

Standard specifications

MC004VFF60001

1st Edition : November 23, 2016
2st Edition : July 31, 2017

KAWASAKI HEAVY INDUSTRIES, LTD.
ROBOT DIVISION

Specification :	90101-2570DEB
(Arm) :	90151-0173DEA
(Controller) :	90152-0048DEB

[1] Robot Arm															
1. Model		MC004V-B													
2. Type		Articulated robot													
3. Degree of freedom		6 axes													
4. Axis specification	Operating axis		Max. operating range	Max. speed											
	Arm rotation	(JT1)	+ 180 ° ~ − 180 °	200 ° /s											
	Arm out-in	(JT2)	+ 135 ° ~ − 95 °	180 ° /s											
	Arm up-down	(JT3)	+ 60 ° ~ − 155 °	225 ° /s											
	Wrist swivel	(JT4)	+ 270 ° ~ − 270 °	700 ° /s											
	Wrist bend	(JT5)	+ 120 ° ~ − 120 °	500 ° /s											
	Wrist twist	(JT6)	+ 270 ° ~ − 270 °	350 ° /s											
5. Repeatability		±0.05 mm (at the tool mounting surface)													
6. Max. payload		4 kg													
7. Max. speed		5000 mm/s (at the center of tool mounting surface)													
8. Load capacity of wrist		<table><tr><td></td><td>Max. torque</td><td>Moment of inertia*</td></tr><tr><td>JT4</td><td>8.5 N・m</td><td>0.20 kg・m2</td></tr><tr><td>JT5</td><td>8.5 N・m</td><td>0.20 kg・m2</td></tr><tr><td>JT6</td><td>4.0 N・m</td><td>0.10 kg・m2</td></tr></table> Note* Each value in this table shows allowable moment of inertia of JT4/JT5/JT6 when max. allowed torque is applied to each axis. If more detailed data is required for your application, please contact Kawasaki.			Max. torque	Moment of inertia*	JT4	8.5 N・m	0.20 kg・m2	JT5	8.5 N・m	0.20 kg・m2	JT6	4.0 N・m	0.10 kg・m2
	Max. torque	Moment of inertia*													
JT4	8.5 N・m	0.20 kg・m2													
JT5	8.5 N・m	0.20 kg・m2													
JT6	4.0 N・m	0.10 kg・m2													
9. Driving motor		Brushless AC Servomotor													
10. Working range		See attached drawing													
11. Mass		25 kg (without options)													
12. External facing		Plating for resistance to VHP and Buff #400													
13. Installation		Floor or Ceiling mounting													
14. Environment cond.		(Temperature) 10 ~ 35 °C, (Humidity) 35 ~ 85 %, no dew, nor frost allowed													
15. Cleanliness		ISO class 5 (Fed. Std. 209D class 100 (0.5μm))													
16. Built-in utilities															
	Air port	2 ports (Rc1/4) in the Connector Panel													
	Sensor harness	Sensor harness (8 circuits), wired inside robot arm													
	Valve	Double solenoid/ Single solenoid valves (2 units max.) Pneumatic piping for hand (φ4 × max 4 lines)													
17. Degree of protection		Wrist : IP67 Arm : IP65													
18. Supported sterilization		Dry process of VHP sterilization Reference Concentration of VHP: 400~1200ppm													
19. Encoder backup battery		External battery extension unit: extension harness 3m													
20. Connector panel		Bottom connector panel													
21. I/O type		NPN(sink) type													
22. Options															
	Encoder backup battery	External battery extension unit: extension harness 1~5m (every 1m)													
	I/O type	PNP(source) Type													
23. Others		Consult Kawasaki about maintenance parts and spare parts.													

[2] Controller		
1. Model	F60	
2. Enclosure	Protection level: IP20 Open structure / Direct cooling system *1	
3. Dimensions	See attached drawing	
4. Number of controlled axes	Max.8 axes (standard 6 axes, option 2 axes)	
5. Servo control and drive system	Full Digital Servo System	
6. Type of control	Teach mode	Joint, Base, Tool, Fixed Tool (option) operation mode
	Repeat mode	Joint, Linear, Circular (option) interpolation
7. Teaching method	Teaching or AS language programming	
8. Memory capacity	16 MB	
9. External operation signals	External Emergency stop, External Hold, etc.	
10. Number of Option board slots	2 slots	
11. Operation panel	Teach/Repeat SW, Emergency Stop SW	
12. Communication I/F	Ethernet (1000BASE-T/100BASE-TX/10BASE-T)	2port
	USB2.0	3port
	RS-232C	2port
13. Mass	See attached drawing	
14. Power requirement	AC200 V - AC230 V±10%, 50/60 Hz, 1 phases, Max. 2.0 kVA	
15. Ground	Less than 100 Ω (robot dedicated ground) Leakage current: max. 100 mA	
16. Ambient temperature	0 - 45℃	
17. Relative humidity	35 - 85 % (non-condensation)	
18. Color	Munsell: 5Y8.5/1 equivalent	
19. Teach Pendant	TFT color display (5.7 inch LCD) with touch panel Emergency Stop SW, Teach Lock SW and Enable SW	
20. Safety Circuit	Category: 4, Performance Level: e (EN ISO13849-1) *2	
21. Number of General purpose I/O signals	IN:16 OUT:16 with an I/O connector. (50pin with cover)	
22. Standard Options		
TP sheet language	English or Japanese or Chinese	
Power/Signal cable	5m, 10m, 15m	
Teach Pendant cable	5m, 10m, 15m	
23. Other Options		
Number of additional I/O signals	Inside Controller	I/O board(IN:32 OUT:32) ...up to 2 boards
	Remote I/O	Remote I/O unit(IN:32 OUT:32) ...up to 4 units
	Total max I/O number	IN:128 OUT:128
Intake Filter	Dusts more than 1mm diameter do not get into the controller from intake FAN	
Enclosure	Protection level: IP54 Enclosed structure / Indirect cooling system (Ambient temperature 0 - 45 °C) *3	
Motor brake release	Manual brake release switch BOX	
PC cable (RS-232C)	1.5 m, 3 m	
External axes control	Additional amplifier and harnesses for external axes	
Extended safety functions	Cubic-S(Motion area monitoring, Joint monitoring, Speed monitoring etc.) *3	
Teach Pendant option	Connector for TP less	
Fast check mode	Fast check mode Switch	
Others	Field BUS, Software PLC, Analog input/output, Conveyor Synchronization, Bluetooth	
24. Others	Consult Kawasaki about maintenance parts and spare parts.	

NOTE*1

Cooling of the electronic components in this open construction F60 controller is achieved by circulation of ambient air.

The enclosure is designed to protect personnel from coming in contact with hazardous parts inside the controller.

There is no protection to less than 10 mm of alien substance and water.

Please consider ①② and ③ and select the option about protection to the environmental specification

①There is no or few non-conductive dusts & particles(influence for the controller is little) ...Option is not needed.

②There is high possibility that non-conductive dusts & particle will get into controller. ...Select the option Intake Filter or Enclosed structure

③There is high possibility that conductive dusts & particle will get into controller. ...Select the option Enclosed structure

NOTE*2

Category and Performance level (PL) are determined by the whole system and conditions.

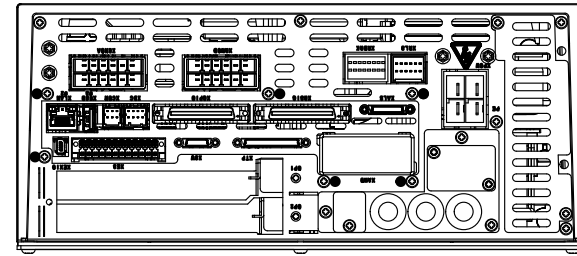
The safety circuit of this controller is available in the system of category: up to 4, PL: up to e.

NOTE*3

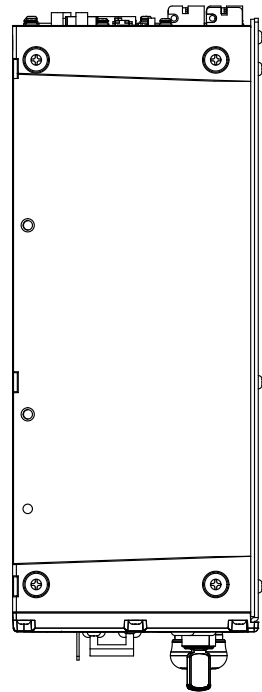
Attaching additional unit makes size of a controller larger.

F60 CONTROLLER

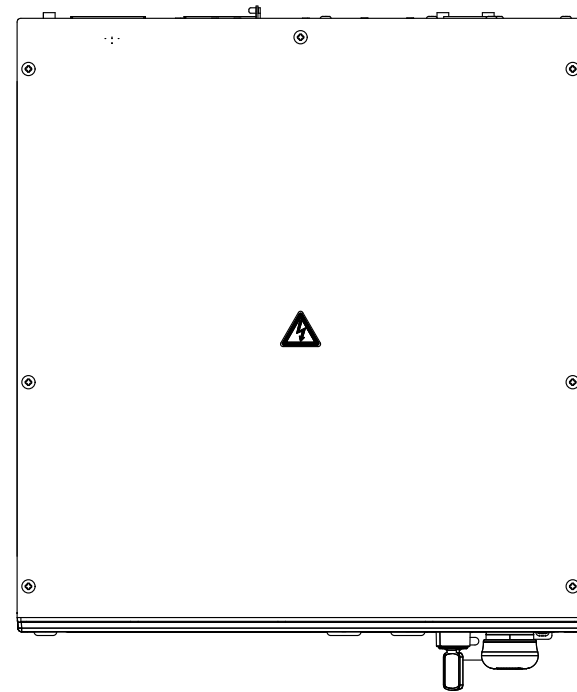
MASS : 8.3Kg (Without any options)



REAR VIEW

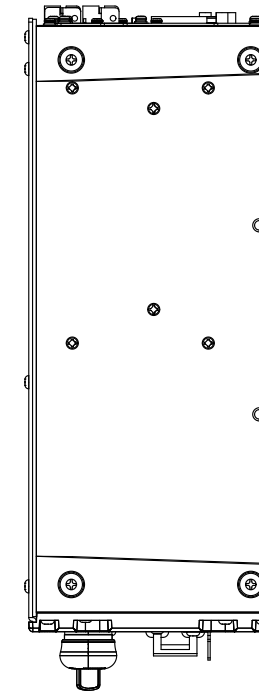


SIDE VIEW

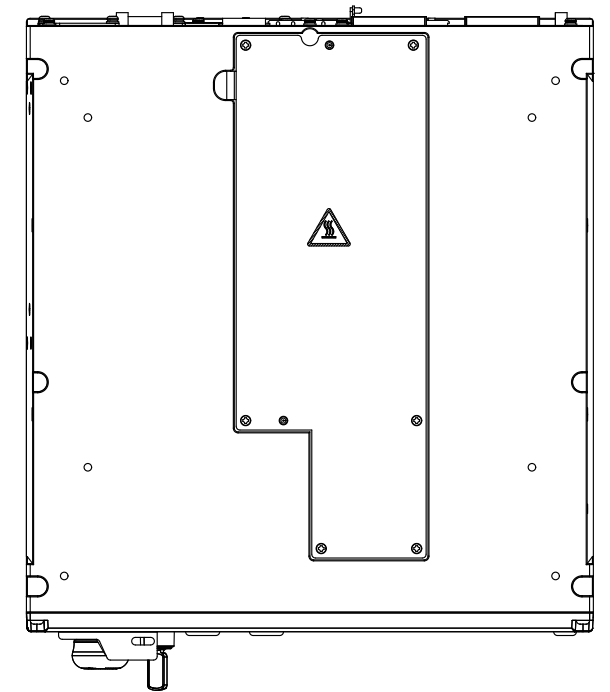


TOP VIEW

320

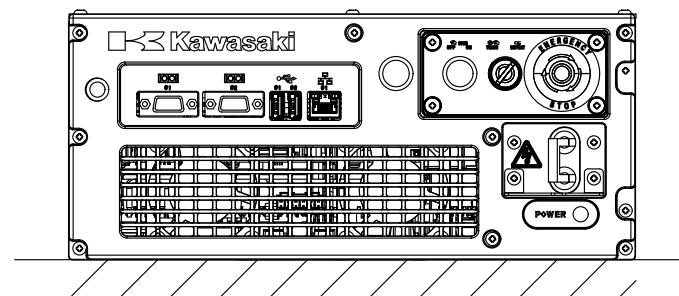
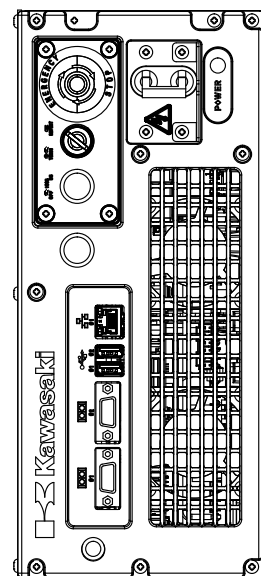


SIDE VIEW



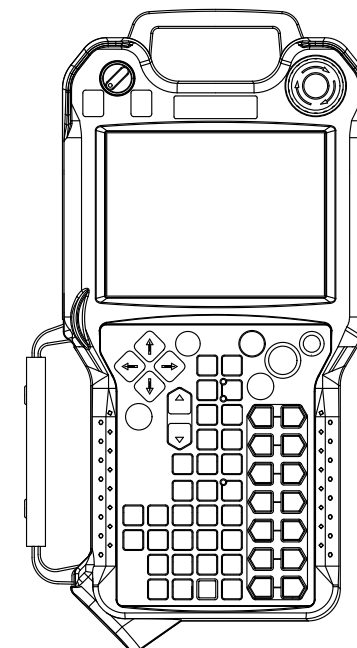
BOTTOM VIEW

Vertical Mount

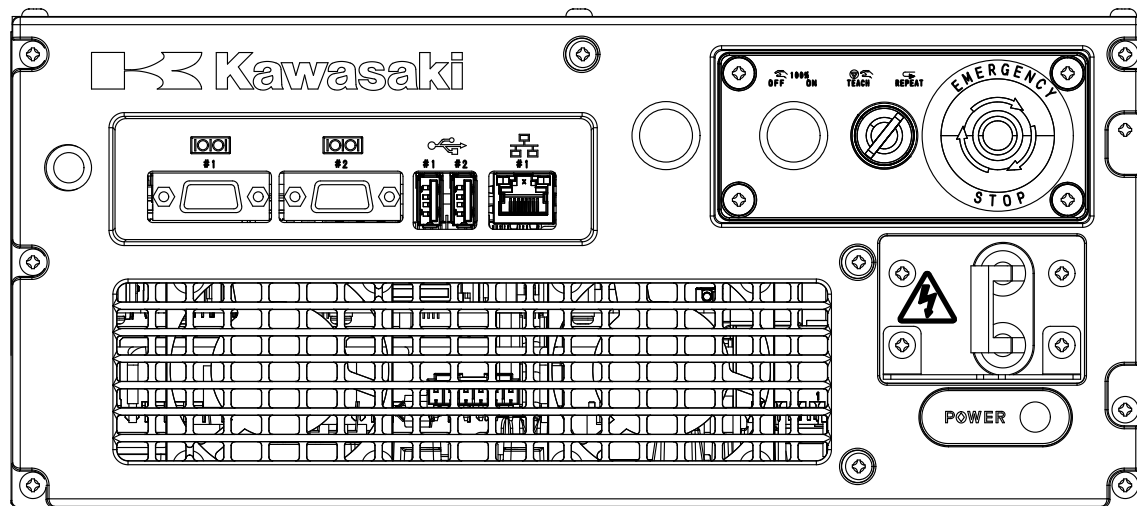


FRONT VIEW

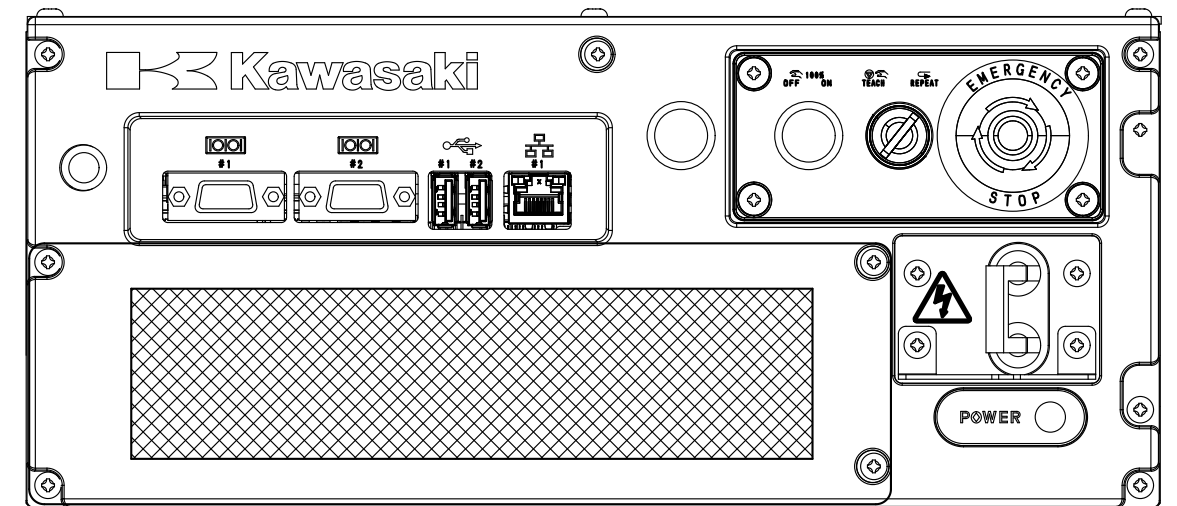
130



① Open Structure
Standard



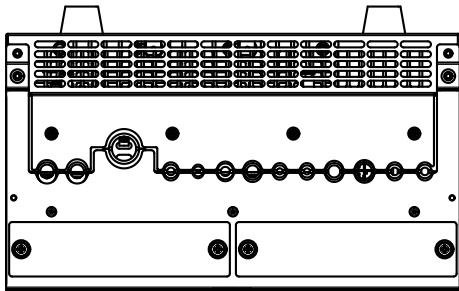
② Open Structure
With Intake Filter



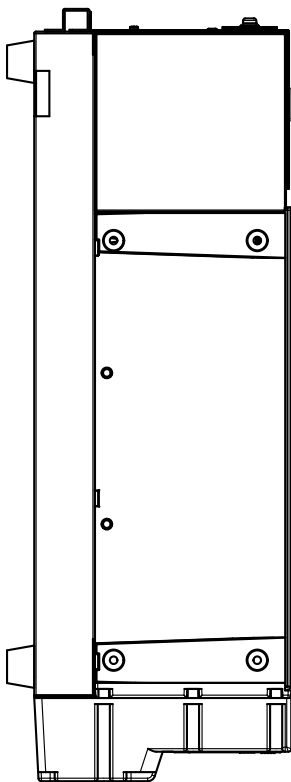
③Enclosed Structure

F60 CONTROLLER

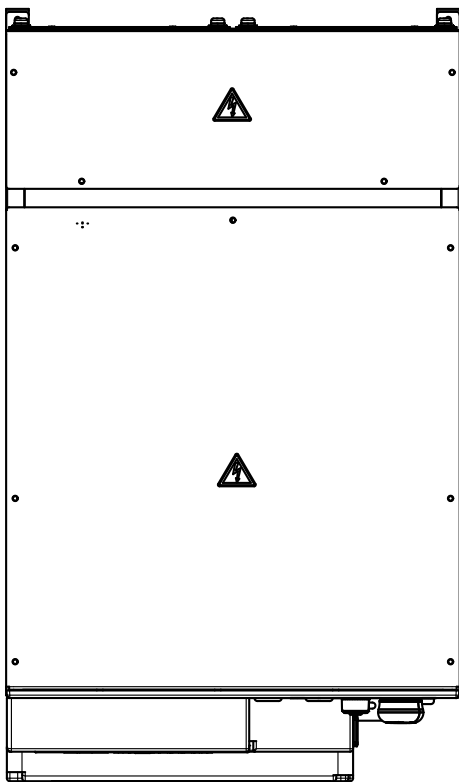
MASS:16Kg
(With Enclosed Structure option)



REAR VIEW



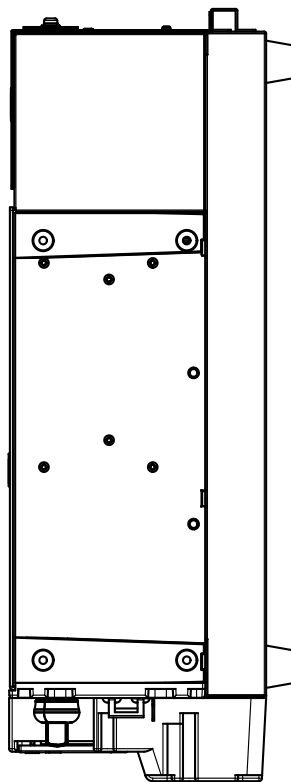
SIDE VIEW



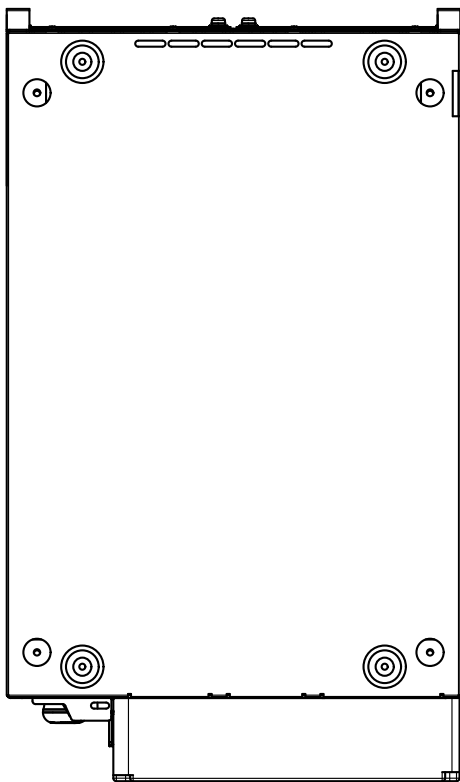
TOP VIEW



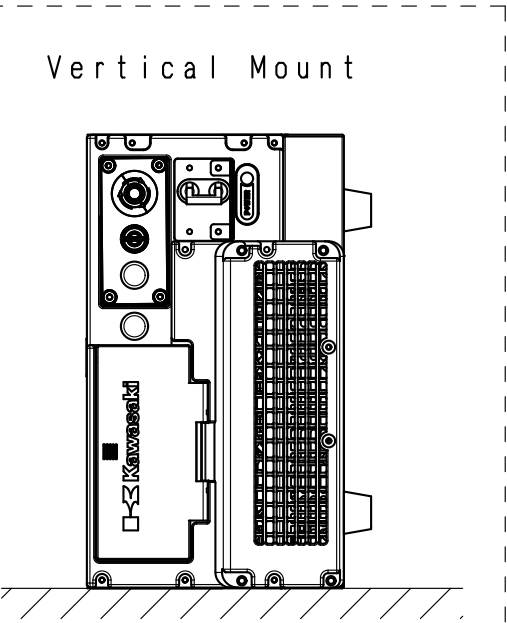
500



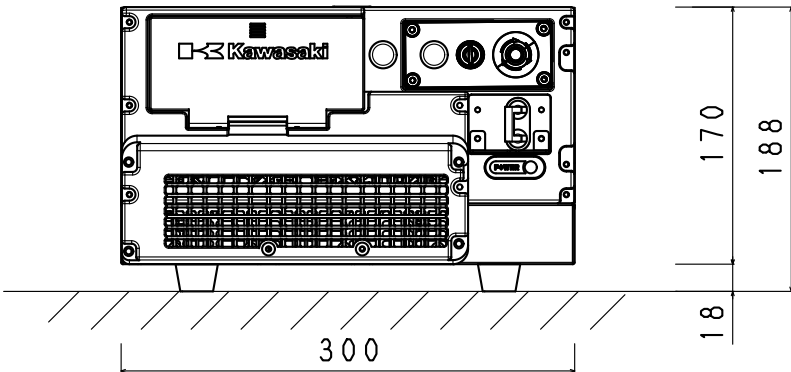
SIDE VIEW



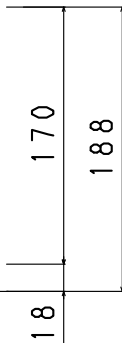
BOTTOM VIEW



Vertical Mount



FRONT VIEW



170

188

18

300