperature air flow rate correction coefficient × (4) pressure air flow rate correction coefficient = corrected inlet air flow rate

Based on the inlet air flow rate corrected as above, confirm whether the compressor capacity is sufficient.

Example of calculation

Conditions	Working conditions	Selecting conditions	Compensation coefficient for outlet nitrogen gas flow rate	Compensation coefficient for inlet air flow rate
Outlet nitrogen flow rate	50 [L/min(ANR)]	50 [L/min(ANR)]	-	-
Outlet nitrogen concentration	99 [%]	99 [%]	-	-
Outlet nitrogen pressure	0.2 [MPa]	0.2 [MPa]	-	-
Inlet air temperature	35 [°C]	40 [°C]	(1) 1.08	(3) 1.25
Inlet air pressure	0.6 to 0.7 [MPa]	0.6 [MPa]	(2) 0.75	(4) 0.91

Calculate the following and select according to the above conditions.

From the formula 50 (outlet nitrogen gas flow rate) ÷ 1.08 ÷ 0.75 = 61.7[L/min(ANR)], the specification field shows that NSU-4L has sufficient flow rate and is the proper size.

For needle size, select NS-QDVL-160 at 0.2 [MPa], which can be adjusted at 50 [L/min (ANR)].

This enables the selection of "NSU-4LC10AAK-N".

In this case, the inlet air flow rate is 278.8 × 1.25 × 0.91 = 317.1L/min (ANR).

How to order

NSU - 4 S A 10A NN - N T - FP1

- A Body size
- B Membrane unit size
- C Needle valve
- D Port size
- E Oxygen monitor/flow rate sensor
- F Option
- G Mounting direction

Code	Description
A Body size	
3	Body width 63
4	Body width 79
B Membrane unit size	***1**
S	Short
F	Short + Short
L	Long
G	Long + Short
H	Long + Long
C Needle valve	***2**
A	Max. flow rate 20 L/min
B	Max. flow rate 80L/min
C	Max. flow rate 160 L/min
D	Max. flow rate 240 L/min
E	Max. flow rate 400 L/min
D Port size	
10 A	Rc3/8
10 B	G3/8 *3
10C	NPT3/8 *4
E Oxygen monitor/flow rate sensor	***5**
NN	No
AK	With oxygen monitor
AM	With O_2 conc. monitor, traceability certif. with series variation diag. / company certif.
BA	With flow rate sensor (20 L/min specification)
BB	With flow rate sensor (50 L/min specification)
BC	With flow rate sensor (100 L/min specification)
BD	With flow rate sensor (200 L/min specification)
BE	With flow rate sensor (500 L/min specification)
CA	With oxygen monitor and flow rate sensor (20 L/min specification)
CB	With oxygen monitor and flow rate sensor (50 L/min specification)
CC	With oxygen monitor and flow rate sensor (100 L/min specification)
CD	With oxygen monitor and flow rate sensor (200 L/min specification)
CE	With oxygen monitor and flow rate sensor (500 L/min specification)
CF	With oxygen monitor (with traceability) and flow rate sensor (20 L/min specification)
CG	With oxygen monitor (with traceability) and flow rate sensor (50 L/min specification)
CH	With oxygen monitor (with traceability) and flow rate sensor (100 L/min specification)
CJ	With oxygen monitor (with traceability) and flow rate sensor (200 L/min specification)
CK	With oxygen monitor (with traceability) and flow rate sensor (500 L/min specification)
F Option	
N	No option
E	With exhaust port *6
K	Flow Rate Sensor Unit Switching Function (Overseas only)
P	Flow rate sensor Switch output: PNP output
X	Reverse flow *7
G Mounting direction	
Blank	Vertical mounting
T	Horizontal mounting (Select from NSU-4S and 4L models)

* Contact CKD for other combinations.

* The oxygen sensor does not include connector cables. Order the following connector cable discrete model No.

Connector cable discrete model No.

● DC cable

PNA-1D

Cable length	
1D	1000 mm
3D	3000 mm
5D	5000 mm

● AC adapter single unit

PNA-A

● AC adapter + conversion plug set

PNA-AG

Refer to page 16 for dimensions.

⚠ Precautions for model No. selection

*1: Only the body size "4" is available for the membrane unit sizes "F", "G" and "H".

*2: ⓒRefer to the table below for needle valve combinations. Select a flow rate sensor with a suitable range for the needle valve.

	Needle valve size NS-QDVL-***				
	20	80	160	240	400
NSU-3S	A	B			
NSU-3L	A	B	C		
NSU-4S/4F	A	B	C	D	
NSU-4L/4G/4H	A	B	C	D	E

*3: When selecting G3/8, the regulator pressure gauge units will be shown as bar.

*4: When selecting NPT3/8, the regulator pressure gauge units will be shown as psi.

*5: Switch output for the flow rate sensor is NPN. Specify the option "P" to obtain PNP output.

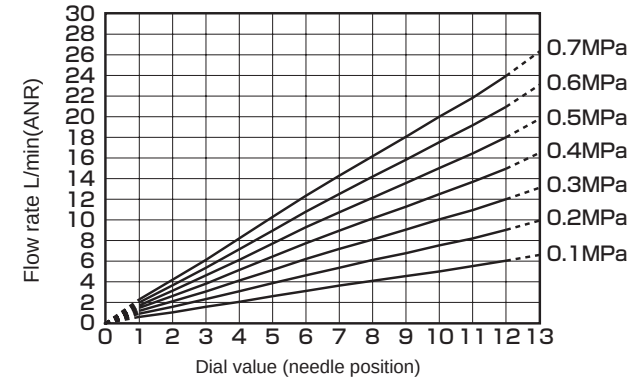
*6: Exhaust air (oxygen-enriched gas) from standard products is released into the atmosphere. For "E", piping connection for exhaust (oxygen-rich gas) is possible. Size of exhaust port is Rc1/2.

*7: Viewed from the front, standard products have an air inlet on the left port and a nitrogen gas outlet on the right port.

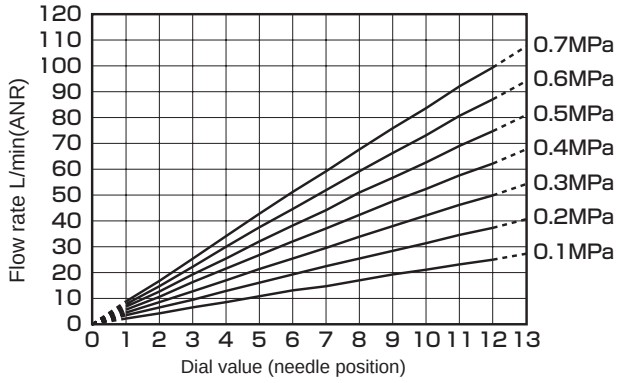
Needle valve flow characteristics

*The flow rate characteristics graph indicates reference values and does not guarantee the values.

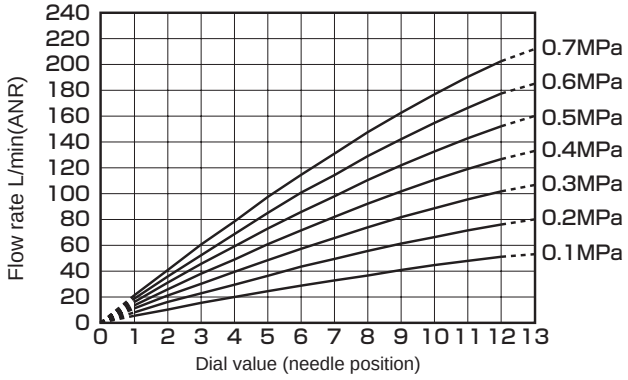
● NS-QDVL-020



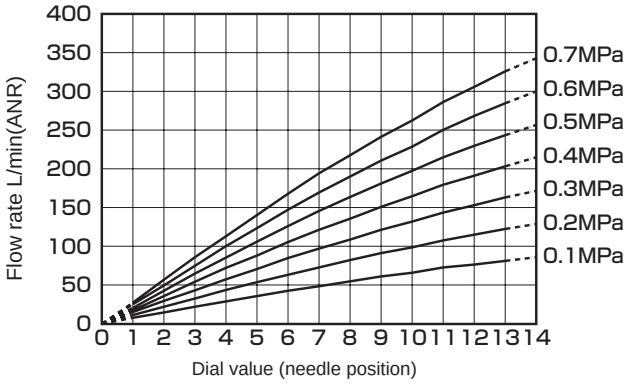
● NS-QDVL-080



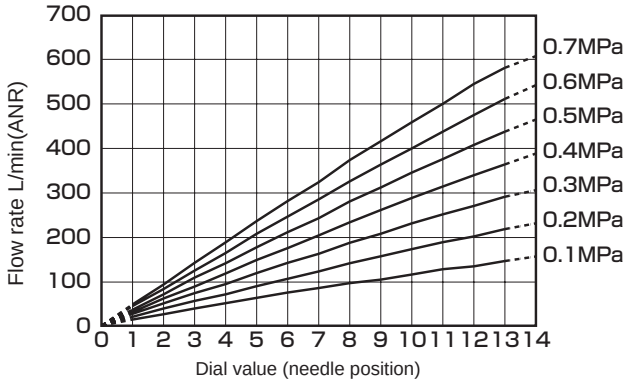
● NS-QDVL-160



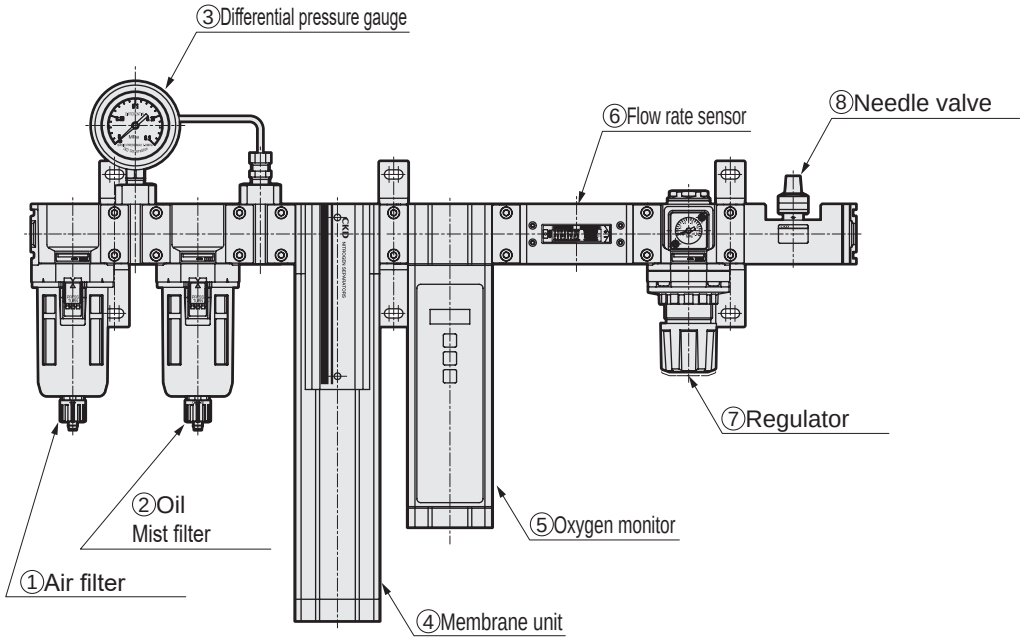
● NS-QDVL-240



● NS-QDVL-400



System components (vertical mount)

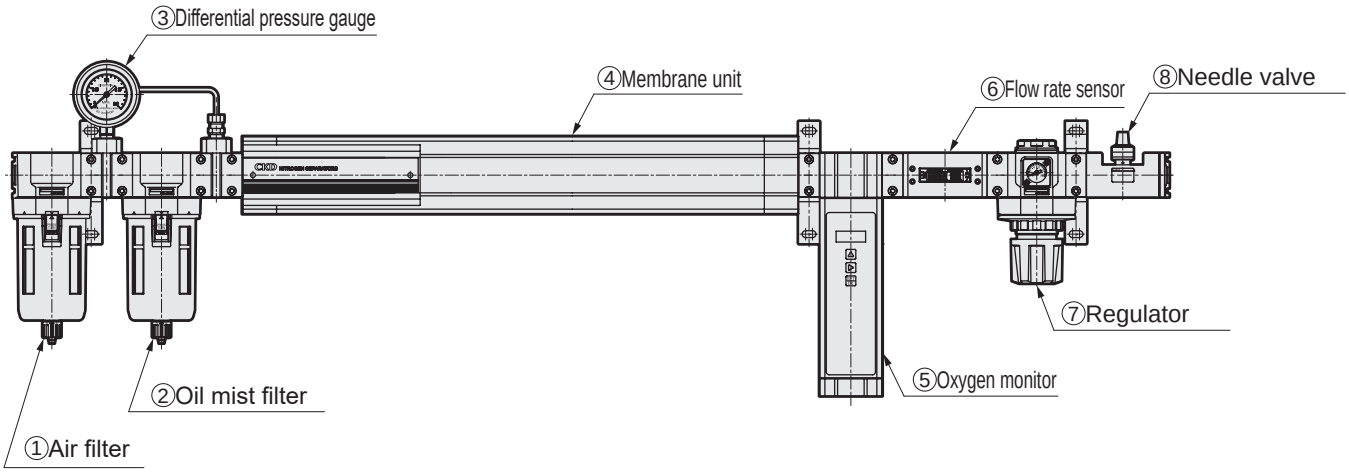


■ With port size Rc3/8

Unit model No.	NSU-3S□-FP1	NSU-3L□-FP1	NSU-4S□-FP1	NSU-4F□-FP1	NSU-4L□-FP1	NSU-4G□-FP1	NSU-4H□-FP1
(1) Air filter	F3000-10-W-F-FP1		F4000-10-W-F-FP1				
(2)Oil mist filter	M3000-10-W-F1-FP1		M4000-10-W-F1-FP1				
(3) Differential pressure gauge	GA400-8-P02						
(4) Membrane unit	NS-3S110A-□-FP2	NS-3L110A-□-FP2	NS-4S110A-□-FP2	NS-4S110A-□-FP2 NS-4S110A-□-FP2	NS-4L110A-□-FP2	NS-4L110A-□-FP2 NS-4S110A-□-FP2	NS-4L110A-□-FP2 NS-4L110A-□-FP2
(5) Oxygen monitor	PNA-10A-□-FP2						
(6) Flow rate sensor	NS-QFS-□						
(7)Regulator	NS-QR3-FP1		NS-QR4-FP1				
(8)Needle valve	NS-QDVL-020 NS-QDVL-080	NS-QDVL-020 NS-QDVL-080 NS-QDVL-160	NS-QDVL-020 NS-QDVL-080 NS-QDVL-160 NS-QDVL-240		NS-QDVL-020 NS-QDVL-080 NS-QDVL-160 NS-QDVL-240 NS-QDVL-400		

*Contact CKD regarding port size G3/8 and NPT3/8.

System components (horizontal mounting)



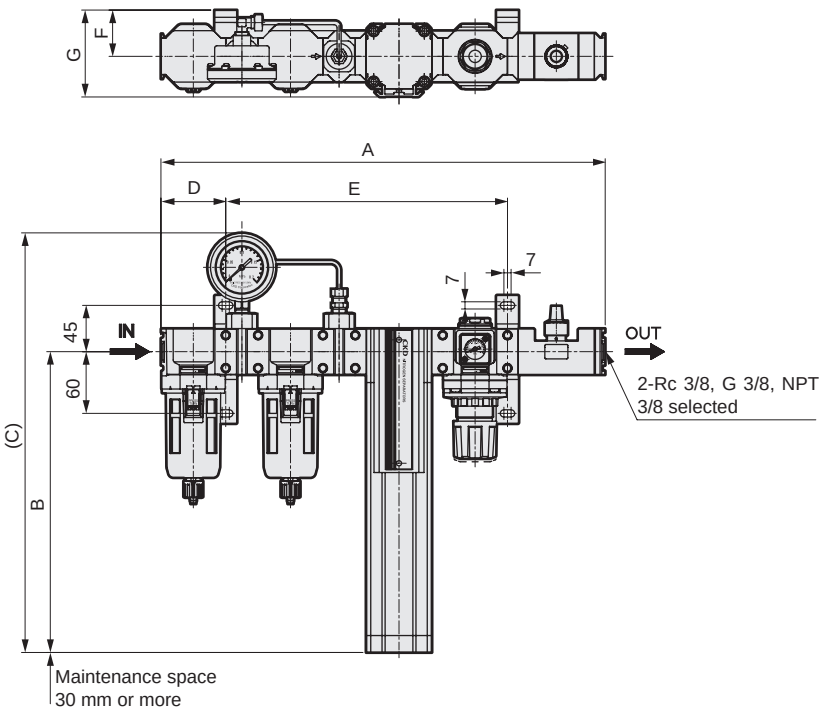
■ With port size Rc3/8

Unit model No.	NSU-4S□-□T-FP1	NSU-4L□-□T-FP1
(1) Air filter	F4000-10-W-F-FP1	
(2)Oil mist filter	M4000-10-W-F1-FP1	
(3) Differential pressure gauge	GA400-8-P02	
(4) Membrane unit	NS-4S110A- □ T-FP2	NS-4L110A- □ T-FP2
(5) Oxygen monitor	PNA-10A- □ -FP2	
(6) Flow rate sensor	NS-QFS- □	
(7)Regulator	NS-QR4-FP1	
(8)Needle valve	NS-QDVL-020 NS-QDVL-080 NS-QDVL-160 NS-QDVL-240	NS-QDVL-020 NS-QDVL-080 NS-QDVL-160 NS-QDVL-240 NS-QDVL-400

*Contact CKD regarding port size G3/8 and NPT3/8.

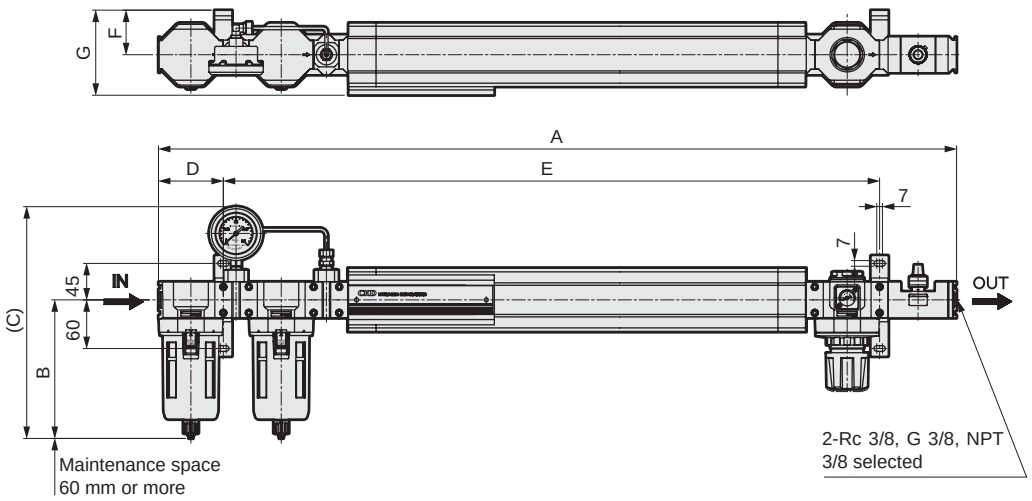
Dimensions(1-station type)

● Without oxygen monitor/without flow rate sensor (NSU-$^{3S}_{4L}$*10*NN-FP1)



Model No.	A	B	C	D	E	F	G	Weight(kg)
NSU-3S*10*NN	432	293	408	63	274	45	85	4.0
NSU-3L*10*NN	432	543	658	63	274	45	85	4.9
NSU-4S*10*NN	498	543	658	80	323	55	106	6.9
NSU-4L*10*NN	498	1043	1158	80	323	55	106	9.7

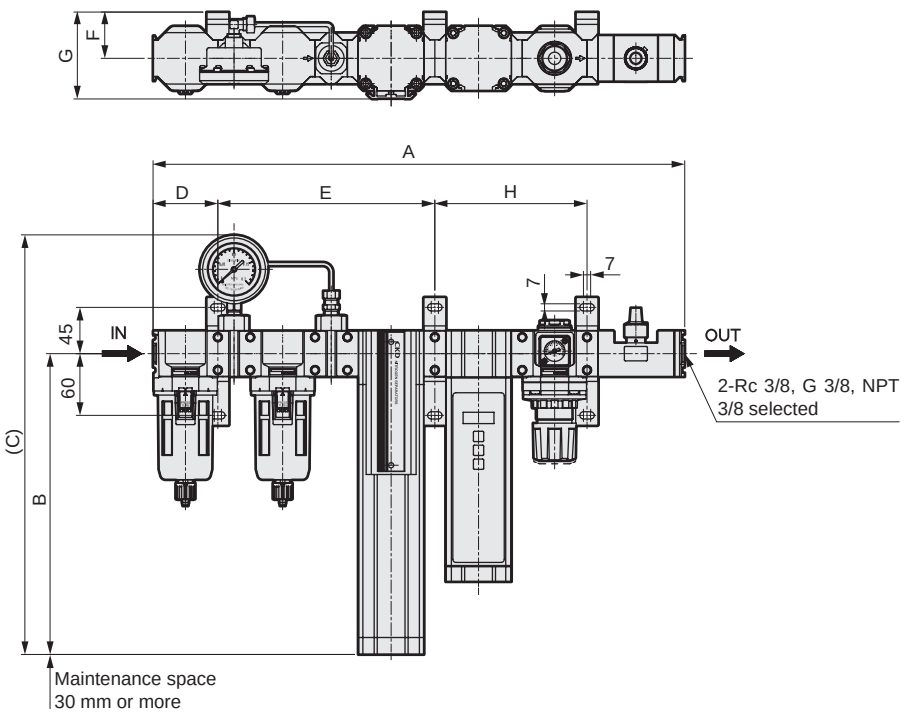
● Without oxygen monitor/without flow rate sensor (NSU-4$^{S}_{L}$* 10*NN-*T-FP1)



Model No.	A	B	C	D	E	F	G	Weight(kg)
NSU-4S*10*NN-*T	985	171	286	80	810	55	106	7.1
NSU-4L*10*NN-*T	1485	171	286	80	1310	55	106	9.9

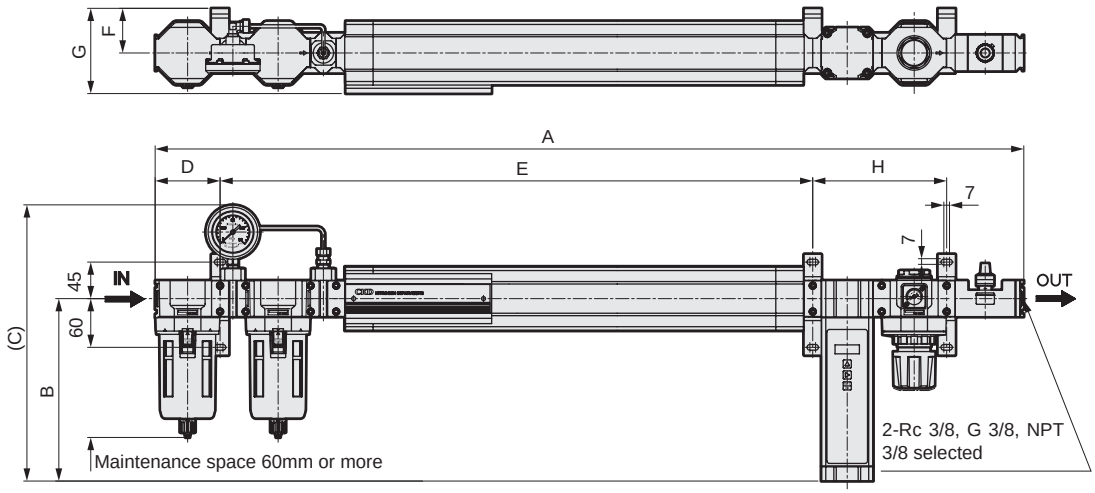
Dimensions

● With oxygen monitor/without flow rate sensor (NSU-$^{3S}_{4L}$*10*A*-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight(kg)
NSU-3S*10*A*	517	293	408	63	211	45	85	148	5.6
NSU-3L*10*A*	517	543	658	63	211	45	85	148	6.5
NSU-4S*10*A*	583	543	658	80	243	55	106	165	8.5
NSU-4L*10*A*	583	1043	1158	80	243	55	106	165	11.3

● With oxygen monitor/without flow rate sensor (NSU-4$^{S}_{L}$* 10*A*-*T-FP1)

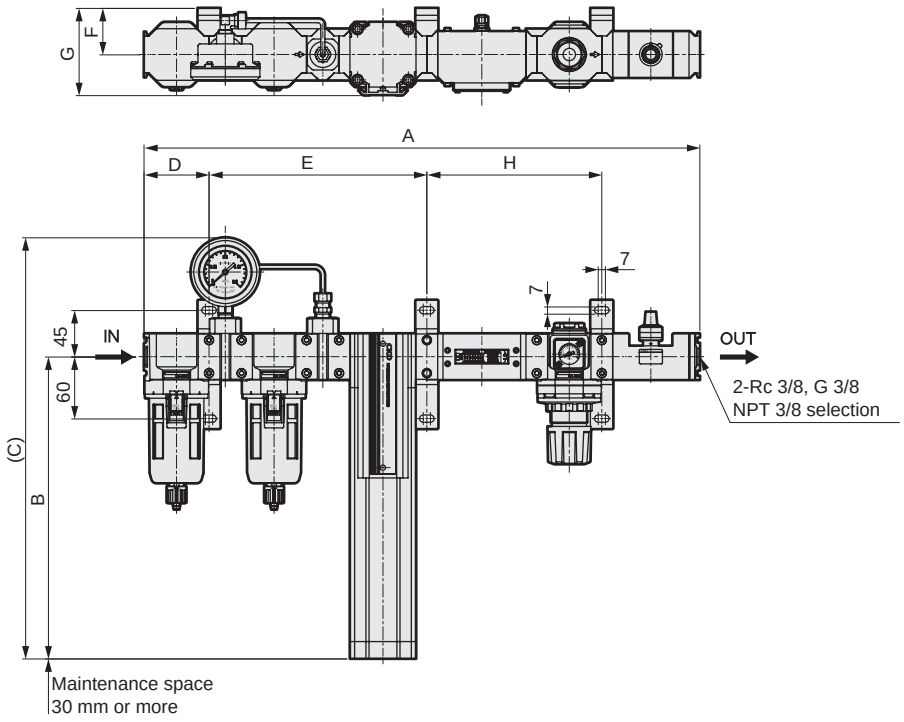


* Required wiring space of 60mm or more under the oxygen concentration monitor.

Model No.	A	B	C	D	E	F	G	H	Weight(kg)
NSU-4S*10*A*-*T	1070	225	340	80	730	55	106	165	8.7
NSU-4L*10*A*-*T	1570	225	340	80	1230	55	106	165	11.5

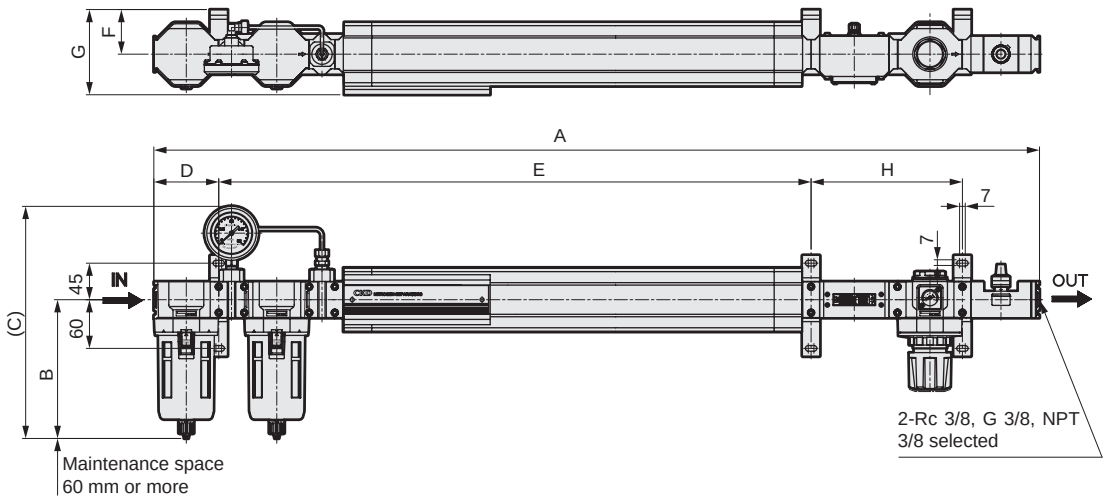
Dimensions (1 station)

● Without oxygen monitor/with flow rate sensor (NSU-$^{3S}_{4L}$*10*B*-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-3S*10*B*	538.5	293	408	63	211	45	85	169.5	4.8
NSU-3L*10*B*	538.5	543	658	63	211	45	85	169.5	5.7
NSU-4S*10*B*	604.5	543	658	80	243	55	106	186.5	7.7
NSU-4L*10*B*	604.5	1043	1158	80	243	55	106	186.5	10.5

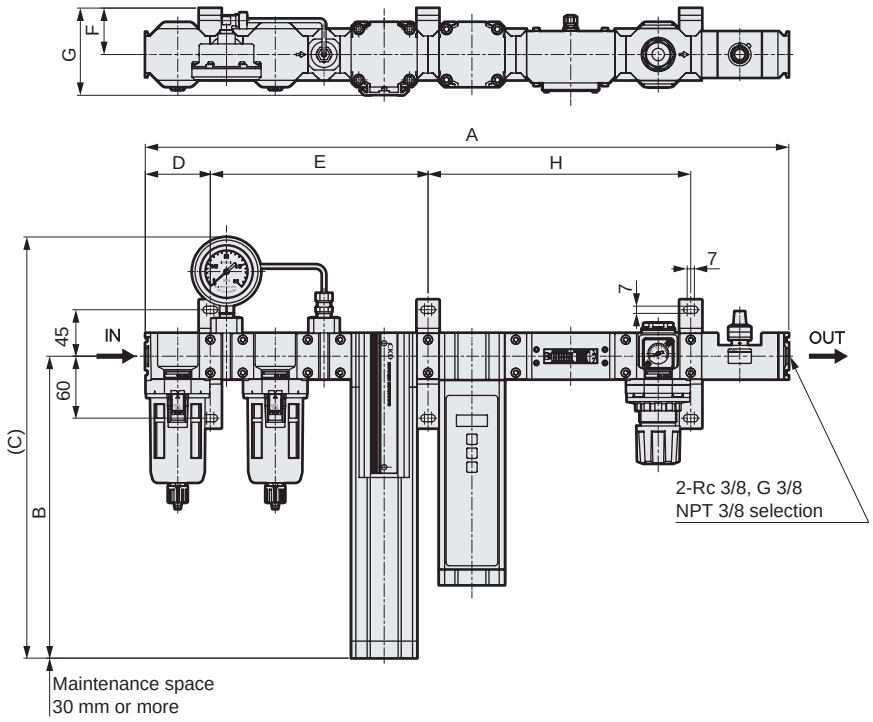
● Without oxygen monitor/with flow rate sensor (NSU-4$^{S}_{L}$* 10*B*-*T-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-4S*10*B*-*T	1091.5	171	286	80	730	55	106	186.5	7.9
NSU-4L*10*B*-*T	1591.5	171	286	80	1230	55	106	186.5	10.7

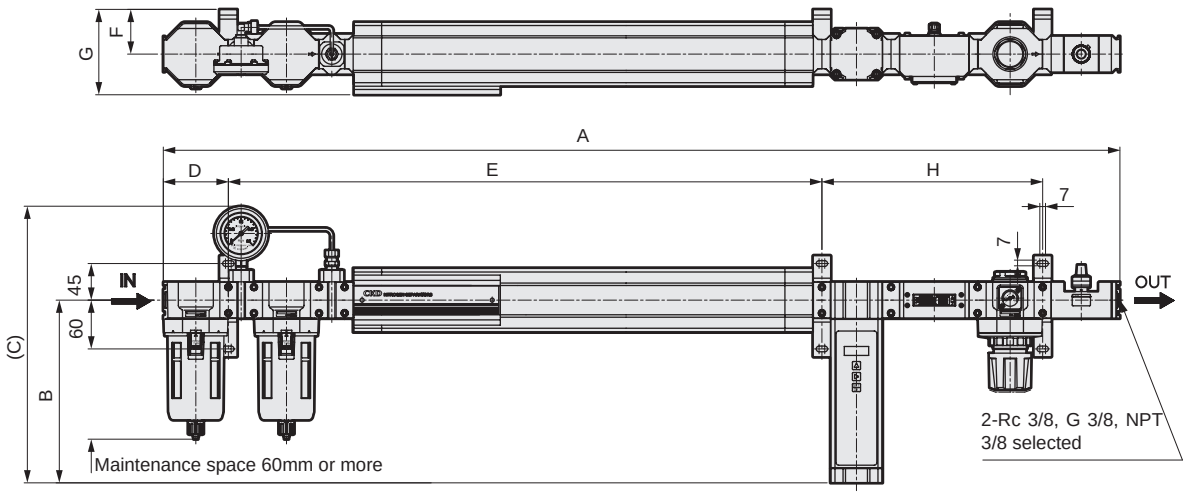
Dimensions (1 station)

● With oxygen monitor/flow rate sensor (NSU-$^{3S}_{4L}$*10*C*-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-3S*10*C*	623.5	293	408	63	211	45	85	254.5	6.4
NSU-3L*10*C*	623.5	543	658	63	211	45	85	254.5	7.3
NSU-4S*10*C*	689.5	543	658	80	243	55	106	271.5	9.3
NSU-4L*10*C*	689.5	1043	1158	80	243	55	106	271.5	12.1

● With oxygen monitor/with flow rate sensor (NSU-4$^{S}_{L}$* 10*C*-*T-FP1)

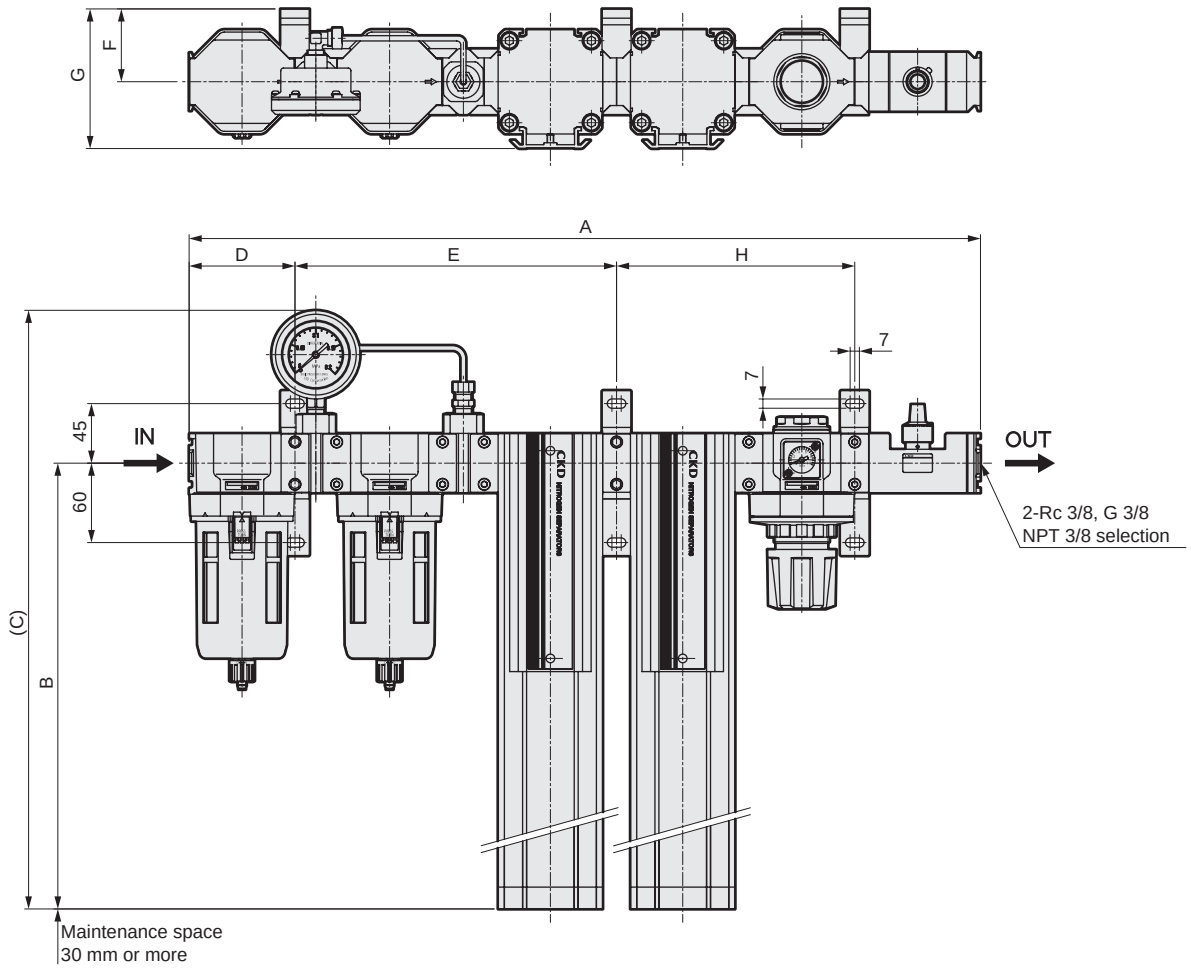


* 60mm or more wiring space is required under the oxygen concentration monitor.

Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-4S*10*C*-*T	1176.5	225	340	80	730	55	106	271.5	9.5
NSU-4L*10*C*-*T	1676.5	225	340	80	1230	55	106	271.5	12.3

Dimensions (2-station type)

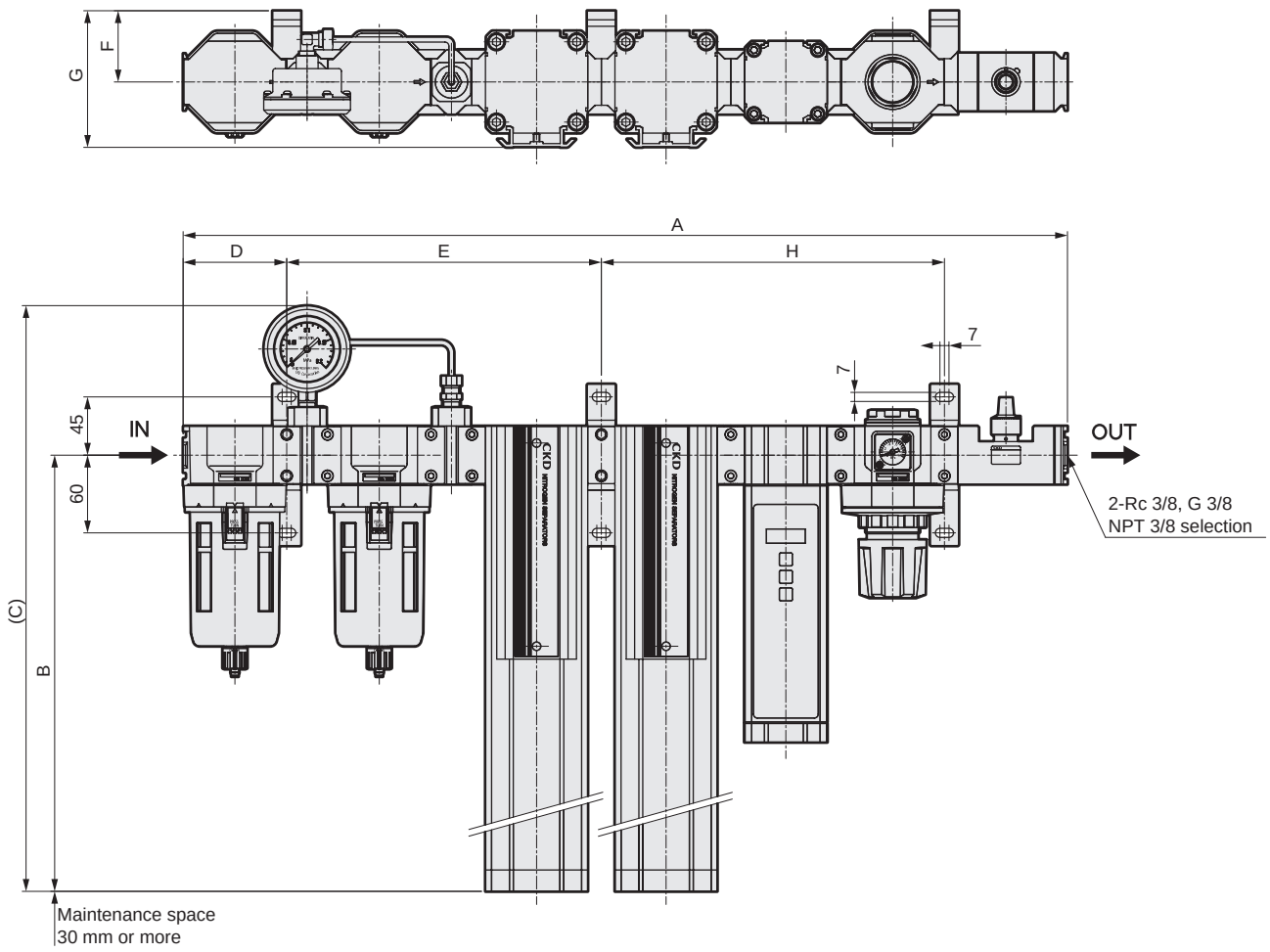
● Without oxygen monitor/without flow rate sensor (NSU-4F/G/H* 10*NN-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-4F*10*NN	598	543	658	80	243	55	106	180	10.9
NSU-4G*10*NN	598	1043	1158	80	243	55	106	180	13.7
NSU-4H*10*NN	598	1043	1158	80	243	55	106	180	16.5

Dimensions (2-station type)

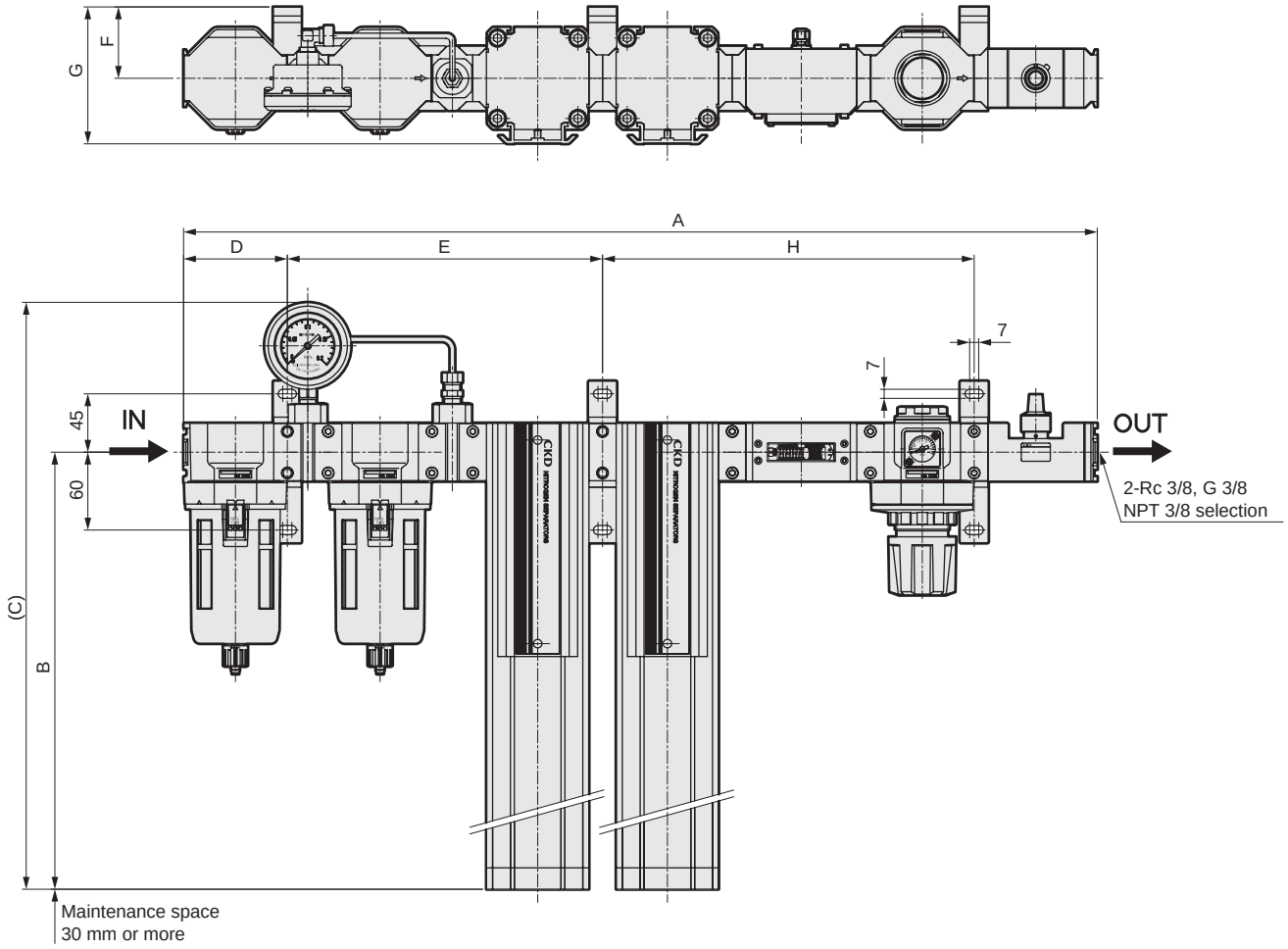
● With oxygen monitor/without flow rate sensor (NSU-4$^{F}_{G}$* 10*A*-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-4F*10*A*	683	543	658	80	243	55	106	265	12.5
NSU-4G*10*A*	683	1043	1158	80	243	55	106	265	15.3
NSU-4H*10*A*	683	1043	1158	80	243	55	106	265	18.1

Dimensions (2 stations)

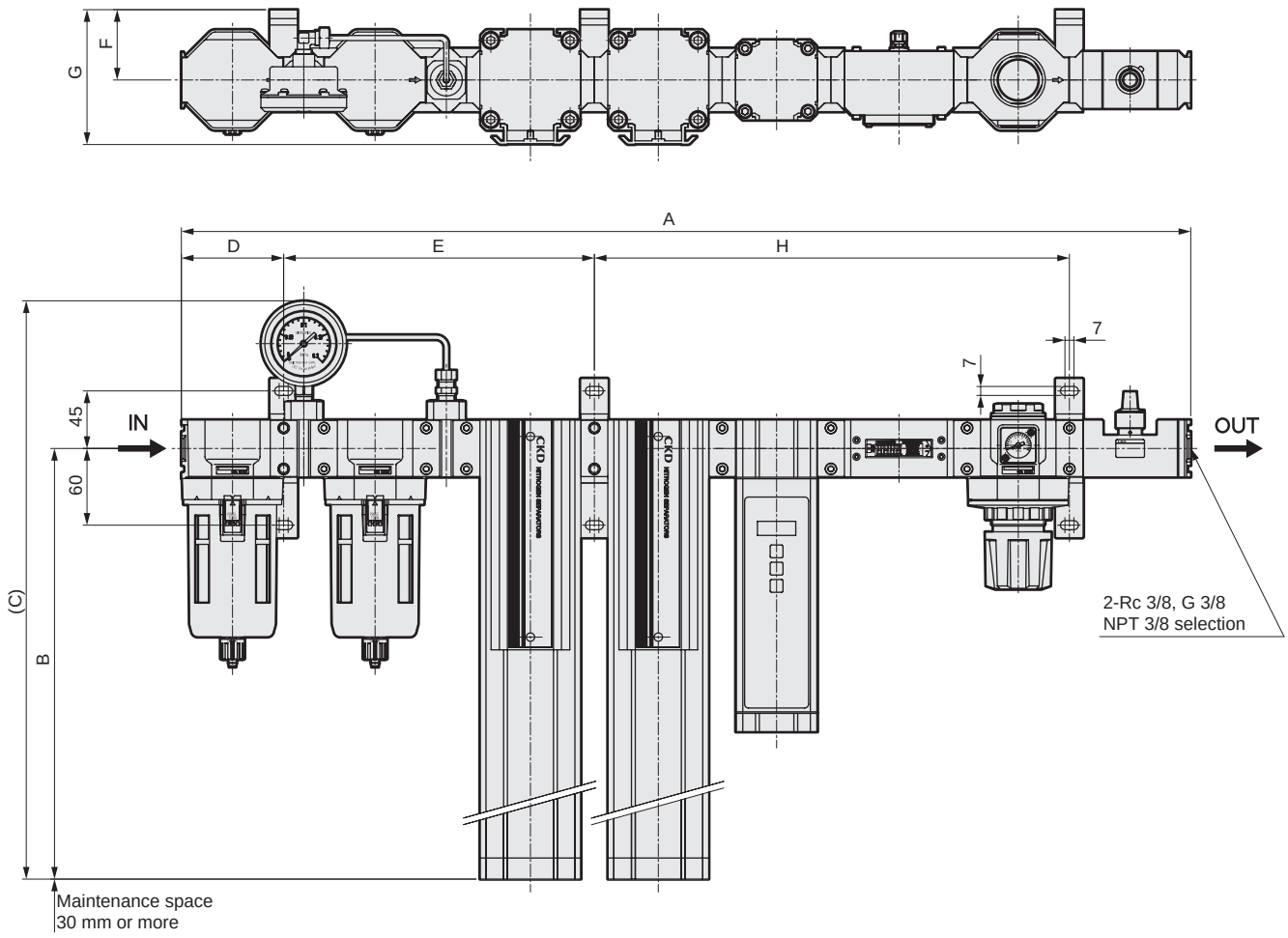
● Without oxygen monitor/with flow rate sensor (NSU-4F/G/H* 10*B*-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-4F*10*B*	704.5	543	658	80	243	55	106	286.5	11.7
NSU-4G*10*B*	704.5	1043	1158	80	243	55	106	286.5	14.5
NSU-4H*10*B*	704.5	1043	1158	80	243	55	106	286.5	17.3

Dimensions (2 stations)

● With oxygen monitor/with flow rate sensor (NSU-4$^{F}_{G}_{H}$* 10*C*-FP1)



Model No.	A	B	C	D	E	F	G	H	Weight (kg)
NSU-4F*10*C*	789.5	543	658	80	243	55	106	371.5	13.3
NSU-4G*10*C*	789.5	1043	1158	80	243	55	106	371.5	16.1
NSU-4H*10*C*	789.5	1043	1158	80	243	55	106	371.5	18.9

Flow sensor for nitrogen gas extraction unit

NS-QFS Series

Modular structure that can be connected to nitrogen gas extraction unit NS Series

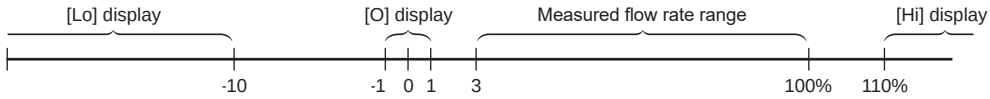
●Flow rate range: 20L/min to 500L/min

NS-QFS specifications

Item				NS-QFS-A	NS-QFS-B	NS-QFS-C	NS-QFS-D	NS-QFS-E
Flow direction				Uni-direction				
Measurement flow rate range *1			(L/min)	0.6 to 20	1.5 to 50	3 to 100	6 to 200	15 to 500
Display				4 digit + +4 digit 2 color LCD				
Flow rate display range *2			(L/min)	-1.9 to 21.9	-4.9 to 54.9	-9.9 to 109.9	-19 to 219	-49 to 549
Integration display (*3)	Display range		L	0.0 to ±999999.9L			0 to ±9999999L	
	Pulse output rate		L	0.2	0.5	1	2	5
Working conditions	Applicable fluid			Nitrogen gas				
	Temperature range		°C	5 to 50 (no condensation)				
	Pressure range		MPa	0 to 1.0				0 to 0.75
	Proof pressure		MPa	1.5				
Operating ambient temperature/humidity				5 to 50 °C, 90% RH or less				
Storage temperature			°C	-10 to 60				
Accuracy *4 (Fluid: in dry air)	Accuracy		*5	Within ±3%F.S. (Secondary side released to atmosphere) (The scope of warranty is in accordance with the "measured flow rate range.")				
	Repeatability		*6	Within ±1% F.S. (Secondary side released to atmosphere)				
	Temperature characteristics			Within ±0.2% F.S./°C (15 to 35°C, base temperature 25°C)				
	Pressure characteristics			Within ±5%F.S. (0.35MPa reference)				
Response time			*7	50 msec or less (setting response time OFF)				
Switch output	[B]	N		NPN open collector 1-point output (50mA or less, voltage drop 2.4V or less)				
		P		PNP open collector 1 point output (50mA or less, voltage drop 2.4V or less)				
Analog output				4 to 20 mA current output (connecting load impedance 0 to 300 Ω)				
Power supply voltage				24 VDC (21.6 to 26.4 V) ripple rate 1% or less				
Current consumption			*8	45 mA or less				
Lead wire				ø3.7 AWG26 or equivalent × 5-conductor, insulator outer diameter ø1.0, length 2.5m				
Functions				(1) Setting copy function, (2) Flow rate integration, (3) Peak hold, etc.				
Degree of protection				IP40 or equivalent (IEC standard)				
Protection circuit			*9	Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection				
EMC Directive				EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8				
Weight			kg	0.8				

*1: The value converted to volumetric flow rate at standard condition (20°C, 1 barometric pressure (101 kPa) relative humidity 65%Rh).

*2: Display at each flow rate is as follows.



*3: The accumulated flow is a calculated (reference) value. When using the integrated save function, take care to prevent the number of saves from exceeding the access count limit of the storage device (100 million times).(Changes to the settings are counted in number of accesses.)
Number of saves = Usage time / 5 minutes < 1 million times
When instantaneous flow rate is below 1% it is not counted as integrating flow.

*4: Compressed air is used for adjusting and inspecting this product.

*5: Accuracy is based on a CKD standard flow rate meter. It does not indicate absolute accuracy. Repeatability, temperature characteristics, and pressure characteristics are not included for an accuracy of ± ±3% F.S.

*6: Repeatability is calculated during a short period of time. Change over time is not included.

*7: The actual response time changes depending on the piping conditions. As a guideline, the response time can be set within the range of 50 msec to 1.5 sec.

*8: Current for when no load is applied. Please note that the current consumption changes depending on the load connection status.

*9: This product's protection function is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

How to order

NS-QFS - A N 1

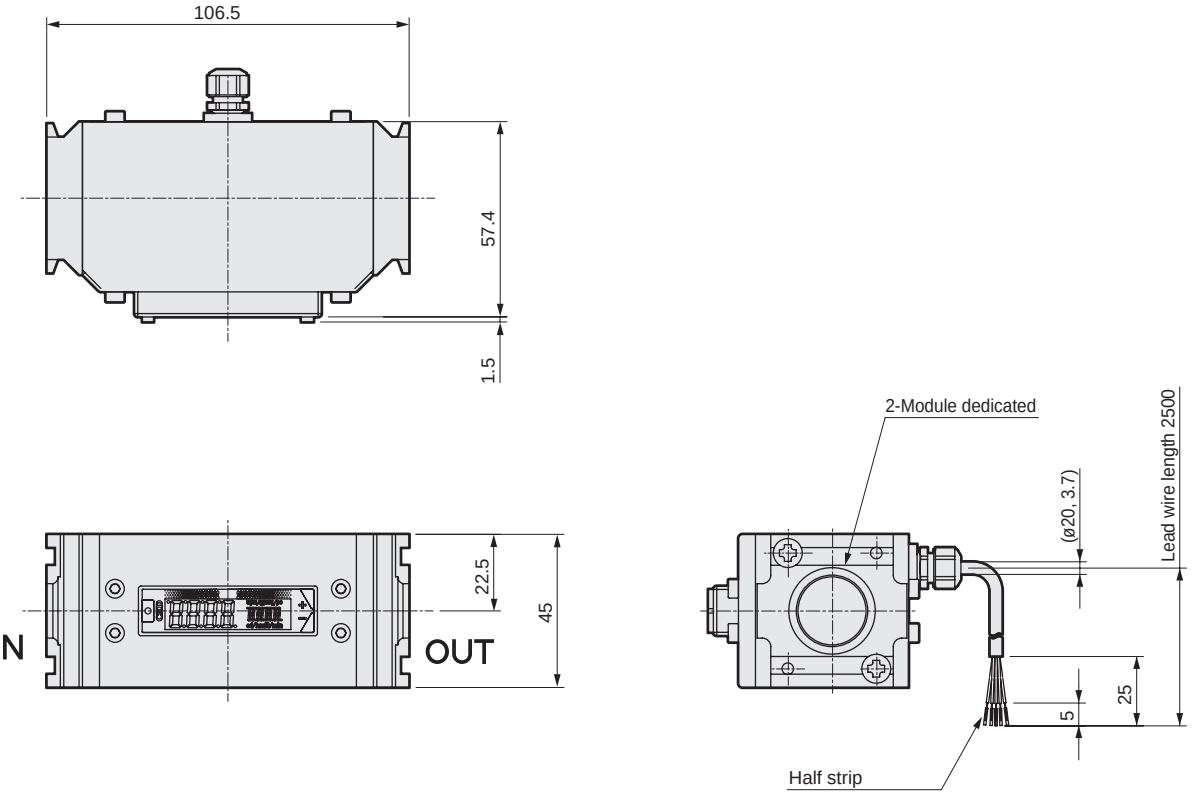
- A Flow rate range (full scale flow rate)
- B Switch output
- C Unit specifications

Code	Description
A Flow rate range (full scale flow rate)	
A	Flow rate range 20L/min
B	Flow rate range 50L/min
C	Flow rate range 100L/min
D	Flow rate range 200L/min
E	Flow rate range 500L/min
B Switch output	
N	NPN transistor open collector output 1 point
P	PNP transistor open collector output 1 point
C Unit specifications	
1	SI units only
2	With unit change function (only for overseas) *1

⚠ Precautions for model No. selection

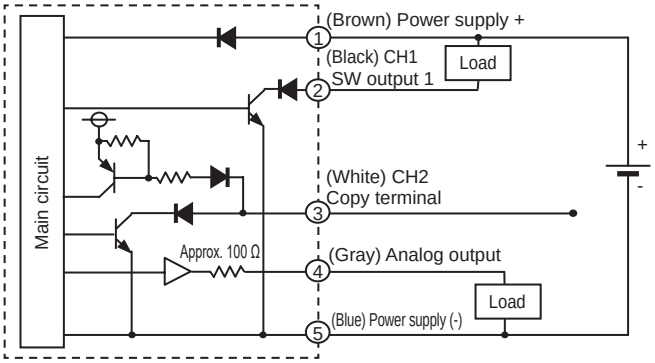
*1 : Models with unit switching cannot be sold in Japan.
*2 : When using with the NSU Series reverse flow option, reverse the display. Refer to page 22 for the display inversion settings.
*3 : The joiner set (joiner, bolt, O-ring) and one gasket are attached.

Dimensions

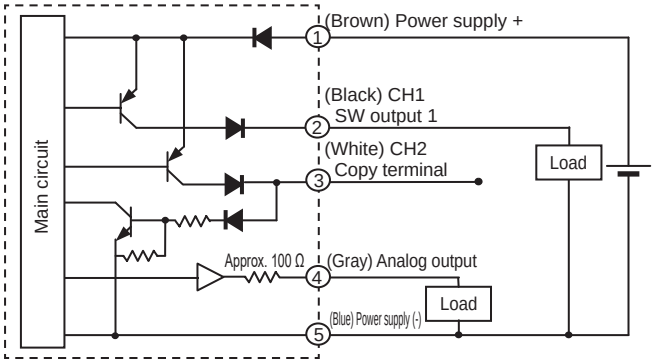


Example of internal circuit and load connection

●NPN output

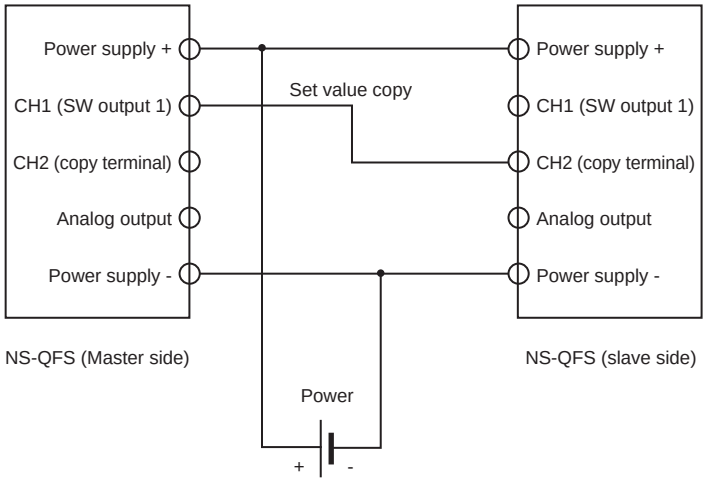


●PNP output



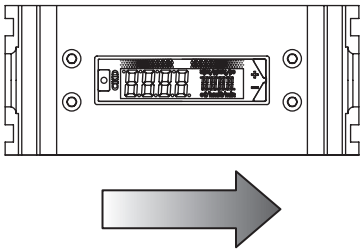
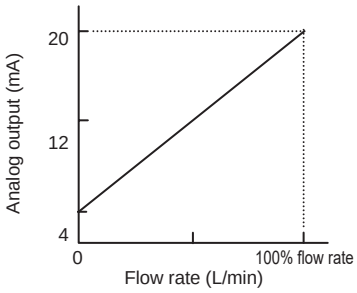
Terminal No.	Option lead wire color	Name
①	Brown	Power supply + (24 V)
②	Black	CH1 (Switch output 1: max. 50 mA)
③	White	CH2 (copy terminal)
④	Gray	Analog output Current output: 4 to 20 mA load impedance 300 Ω or less
⑤	Blue	Power supply - (GND)

<When using setting copy function>



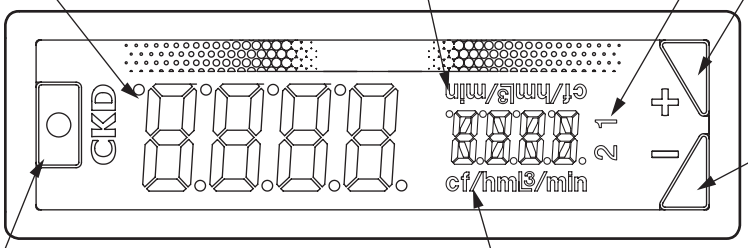
Connect CH1 (SW output 1) on the master side to CH2 (copy terminal) on the slave side and power ON the sensor to use the setting copy function (F93). Note that this connection can only be used when using the setting copy function. As shown in the load connection example above, if copying is performed with the load connected to CH1 or the switch is operated with CH1 and CH2 connected, the driver may operate unexpectedly or the driver and NS-QFS may breakdown. Never use the product while connected to the copy terminal.

Analog output characteristics

Flow direction	Current output
[Uni-directional] 	

Names and functions of display/operation section (LCD display)

● Display section name



Main display section (green/red)
- Displays the flow rate and output setting value.
- Display color can be changed.

Flow rate unit display
- Displays the flow rate unit.

Output (OUT1) display
- Lights when CH1 output is ON.
- The background and blinks together.

Key
- Starts reading peak hold and integrated flow.
- Successively moves to the next function selection screen.
- When setting each data, this key is used to count up the values, etc.

Key
- Stops reading peak hold and integrated flow.
- Successively moves to the next function selection screen.
- When setting each data, this key is used to count down the values, etc.

MODE key
- Sets when entering each setting mode.
- Used to return to flow rate display.

Sub-display section (green/red)
- Displays the flow direction/operation status, etc.
- Display color can be changed.

Names and functions of display/operation section

The function and various settings may be performed during normal flow rate display or after entering each mode.
The modes are also divided into Maintenance mode, SET mode, and Setting Monitor mode according to the frequency of use.

● Normal operation (RUN mode)

Item	Explanation	Default setting
Instantaneous flow rate display	Displays the instantaneous flow rate.	Display (measurement)
Peak hold function	Max. and min. values for the flow rate within a set interval are displayed.	Hidden (Stopped)
Accumulated flow display	The accumulated flow can be displayed. The switch output function includes a function to turn the switch ON/OFF at a level higher than the recommended cumulative value, and an integrated pulse function to output the pulse at a set cumulative value.	Non-display (measurement)

● SET mode

No.	Item	Explanation	Default setting
F.01	Selection of CH1 operation	Select the CH1 feature. Switch output operation and integrated pulse settings can be set.	No switch output
F.03	Integrating function settings	You can choose to acquire integrating flow values consecutively or at set times. You can also choose to keep the data or not.	Continuous acquisition: Data hold OFF
F.04	Sub-screen display setting	Set the sub-display section's display method. The display can be switched to Flow direction, Reference state, or Numbering display.	Flow direction
F.05	Display color setting	Set the display color. (red, green) The color for a normal display and for switch output ON can be set.	At normal: Green At switch ON: Red
F.07	Display inversion function	The LCD display can be vertically inverted.	Standard display
F.08	Reference state setting	Select from the standard state or reference state. Standard condition (ANR): Converted into volumetric flow rate at 20°C, 1 barometric pressure 65%RH Reference state (NOR): Converted into volumetric flow rate at 0°C, 1 barometric pressure 0%RH	ANR
F.09	Unit setting (For overseas only)	The units can be set. Can be selected from L/min, cf/h.	Domestic model: L/min Overseas model: L/min
F.10	Display cycle setting	The digital display refresh cycle can be set in three stages from 0.25sec to 1sec. If the display flickers, it may be improved by setting a longer display refresh cycle.	0.5 sec
F.11	Analog output Setting response time	Set the response time. The response can be set in seven steps from 0.05sec to 1.50sec. Chattering and mis-operation caused by sudden flow rate changes or noise are prevented.	0.05 sec
F.12	Numbering setting	You can set the numbering.	0000
F.14	Setting ECO mode	An ECO mode can be set. If the buttons are not operated for approx. one minute, the eco mode will activate and turn off the display's backlight. Current consumption can be reduced with this mode.	OFF
F.16	Lock setting	You can set the key lock method and the PIN code method. Use selectively depending on the working environment.	OFF
F.17	Peak hold setting	You can choose to acquire peak bottom values consecutively or at set times. You can also choose to keep the data or not.	Continuous acquisition: Data hold OFF

● Maintenance mode

No.	Item	Explanation	Default setting
F.91	Forced output function	Use this function to forcibly turn the switch output ON and confirm the wiring connection or initial operation of the input device.	-
F.92	Zero adjustment	The zero point deviation is compensated.	Adjust value: 0
F.93	Setting copy function	Set values can be copied if the model supports copying between two NS-QFS's. (Copying is only possible between products with the same model No.)	-
F.99	Reset function	Returns the settings to the default settings.	-

● Setting monitor mode

Item	Explanation	Default setting
Settings monitor function	SET mode setting details can be checked. (Setting details cannot be edited.)	-