

TITLE DOCUMENTS FOR MULTI-STAGE DRY VACUUM PUMP DOC. No. 7311-Y8N172 REV. 2

CUSTOMER COMPLETE IN 20 SHEETS WITH COVER

FINAL USER

PROJECT	SERVICE
JOB No.	EBARA SER. No.
ITEM No.	MODEL/ EQUIP. EV-S series SET

TO SET

Application Engineering Group
 Business Promotion Department
 ISSUED BY Components Division

5						
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REV.	PAGE	DATE	APP'D	BY		



EBARA CORPORATION

1. Detailed Specifications

Table 1.1 Specification

Model		EV-S20	EV-S20P	EV-S20N (Corrosion-Resistant Model)	
Pumping Speed		1670 L/min			
Ultimate Pressure		3.0 Pa	5.0 Pa		
Connection	Gas Inlet	NW50			
	Gas Outlet	NW25			
Approx. Power at Ultimate Pressure (Max. Power)		0.4 kW (2.2 kW)			
Utility	Cooling Water	Connection	Coupler (Rc1/4)		
		Pressure [Gauge Press.]	$\triangle 1$ Supply: Max. 0.4 MPa Differential Press.: Min. 0.2 MPa		
		Flow rate	1.5 – 3.0 L/min		
		Temperature	Max. 30°C		
	N2 Gas	Connection	—	1/4" Tube Fitting(Same as SWAGELOK)	
		Pressure [Gauge Press.]	—	Supply: 0.15 – 0.7 MPa [Setting: 0.09 – 0.12 MPa]	
		Approx. Flow rate [N2-0 Mode]	—	$\triangle 2$ 17 – 20 Pa·m ³ /s [2.4 Pa·m ³ /s]	
	Duct Ventilation	Connection	—	φ 50mm	
		Pressure	—	-196 Pa	
		Approx. Flow rate	—	0.5 m ³ /min	
	Lubrication Oil	Brand	BARRIERTA J100ES (NOK)		
		Quantity	0.05 L		
Approx. Weight		60 kg			
Power Supply	Phase/Volt/Freq.	3 Phase, 200-220V, 50/60Hz			
	Power capacity	3.2 kVA			
	Connection	Amphenol C016 20C003 100 12			
Control Signal		D-sub 15Pin + D-sub 25Pin			
CP Rating		15A			

※This pump is served as a product for the uses which does not generate reaction by-products.

Please consult EBARA if the pump might be used for process gas pumping use.

※The ambient temperature of the pump installation place shall be 30°C or lower.

※Since the judgment based on Japanese regulation of foreign trade control is required, please ask EBARA when the product written in this document is exported outside Japan.

Table 1.2 Specification

Model		EV-S50	EV-S50P	EV-S50N (Corrosion-Resistant Model)	
Pumping Speed		5000 L/min			
Ultimate Pressure		0.5 Pa			
Connection	Gas Inlet	NW50			
	Gas Outlet	NW25			
Approx. Power at Ultimate Pressure (Max. Power)		0.55 kW $\triangle 2$ (3.6 kW)			
Utility	Cooling Water	Connection	Coupler (Rc1/4)		
		Pressure [Gauge Press.]	$\triangle 1$ Supply: Max. 0.4 MPa Differential Press.: Min. 0.2 MPa		
		Flow rate	2.0 – 3.0 L/min		
		Temperature	Max. 30°C		
	N2 Gas	Connection	—	1/4" Tube Fitting(Same as SWAGELOK)	
		Pressure [Gauge Press.]	—	Supply: 0.15 – 0.7 MPa [Setting: 0.09 – 0.12 MPa]	
		Approx. Flow rate [N2-0 Mode]	—	$\triangle 2$ 17 – 20 Pa·m ³ /s [2.4 Pa·m ³ /s]	
	Duct Ventilation	Connection	—	φ 50mm	
		Pressure	—	-196 Pa	
		Approx. Flow rate	—	0.5 m ³ /min	
	Lubrication Oil	Brand	BARRIERTA J100ES (NOK)		
		Quantity	0.1 L		
Approx. Weight		100 kg			
Power Supply	Phase/Volt/Freq.	3 Phase, 200-220V, 50/60Hz			
	Power capacity	$\triangle 2$ 4.8 kVA			
	Connection	Japan Aviation Electronics Industry JL04HV-2E22-22PE-B			
Control Signal		D-sub 15Pin + D-sub 25Pin			
CP Rating		$\triangle 2$ 20A			

※This pump is served as a product for the uses which does not generate reaction by-products.

Please consult EBARA if the pump might be used for process gas pumping use.

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Table 1.3 Specification

Model		EV-S100	EV-S100P	EV-S100N (Corrosion-Resistant Model)	
Pumping Speed		10000 L/min			
Ultimate Pressure		0.5 Pa			
Connection	Gas Inlet	NW80			
	Gas Outlet	NW40			
Approx. Power at Ultimate Pressure (Max. Power)		0.65 kW (4.6 kW)			
Utility	Cooling Water	Connection	Coupler (Rc1/4)		
		Pressure [Gauge Press.]	△ ₁ Supply: Max. 0.4 MPa Differential Press.: Min. 0.2 MPa		
		Flow rate	2.0 – 3.0 L/min		
		Temperature	Max. 30°C		
	N2 Gas	Connection	—	1/4" Tube Fitting(Same as SWAGELOK)	
		Pressure [Gauge Press.]	—	Supply: 0.15 – 0.7 MPa [Setting: 0.09 – 0.12 MPa]	
		Approx. Flow rate [N2-0 Mode]	—	△ ₂ 17 – 20 Pa·m ³ /s [2.4 Pa·m ³ /s]	
	Duct Ventilation	Connection	—	φ 50mm	
		Pressure	—	-196 Pa	
		Approx. Flow rate	—	0.5 m ³ /min	
	Lubrication Oil	Brand	BARRIERTA J100ES (NOK)		
		Quantity	0.1 L		
Approx. Weight		120 kg			
Power Supply	Phase/Volt/Freq.	3 Phase、200-220V、50/60Hz			
	Power capacity	6.4 kVA			
	Connection	Japan Aviation Electronics Industry JL04HV-2E22-22PE-B			
Control Signal		D-sub 15Pin + D-sub 25Pin			
CP Rating		30A			

※This pump is served as a product for the uses which does not generate reaction by-products.

Please consult EBARA if the pump might be used for process gas pumping use.

※The ambient temperature of the pump installation place shall be 30°C or lower.

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Table 1.4 Specification

Model		EV-S200	EV-S200P	EV-S200N (Corrosion-Resistant Model)	
Pumping Speed		20000 L/min			
Ultimate Pressure		0.5 Pa			
Connection	Gas Inlet	NW100			
	Gas Outlet	NW40			
Approx. Power at Ultimate Pressure (Max. Power)		0.75 kW (5.1 kW)			
Utility	Cooling Water	Connection	Coupler (Rc1/4)		
		Pressure [Gauge Press.]	△ ₁ Supply: Max. 0.4 MPa Differential Press.: Min. 0.2 MPa		
		Flow rate	2.0 – 3.0 L/min		
		Temperature	Max. 30°C		
	N2 Gas	Connection	—	1/4" Tube Fitting(Same as SWAGELOK)	
		Pressure [Gauge Press.]	—	Supply: 0.15 – 0.7 MPa [Setting: 0.09 – 0.12 MPa]	
		Approx. Flow rate [N2-0 Mode]	—	△ ₂ 17 – 20 Pa·m ³ /s [2.4 Pa·m ³ /s]	
	Duct Ventilation	Connection	—	φ 50mm	
		Pressure	—	-196 Pa	
		Approx. Flow rate	—	0.5 m ³ /min	
	Lubrication Oil	Brand	BARRIERTA J100ES (NOK)		
		Quantity	0.15 L		
Approx. Weight		170 kg			
Power Supply	Phase/Volt/Freq.	3 Phase、200-220V、50/60Hz			
	Power capacity	6.8 kVA			
	Connection	Japan Aviation Electronics Industry JL04HV-2E22-22PE-B			
Control Signal		D-sub 15Pin + D-sub 25Pin			
CP Rating		30A			

※This pump is served as a product for the uses which does not generate reaction by-products.

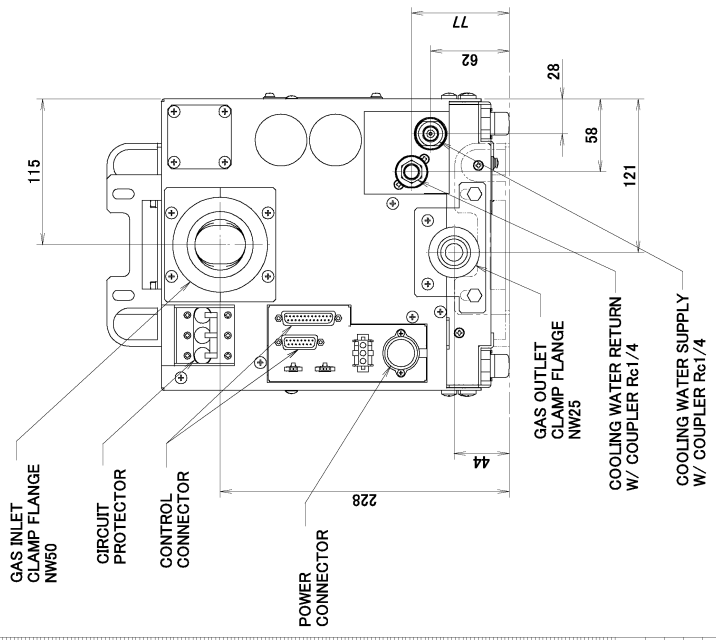
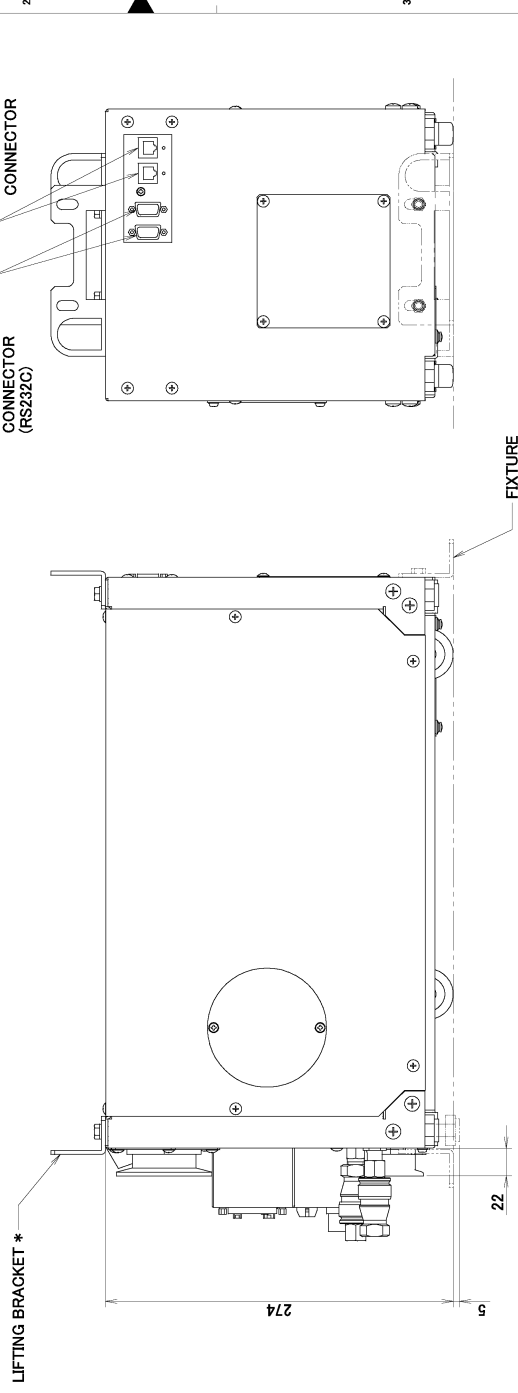
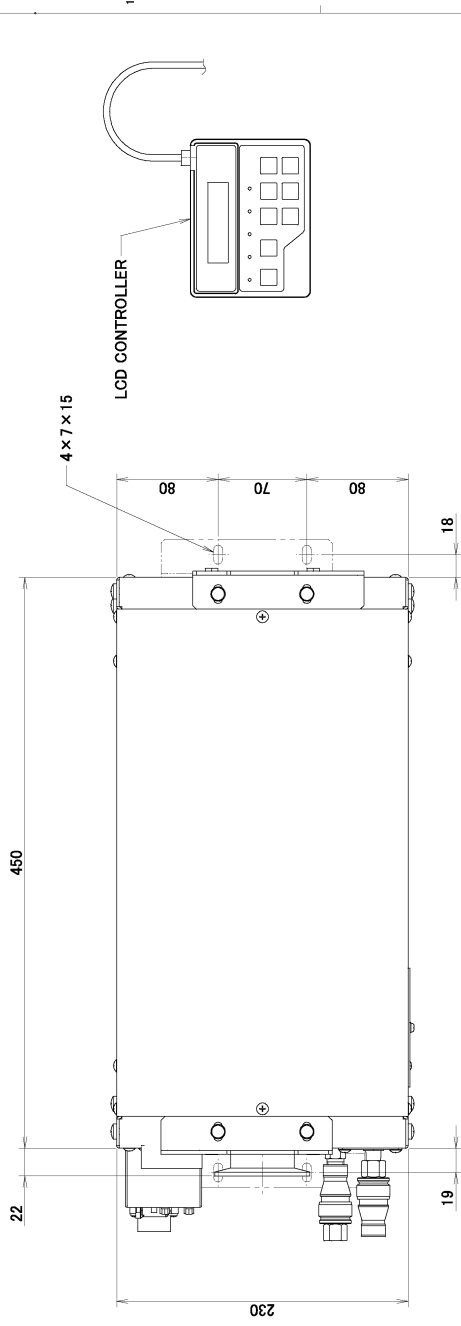
Please consult EBARA if the pump might be used for process gas pumping use.

※The ambient temperature of the pump installation place shall be 30°C or lower.

※Since the judgment based on Japanese regulation of foreign trade control is required, please ask EBARA when the product written in this document is exported outside Japan.

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No.	DESCRIPTION	DATE	BY	APP.

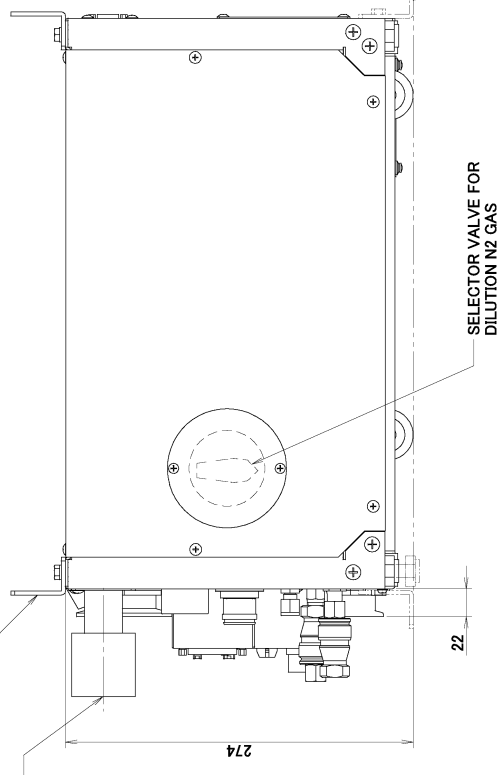
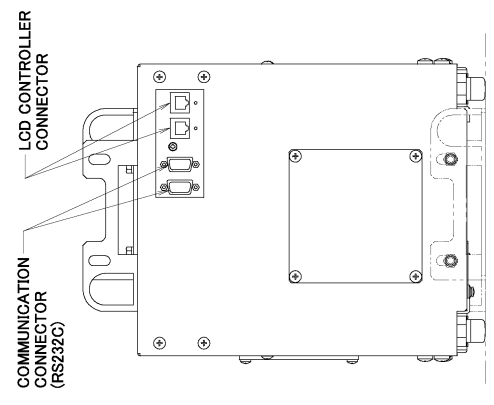
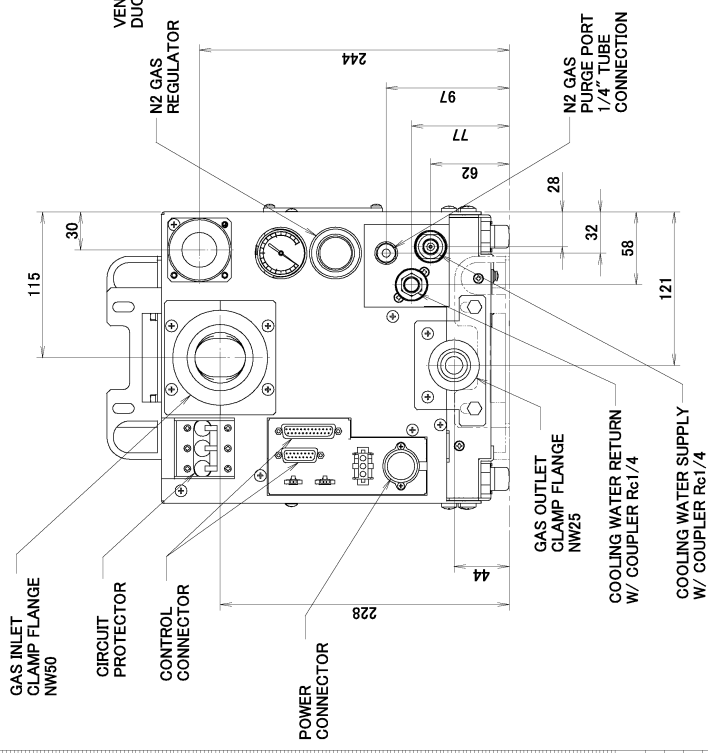
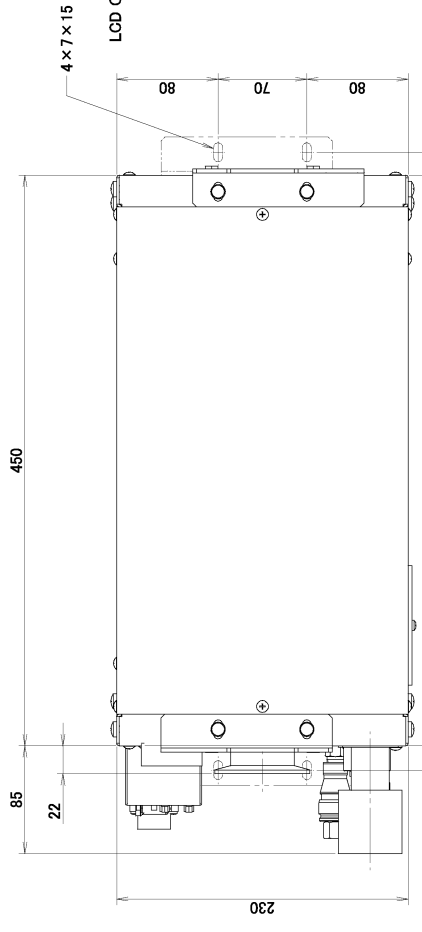


* LIFTING BRACKET CAN BE USE FOR FIXTURE

EBARA SER.No.		CUSTOMER	
MODEL/	EY-S20	SET	FINAL USER
APPR'D BY	DESIGN'D BY	TITLE	
K.USUT	KITO	Nov.17.08	
Nov.18.08	CHK'D BY	Nov.17.08	
	DRWN BY	Nov.17.08	
	KITO	Nov.17.08	
EBARA CORPORATION		DWG.No.	
EBARA		WB-A082040201-00	
REV		REV	
P. 5		OUTLINE DRAWING	

METRIC

No.	REVISIONS DESCRIPTION	DATE	BY	APP

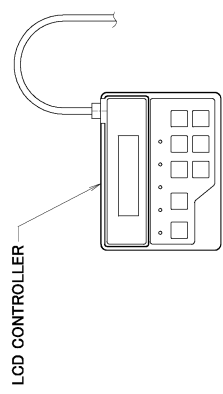
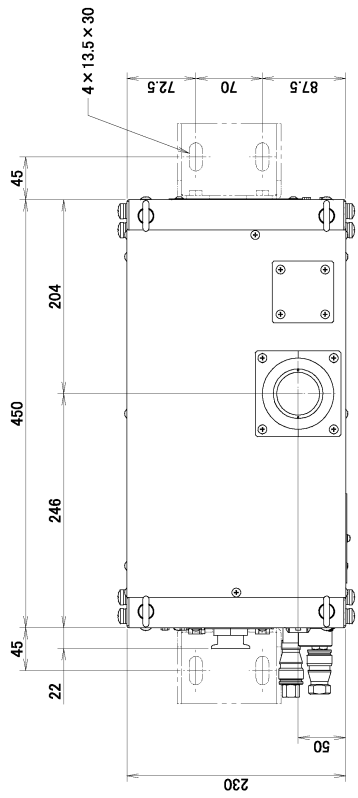


* LIFTING BRACKET CAN BE USE FOR FIXTURE

EBARA SERIAL No.		CUSTOMER	
MODEL	EV-S20P/EV-S20N	SET	FINAL USER
APP'D BY	KITO	DS'VD BY	KITO
K.USUT	Nov.18.08	CHK'D BY	KITO
		DRWN BY	KITO
		Nov.17.08	
TITLE		OUTLINE DRAWING	
DWG.No.		WB-A082040301-00	
REV		REV	

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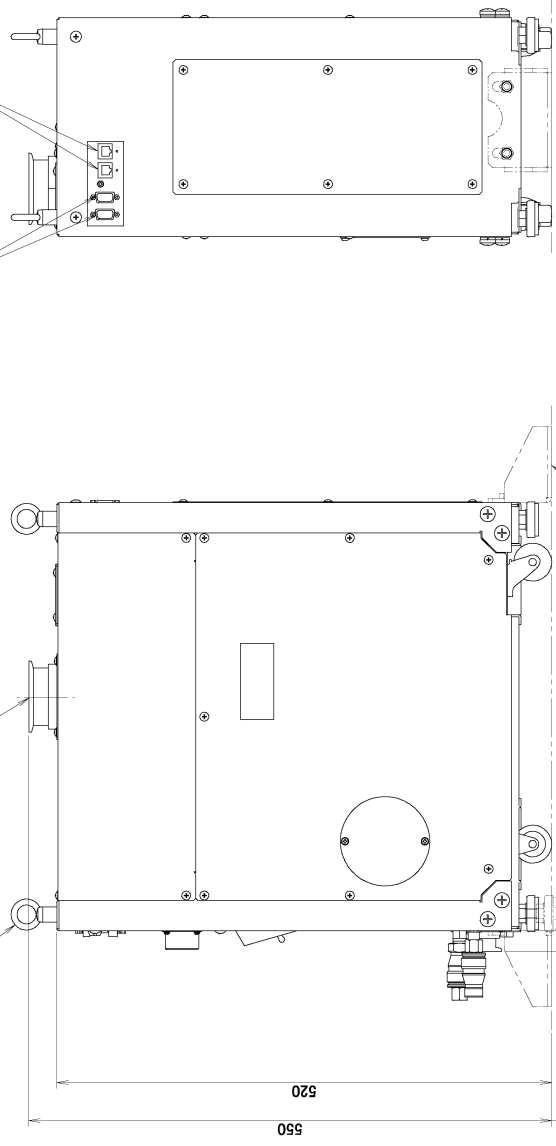


COMMUNICATION CONNECTOR (RS232C)

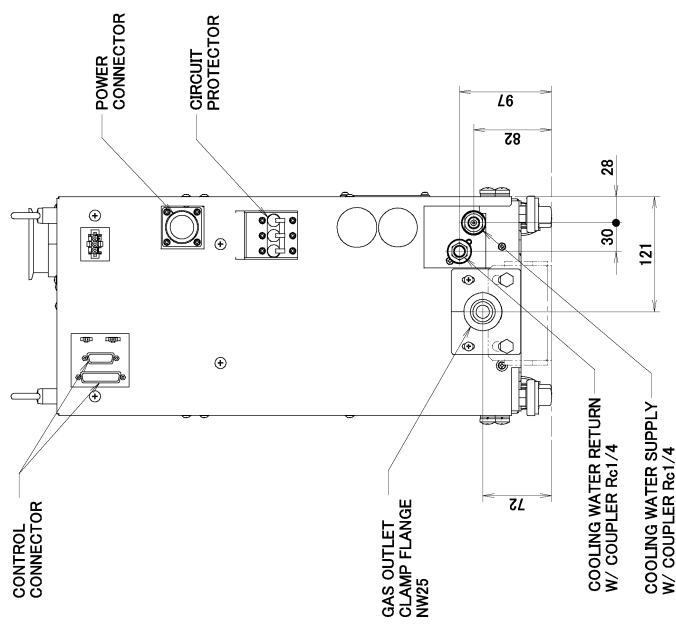
LCD CONTROLLER CONNECTOR

EYE BOLT M8

GAS INLET CLAMP FLANGE NW50



FIXTURE (OPTIONAL PARTS)



CONTROL CONNECTOR

POWER CONNECTOR

CIRCUIT PROTECTOR

GAS OUTLET CLAMP FLANGE NW25

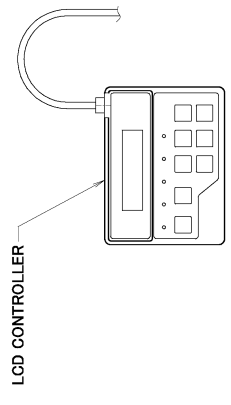
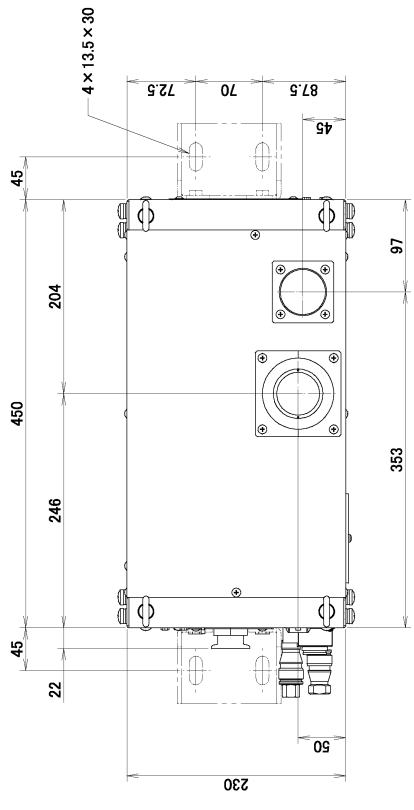
COOLING WATER RETURN W/ COUPLER Rc1/4

COOLING WATER SUPPLY W/ COUPLER Rc1/4

EBARA SER.No.		CUSTOMER	
MODEL/	EV-S60	SET	FINAL USER
APPR'D BY	K.ITO	DESIGN'D BY	K.ITO
K.USUT	Nov.18.08	CHK'D BY	K.ITO
		DRWN BY	K.ITO
			Nov.18.08
TITLE		OUTLINE DRAWING	
DWG.No.		WB-A08204041-00	
REV		P.7	
EBCORPORATION		EBCORPORATION	

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No.	DESCRIPTION	DATE	BY	APP.

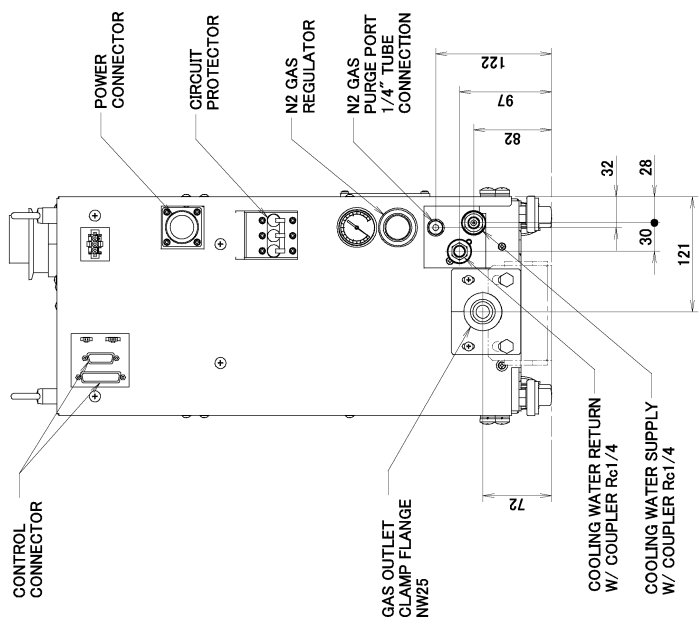
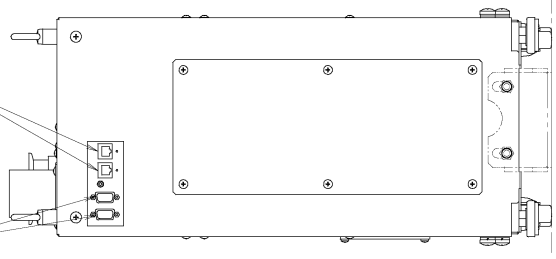


COMMUNICATION CONNECTOR (RS232C)

VENTILATING DUCT Ø50

GAS INLET CLAMP FLANGE NW50

EYE BOLT M8



CONTROL CONNECTOR

POWER CONNECTOR

CIRCUIT PROTECTOR

N2 GAS REGULATOR

N2 GAS PURGE PORT 1/4" TUBE CONNECTION

GAS OUTLET CLAMP FLANGE NW25

COOLING WATER RETURN W/ COUPLER Rc1/4

COOLING WATER SUPPLY W/ COUPLER Rc1/4

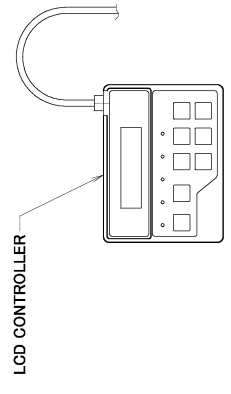
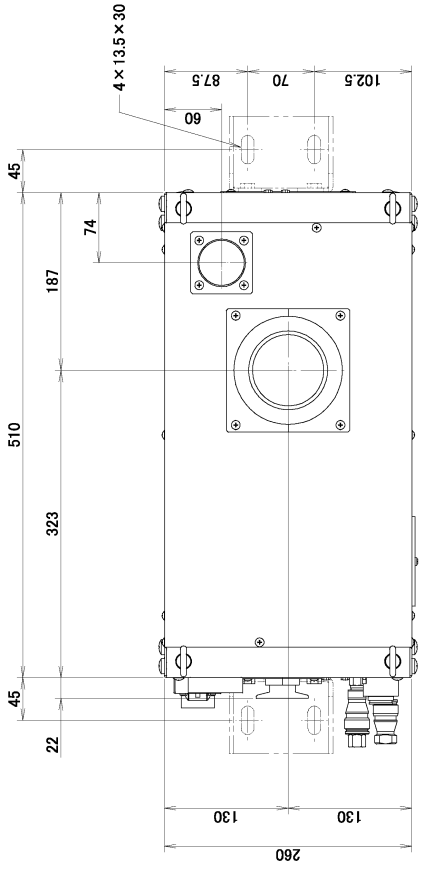
FIXTURE (OPTIONAL PARTS)

SELECTOR VALVE FOR DILUTION N2 GAS

EBARA SERIAL No.		CUSTOMER	
MODEL	EV-S50P/EV-S50N	SET	FINAL USER
APP'D BY	DESIGN BY KITO	Nov.18.08	TITLE
K.USUT	CHK'D BY KITO	Nov.18.08	OUTLINE DRAWING
	DRWN BY KITO	Nov.18.08	DWG.No.
			REV
			WB-A082040501-00

METRIC

No.	DESCRIPTION	DATE	BY	APP.



LCD CONTROLLER

COMMUNICATION CONNECTOR (RS232C)

VENTILATING DUCT Ø50

GAS INLET CLAMP FLANGE NW80

EYE BOLT M8

CONTROL CONNECTOR

CIRCUIT PROTECTOR

N2 GAS REGULATOR

N2 GAS PURGE PORT 1/4" TUBE CONNECTION

GAS OUTLET CLAMP FLANGE NW40

POWER CONNECTOR

COOLING WATER RETURN W/ COUPLER Rc1/4

COOLING WATER SUPPLY W/ COUPLER Rc1/4

LCD CONTROLLER CONNECTOR

VENTILATING DUCT Ø50

GAS INLET CLAMP FLANGE NW80

EYE BOLT M8

CONTROL CONNECTOR

CIRCUIT PROTECTOR

N2 GAS REGULATOR

N2 GAS PURGE PORT 1/4" TUBE CONNECTION

GAS OUTLET CLAMP FLANGE NW40

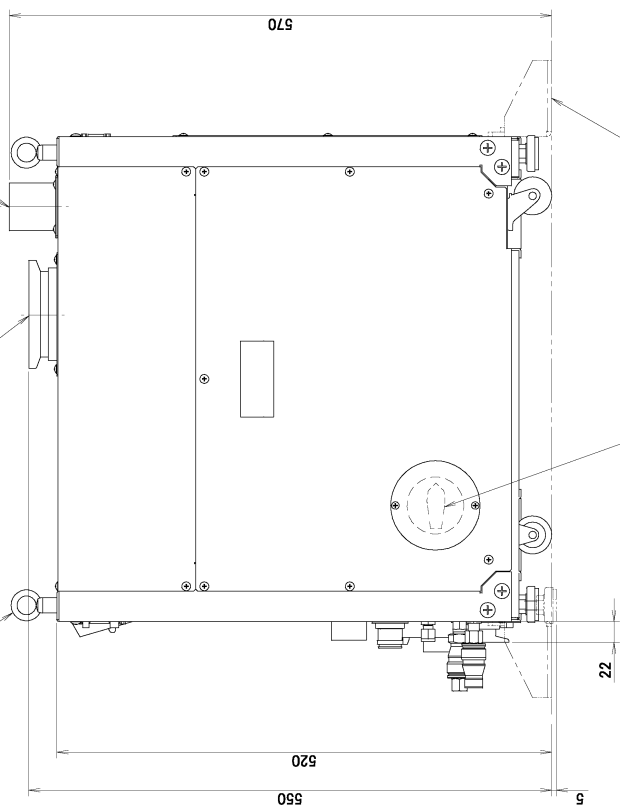
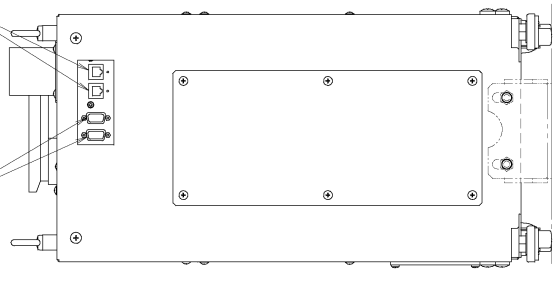
POWER CONNECTOR

COOLING WATER RETURN W/ COUPLER Rc1/4

COOLING WATER SUPPLY W/ COUPLER Rc1/4

SELECTOR VALVE FOR DILUTION N2 GAS

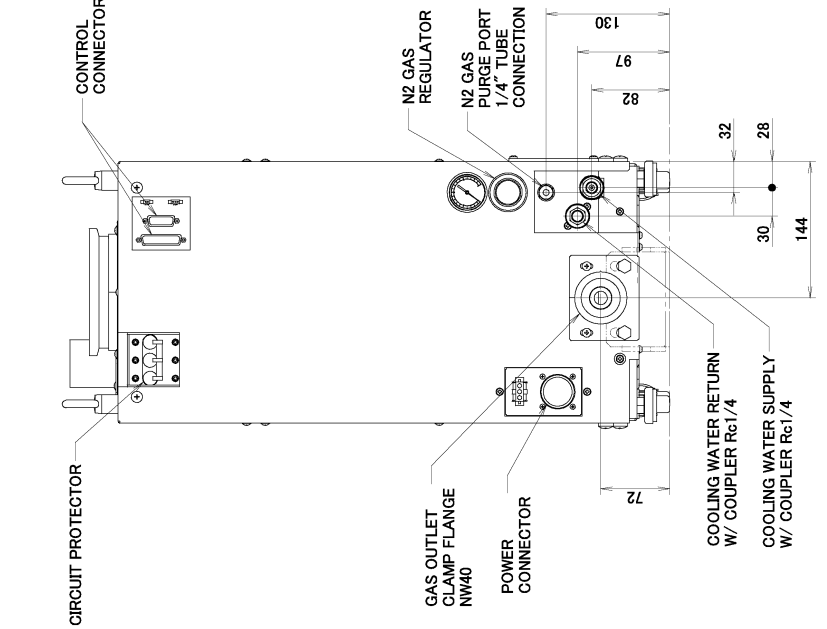
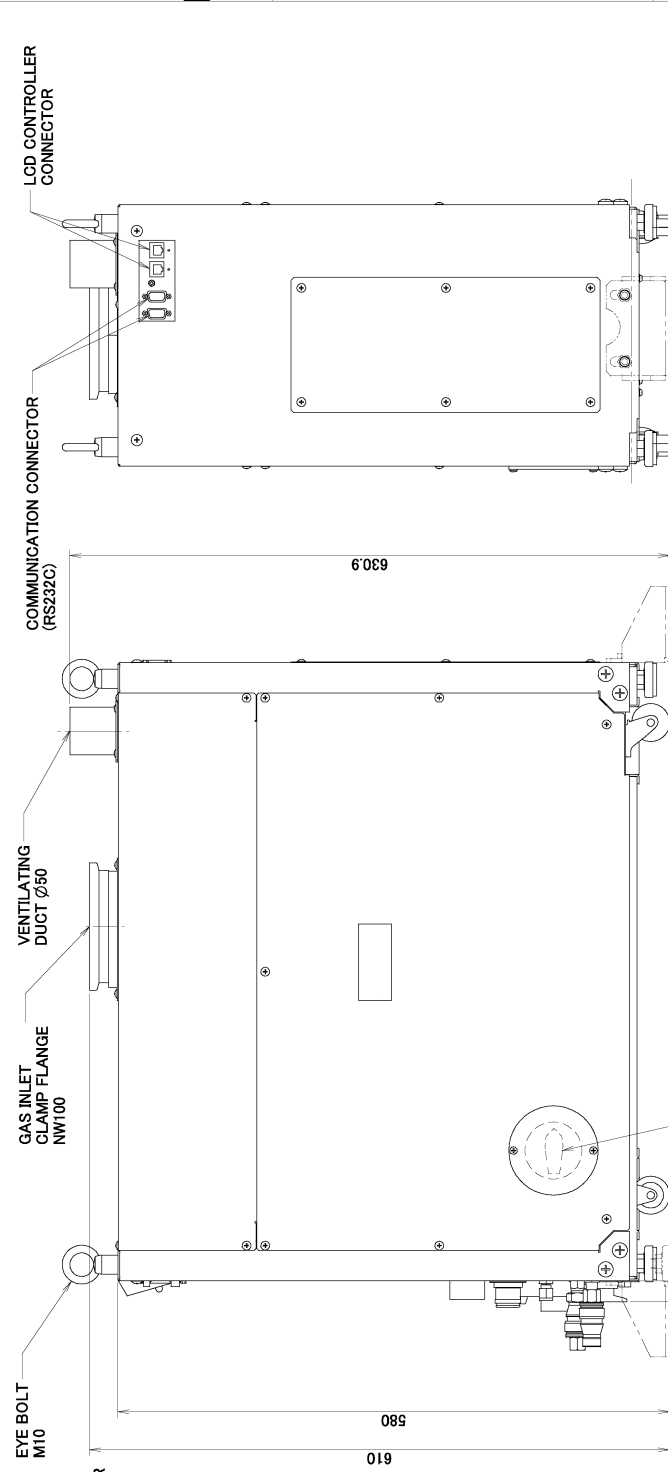
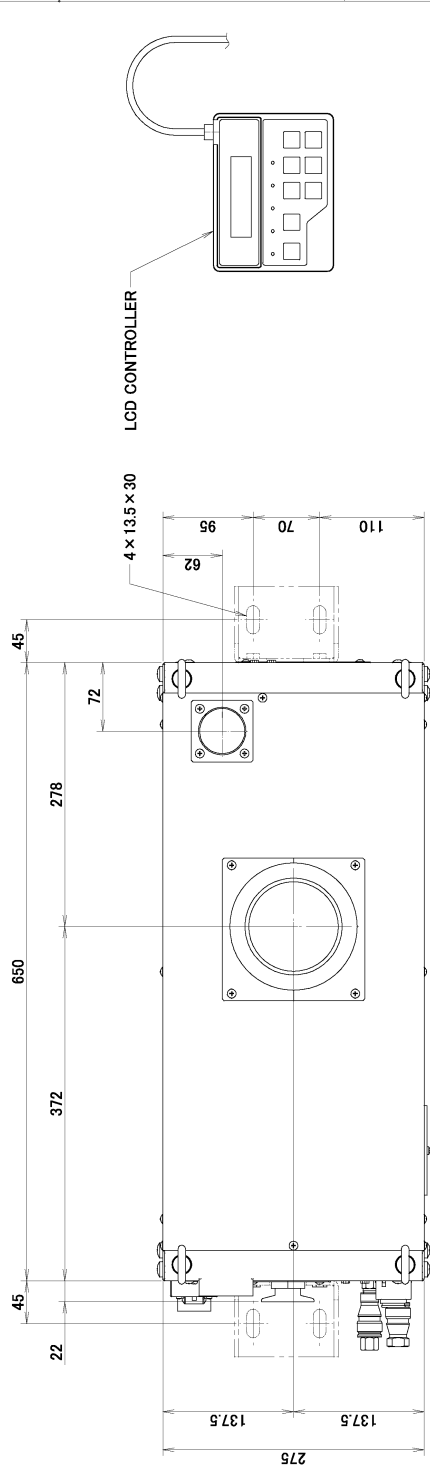
FIXTURE (OPTIONAL PARTS)



EBARA SERIAL No.		CUSTOMER	
MODEL	EV-S100P/EV-S100N	SET	FINAL USER
APPROD BY	KITO	DESIGN BY	KITO
K. USUI	Nov.18.08	CHK'D BY	KITO
		DRWN BY	KITO
			Nov.18.08
TITLE		DWG.No.	
OUTLINE DRAWING		WB-A082040701-00	
REV		REV	
P.10			
EBARA CORPORATION		EBARA	

METRIC

No.	DESCRIPTION	DATE	BY	APP.



EBARA SER.No.		CUSTOMER	
MODEL	EV-S200P/EV-S200N	SET	FINAL USER
APP'D BY	KITO	DESIGN BY	KITO
K. USUI	Nov.18.08	CHK'D BY	KITO
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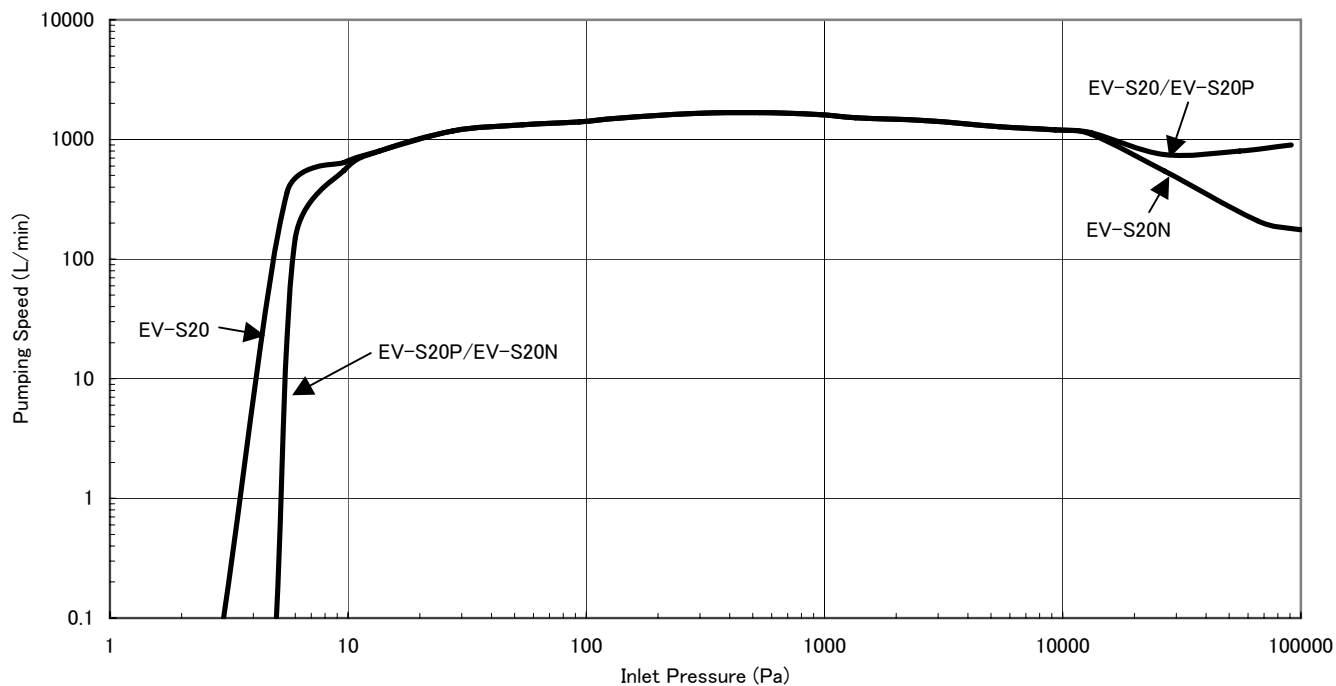


Fig.1.1 EV-S20(P/N) Performance curve

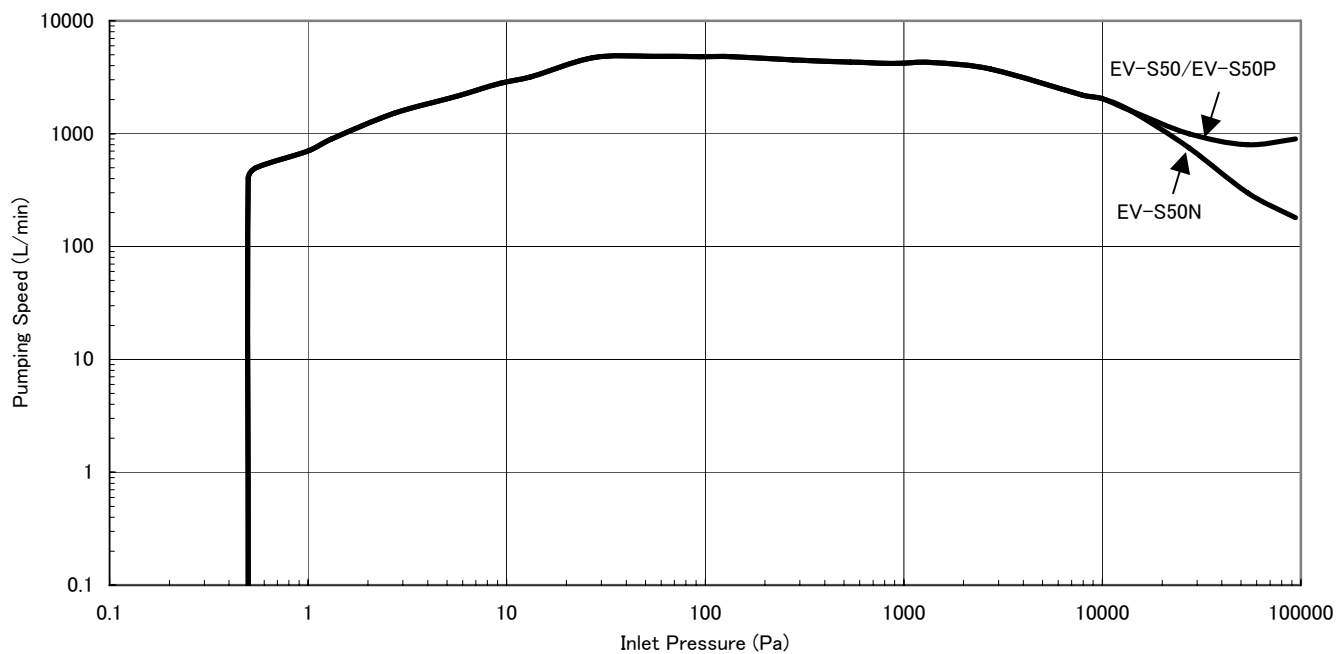


Fig.1.2 EV-S50(P/N) Performance curve

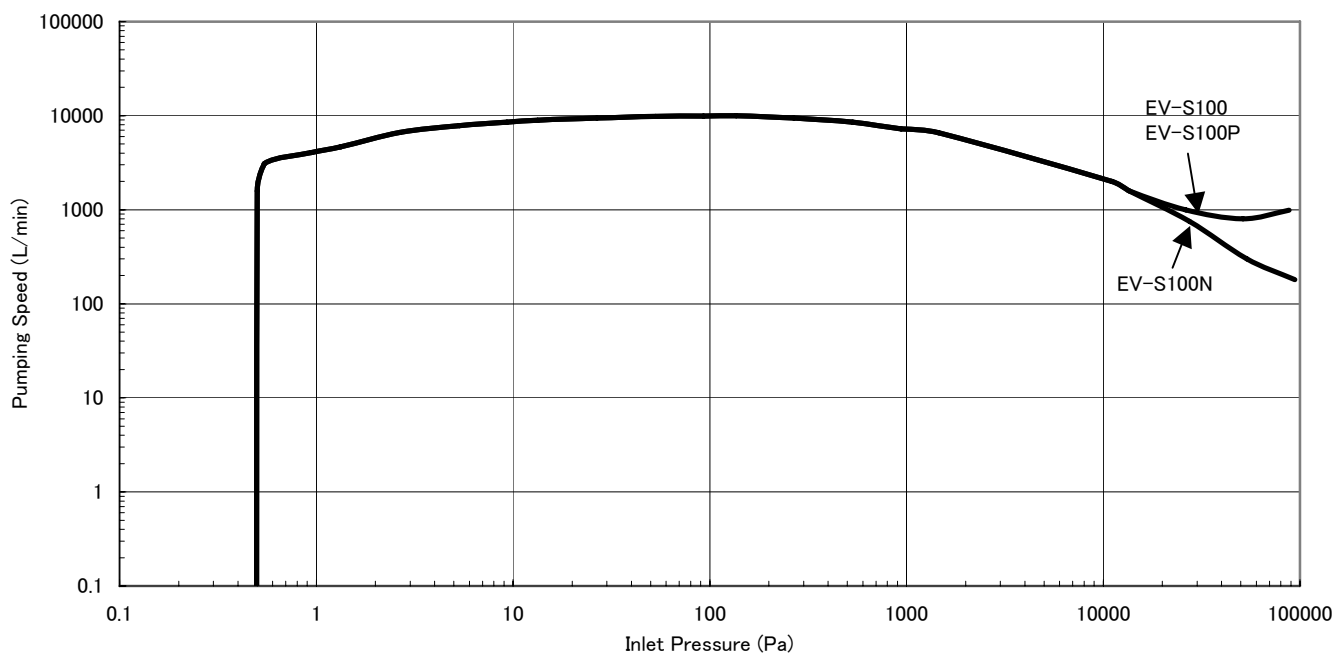


Fig.1.3 EV-S100(P/N) Performance curve

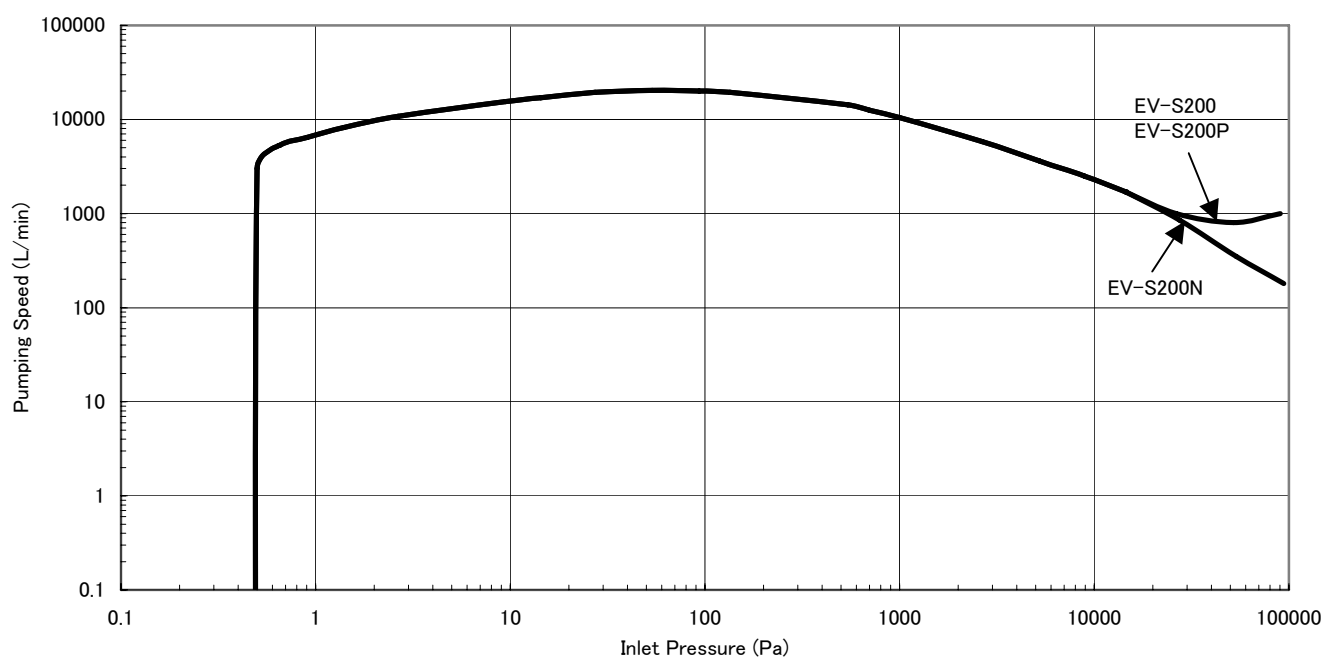
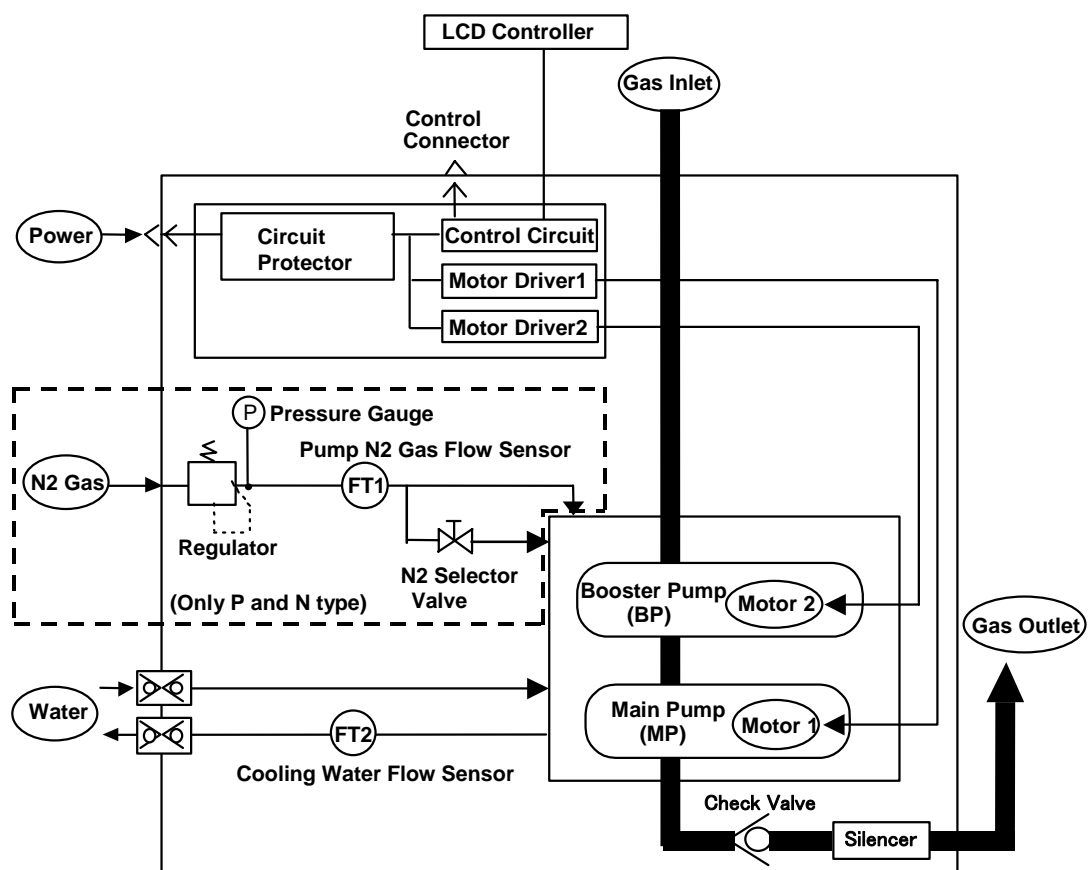


Fig.1.4 EV-S200(P/N) Performance curve



※EV-S20(P/N) pump is supplied without a booster pump (BP).

Fig. 1.5 System Flow

2. Electrical connection

2.1 Power Supply Wiring

Wire the connector for the main power supply (200–220V AC at 3–Phase and 50/60Hz)

Figure 2.1, 2.2 and Tables 2.1, 2.2 and 2.3 show the connector pin assignment.

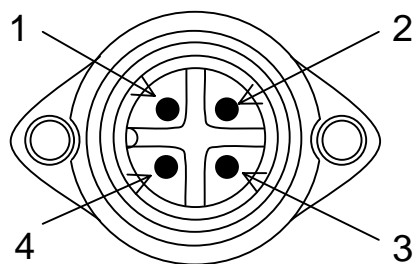
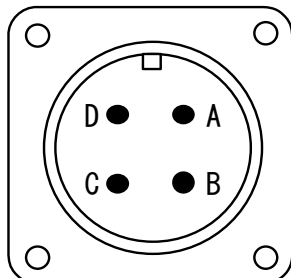


Table 2.1 EV-S20(P/N) Pin Assignment of Power Supply Receptacle

No.	Phase
1	R
2	S
3	T
4	GND

Fig. 2.1 EV-S20(P/N) Power Supply Receptacle
(As seen from connecting side)

Table 2.2 EV-S50~200(P/N) Pin Assignment of Power Supply Receptacle



No.	Phase
A	R
B	S
C	T
D	GND

Fig. 2.2 EV-S50~200(P/N) Power Supply Receptacle
(As seen from connecting side)

Table 2.3 Receptacle Specification

Pump Model	EV-S20(P/N)	EV-S50(P/N)	EV-S100(P/N)	EV-S200(P/N)
Receptacle type	C016 20C003 100 12	JL04HV-2E22-22PE-B		
Receptacle Manufacturer	Amphenol	Japan Aviation Electronics Industry Co.,Ltd		
Adapted plug type	C016 20D003 100 12	JL04V-6A22-22SE-EB		
Suitable wire	AWG #14	\triangle AWG #12	AWG #10	
Power capacity	3.2 kVA	\triangle 4.8 kVA	6.4 kVA	6.8 kVA

2.2 Control Signal Wiring

Connect wires to the control connector for remote operation and remote monitoring. Tables 2.4 , 2.5 , 2.6 and 2.7 and Figs. 2.3 and 2.4 show the pin assignment.

Table 2.4 Receptacle Specification

Connector No.	Connector type
CN-Z	15 pin D-sub miniature Female receptacle (Applicable for SEMI E73)
CN-Y	25 pin D-sub miniature Female receptacle

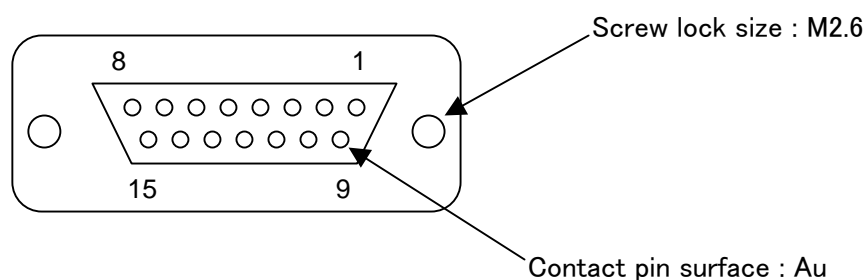


Fig. 2.3 15 Pin D-Sub Miniature Female Receptacle(As seen from connecting side)

Table 2.5 Control Connector Pin Assignment (CN-Z) (Applicable for SEMI E73)

Pin No.	Signal name	I/O	Signal type
1	MP START (+)	IN	Run: CLOSE, Alternate
2	BP START (+)	IN	Run: CLOSE, Alternate
3	MP START STATUS (+)	OUT	Run: CLOSE, Alternate
4	BP START STATUS (+)	OUT	Run: CLOSE, Alternate
5	WARNING STATUS (+)	OUT	WARNING: OPEN, Alternate
6	ALARM STATUS (+)	OUT	ALARM: OPEN, Alternate
7	REMOTE STATUS (+)	OUT	REMOTE: CLOSE
8	—		
9	MP START (-)		
10	BP START (-)		
11	MP START STATUS (-)		
12	BP START STATUS (-)		
13	WARNING STATUS (-)		
14	ALARM STATUS (-)		
15	REMOTE STATUS (-)		

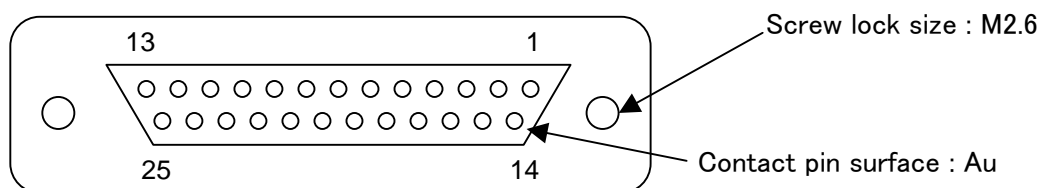


Fig. 2.4 25 Pin D-Sub Miniature Female Receptacle
(As seen from connecting side)

Table 2.6 Control Connector Pin Assignment (CN-Y)

Pin No.	Signal name	I/O	Signal type
1	RESET (+)	IN	RESET: CLOSE
2	SAVING ENERGY CONTROL (+)	IN	SAVING ENERGY: CLOSE, Alternate
3	RESERVED (+)	IN	
4	RESERVED (+)	IN	
5	RESERVED (+)	IN	
6	EMO STATUS (+) ※1	OUT	Abnormality: OPEN, Alternate
7	PUMP N2 WARNING STATUS (+) ※2	OUT	Abnormality: CLOSE, Alternate ※3
8	RESERVED (+)	OUT	
9	SAVING ENERGY STATUS (+)	OUT	SAVING ENERGY: CLOSE, Alternate
10	RESERVED (+)	OUT	
11	RESERVED (+)	OUT	
12	RESERVED (+)	OUT	
13	—		
14	RESET (-)		
15	SAVING ENERGY CONTROL (-)		
16	RESERVED (-)		
17	RESET (-)		
18	RESET (-)		
19	EMO STATUS (-) ※1		
20	PUMP N2 WARNING STATUS (-) ※2		
21	RESET (-)		
22	SAVING ENERGY STATUS (-)		
23	RESERVED (-)		
24	RESERVED (-)		
25	RESERVED (-)		

※1 EMO is option correspondence.

※2 For P and N type only.

※3 It can change to “Abnormality: OPEN, Alternate” by DIP SW. setting.

Table 2.7 CN-Z & CN-Y Signal Contacts

