Material compatible with the Food Sanitation Act

Nitrogen Gas Extraction Unit

NS-FP2 Series

Modular design for easy system expansion with peripheral components

■ Nitrogen gas is obtained just by supplying compressed air.

RoHS CAD

Specifications

■ Single cylinder

Item				NS-3S1	NS-3L1	NS-4S1	NS-4L1
Range of working conditions	Working fluid			Compressed air			
	Inlet air pressure	MPa		0.4 to 1.0			
	Proof pressure	MPa		1.5			
	Inlet air temperature	°C		5 to 50			
	Relative humidity of inlet air	RH		50% or less			
	Ambient temperature	°C		5 to 50			
Rating	Inlet air purity class			1:6:1(JIS B 8392-1:2012, ISO 8573-1:2010)			
	Inlet air pressure	MPa		0.7			
	Inlet air temperature	°C		25			
	Ambient temperature	°C		25			
Rated flow rate	Outlet nitrogen gas flow rate L/min(ANR)	Nitrogen concentration (%) or higher	99.9	1.9	5.6	11.0	30.6
			99	5.0	15.5	28.2	66.9
			97	8.9	28.7	49.9	118.1
			95	14.0	39.8	65.3	169.2
			90	27.0	78.1	137.3	313.5
	Inlet air flow rate L/min(ANR)		99.9	17.3	50.9	100.0	278.2
			99	20.9	64.6	117.5	278.8
			97	24.1	77.6	134.9	319.2
			95	31.2	88.5	145.2	376.0
			90	60.0	173.6	305.1	696.7

■ Double cylinder

Item				NS-4S2	NS-4S3	NS-4L2	NS-4L3	NS-4L4	NS-4S6	NS-4S8	NS-4SA	NS-4L6	NS-4L8
Range of working conditions	Working fluid			Compressed air									
	Inlet air pressure	MPa		0.4 to 1.0									
	Proof pressure	MPa		1.5									
	Inlet air temperature	°C		5 to 50									
	Relative humidity of inlet air	RH		50% or less									
	Ambient temperature	°C		5 to 50									
Rating	Inlet air purity class			1:6:1(JIS B 8392-1:2012, ISO 8573-1:2010)									
	Inlet air pressure	MPa		0.7									
	Inlet air temperature	°C		25									
	Ambient temperature	°C		25									
Rated flow rate	Outlet nitrogen gas flow rate L/min(ANR)	Nitrogen concentration (%) or higher	99.9	22.0	33.0	61.2	91.8	122.4	66.0	88.0	110.0	183.6	244.8
			99	56.4	84.6	133.8	200.7	267.6	169.2	225.6	282.0	401.4	535.2
			97	99.8	149.7	236.2	354.3	472.4	299.4	399.2	499.0	708.6	944.8
			95	130.6	195.9	338.4	507.6	676.8	391.8	522.4	653.0	1015.2	1353.6
			90	274.6	411.9	627.0	940.5	1254.0	823.8	1098.4	1373.0	1881.0	2508.0
	Inlet air flow rate L/min(ANR)		99.9	200.0	300.0	556.4	834.6	1112.8	600.0	800.0	1000.0	1669.2	2225.6
			99	235.0	352.5	557.6	836.4	1115.2	705.0	940.0	1175.0	1672.8	2230.4
			97	269.8	404.7	638.4	957.6	1276.8	809.4	1079.2	1349.0	1915.2	2553.6
			95	290.4	435.6	752.0	1128.0	1504.0	871.2	1161.6	1452.0	2256.0	3008.0
			90	610.2	915.3	1393.4	2090.1	2786.8	1830.6	2440.8	3051.0	4180.2	5573.6

Note: The product will be floor-mounted for 6 units or more.

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 and the rated values listed in the specifications.
Working conditions: Inlet air pressure, inlet air temperature, required nitrogen gas flow rate

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 Determine the appropriate model from the rated outlet nitrogen gas flow rate of each model.
Rated outlet nitrogen gas flow rate x (1) temperature gas flow rate correction coefficient x (2) pressure gas flow rate correction coefficient = corrected outlet nitrogen gas flow rate
Select one with sufficient outlet nitrogen gas flow rate after correction with the above formula.

STEP 5 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 6 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 7 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 STEP4 × (3) temperature air flow rate correction coefficient × (4) pressure air flow rate correction coefficient = corrected inlet air flow rate L/min (ANR)
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
Inlet air temperature	35 to 39°C	40°C	(1)1.08	(3)1.25
Inlet air pressure	0.5 to 0.55 MPa	0.5 MPa	(2)0.65	(4)0.79

Substitute the above conditions into the equation above to obtain the outlet nitrogen gas flow rate when using NS-4L1 at a nitrogen concentration of 99%.
66.9 (rated outlet nitrogen gas flow rate) ×1.08×0.65=46.9L/min (ANR).
If the required nitrogen gas flow rate is less than or equal to this value, select that model.
In this case, the inlet air flow rate is 278.8 × 1.25 × 0.79 = 275.3L/min(ANR)

How to order

NS - 4 S 1 10A - B T - FP2

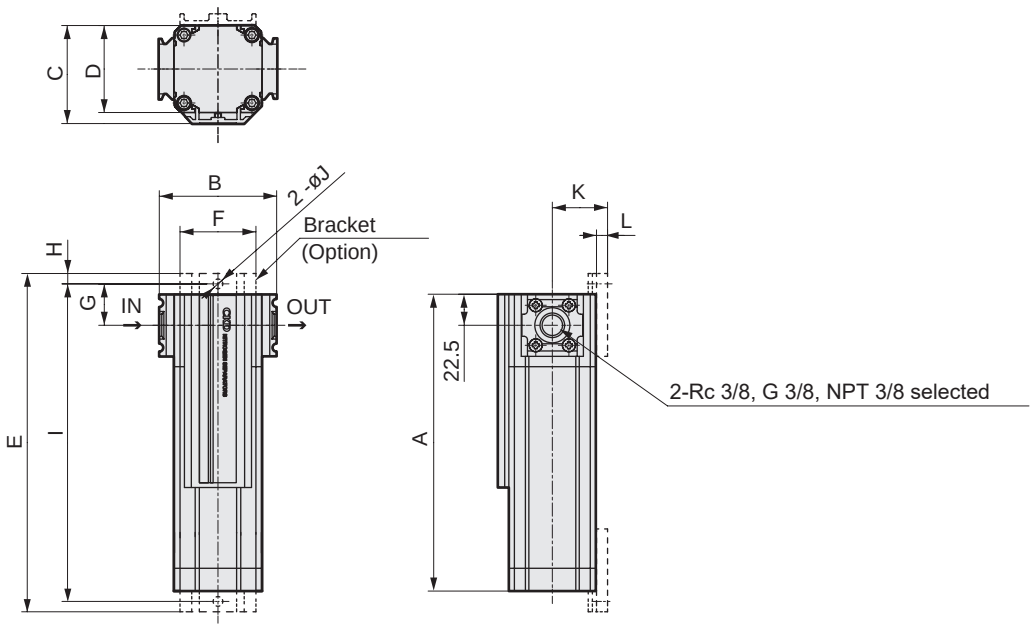
Model No.
Ⓐ Body size
Ⓑ Membrane unit size
Ⓒ Quantity
Ⓓ Port size
Ⓔ Option
Ⓕ Mounting direction

Code	Description
Ⓐ Body size	
3	Body width 63
4	Body width 79
Ⓑ Membrane unit size	
S	Short
L	Long
Ⓒ Quantity	***1**
1	1 pc.
2	2 units (available with NS-4S, 4L)
3	3 units (available with NS-4S, 4L)
4	4 units (available with NS-4L)
6	6 units (available with NS-4S, 4L)
8	8 units (available with NS-4S, 4L)
A	10 units (available with NS-4S)
Ⓓ Port size	
10A	Rc 3/8 (NS-3S1, 3L1, 4S1, 4L1)
10B	G 3/8 (NS-3S1, 3L1, 4S1, 4L1)
10C	NPT 3/8 (NS-3S1, 3L1, 4S1, 4L1)
20A	Rc 3/4 (NS-4S2, 4S3, 4L2, 4L3, 4L4)
20B	G 3/4 (NS-4S2, 4S3, 4L2, 4L3, 4L4)
20C	NPT 3/4 (NS-4S2, 4S3, 4L2, 4L3, 4L4)
25A	Rc 1 (NS-4S6, 4S8, 4SA, 4L6, 4L8)
25B	G 1 (NS-4S6, 4S8, 4SA, 4L6, 4L8)
25C	NPT 1 (NS-4S6, 4S8, 4SA, 4L6, 4L8)
Ⓔ Option	***2**
N	No option
B	Bracket
C	Bracket + reverse flow
D	Bracket + exhaust port
F	Bracket + reverse flow + exhaust port
X	Reverse flow *3
E	With exhaust port
H	Reverse flow + With exhaust port *3
Ⓕ Mounting direction	
Blank	Vertical mounting
T	Horizontal mounting (available with NS-4S1, 4L1)

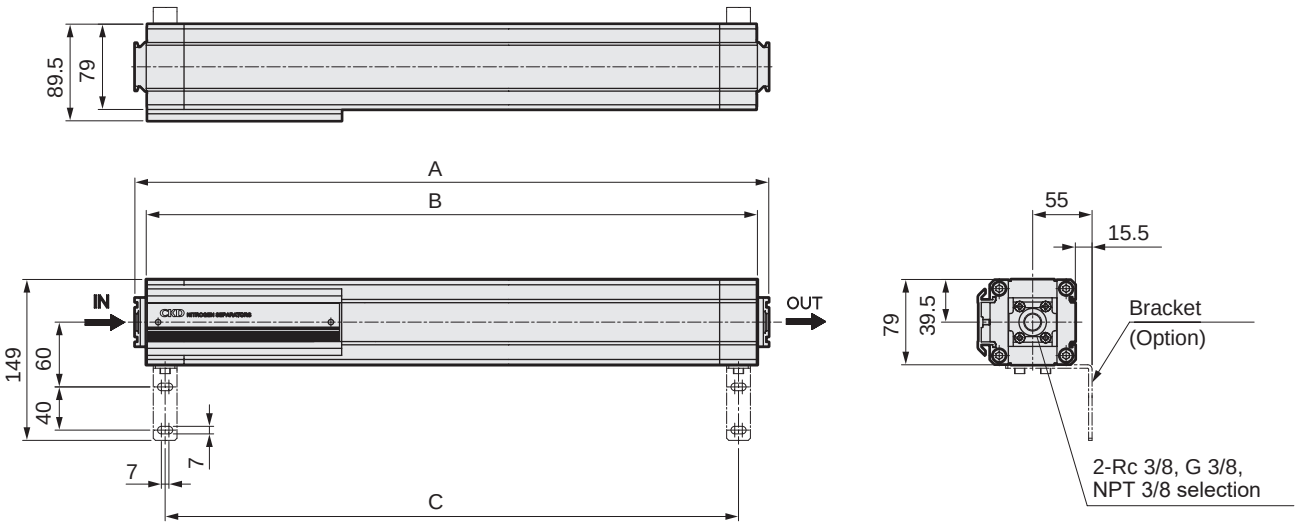
⚠ Precautions for model No. selection

*1 : The product will be floor-mounted without bracket for 6 units or more.
*2: 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.
*3: Viewed from the front, a standard product has an air inlet on the left port, while an air outlet on the right port. For "X", an air inlet is provided on the right port, with an air outlet provided on the left port.

Dimensions



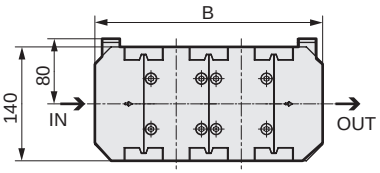
Model No.	A	B	C	D	Weight (kg)	Bracket relational dimensions							
						E	F	G	H	I	J	K	L
NS-3S1	315	85	71	63	1.8	345	55	30	7.5	330	7	40	8
NS-3L1	565	85	71	63	2.7	595	55	30	7.5	580	7	40	8
NS-4S1	565	100	90	79	4.0	605	70	32.5	10	585	9	50	10
NS-4L1	1065	100	90	79	6.8	1105	70	32.5	10	1085	9	50	10

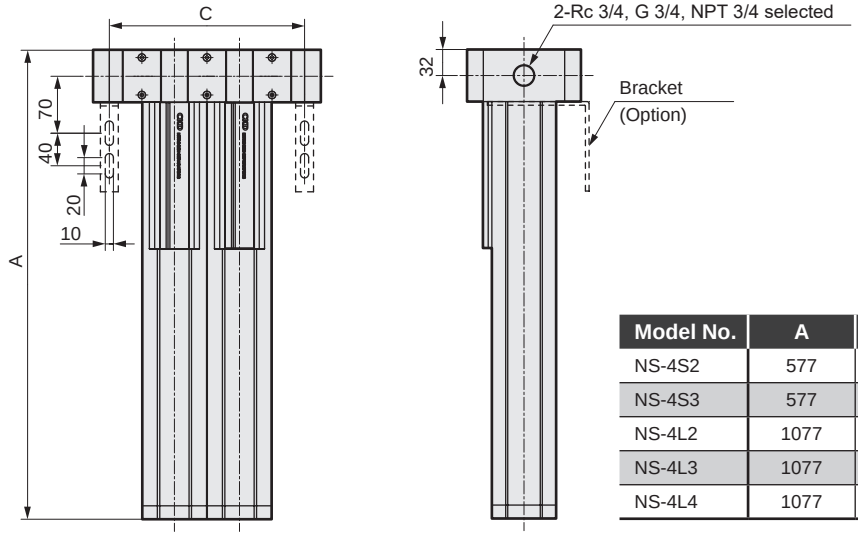


Model No.	A	B	C	Weight (kg)
NS-4S1*-*T	587	566	531	4.2
NS-4L1*-*T	1087	1066	1031	7.0

Dimensions

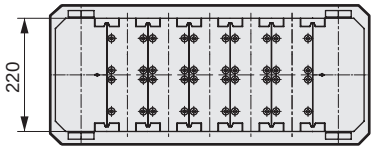
● Quantity: 2 / 3 / 4 units

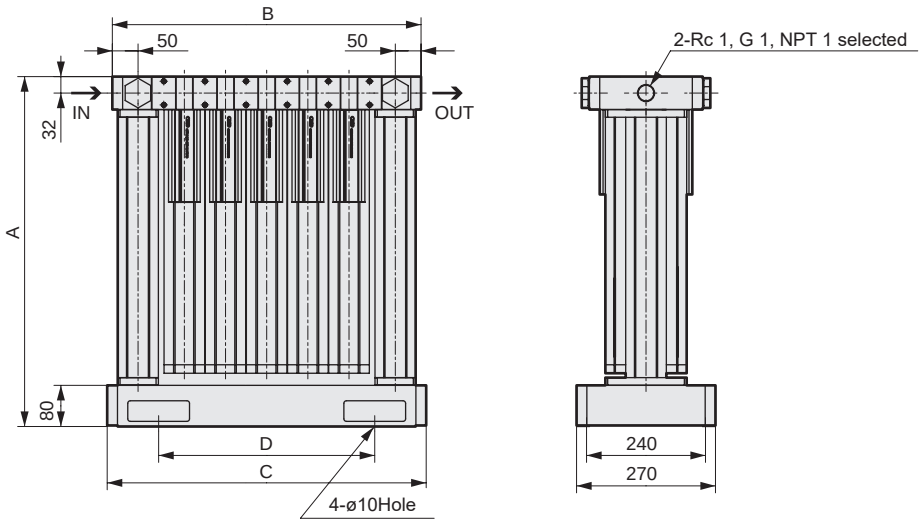




Model No.	A	B	C	Weight(kg)
NS-4S2	577	280	240	12
NS-4S3	577	360	320	17
NS-4L2	1077	280	240	18
NS-4L3	1077	360	320	25
NS-4L4	1077	440	400	32

● Qty.: 6, 8 or 10 units





Model No.	A	B	C	D	Weight (kg)
NS-4S6	680	440	460	260	41
NS-4S8	680	520	540	340	50
NS-4SA	680	600	620	420	59
NS-4L6	1180	440	460	260	63
NS-4L8	1180	520	540	340	78