

OM-EN-EB3-3.10

April 1, 2021

EcoBooster[®]

Operation Manual


Type **EB3**


FUJI BC
ENGINEERING

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FOR YOUR SAFETY

 **WARNING** Improper use of the equipment may cause serious injury or death.

 **CAUTION** Improper use of the equipment may cause injury or material damages.



- EcoBooster is the device for Micro lubrication system to cut metals.
Do not use for other purposes.
- When flammable oil such as volatile oil is used, it may catch a fire.
- Air pressure should be less than 0.7MPa. When it was over 0.7 MPa, it may damage tubing and other devices.
- Do not expose to a material, such as strong acid, strong alkali, corrosive gas.
They may damage tubing and other devices.



- Use Bluebe LB-1, LB-7, or LB-10 type oil. When other oil is used, it may damage the device.
- Do not fill the oil over H line. Drain the overflow oil from the drain valve.

Background Information

EcoBooster has been specifically designed to dispense controlled amount of Bluebe oil for variety of machining applications. Use of non-genuine oil in the system may result in damage to the unit.

SPECIFICATION

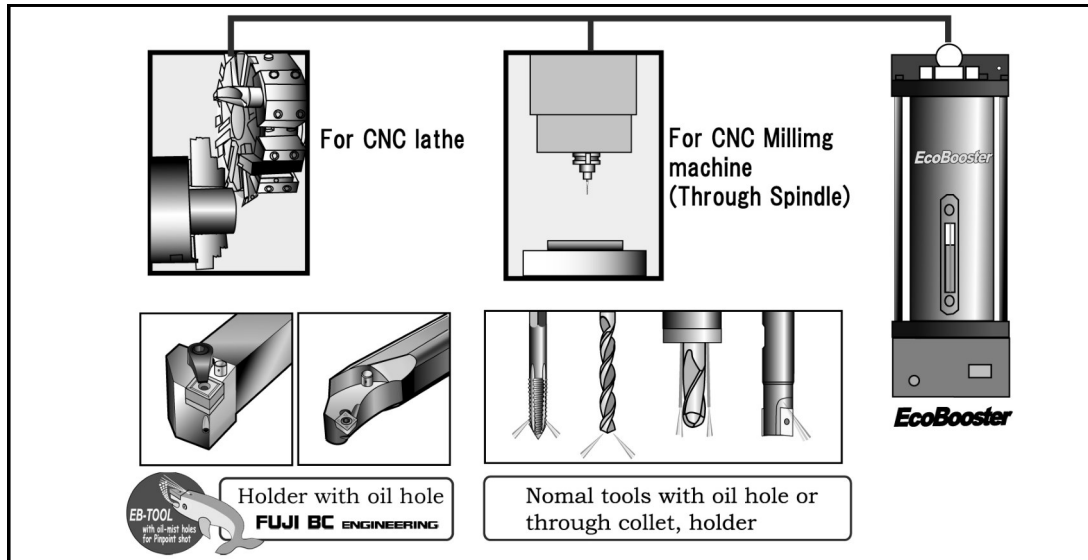
○ <u>Maximum working pressure</u>	<u>0.7 MPa</u>
○ <u>Working pressure range</u>	<u>0.4 ~ 0.7 MPa</u>
○ <u>Tank capacity</u>	<u>1,200mL</u>
○ <u>Oil consumption</u>	<u>2 ~ 20 mL/hour (Depend on use condition)</u>
○ <u>Pump strokes</u>	<u>1 Hz (recommendation)~ 3 Hz (Max)</u>
○ <u>Mounting</u>	<u>M6 (2 holes)</u>
○ <u>Mist outlet</u>	<u>1 place (Φ12 tube connector)</u>
○ <u>For input connect</u>	<u>OIL DETECTOR (in Tank)</u>
○ <u>For output connect</u>	<u>EB OPERATION SOLENOID VALVE</u>
○ <u>Dry weight</u>	<u>8kg</u>

SET UP OF OIL DETECTOR

Oil level may vary due to the change of air pressure and other reasons. Specific gravity of oil may also change due to the volume of air in the oil. Under these conditions, the use of "timer" is highly recommended. Alarm signal of oil detector (float switch) shall be activated only when the signal stays at the same condition for a certain period.

Recommendation of timer set up: 10 minutes for EB3

RECOMMENDED TOOLS



Cutting tool / Holder	Total cross section area
Gap(sukima) through	0.8 mm ² < Total cross sectional area < 5.0 mm ²
Collett through nozzle	
Drill with oil hole	
Tap with oil hole	
Milling tool with oil hole	
Bluebe EB-TOOL	Optimized for EcoBooster

One hole		Two holes	
ΦD	mm ²	ΦD	mm ²
Φ0.4	0.13	Φ0.4	0.25
Φ0.5	0.20	Φ0.5	0.40
Φ0.6	0.28	Φ0.6	0.56
Φ0.7	0.38	Φ0.7	0.76
Φ0.8	0.50	Φ0.8	1.00
Φ0.9	0.63	Φ0.9	1.26
Φ1.0	0.78	Φ1.0	1.56
Φ1.1	0.95	Φ1.1	1.90
Φ1.2	1.13	Φ1.2	2.26
Φ1.3	1.33	Φ1.3	2.66
Φ1.4	1.54	Φ1.4	3.08
Φ1.5	1.77	Φ1.5	3.54
Φ1.6	2.02	Φ1.6	4.04
Φ1.7	2.27	Φ1.7	4.54
Φ1.8	2.54	Φ1.8	5.08
Φ1.9	2.83	Φ1.9	5.66
Φ2.0	3.14	Φ2.0	6.28
Φ2.2	3.80	Φ2.2	7.60
Φ2.4	4.52	Φ2.4	9.04
Φ2.6	5.30	Φ2.6	10.6
Φ2.8	6.10	Φ2.8	12.3
Φ3.0	7.10	Φ3.0	14.1
Φ3.2	8.00	Φ3.2	16.1



Recommended oil hole diameter

Dry mist does not adhere to the inside of piping or spindle but it must be liquefied at the cutting point. Oil hole diameter need to be between 0.8mm² to 5mm² in diameter to obtain the workable condition of EB3.

HOW TO USE

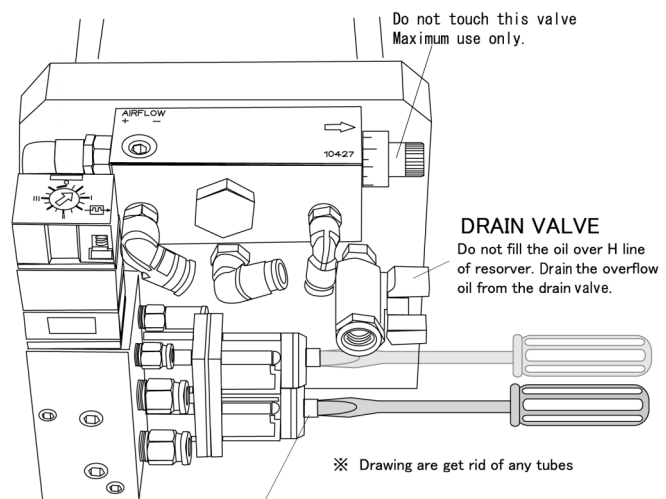
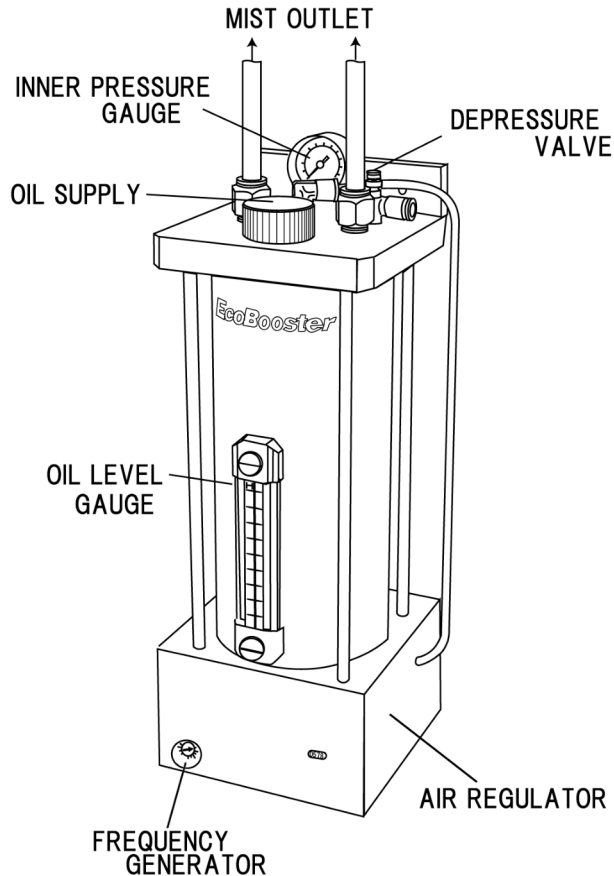
Open the air valve manually or activate the solenoid valve by M-code to supply air. Lubricant volume is determined by the combination of pumping cycle and oil hole size of the tool.

FREQUENCY GENERATOR

This device controls the speed of the pump cycle. The standard speed of the pump is one stroke per one second. Adjustment is made by changing the position of the indicator using a screw driver. Time the sound interval. Sound of 3 times/sec is for maximum volume and 1 time / 3 sec. is for minimum volume of lubricant.

AIR CONTROL

EcoBooster should keep it's inner air pressure 0.2MPa less than supplied air to generate the ultra fine mist, so called dry mist. Dry mist does not adhere to the piping, machine spindle or tubing of turret. Set the most common cutting tool to use and set the air regulator so that inner air pressure is going to be 0.2MPa less than supplied air. There are two regulators set up and both need to be adjusted simultaneously. Inner air pressure will be changed according to the size of oil hole of cutting tools. In case, size of oil hole gets larger than 5mm², dry mist (white smoke) can be seen. In this case, air regulator need to be opened until smoke disappeared. The use of smaller oil hole or increase of supply air pressure is required when white smoke can not be eliminated.

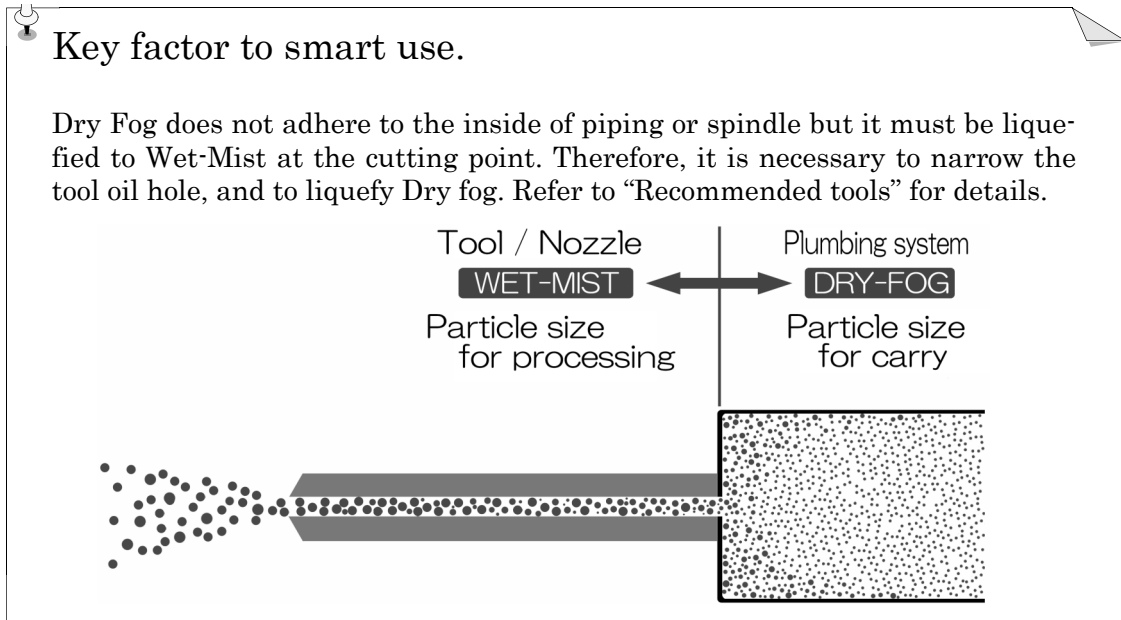


AIR REGULATOR

Switch on the EcoBooster with the most standard tool.
Set the twin regulator 0.2MPa less than from supplying air pressure, measuring by the pressure gauge.
Set the twin regulator at the same time and set at same position.

OIL CONSUMPTION

Oil consumption is determined by the combination of frequency generator and oil hole size of the tool. Standard consumption is 4ml per one hour. From 2ml to 20ml per one hour is normal range of oil consumption.



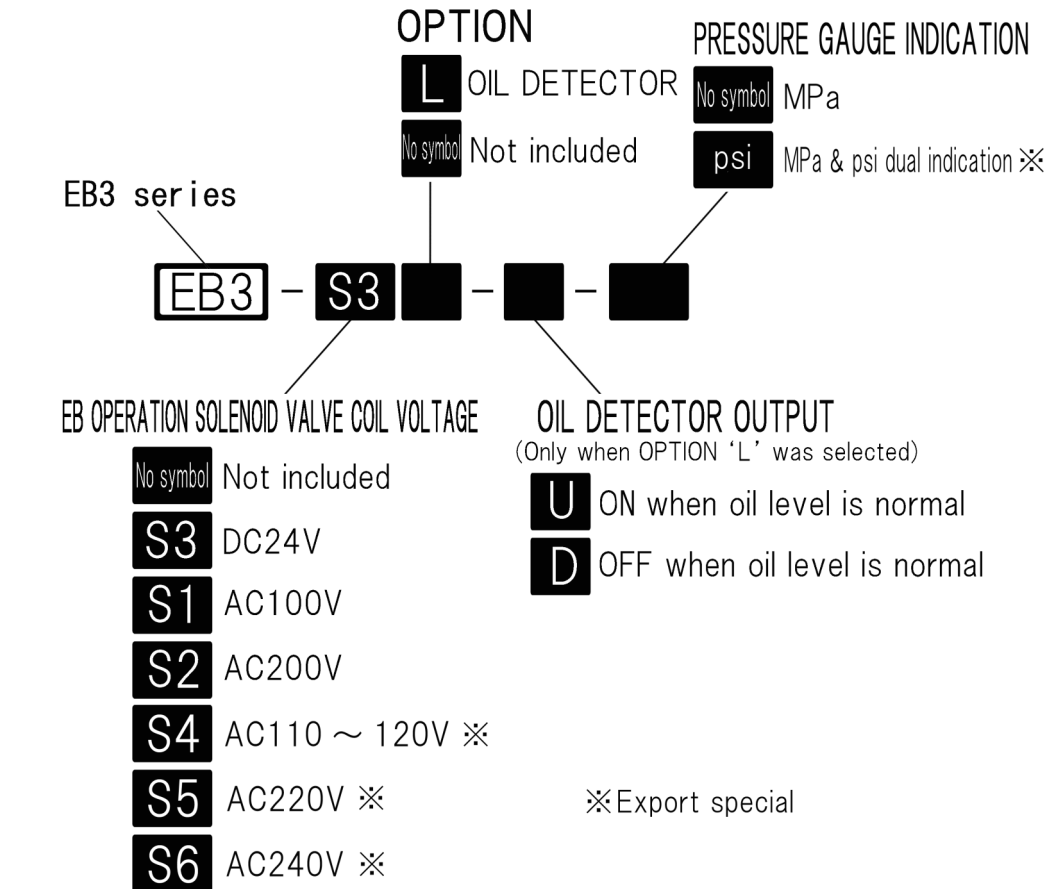
PROCEDURE TO FILL THE OIL



CAUTION
 Depressurize oil tank (EB body) before filling the oil by the DEPRESSURE VALVE.

1. For your safety, stop operation of the EcoBooster when oil is supplied.
2. Depressurize the oil tank before filling the oil by the DEPRESSURE VALVE.
3. Check if the tank is completely depressurized.
4. Remove the OIL SUPPLY cap.
 Do not allow any dust getting into the oil tank.
5. Supply slowly not to spill the lubricant over the unit.
 The capacity of the tank is 1,200ml (Max.).
6. Do not fill the oil over the H level.
 When the filling level is over the H level, drain the oil from drain valve.
7. When oil is filled, tighten the OIL SUPPLY cap and close the DEPRESSURE VALVE.

EB3 TYPE SELECTION GUIDE



A standard type : **EB3-S3**

Other types : EB3-S3L-U, EB3-S3L-D, EB3-S1, EB3-S1L-U, EB3-S1L-D, EB3-S2, EB3-S2L-U, EB3-S2L-D, EB3, EB3-L-U, EB3-L-D, EB3-S4 ※, EB3-S4L-U ※, EB3-S4L-D ※, EB3-S5 ※, EB3-S5L-U ※, EB3-S5L-D ※, EB3-S6 ※, EB3-S6L-U ※, EB3-S6L-D ※, EB3-S3-psi ※, EB3-S3L-U-psi ※, EB3-S3L-D-psi ※, EB3-S1-psi ※, EB3-S1L-U-psi ※, EB3-S1L-D-psi ※, EB3-S2-psi ※, EB3-S2L-U-psi ※, EB3-S2L-D-psi ※, EB3-psi ※, EB3-L-U-psi ※, EB3-L-D-psi ※, EB3-S4-psi ※, EB3-S4L-U-psi ※, EB3-S4L-D-psi ※, EB3-S5-psi ※, EB3-S5L-U-psi ※, EB3-S5L-D-psi ※, EB3-S6-psi ※, EB3-S6L-U-psi ※, EB3-S6L-D-psi ※

Types not mentioned above are applicable only for the machine tool manufacturer.

RECOMMENDED LUBRICANTS

Viscosity of oil is important factor to generate micro lubricant droplets. Also from the safer work condition view point, we recommend the following oil to use.

Bluebe LB-1, LB-7, or LB-10 (in JAPAN)
Accu-lube LB-2000 or LB-6000 (in USA, Europe)

WARRANTY

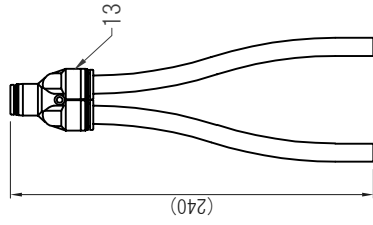
EcoBooster is backed with One-year Limited Warranty against defects in workmanship and/or materials. Warranty applies only when used under normal operating conditions. Warranty does not applied if a lubricant other than recommended oil is used.

CONTACT

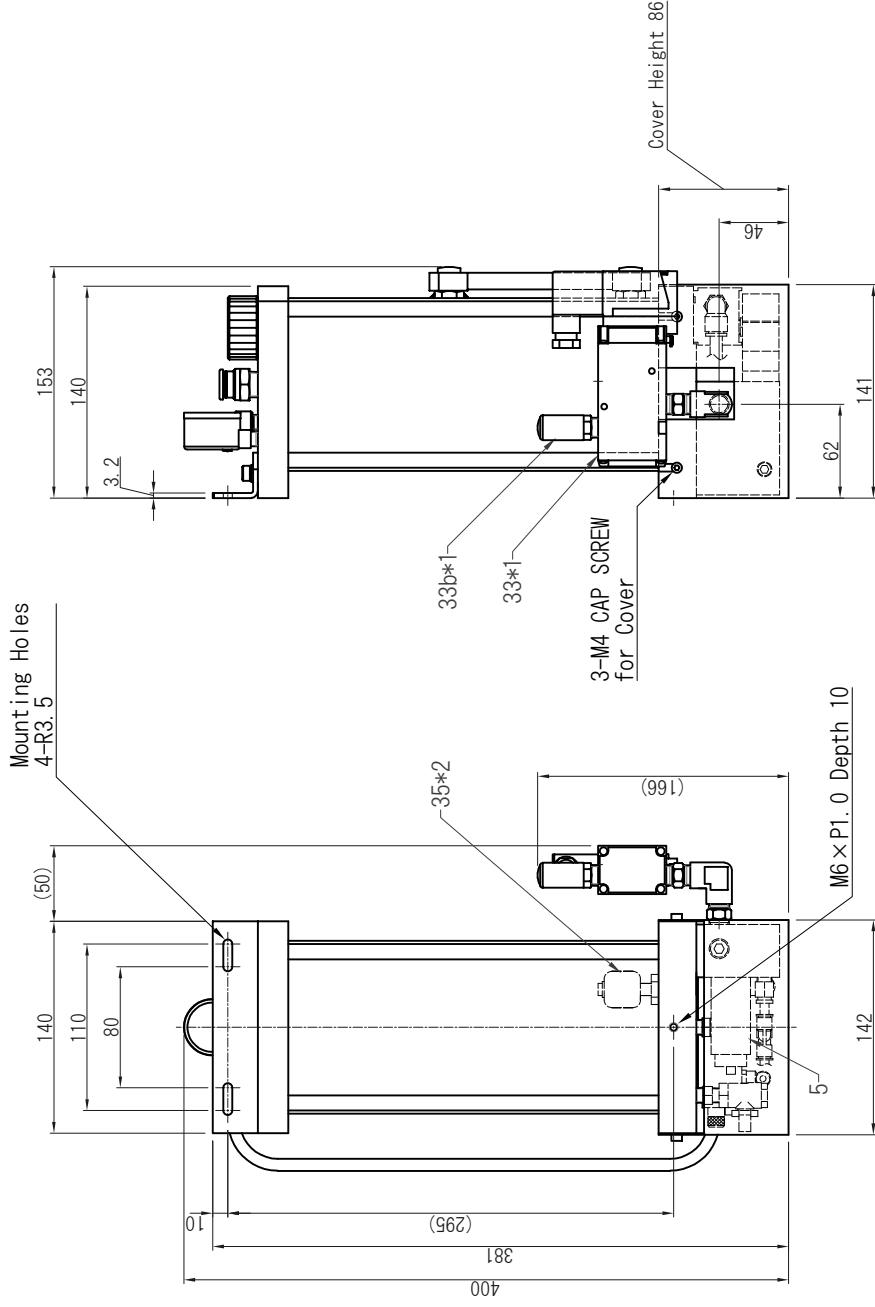
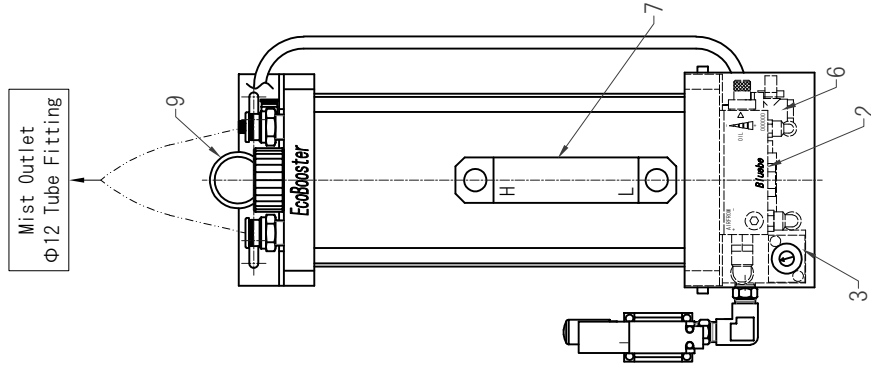
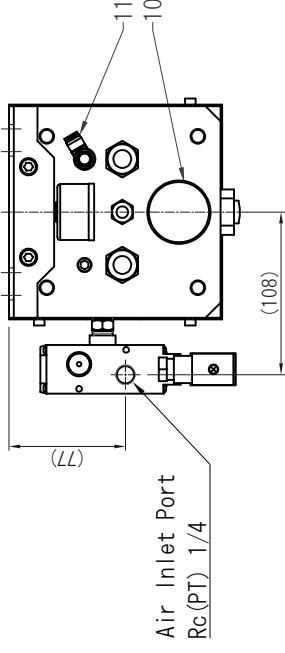
JAPAN	FUJI BC ENGINEERING CO., ltd. 3-1, Shioiricho, Mizuho-ku, Nagoya, 467-0851 JAPAN TEL: 81-52-819-5411 FAX: 81-52-819-5410 www.fuji-bc.com
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GERMANY	ACCU-LUBE MFG. GMBH Postfach 80 D-75433 Maulbronn, Germany TEL: 66-7043-5612 FAX: 66-7043-907098 www.accu-lube.com
CHINA	BLUEBE(SHANGHAI)ENVIRONMENTAL TECHNOLOGY CO., LTD. Room716-717, No.3, Lane no.58, East Xinjian Road, Minhang Shanghai, 201100, China TEL: 86-21-6427-3096 FAX: 86-21-6427-2373
TAIWAN	KANDO GROUP CORPORATION 7F, No.8 Lane 83, Sec. 1, Guang Fu Road, San Chung City, Taipei Hsien 242 Taiwan R.O.C. TEL: 886-2-2999-0393 FAX: 886-2-2999-0856
KOREA	HANSUNG GT CO., LTD. Gunpocheomdansaneop 1-ro 39, Gunpo-si, Gyeonggi-do, 15881 South Korea TEL: 82-31-428-8250 FAX: 82-31-455-0487
THAILAND	THAI WORTH CO., LTD. 2/9 Serithai Road, Kwaeng Kannayao, Khet Kannayao, Bangkok 10230 Thailand TEL: 66-2736-4560 FAX: 66-2736-4694
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INDONESIA	569510 Singapore
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VIETNAM	
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Accessories:
Union Y Φ12 Tubes (Connect to Mist outlet)



Install and keep EcoBooster vertically.
Keep enough room on the top and bottom of EcoBooster to fill lubricant, set piping, remove bottom cover and drain lubricant.



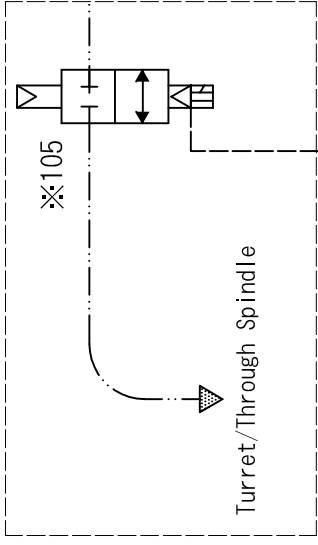
*1) Solenoid valves (Item 33 and 33b) to operate EB are not equipped when model number does not offer "SQ".

*2) Float Switch (Item 35) is not equipped when model number does not offer "L".

PAPER SIZE : A 4

REVIEWS		DATE		DESIGNED	DRAWN	CHECKED	APPROVED	TITLE	
		' 20.09.10	INOUE	伊能 英二	20.09.11	伊能 英二	20.09.17	EcoBooster EB3 Outline	
						3RD ANGLE PROJECTION		SCALE	DRAWING CODE
				FUJI BC ENGINEERING CO., LTD				1:5	EN-EB3-01-STD3.10

※105 We recommend to install Rotary Valve [Full Boa Type].



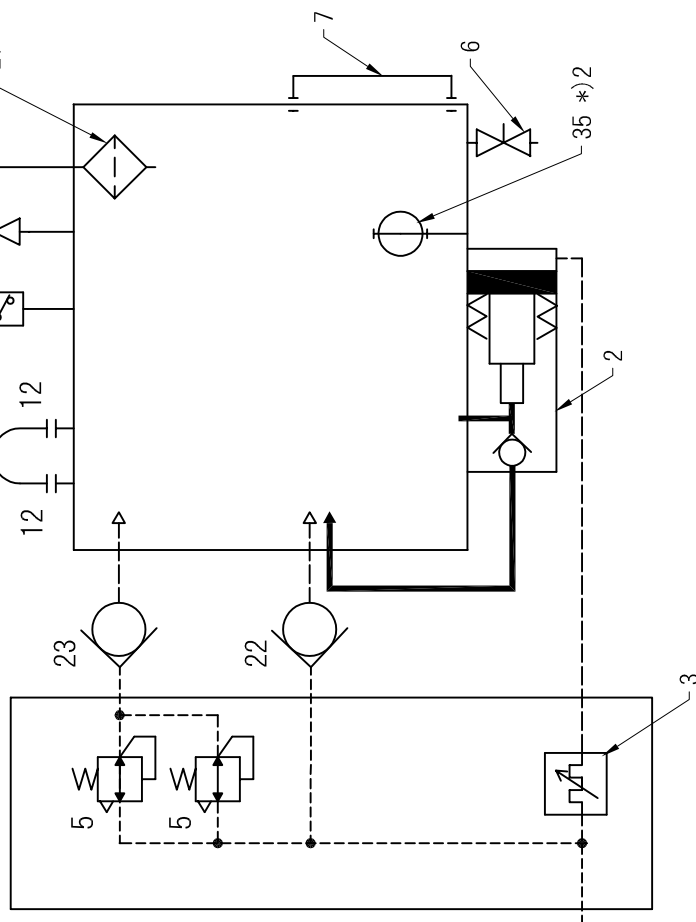
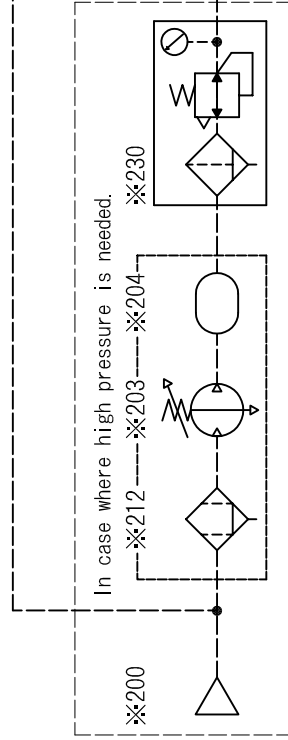
--- Air
 --- Oil
 --- Mist

□ OR ※Prepare them by the customer.

Prepare them by the customer.

Air supply
 Recommend pressure 0.6MPa
 Max. pressure 0.7MPa
 Min. pressure 0.4MPa
 Max. flow 350L/min[ANR]

Supply filtered clean air.



※ They are not included in EcoBooster.

*1) Solenoid valves (Item 33 and 33b) to operate EB are not equipped when model number does not offer "S□".

*2) Float Switch (Item 35) is not equipped when model number does not offer "L".

PAPER SIZE : A 4

REVIEWS		DATE	DESIGNED	DRAWN	CHECKED	APPROVED	TITLE
		' 18. 06. 06	INOUE	MAENO	SAKAI	GOTO	EcoBooster EB3 Flow Sheet
							SCALE
							DRAWING CODE
							EN-EB3-02-STD3. 01

EcoBooster EB3 Parts List

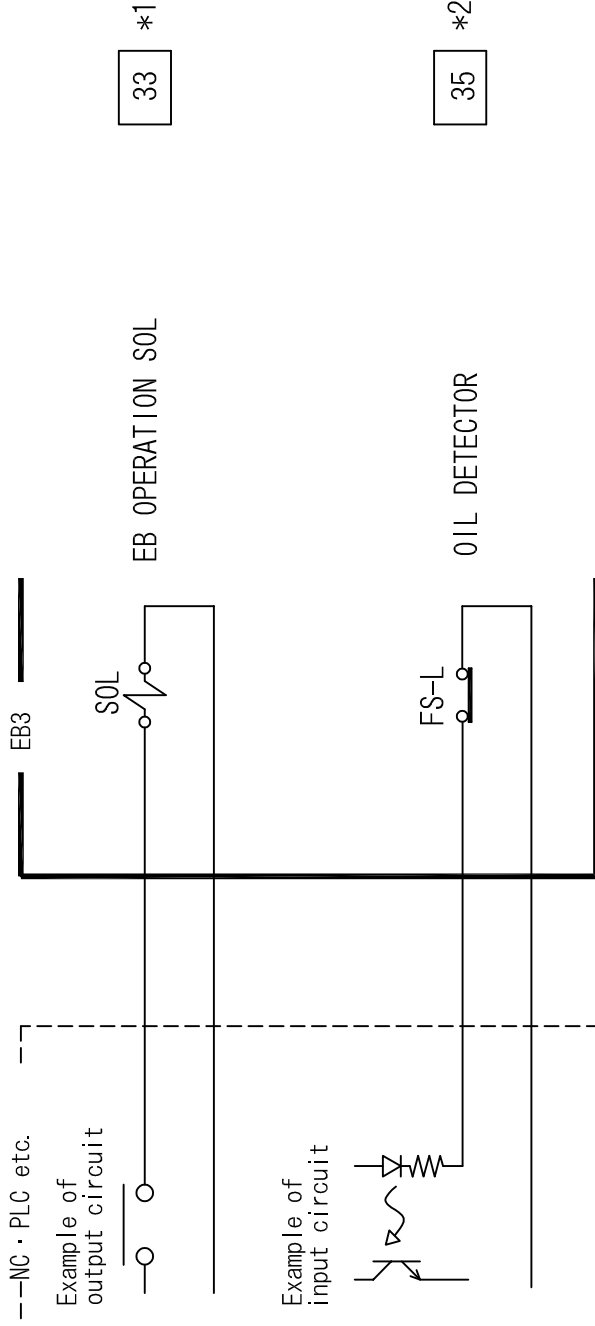
Drawing Code: EN-EB3-03-3.10

'20.09.10

No.	ITEM	Q'ty	MAKER	TYPE	REMARKS
2	FK PUMP	1	FUJI BC	9722EB3	
3	FREQUENCY GENERATOR	1	FUJI BC	9460	
5	AIR REGULATOR	2	FESTO	LR-3.3	
6	DRAIN	1	KITZ	TKT1/8	
7	OIL LEVEL GAUGE	1	KYOWA	KHR-120A-M10	
9	INNER PRESSURE GAUGE	1	SMC	GA36-10-01	
10	OIL SUPPLY	1	FUJI BC	101MP1001	D42 × M27
11	DEPRESSURE VALVE	1	PISCO	JNC6-01	
12	MIST OUTLET	2	PISCO	PC12-03	
13	UNION Y	1	PISCO	PY12	
21	OIL FILTER	1	FUJI BC	102TNK2103	
22	CHECK VALVE	1	PISCO	CVU6-6FN	MIST AIR LINE
23	CHECK VALVE	1	PISCO	CVU6-6FN	ACCELERATION AIR LINE
33	EB OPERATION SOLENOID VALVE ※	1	SMC	VP542K-5DUE1-02A-X108 VP542K-1DZE1-02A-X108 VP542K-2DZE1-02A-X108	DC24V AC100V AC200V
33b	SILENCER ※	1	SMC	AN200-02	
35	FLOAT SWITCH (OIL DETECTOR)※※	1	NOHKEN	OLV-5	
Prepare it by the customer.					
105	Rotary valve (Air operated type 2 port valve)		CKD	CHB-V1-10-0L-□ (□ : Coil voltage)	(We recommend it.)
200	Air supply				
203	Booster regulator		SMC	VBA40A-04GN	''
204	Air tank		SMC	VBAT20A1-V	''
212	Mist separator		SMC	AFM30-03C-2-A	''
230	Filter regulator		SMC	AW30-03CG-2-B	''

※Solenoid valves (Item 33 and 33b) to operate EB are not equipped when model number does not offer “S□”.

※※Float Switch (Item 35) is not equipped when model number does not offer “L”.



The number in the square shows the product number in the drawing.

*1) Solenoid valves (Item 33 and 33b) to operate EB are not equipped when model number does not offer "SQ".

*2) Float Switch (Item 35) is not equipped when model number does not offer "L".

DATE	DESIGNED	DRAWN	CHECKED	APPROVED	TITLE
'18.01.17	INOUE	MAENO	SAKAI	GOTO	EcoBooster EB3 wiring
					SCALE
					DRAWING CODE
FUJIBO ENGINEERING CO., LTD				3RD ANGLE PROJECTION	FREE (NTS)
					EN-EB3-04-STD3.00