

Sunrise Instruments Calibration Report

Address: 2nd Floor Building B2 19#Keyuan Xishi Road Nanning Guangxi Province China 530007

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Calibration Report

Calibration No.	SRI-V-251108-W	Cal Date	2025/11/8
Model No.	M4313S1J6D	Serial No.	36033
Technician	Chen Feng Sheng	Temp(C)/Hum.(%)	25/60
Customer	北京人形机器人创新中心	Excitation(V)	10.0000
Description	6 AXIS FORCE SENSOR	Cable Length	300mm
Comments			

Voltage Calibration

<u>Bridge</u>	<u>Capacity</u>	<u>Zero Offset</u>	<u>Nonlinearity</u>	<u>Hysteresis</u>	<u>Output @ Capacity</u>	<u>Sensitivity</u>	<u>Change</u>
	N/Nm	V	%FS	%FS	V	V/EU	%
FX	-300	0.0000	0.40	0.39			
FY	300	0.0000	0.37	0.37			
FZ	-300	0.0000	0.33	0.32			
MX	-60	0.0000	0.32	0.25		DECOUPLE	
MY	-60	0.0000	0.27	0.35			
MZ	60	0.0000	0.37	0.20			

Wire Color Codes

FUNCTION

+EXC

+SIG

-EXC

-SIG

Sensor ID

ID Return

Reference Load Cell

<u>Manufacturer</u>	<u>Model Type</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Cal Due Date</u>
SUNRISE	GOLDEN TYPE	SRI_1000N-1	30727	2026/6/30

Calibrated by

Chen Feng Sheng

Approved by

Zhou

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CROSSTALK

<u>Bridge</u>	<u>Load</u>	<u>FX</u>	<u>FY</u>	<u>FZ</u>	<u>MX</u>	<u>MY</u>	<u>MZ</u>
	N/Nm	% FS	% FS	% FS	% FS	% FS	% FS
FX	-300	0.00	0.15	0.35	0.63	0.23	0.33
FY	300	0.20	0.00	0.27	0.16	1.36	0.35
FZ	-300	0.05	0.56	0.00	1.70	1.36	0.02
MX	-60	0.07	0.56	0.60	0.00	1.12	0.23
MY	-60	0.47	0.38	1.59	1.36	0.00	0.37
MZ	60	0.25	0.83	0.13	0.08	1.06	0.00

Bridge to Transducer body resistance greater than 5G Ohm when measured with 50V excitation

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SENSOR TYPE A ----- OUTPUT RELATED TO EXCITATION VOLTAGE.

Decoupled Matrix

-2.58	-476.96	-4.16	466.72	10.76	8.92	-278.76	241.96	-516.27
-11.35	271.70	3.83	271.60	-4.03	-547.25	-409.97	-462.28	-15.91
-515.01	3.44	-509.60	0.11	-511.37	0.86	0.00	0.00	0.00
-11.99	2.28	7.19	1.71	-2.38	-4.11	8.78	-30.60	-21.67
7.23	5.99	8.17	-4.01	-10.10	-1.86	-8.23	13.19	24.49
-0.04	12.73	-0.02	13.12	0.09	13.11	0.00	0.00	0.00

The six axis loads can be decoupled as follows:

Step 1: Obtain the raw data of Channels 1 through 9 into Volt

[RAW] = {rawchn1, rawchn2, rawchn3, rawchn4, rawchn5, rawchn6, rawchn7, rawchn8, rawchn9}

where rawchn1, rawchn2, rawchn3, rawchn4, rawchn5, rawchn6, rawchn7, rawchn8 and rawchn9 are in V

Step 2: Convert the raw data into mV/V

Assume the raw data output in Volt, Excitation voltage = EXC, Amplifier gain = GAIN

[DAT] = {chn1, chn2, chn3, chn4, chn5, chn6, chn7, chn8, chn9} * 1000 / (EXC * GAIN)

where chn1, chn2, chn3, chn4, chn5, chn6, chn7, chn8 and chn9 are in mV/V

Step 3: To calculate decoupled loads

[RESULT]^T = [DECOUPLED] * [DAT]^T

where [RESULT] = {FX, FY, FZ, MX, MY, MZ}. Force Unit: N. Moment Unit: Nm

[DECOUPLED] is the above decoupled matrix