CubeSat Dispenser
-飛龍 Hiryu-

Rev.B

ORBITAL
ENGINEERING INC.

1. Dispenser Descriptions and Overview

ORBITAL ENGINEERING offers two lines of dispensers which is 3U, W6U. 3U sizes dispenserhad launched by H3 rocket at Feb-17 2024.These dispensers are simple which reduces cost by maintaining part commonality. Constructed of carbon fiber and aluminum, our dispensers provide launch cost savings to rockets by minimizing dispenser mass. In addition to offering low empty mass, our dispensers also offer customizable deploy velocities.These dispensers fully enclose the hosted CubeSat. The dispenser door is actuated via a non-explosive release mechanism (Simple Pin Puller) ; when initiated, the release mechanism opens a door, which locks in place when fully open to allow the CubeSat to be safely ejected into orbit. Volute springs and a push plate impose a force on the back of the CubeSat, which is then guided along smooth, rails until it fully exits the dispenser. A door switch indicates that the door has successfully opened, and provides a telemetry signal to Rocket to indicate successful deployment.

2. Dispenser Data Parameters

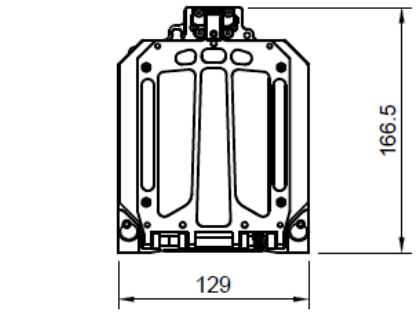
Parameter Description		Hiryu-3	Hiryu-6	Notes
Part Number		DISP3U-1001AB	DISPW6U-1001AB	
System Mass		1.2 kg	2.2 kg	Include non-explosive release mechanism Does not include harnessing
Maximum Payload Mass		7 kg	15 kg	Maximum payload mass accommodation
External	Max Width [X Axis]	129.0 mm	273.3 mm	Static Envelope
	Max Height [Y Axis]	166.5 mm	166.5 mm	
	Max Length [Z Axis]	411.5 mm	435 mm	
Internal	Max Width [X Axis]	100 mm	226.3 mm	Static Envelope
	Max Height [Y Axis]	100 mm	100 mm	
	Max Length [Z Axis]	340.5 mm	Min: 340.5 mm Max: 366 mm	

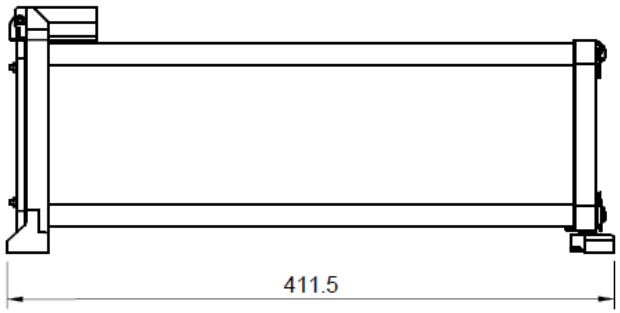
2. Dispenser Data Parameters (cont.)

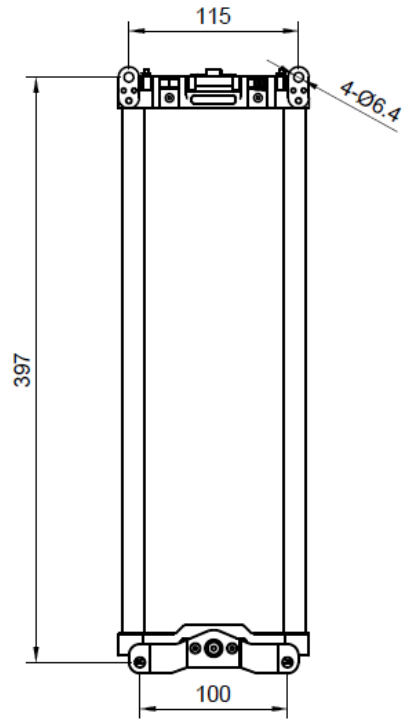
Parameter Description	Hiryu-3	Hiryu-6	Notes
Random Vibration Levels (AT)	15 grms	15 grms	QT (+3dB) also been performed
First Fundamental Frequency	85 Hz	65 Hz	
Random Vibration Levels	15 grms	15 grms	
Separation Angle	+/-10 degrees	+/-10 degrees	Assumes standard deploy velocity and CubeSat mass property tolerances
Flight Heritage	Feb-17 2024	Aug 2025*	*Planned Launch Dates

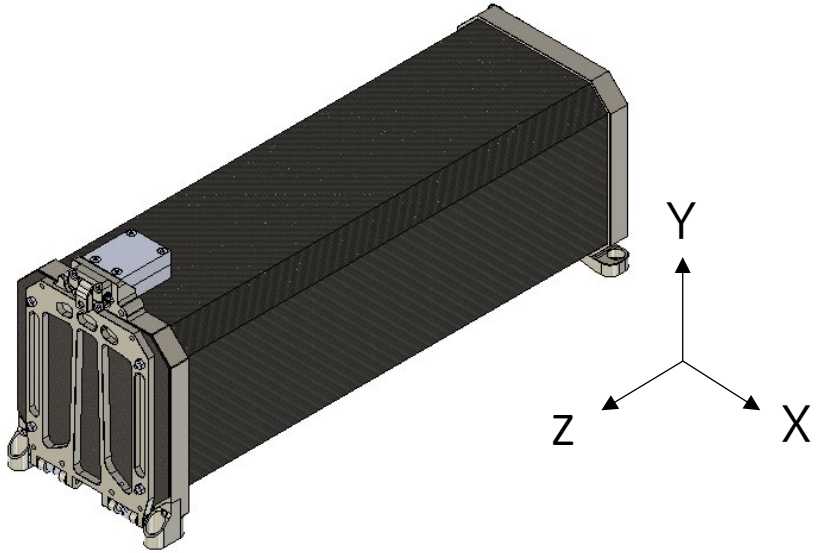
3-1. Mechanical Interface <Hiryu-3>

All Dimensions are in mm.



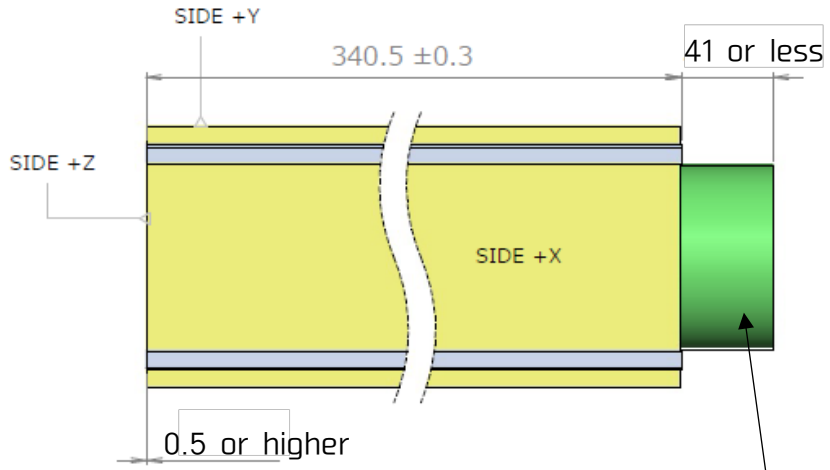


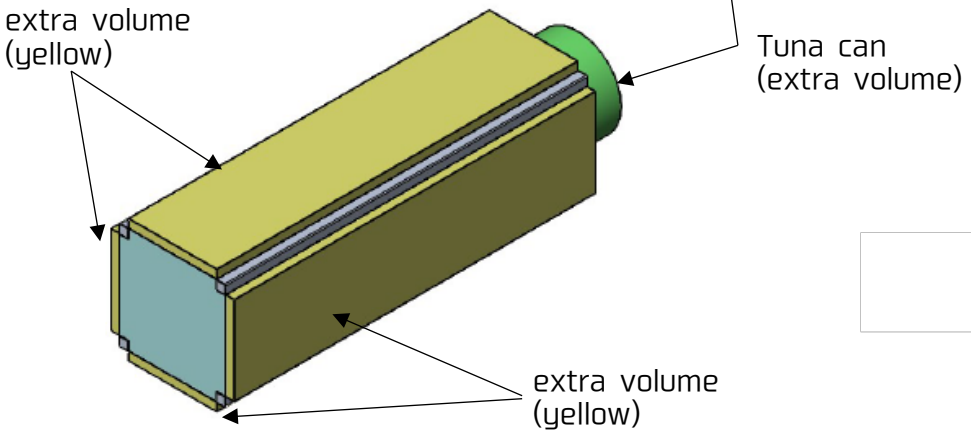


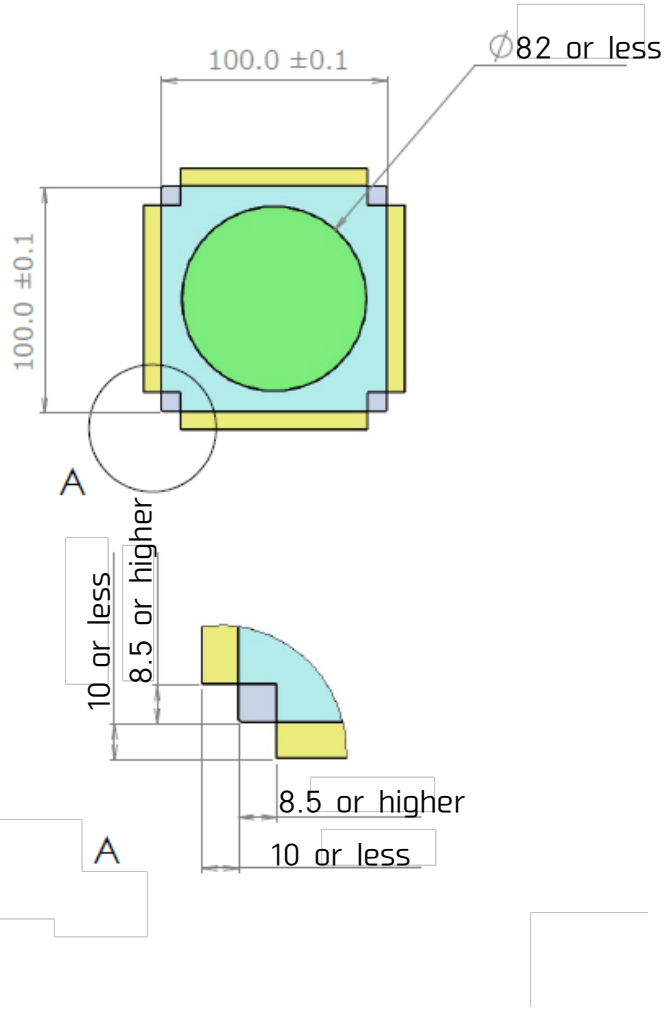


3-1. Internal dimension and extra volume <Hiryu-3>

All Dimensions are in mm.

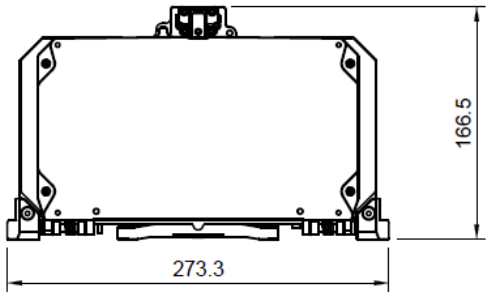


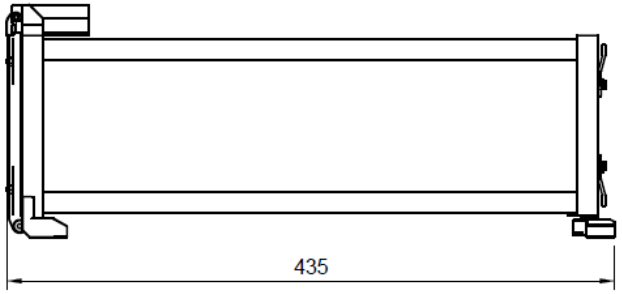


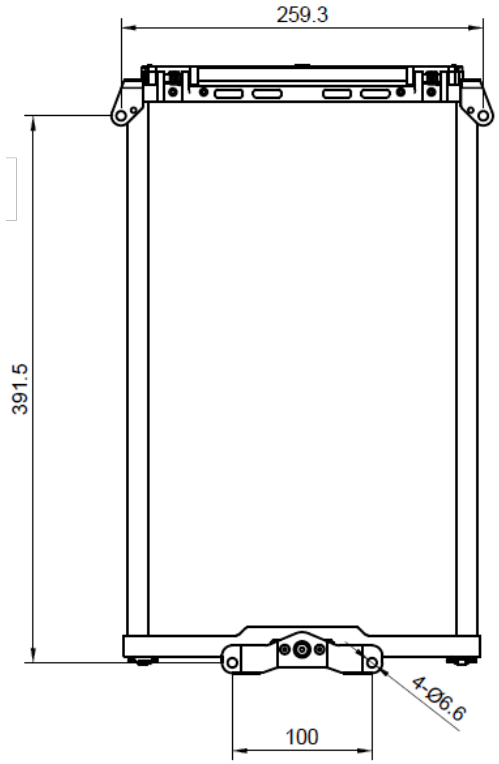


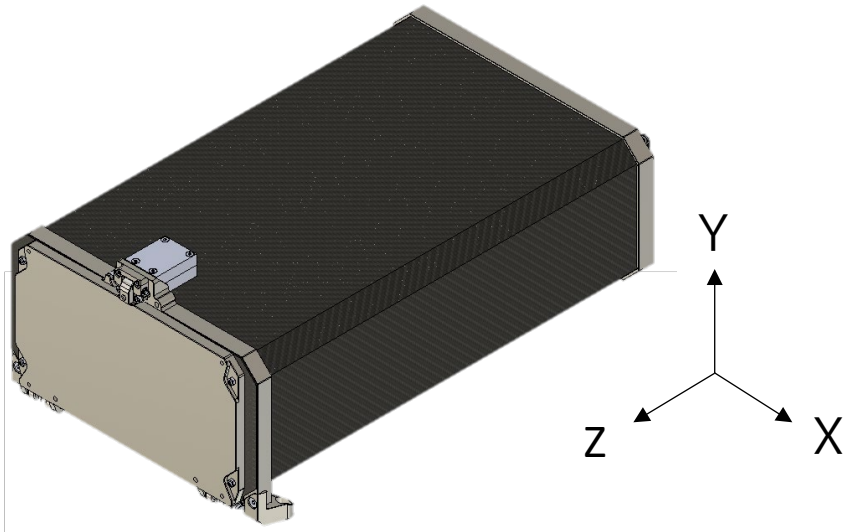
3-2. Mechanical Interface <Hiryu-6>

All Dimensions are in mm.



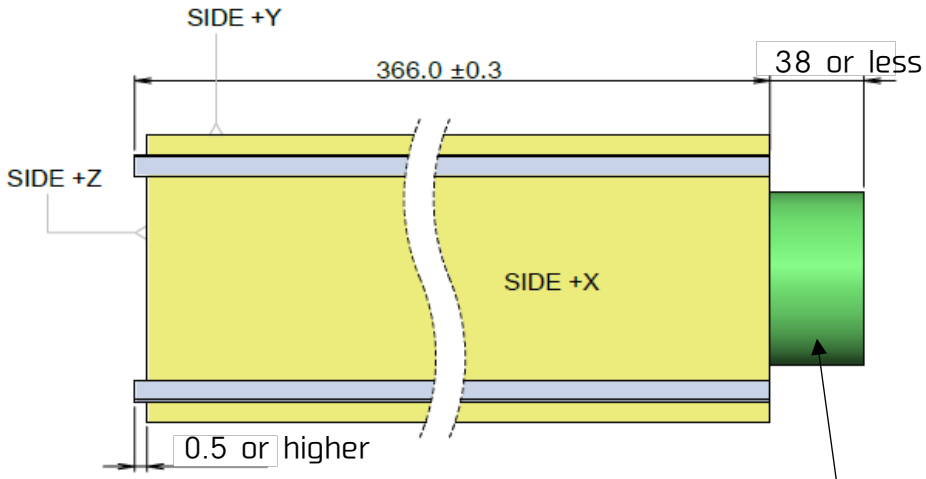


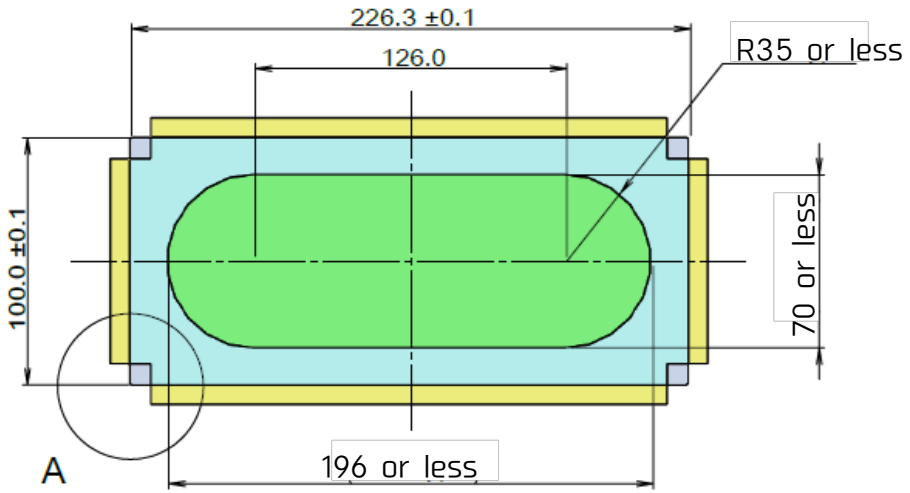


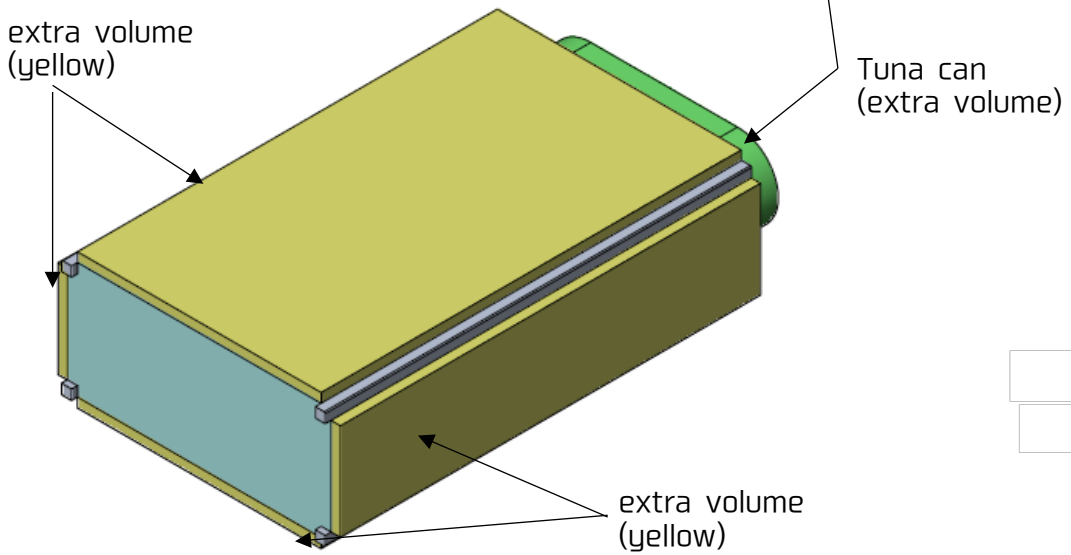


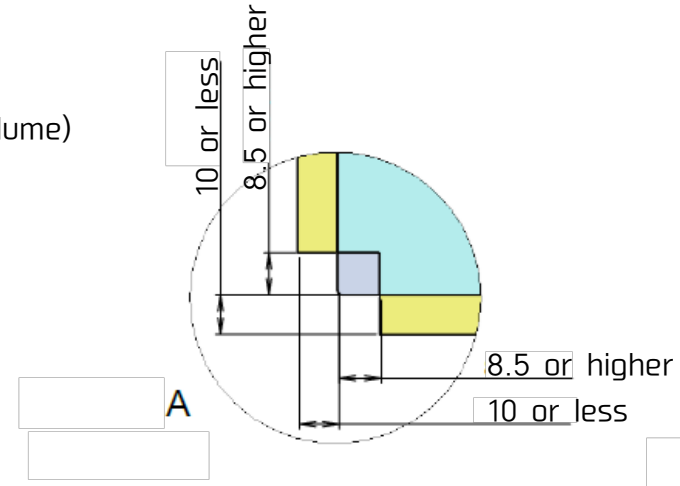
3-2. Internal dimension and extra volume <Hiryu-6>

All Dimensions are in mm.









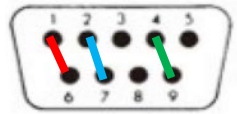
4. Electrical Interface

The dispenser door is actuated via a Simple Pin Puller (non-explosive release mechanism).To activate the Simple Pin Puller, a current of 4 A must be applied for at least 50 msec.
The electrical harness utilizes wiring which conforms to either the M27500 or M22759 specifications. DEMA-9P is used for connectors. In addition, door status telemetry is provided for each dispenser door; the switch is closed while stowed and goes open loop after door opened.

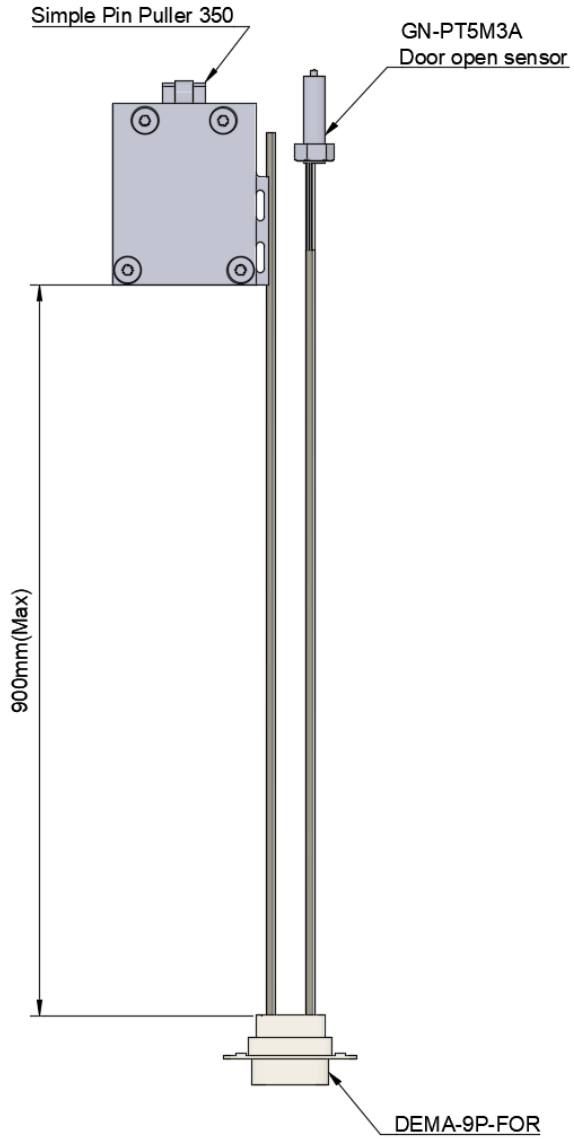
Table 1 – Dispenser Electrical Characteristics

CONNECTOR MARKING; W6U01J			MATED CONNECTOR MARKING;W6U01P				
CONNECTOR P/N; DEMA-9P Lock nut;#4-40			MATED CONNECTOR P/N; DEMA-9S (equivalent), Screw; #4-40				
PIN No.	TWIST	Description	Volt	Current	AWG	Contact Size	I/F Connctor
1	]	pin puller-HOT1 (Main)	5V	4A	24	#20	W6U01P
6	]	pin puller-RTN 1 (Main)	5V	4A	24	#20	W6U01P
2	]	pin puller-HOT2 (Sub)	5V	4A	24	#20	W6U01P
7	]	pin puller-RTN2 (Sub)	5V	4A	24	#20	W6U01P
3							
8							
4	]	door open sensor HOT	5V	1mA	30	#20-26	W6U01P
9	]	door open sensor RTN	5V	1mA	30	#20-26	W6U01P
5							

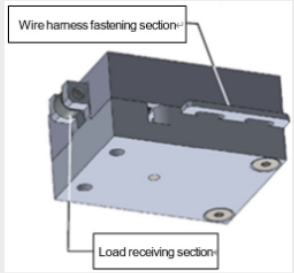
Cutout Figure



4. Electrical Interface (cont.)



Simple Pin Puller 350 Main Specifications

Shape	Dimensions: 42 × 33 × 22 mm (excl. protruding portions) 	
Mass	100 g or less (incl. 980 ± 50 mm operating line)	
Operating temperature range	−50°C to 100°C	
Electrical interface	Dual redundancy	
	Guaranteed operating current	3.5 A or more
	Non-operating current	0.2 A or less
	1.0 ± 0.4 Ω	
Pull-in force for load receiving section	345 N ± 10%	
Operating-environment vibration resistance	44.2 Grms (random)	
Operating-environment impact resistance	2000 Gsrs	