KITAGAWA
Machine Tool Accessories

Version 2.00E (2011.**.**)
Original instructions

INSTRUCTION MANUAL

JFT-S100

Static grasping force Tester

DANGER

- **This instruction manual is for production engineers and maintenance personnel in charge of operation of this product. When a beginner uses this product, receive instructions from experienced personnel, the distributor or our company.**

- **Before installing, operating or maintaining this equipment, carefully read this manual and the safety labels attached to the equipment. Failure to follow these instructions and safety precautions could result in serious injury, death, or property damage.**

- **Store this manual near equipment for future reference.**

If any questions related to safety arise about this manual, please confirm them with the distributor or our company.

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KITAGAWA
Machine Tool Accessories

EC DECLARATION OF CONFORMITY

Product	:	Static grasping force Tester
Type	:	JFT-S100
Directives	:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC

conforms with the essential requirements of the EMC Directive 2004/108/EC, based on the following specifications applied:

EMC Directive:
Emissoion : EN 55011+A2:2009
Immunity : EN 61000-6-2:2005

and therefore complies with the essential requirements and provisions of the EMC Directive 2004/108/EC

Preface

This manual provides detailed information about how to safely and correctly use the Static grasping force Gripping Tester JFT-S100.
Before starting to use this power chuck, read this manual carefully and always follow the instructions and warnings in **"Important Safety Precautions"** and **"Precautions for Use"** at beginning of the manual. Failure to follow these precautions could result in a serious accident.

Terms and Symbols Used for Safety Messages

In this manual, precautions for handling that are considered especially important are classified and displayed as shown below depending on the damage of risk including the seriousness of the harm that could result. Please sufficiently understand the meanings of these terms and follow the instructions for safe operation.

Safety Alert Symbol

The triangle is the safety alert symbol used to alert you to potential safety hazards that could result in injury or death.

DANGER	**Indicates a hazardous situation which, if you not avoided, will result in death or serious injury.**
WARNING	**Indicates a hazardous situation which, if you not avoided, could result in death or serious injury.**
CAUTION	**Indicates a hazardous situation which, if you not avoided, could result in minor or moderate injury.**
NOTICE	**Indicates instructions which, if not avoided, could result in damage to the equipment or a shortened work life.**

Liability and How to Use this Manual

This equipment is used for measuring the gripping force of Power Chuck. For any other applications, please contact us.
Our company will not assume responsibility for injury, death, damage, or loss resulting from not following the instructions in this manual.

There are countless things that cannot or should not be done, and it is impossible to cover all of them in this manual.
Therefore, do not perform any actions unless they are specifically allowed in this manual. If any questions related to safety arise about operation, control, inspection and maintenance which are not specified in this manual, please confirm them with our company or distributor before performing them

Guarantee and Limitation of Liability

The meter’s warranty period is a single year following its delivery to you.
All of the parts to use, other than the battery, are to be supplied by Kitagawa Iron Works. In the case that using any part not supplied by Kitagawa Iron Works has resulted in a problem and/or an accident, Kitagawa is not to be held responsible in any way for such a problem/accident. Also, in the case that any part that is not a genuine part manufactured by Kitagawa Iron Works is used, the whole warranty becomes invalid.

Information on disposal

Dispose of this unit in accordance with the laws and regulations of your country.

Table of Contents

1. Structural Drawings and List of Parts

1-1. Structural drawings

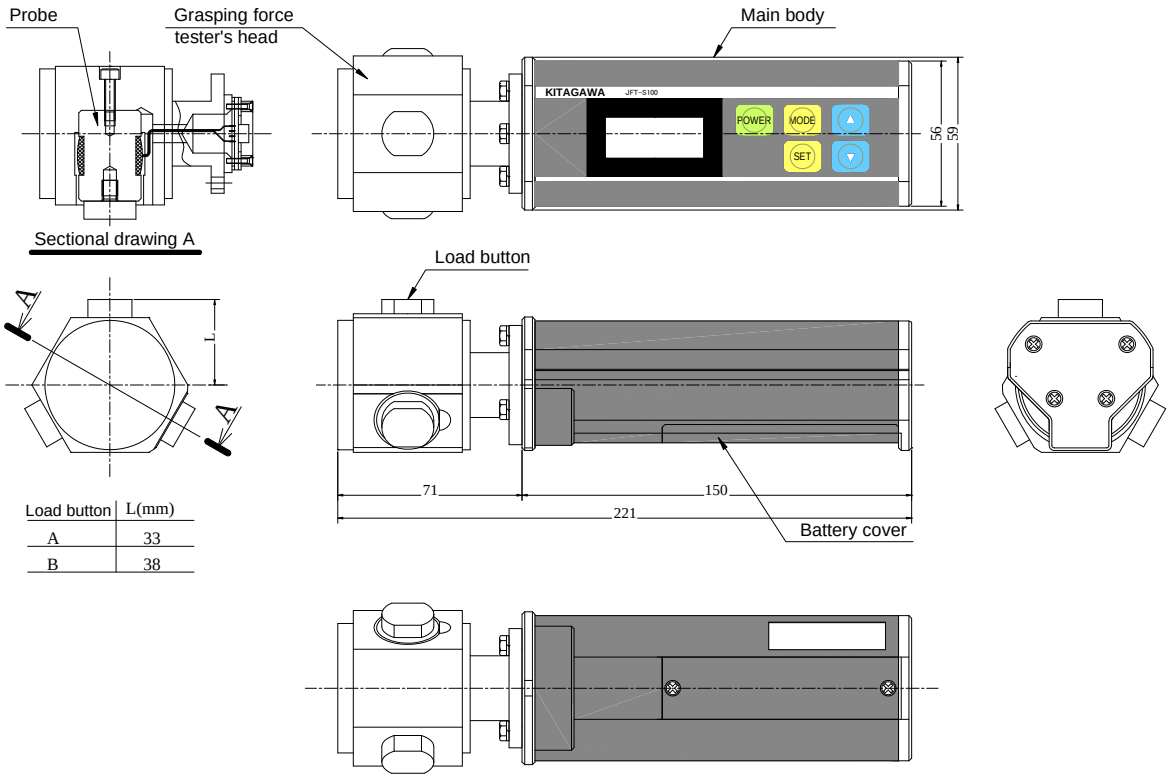


Fig 1-1-1

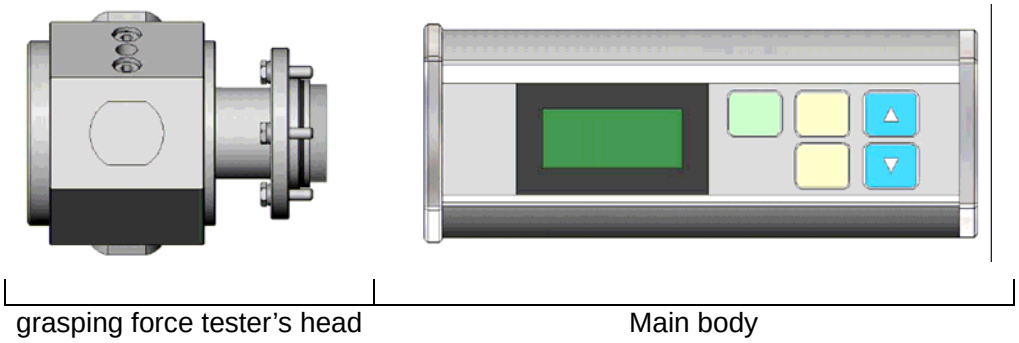


Fig 1-1-2

1-2. List of parts

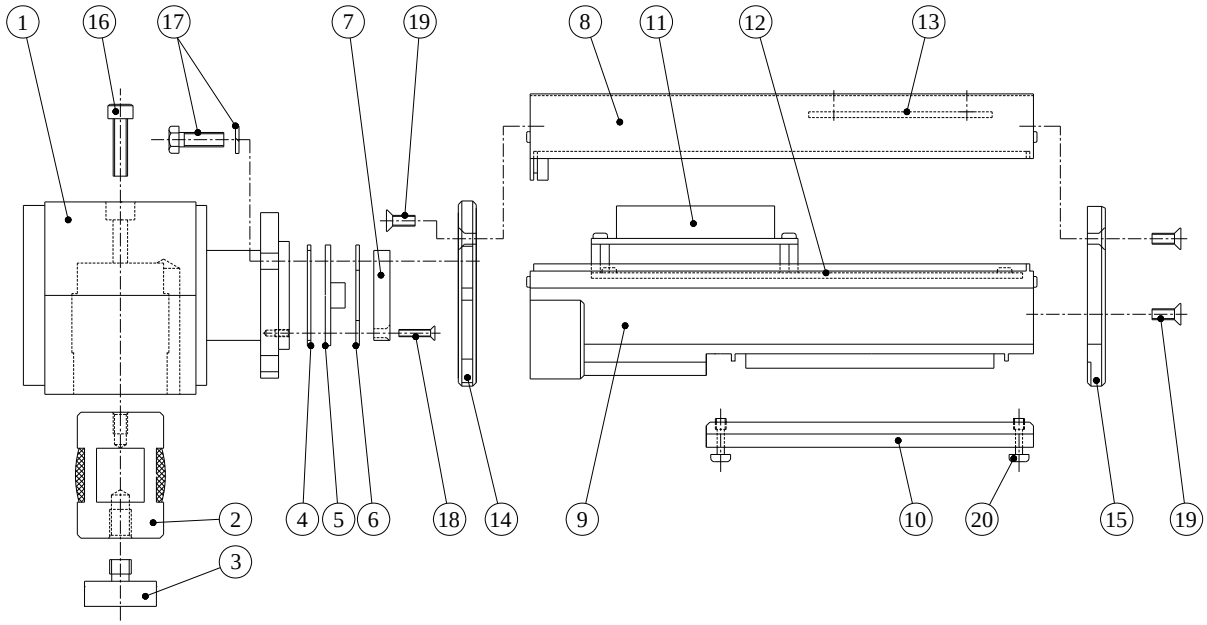


Fig 1-2-1

Table 1-2-1

No.	Name of part	Qty.	No.	Name of part	Qty.
1	Frame	1	11	LCD display	1
2	Probe	1	12	Main substrate	1
3	Load buttons (attachments)	3+3	13	Panel substrate	1
4	Packing rubber	1	14	Frame side plate	1
5	Connector substrate	1	15	Back side plate	1
6	Packing rubber	1	16	Probe mounting bolts	2
7	Connector guard	1	17	Frame mounting bolts and washers	3 pairs
8	Upper part of the case	1	18	Small flat-head Phillips screws	4
9	Lower part of the case	1	19	Small flat-head Phillips screws	4*2
10	Battery cover	1	20	Battery cover mounting screws	2

This static grasping force tester has attached to it three of both Load Buttons A and B, as shown above at 3.

2. Important Safety Precautions

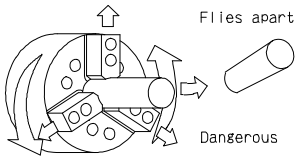
Important safety precautions are summarized below. Please read this section before first starting to use this product.

DANGER

Failure to follow the safety precautions below will result in serious injury or death.

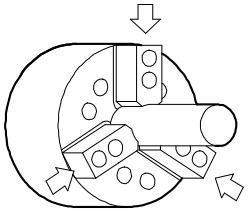
Do not clamp the Static Gripping Tester onto a rotating body and rotate it.

- If you clamp the Static Gripping Tester onto a rotating body and rotate it, the meter will fly apart and be very dangerous.



Input value into the Static Gripping Tester must not exceed its maximum input allowed.

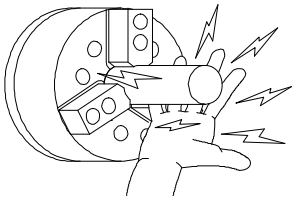
- Never let the gripping force applied to the Static Gripping Tester exceed its maximum input allowed
- Excessive force input destroys or damages the Static Gripping Tester.



WARNING

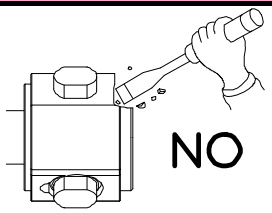
Failure to follow the safety precautions below could result in serious injury or death.

When making a chuck grip the Static Gripping Tester, be careful not to let the chuck grip your finger.



Do not alter any part of the Static Gripping Tester, unless permitted by the manufacturer.

- Such an alteration destroys or damages the Static Gripping Tester and invites danger.



- Alteration of the load buttons is permitted only to the section where further processing is allowed.

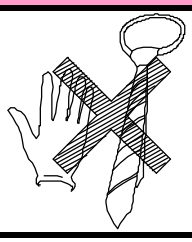
Do not operate the machine after drinking alcohol or taking medication.

- Dangerous since these lead to operation mistakes and misjudgment.

Do not operate the machine wearing gloves, a necktie, and other loose clothing or jewelry.

For All Users

- Dangerous since it will be caught.



3. Specifications

Table 3-1

Basics	
Rated capacity	100 kN (per jaw)
Overload permitted	150%
Bridge power	2.5 V/10mA
Number of input points	1
Range measurable	0.5 to 100.0 kN
Unit of measurement displayed	0.1 kN
Maximum value indicated	110.0 kN
General precision	Within 2% (including the load cell)
Operation switches	Silicon seat switch panel (5 contacts)
Display section	LCD character display (8 x 2 lines, with a back light)
Functional	
Automated zero setting	Settings available with the automated zero-point adjustment function ♦ None: The automated zero-point adjustment function not used ♦ B mode: The zero-point is set when the power is turned on. ♦ R mode: The zero-point is set to real time.
Automatic power shutoff	Shut off after the specified time length. The time length is chosen from 3, 10, and 30 minutes. This function can also be set to “off.”
Number of measured values stored in the memory	3
Warning message display	The warning messages that can appear: ♦ *: The battery voltage is too low ♦ zErr: Problem with zero-point adjustment ♦ OL.: Input too large to measure
Others	
Power	Lithium battery (CR123A x 2)
Operating temperature range	0 to 50 °C
Storage temperature range	-10 to 50 °C
Operating humidity range	20～80％RH or less（Condensation or freezing not to be occurred.）
Storage humidity range	30～95％RH or less（Condensation or freezing not to be occurred.）
Safekeeping place	Store the unit in a place free from wetting,condensation,or freeze
Attachments	Load button A (3 buttons), Load button B (3 buttons) Battery to be used for confirmation of correct operation (2 batteries)

4. How to Operate and Use

4−1. Operations

4−1−1. Operation switches

Power switch 

Turns the Static Gripping Tester's power on/off.

MODE switch 

Lets you select the mode of your choice for the screen.

SET switch 

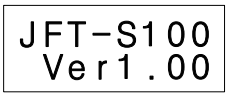
Used to set up the zero-point and to clear the measurement memory.

Selection switches 

Used to choose an item and switch between screens.

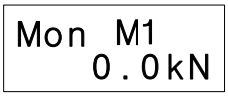
4−1−2. Operation screens

4−1−2−1. Startup screen

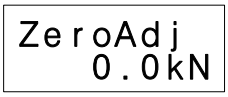


Displays the Model and Version.
Appears for around 2 seconds and then gives way to the Gripping Force Display Monitor screen.

4−1−2−2. Measuring Enabled screens



Gripping Force Display Monitor screen (MONITOR)
Displays the current gripping force. A number appears in the upper right corner of the screen, "M1," "M2," or "M3," to indicate the number corresponding to the measured value memorized.
Pressing the <SET> switch stores the measured value in the memory and displays the Measurement Memory screen.
Pressing the <↑> switch brings up the Measurement Memory screen.
Pressing the <↓> switch changes the upper number corresponding to the memorized measurement value.

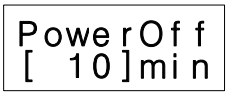


Manual Zero-point Adjustment screen (ZERO ADJUST)
In this screen, you manually set up the zero-point.
Pressing the <SET> switch for 1 second stores the measured value as the zero point and brings up the Gripping Force Monitor screen.
* Pressing the <↑> switch for 3 seconds alternately changes the measured value display between the load display and the AD value display.

Automated Zero-point Adjustment Function Setting screen (AUTO ZERO ADJUST FUNCTION)
Press either the <↑> or <↓> switch to choose from operational modes available for the automated zero-point adjustment function:
[None]: The automated zero-point adjustment function not used
[B mode]: The zero-point is automatically set right after the power is turned on.

[R mode]: The zero-point is automatically set right after the power is turned on and every 10 seconds afterwards.

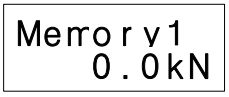
※ * The automated zero-point adjustment requires that the difference between current measurement value of gripping force and the last value memorized is within 0.05 kN.



Automatic Power Shutoff Time Setting screen (AUTO POWER OFF TIME)

Press either the <↑> or <↓> switch to choose the time length before the automatic power shutoff out of [3], [10], [30], and [OFF] in minutes.

4-1-2-3. Memory Display screen



Measurement Memory Display screen (MEMORY DISPLAY)

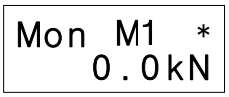
The value memorized by the Gripping Force Display Monitor is displayed.

Pressing the <SET> switch for 3 seconds clears the memory of measured value.

Pressing the <↑> switch changes the screen to the Gripping Force Display Monitor.

Pressing the <↓> switch changes the number corresponding to a memory of a measured value, and the memorized value for each number appears.

4-1-2-4. Warning messages

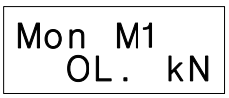


The battery voltage is too low

In the Gripping Force Display Monitor and the Manual Zero-point Adjustment screens, if the battery voltage becomes too low for the meter to operate normally, the “*” blinks in the upper right corner of the screen.

Problem with zero-point adjustment

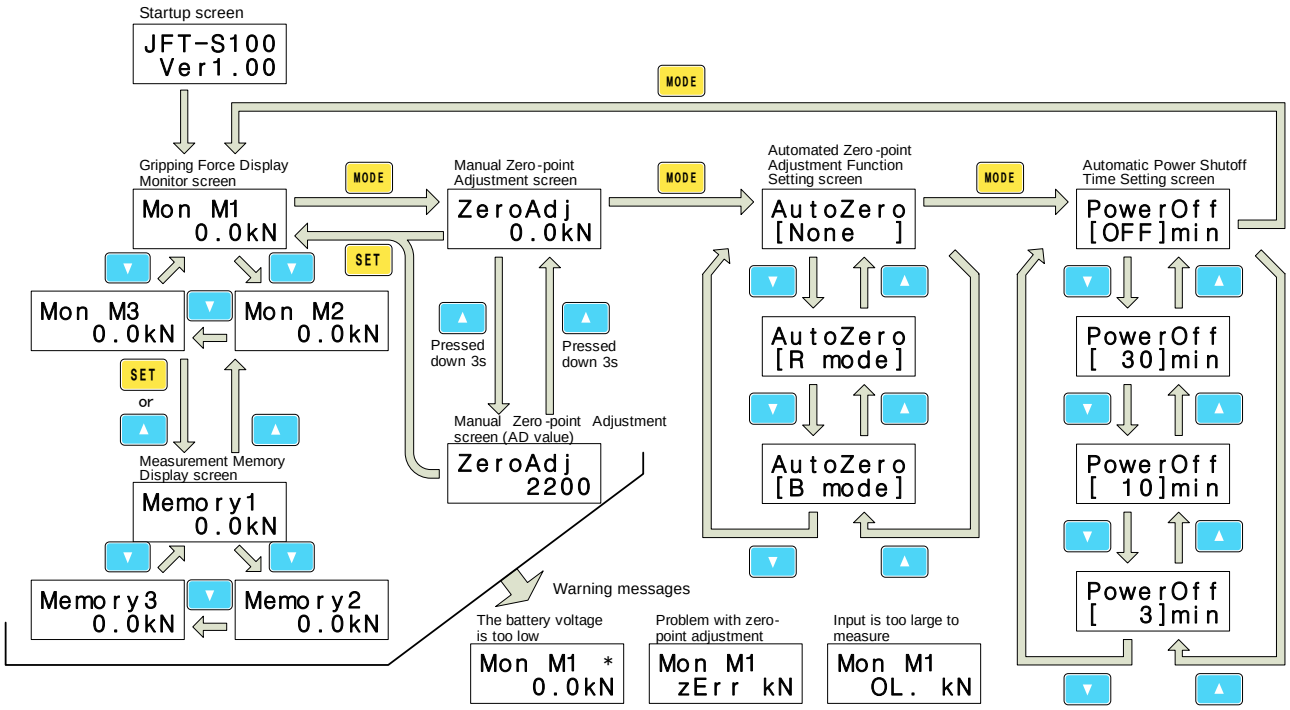
In the case that a manual adjustment or automated zero-point adjustment following power-on fails, “zErr” appears on the screen. This warning display of a problem with zero-point adjustment disappears after 3 seconds.



Input is too large to measure (out of the range)

If the load to measure exceeds 110 kN, “OL.” appears in the Gripping Force Display Monitor and the Manual Zero-point Adjustment screens.

4−1−3. Screen transition



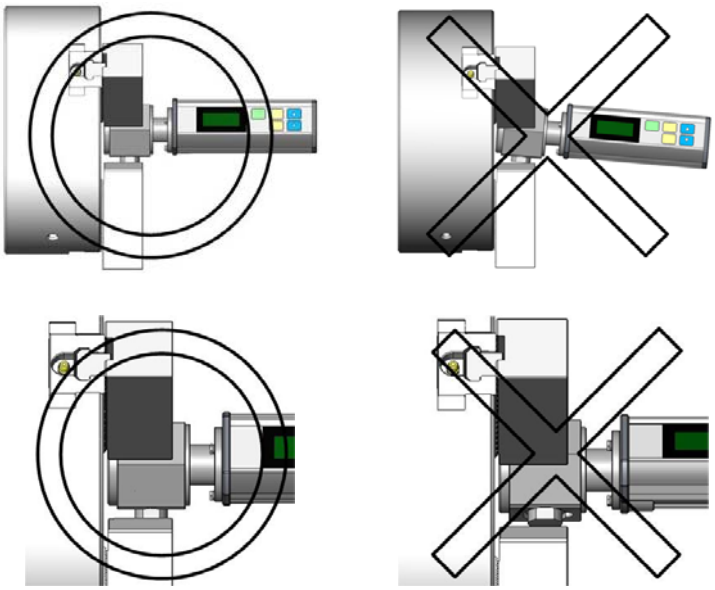
4−2. How to use

DANGER

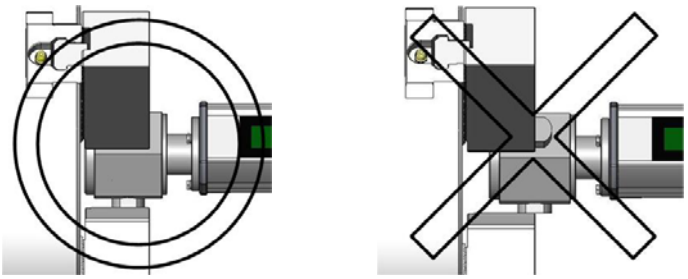
- The Static Gripping Tester measures the gripping force working on a single jaw. Therefore use the formula below to obtain the gripping force of the whole chuck.

  Chuck's gripping force = Measured value x No. of jaws

Set up the Static Gripping Tester in a way that applies the force to the probe (measuring section) at right angles.



Make the whole of the probe (measuring section) subject to the load.



5. Shape Forming of the Static Gripping Tester's Head

To enable the chuck to grip the Static Gripping Tester with its jaws, you need to form the meter's head into a shape that matches those of the chuck's jaws.

5-1. Removing the Static Gripping Tester's head

① To form the shape of the meter's head, first remove it from the meter's main body.

② Remove the ⑰Frame mounting bolts and washers shown at 1-2 List of parts. Next, pull the main-body-side connector off the connector substrate. Then remove the Static Gripping Tester's head from the main body.

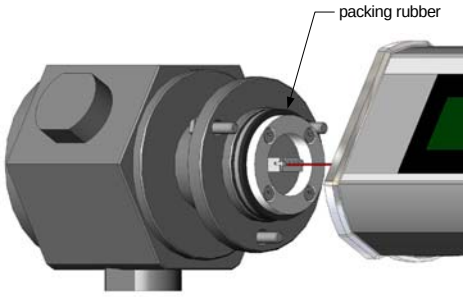


Fig 5-1-1

Things to note

- The meter's head is connected to the main body through wiring. Therefore, do not pull the head too hard.
- There is packing rubber at the joint combining the head and the main body. Be careful not to lose the rubber when and after you remove the head from the main body.

5-2. Forming the Static Gripping Tester's head

1. Protect the Static Gripping Tester's connector.

   To form the shape of the load buttons of the meter's head, carve those buttons. While you do this carving, cover up the head's connector with tape, etc. so that no chip could enter the connector.

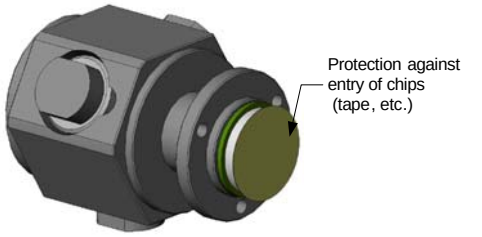


Fig 5-2-1

2. Grip the Static Gripping Tester's head.

   Grip the edge of the meter's head.

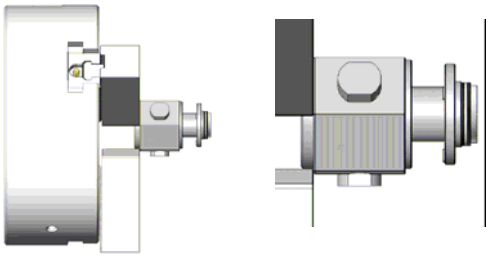


Fig 5-2-2

3. Form the load cell

While gripping the meter's head process the load cell (dimension: A). Process the A section to the size that fits the chuck's jaws. Also, process the section's surface to a roughness of 6 s or below.

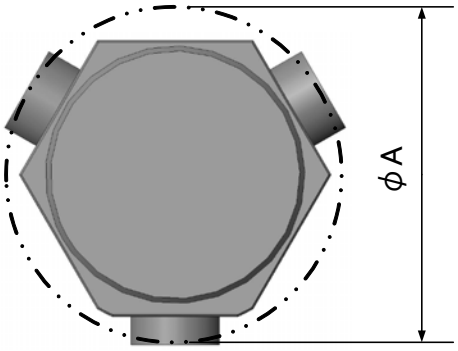


Fig 5-2-3

DANGER

- During the processing above, set the cutting (carving) torque and the gripping torque as below. Any torque other than the values specified below results in the meter's head flying apart, which is very dangerous.

Gripping torque = (Gripping force – Centrifugal force) x Friction resistance x Radius of the grip

Note) Friction resistance: 0.1 for a soft jaw. 0.2 for a hard jaw.

Cutting (carving) torque < Gripping torque x 1/2.5

6. Instructions for Use

DANGER

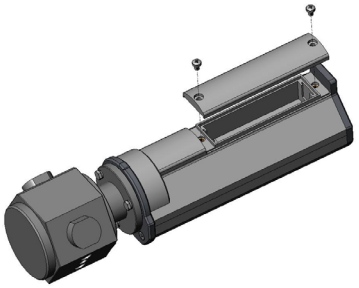
- Never let the load measure exceed 150 kN.
  Any load above 150 kN results in a failure and incorrect measurement.
- Do not drop or apply an impact to the Static Gripping Tester. Such a shock damages the meter's electronic parts.
- Do not let the meter get in contact with oil or water. Any entry of water or oil into the meter's inside damages its electronic parts.
- Do not disassemble the meter, except for the disassembling specified above, which is necessary for forming the shape of the meter's head.
- Do not clamp the Static Gripping Tester onto a rotating body and rotate it.
- A radical change in the temperature, even within the operating temperature range, disturbs the meter's measuring.

7. Maintenance

7-1. Changing the battery

① Remove the battery cover mounting screws and take off the battery cover.

② Install the battery at the right polarity direction and attach the battery cover back on.



7-2. What to do in the case of a warning or a problem

"*" Warning: The battery voltage is too low

[Cause of the warning]	[How to fix]
The battery's voltage is below the minimum value required for the meter to operate correctly.	Replace the battery with a new one.

"zErr" Warning: Problem with zero-point adjustment

[Cause of the warning]	[How to fix]
Load of 10 kN or more is at work on the Static Gripping Tester during the automated zero-point adjustment following power-on or manual zero-point adjustment.	Release the meter from the chuck and try the zero-point adjustment again with no load applied.

"OL." Warning: Input is too large to measure (out of the range)

[Cause of the warning]	[How to fix]
Excessive load (110 kN or above) is at work on the meter.	Use the meter at or below its rated capacity.

Automated zero-point adjustment is not conducted when starting up the meter.

[Cause of the warning]	[How to fix]
The load at the power on is exceeding + or – 0.5 kN.	◆ Do not apply any load to the meter when turning its power on. ◆ In the case that the meter recognizes excessive load while in fact there is no load at work, manually adjust the zero-point.
The automated zero-point adjustment function is set to "None."	Set the automated zero-point adjustment function to either "B mode" or "R mode."

Automated zero-point adjustment is not conducted in the R mode.

[Cause of the warning]	[How to fix]
The difference is too large between the last zero-point memorized and the current point for the meter to have the automated adjustment.	Remove the load from the meter and manually adjust the zero-point.

8. Other information

8-1. Information about markings of product

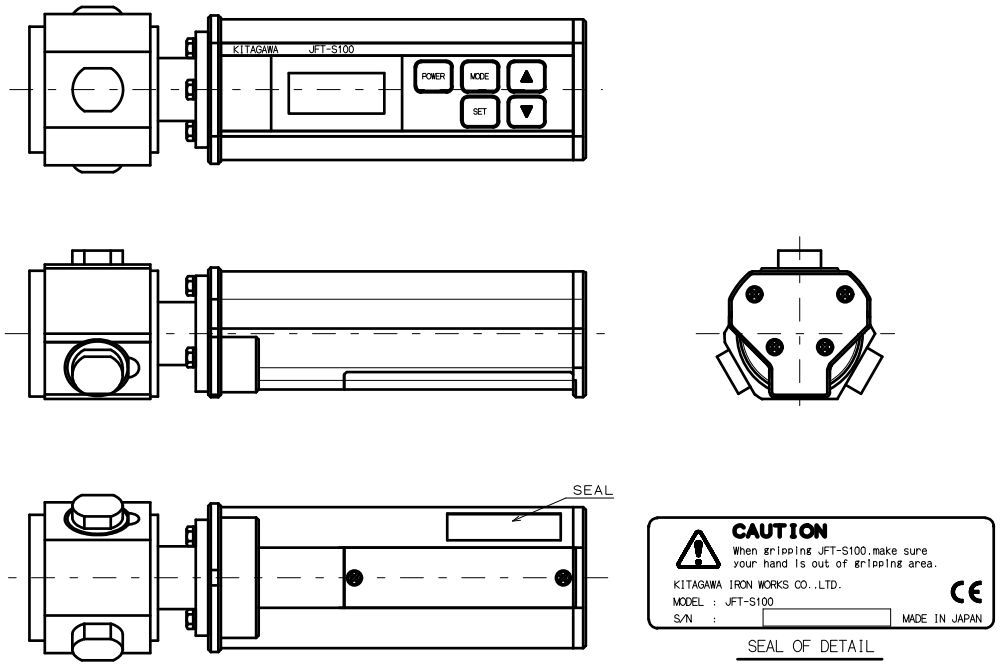


Fig 8-1

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