

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-251109-C	Cal Date	2025/11/9
Model No.	M4313S1J6D	Serial No.	36031
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	0.05	0.15			
FY	300	0.0000	0.06	0.21			
FZ	-300	0.0000	0.03	0.13			
MX	-60	0.0000	0.15	0.14		DECOUPLE	
MY	-60	0.0000	0.08	0.20			
MZ	60	0.0000	0.11	0.12			

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	0.16	0.07	0.02	0.29	0.58
FY	300	0.05	0.00	0.04	0.20	0.02	0.18
FZ	-300	0.05	0.05	0.00	0.15	0.08	0.03
MX	-60	0.12	0.10	0.03	0.00	0.21	0.14
MY	-60	0.11	0.03	0.04	0.06	0.00	0.06
MZ	60	0.11	0.09	0.05	0.18	0.30	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

-5.87	-479.20	-5.46	475.78	18.18	1.01	259.59	258.27	-482.02
0.09	283.32	22.92	272.80	2.32	-562.87	512.40	-346.64	61.34
-523.72	-4.36	-513.45	5.38	-521.30	2.07	0.00	0.00	0.00
-10.06	3.53	10.44	2.63	-0.20	-6.26	11.54	-4.49	1.70
6.81	5.52	6.72	-5.08	-11.51	-0.43	0.58	1.75	14.31
-0.07	13.31	0.13	13.10	0.06	12.95	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