

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-X	Cal Date	2025/11/8
Model No.	M4313S1J6D	Serial No.	36023
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	0.37	0.20			
FY	300	0.0000	0.32	0.30			
FZ	-300	0.0000	0.25	0.35			
MX	-60	0.0000	0.44	0.37		DECOUPLE	
MY	-60	0.0000	0.31	0.38			
MZ	60	0.0000	0.35	0.40			

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	0.28	0.10	0.31	0.81	0.24
FY	300	0.27	0.00	0.31	0.34	0.12	0.19
FZ	-300	0.19	0.53	0.00	0.98	1.22	0.03
MX	-60	0.17	0.12	0.67	0.00	0.73	0.16
MY	-60	0.38	0.68	0.29	0.78	0.00	0.63
MZ	60	0.13	0.62	0.25	0.50	0.29	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

-6.12	-491.56	-4.82	484.72	17.26	3.06	290.61	260.22	-475.10
-17.43	275.26	3.02	280.74	-6.52	-559.61	388.75	-472.59	-18.24
-527.36	5.07	-511.38	0.40	-514.88	4.07	0.00	0.00	0.00
-11.93	3.01	7.54	1.71	-2.29	-4.74	-7.81	-28.34	-19.79
6.88	6.10	7.72	-4.78	-10.83	-1.20	3.41	9.43	19.64
0.02	13.05	-0.10	13.24	0.08	13.34	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