

AD2-I20-A048

6t Mass Properties Measuring Facility

Users' Manual

Advanced Engineering Services Co., Ltd.

本文書は、AD2-I20-A011「総合環境試験棟ユーザーズマニュアル（第6分冊）6トン質量特性測定設備編」初版を英訳したものであり、最新版であることは保証されていません。英訳版を用いての設備利用検討に当たっては、以下の連絡先にお問い合わせの上、最新情報をご確認ください。

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This document was translated from first edition of AD2-I20-A011 “6t Mass Properties Measuring Facility Users’ Manual”, which may not be the latest edition. Please contact the following address for the confirmation of the latest edition or if you have any inquiry concerning the contents of the English edition.

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1 Introduction

This users' manual is to provide necessary information to the users of 6t Mass Properties Measuring Facility (referred to as “this facility” hereafter) located in Spacecraft Integration and Test Building.

This facility is used to measure the mass of a test specimen (■ abbreviated as TS hereafter) for system tests, e. g., “development test”, “qualification test”, “proto flight test”, “acceptance test”, etc.

2 Brief Overview of this Facility

2.1 System Outline

This facility is made up of a mass measuring system which measures the mass of a TS, and a mass properties measuring system which measures the center of gravity (■ abbreviated as CG hereafter) and the inertia moment of a TS.

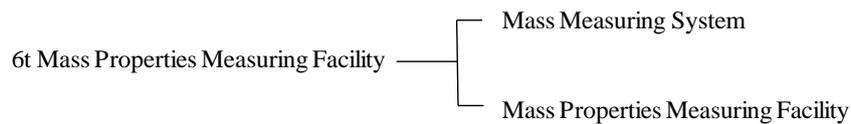


Figure 2-1 System Outline of 6t Mass Properties Measuring Facility

(1) Mass measuring system

This system is used to hang a TS by a crane with a load cell in between whose output is calculated to obtain the mass of the TS. Furthermore, accurate mass measurement can be achieved by calculating the correction factor using a calibration weight that has the mass of approximately around the predicted mass before performing measurement. Also, the mass of a TS weighing 150 kg or less can be accurately measured using the large precision platform scale which belongs to the system.

The system is made up of the following items.

(a) Mass measuring load cell

- | | | |
|---|---|------|
| ① | Load cell for 1t | |
| | model #: TCLM-10KNS004 (Tokyo Sokki Kenkyujo Co., Ltd.) | 1set |
| ② | Load cell for 2t | |
| | model #: TCLM-20KNS002 (Tokyo Sokki Kenkyujo Co., Ltd.) | 1set |
| ③ | Load cell for 5t | |
| | model #: TCLM-50KNS004 (Tokyo Sokki Kenkyujo Co., Ltd.) | 1set |
| ④ | Load cell for 10t | |
| | model #: Z4A/100KN (HBM) | 1set |

- ⑤ Extension cable (length: 30m, 1/2/5/10t-weighting load cells) 4
Furthermore, the load cells and the digital indicator including its extension cables are calibrated every other year.

(b) Digital indicator

Load measuring device model #: TD-23L (Tokyo Sokki Kenkyujo Co., Ltd.)

(c) Load cell calibration weight

- ① 50 kgf weight (balance weight) 11 sheets
② 500 kgf weight (balance weight) 12 sheets
③ 500 kgf hanging rod/shackle-attached weight (balance weight) 2 sets
④ Weight bench for assembly and storage 3 benches

Furthermore, the weights are put through the 3rd-grade calibration (1/10,000) once every 6 years.

(d) Turning attachment (of common use for 1t/2t, and of separate use for 5t and 10t)

(e) 6t mass properties measuring facility terminal

(f) Attachment device

Large precision platform scale

model #: IPS-150KG (Shimadzu Access Corporation)

(2) Mass properties measuring system

This system is one of the items regulated by the International Traffic in Arms Regulations (ITAR), and therefore its detailed information cannot be provided in this users' manual. Contact us at AES for further information.

2.2 Main Specifications

(1) Mass measuring system

(a) Mass measuring system (mass measuring load cell)

- ① Maximum measurable mass 6,500 kg
② Minimum measurable mass about 100 kg
③ Accuracy 0.1%

(b) Large precision platform scale (attachment device)

- ① Maximum measurable mass 150 kg
② Minimum measurable mass about 0.01 kg (10g)
③ Accuracy $\pm 5g$ for mass of 50 kg or less
 $\pm 10g$ for mass of over 50 kg to 150 kg

3 Users' I/F

3.1 Test Configuration

(1) Location of this facility

This facility is located in the properties test room where the 10-m alignment measuring facility is also located.

A TS is carried in from the shutters on the satellite path side of the properties test room, and placed on the turn table using an overhead crane.

(2) Crane

The specifications of the crane in the properties test room are shown below.

Table 3-1 Specifications of Crane

model #	number of cranes	capacity [t]	distance from the bottom of hook to floor [m]	velocity [m/min]			serial #
				travel low / high speed	traverse low / high speed	hoist low / high speed	
XY	1	10	16	1/10	1/10	0.5/5	H-6

(3) Power supply system

The breakers on the distribution boards shown below can be used.

Table 3-2 Specifications of Distribution Boards for Users

name of distribution board		PB-1-D	installation site	properties test room	
#	specifications of breaker			breaker sign	notes
	source resultant pulse number × voltage	rating	capacity kVA		
1	3φ×210V	MCB3P 50/50AT	12 kVA	Ⓖ, Ⓗ, Ⓚ	
			10.4 kVA	Ⓛ, Ⓜ	
2	1φ×115V	MCB3P 50/20AT	1 kVA	Ⓒ, Ⓓ	
3	1φ×100V	MCB2P 50/20AT	1.5 kVA	Ⓔ, Ⓡ, Ⓢ Ⓣ, Ⓜ, Ⓝ	
4	1φ×100V	MCB2P 50/50AT	3 kVA	Ⓛ	

(4) Carrying in/out of TS

A TS is to be carried in/out through the loading docks shown below.

- Unpacking room (1)
 - dimensions of shutter: 8.3m (width) × 14m (height)
 - rated load of overhead crane: 20t
- Unpacking room (2)
 - dimensions of shutter: 8.3m (width) × 12m (height)
 - rated load of overhead crane: 5t

3.2 Device I/F

(1) Mass measuring system

(a) Mass measuring system (mass measuring load cell)

A configuration example of a suspended TS for mass measurement is shown in Figure 3-1. The I/F dimensions and the external appearance of the jig to connect a TS and a load cell are shown in Figures 3-2 and 3-3, respectively.

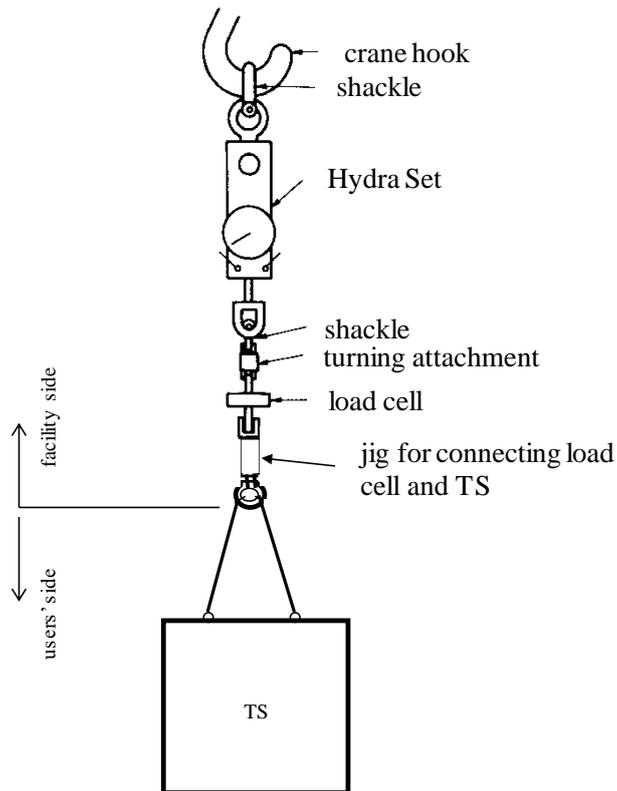
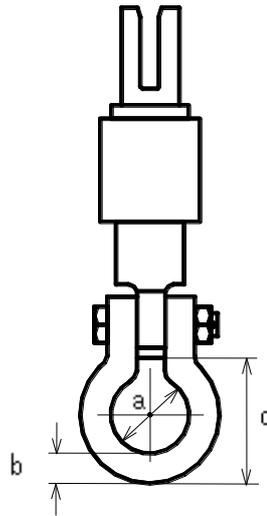


Figure 3-1 Configuration of Suspended TS



load cell/TS connecting jig	dimensions [mm]		
	a	b	c
load cells for 1t / 2t / 5t	80φ	32	136
load cell for 10t	140φ	60	237

Figure 3-2 I/F Dimensions of Load Cell / TS Connecting Jig

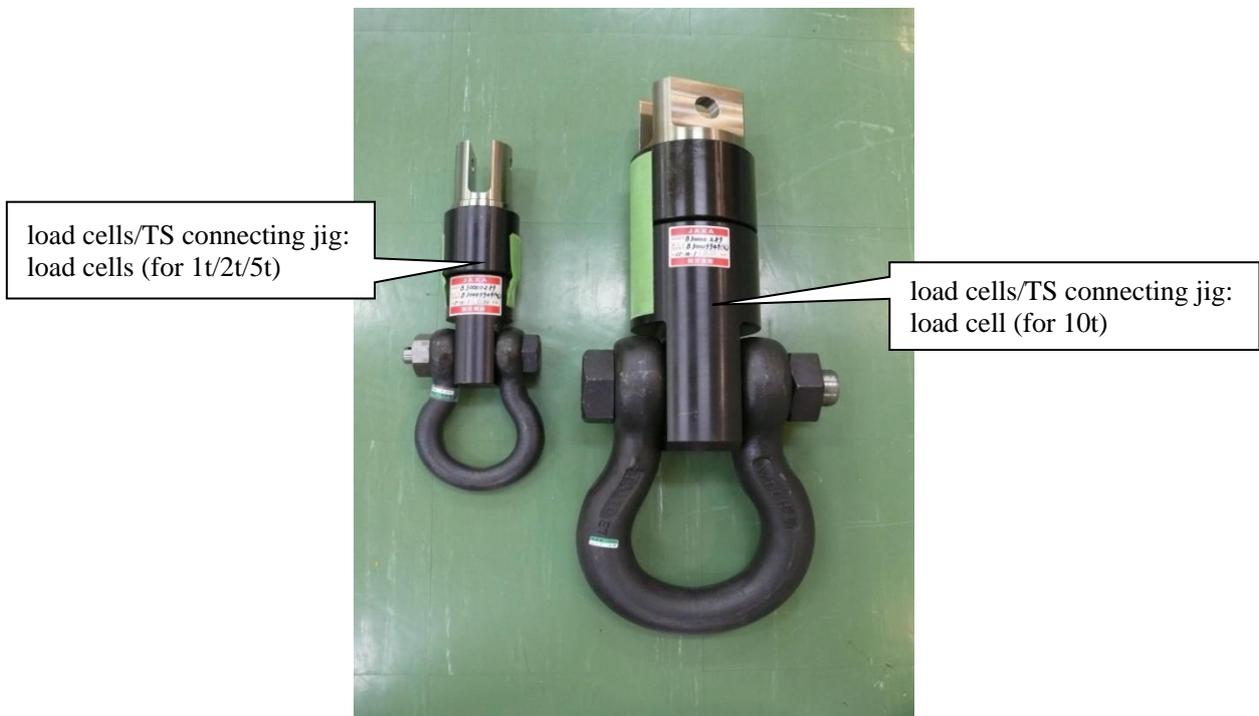


Figure 3-3 External Appearance of Load Cell / Test Item Connecting Jig

(b) Attachment device:

Large precision platform scale (model #: IPS-150KG)

The dimensions of the mounting platform are 800×600 mm. The external appearance of the large precision platform scale is shown in Figure 3-4.

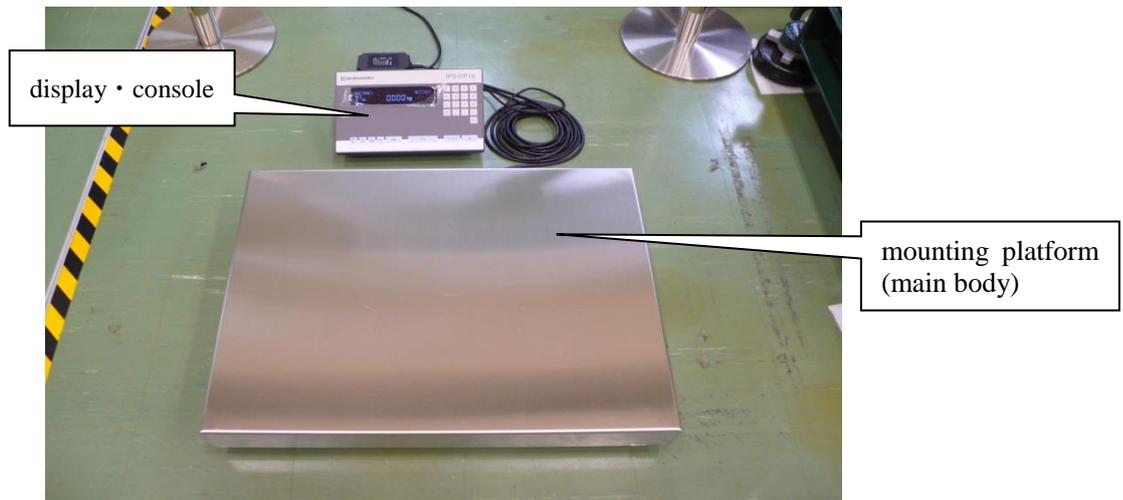


Figure 3-4 External Appearance of Large Precision Platform Scale