

SCHMIDT

control instruments

Instruction Manual for Digital Force Gauge

DSV/DST series



Read through this manual before using this gauge.

Hans Schmidt & Co GmbH

Mailing address:

*P. O. B. 1154
84464 Waldkraiburg Germany*

Shipping address:

*Schichtstr. 16
84478 Waldkraiburg Germany*

Phone: int. + 49 / (0)8638 / 9410-0

Fax: int. + 49 / (0)8638 / 4825

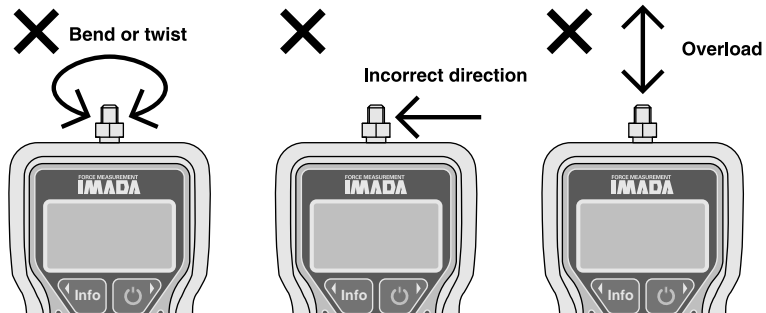
e-mail: info@hans-schmidt.com

Internet: <http://www.hans-schmidt.com>



Precautions

Cautions of overload



- Keep in mind that this unit will break down if the force exceeding capacity is applied irrespective of power status.
- If the force exceeding approx. 110% of capacity is applied, the following message shows up while the power is on. In this case, please stop applying force immediately. The sensor breaks down when it is overloaded.
- The sensor breaks down when apply force to bend or twist the measuring shaft.



Cautions of use

- Use this product only for measurement.
- Read these instructions before using this product. Use it based on this instruction.
- Avoid misuse or rough treatment.
- Do not disassemble or tamper with this product.

Cautions of storage

- Please avoid oil, dust, and heat and high humidity, and keep it in a cool place.
- Please keep it after use in an attached carrying case to prevent from force or a shock applying to a measuring shaft.
- In case you remove the dirt of this unit, please do not use organic solvents, such as thinner.
- Very small electrical current is consumed also at the time of a power OFF. Please use it after charging, when it is not used for a long period of time.

Cautions of an accuracy warranty

- Although based on operating frequency or force range, measurement accuracy deteriorates little by little. We recommend periodical calibration.
- The specification temperature range of this is 0 to 40 Celsius degrees. In order to carry out more exact measurement, please use it by temperature within the limits set to the inspection certificate.
- Please turn on the power 10 minutes before starting measurement in order to stabilize the indication of value.

Cautions on safe

- During destruction, breaking points, or performing another test where fragments could fly out, always wear protection for the eyes and body.
- When you attach this unit on a test stand etc., please read this instruction manual well and attach it correctly.

Error Messages

- The display may show error messages such as 'MEMORY ERROR' or 'FATAL ERROR' when there is a damage found in the memory data or the setting data. There is a possibility of some internal problems. Please contact our distributor.

Index

Precautions	1 - 2
Features	4
1. Models	5
2. Names and Functions	6
3. Accessories	7
4. Preparation	
4-1. Battery and Charge	8 - 9
4-2. Mounting attachments	9 - 10
4-3. Mounting the force gauge on a test stand	10
5. Basic Operation	
5-1. Power on	11
5-2. Power off	11
5-3. Select a measurement mode	11
5-4. Reset to zero	12
5-5. Transfer the measurement from the force gauge to a PC or a printer	12
5-6. Store the measurement in internal memory (DSV series only)	13
6. Select a Measurement Mode	
6-1. How to select a measurement mode	14 - 15
6-2. Real time mode	16
6-3. Peak mode	17
6-4. Continuous peak mode (DSV series only)	18 - 19
7. Tilt Alarm (DSV series only)	
7-1. Enable Tilt alarm	20
7-2. Initialize tilt sensor	20
7-3. How to use Tilt alarm	21 - 22
7-4. Tilt state of a peak value	23
8. Internal Memory (DSV series only)	
8-1. Store the measurement in internal memory	24
8-2. Recall internal memory data	24
8-3. Delete the measurement in internal memory	25
8-4. Print data in internal memory	25
9. Program	26 - 28
10. Initial Setting (Setup Menu)	29 - 31
11. Connect External Devices	
11-1. Connect the force gauge with a PC via USB interface	32 -33
11-2. RS-232C / USB output	34
11-3. Command list (RS-232C & USB)	35
11-4. RS-232C interface connector ...	36
11-5. Connect a printer via RS-232C interface	37 - 39
12. Specifications	40
13. Dimensions	41
14. Option	42
15. Maintenance	
15-1. Battery Replacement	43
15-2. Calibration and Repair	44 - 45
16. Warranty	46

Features

Thank you for your purchase.

This force gauge is designed especially for handheld-use, enabling you to perform force measurement very easily in the actual job site of production or Quality Control. DSV/DST-2N, 5N, 20N or 50N has mechanical stopper for preventing overload.

* You cannot prevent overload in some cases.

Graphic LCD display panel can indicate various information to fit your needs. And, you can set functions readily due to user-friendly menu display.

Moreover, this force gauge is equipped with USB interface, allowing for communications with external devices like a PC through USB cable. You can transfer data from the force gauge to a PC easily.

DSV series have all the functions of DST gauges, with a few additional features, including Tilt alarm function, Internal memory, and Continuous peak mode.

<Tilt alarm> DSV sounds alarms when you tilt it to right/left or up/down from the pre-set position, for greater accuracy.

<Internal memory> You can save the measurement up to 1000 in DSV's internal memory. If you cannot connect it to any PCs due to restrictions, this internal memory would be very helpful.

<Continuous peak mode> In this mode, you can save peak values continuously.

This force gauge is produced and shipped under strict quality control standards, however, if you notice any errors or problems, please feel free to contact us or the dealer where you purchased it.

After you have finished reading through this manual, keep it in a safe, readily accessible place for future reference.

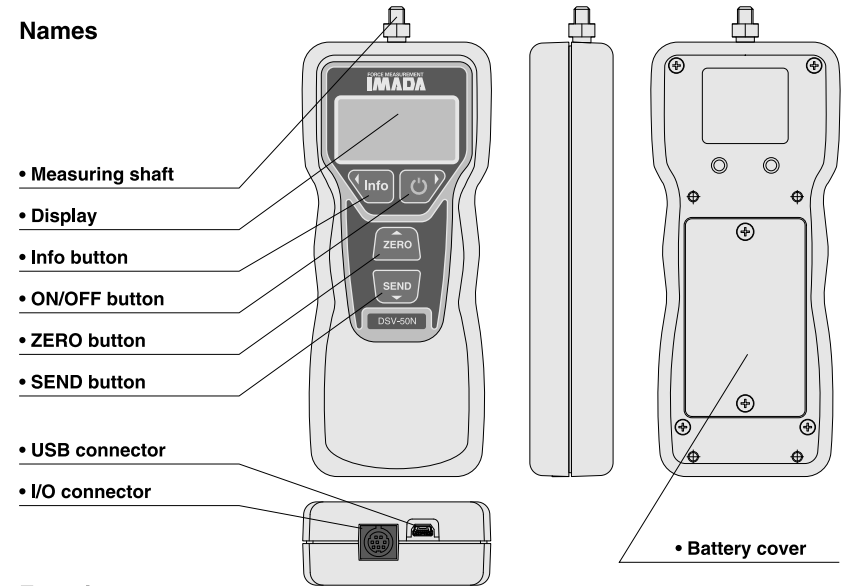
1. Models

DST series are basic models. DSV series have all the functions of DST gauges, with a few additional features, including Tilt alarm, Internal memory, and Continuous peak mode.

Model	Capacity	Display	Resolution
DSV(DST)-2N	2N	2.000N	0.001N
DSV(DST)-5N	5N	5.000N	0.001N
DSV(DST)-20N	20N	20.00N	0.01N
DSV(DST)-50N	50N	50.00N	0.01N
DSV(DST)-200N	200N	200.0N	0.1N
DSV(DST)-500N	500N	500.0N	0.1N
DSV(DST)-1000N	1000N	1000N	1N

2. Names and Functions

Names



Functions

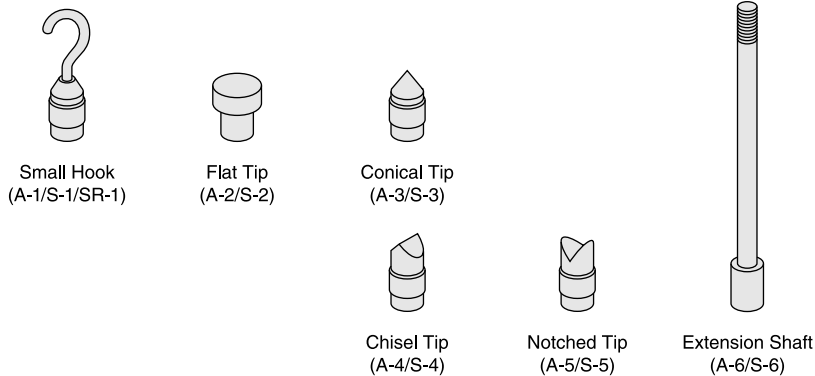
ON/OFF button	Turn ON/OFF the power. In the settings, use this button as OK button or right button.
Info button	Select display format / See internal memory In the settings, use this button as left button.
ZERO button	Reset the measurement to zero. In the settings, use this button as up button.
SEND button	Store the measurement in internal memory (DSV only*). Transfer the measurement to a PC or RS-232C printer. In the settings, use this button as down button.
Display	Indicate the measurement, settings, and the status.
Measuring shaft	Mount a supplied/an optional attachment on this measuring shaft to be ready for force testing.
USB connector	Connect a supplied USB cable and a PC to transfer the measurement to the PC. Connect a supplied USB cable and AC adaptor to charge the force gauge.
I/O connector	Connect an optional cable and a RS-232C device.
Battery cover	Contain rechargeable battery inside. You can replace the battery as required. For further information of replacing battery, see page 43 {15-1.} "Battery replacement".

* Only DSV series can store the measurement in internal memory by SEND button.

3. Accessories

DSV/DST series come with the following accessories. To protect the force gauge and the accessories, put them away in the carrying box for storage. When you ship them to us or your dealer for calibration or repair services, make sure to put the force gauge and accessories in the case.

- **This instruction manual**
- **Inspection certificate**
- **Warranty card**
- **AC adapter**
- **Carrying case**
- **USB cable**
- **CD-ROM**
- **6 pcs of attachments**



DSV(DST)-2N/5N/20N/50N come with aluminum attachments (A-type).

DSV(DST)-200N/500N/1000N come with steel made attachments (S-type).

* DSV(DST)-1000N come with SR-1 instead of S-1.

4. Preparation

4-1. Battery and Charge

Make sure to charge the force gauge before using.

You can charge it fully within approximately 4.5 hours.

The battery icon () shows the remaining battery level (3 steps). The icon shows up for a while after you turn on its power. When this icon () shows up, charge it. While charging, this icon () shows up. When the force gauge is charged fully, it automatically stops charging and the icon indicating battery level shows up again.

Charging through the AC adaptor

Connect the force gauge to a supplied AC adaptor using a supplied USB cable.

Charging through a PC

Connect the force gauge to a PC's USB port using a supplied USB cable.

Charging through a portable battery charger

What is a portable battery charger?

Ans. It is a portable recharger for smart phones or other devices, allowing for charging without outlet.

You can charge the force gauge on the go if you take the portable battery charger with you. Connect the force gauge and the portable battery charger using a supplied USB cable. You can connect the force gauge to a portable battery charger having the specifications below:

Outlet voltage: FDC5V 500mA or more


Battery capacity: F1500mAh or more

Connector shape: FUSB Type A, female

* Some portable battery chargers does NOT work properly even though they fulfill the specification requirements above. After connecting the force gauge to a portable battery charger, make sure to see if the force gauge's display indicates the charging icon ().

4. Preparation



- Make sure to use the supplied AC adaptor only for recharging with AC adaptor. Other AC adaptors may cause bad accuracy, damage, or even fire.
- Do not apply excessive force to the force gauge and connection part with AC adaptor to prevent damage.
- The current consumption of the force gauge is 500mA at maximum. At the mention of a USB hub, use only a self-powered USB hub since it can draw the power directly through the AC adaptor, which enables supplying power to the force gauge stably.
- If the battery's life is near the end, the battery does not last long even after full charge or it cannot be charged. If that happen, we recommend that you replace it to a new battery. See page 43 {15-1.} "Battery replacement".
- The force gauge monitors the remaining battery level, and it automatically starts/stop charging while the AC adaptor is connected. Therefore, you can keep connecting the AC adaptor even after charging is completed.
- The force gauge may become hotter while charging, which is normal condition. It occurs temporarily, so do not worry.
- As the battery runs out, this icon  shows up, and the force gauge is automatically turned off.
- When the battery dies, the date and time setting may be reset. Once the date and time is reset, calibration reminder function does not work appropriately.

4-2. Mounting attachments

Mount appropriate attachment to the measuring shaft. The direction can be adjusted with the supplied nut.



- Applying the force to wrong direction or using tools to mount an attachment will cause load cell damage. For safety, please mount an attachment while checking a display value.
- The point where force is applied should come to the point where a hook crosses an extension of the gauge measuring shaft when you use a hook attachment. If force is applied at a tip of hook, it may bend or break, which is very DANGEROUS.
- The weight of attachment is detected as force to the sensor. We recommend the weight of attachment should be under 10% of gauge capacity.

4-3. Mounting the force gauge on a test stand

You can mount the force gauge on an optional test stand as required.

Use four female screws on the back of the force gauge for mounting it on a test stand.

You can see the dimensions on page 41.

How to mount the force gauge

A test stand come with four screws and a mounting plate. Mount the force gauge on the mounting plate with the four screws. Then, mount the mounting plate with the force gauge on the head of the test stand.


Attach A-2/S-2 (Disk attachment) to measuring shaft of the force gauge, which helps you mount the force gauge straight. In detail, make the disk attachment face parallel to the surface of test stand's table, which enables you to mount the force gauge straight.



- Do not screw more than 8mm in depth.

5. Basic Operation

5-1. Power on


Press  (ON/OFF button), then you will see the measurement screen after the start screen.


After the display switches to the measurement screen, you can start measurement.

In the start screen, it indicates information such as model name, capacity (measurable maximum force), and date.

As required, you can set up the desired date for the next calibration, then on 30 days before the set date, it reminds you of the next calibration by a message after the start screen.

5-2. Power off

Press  (ON/OFF button) for more than one second at the measurement screen to power off the force gauge.

You can power it off only on the measurement screen. Thus to power it off, make sure to go back to the measurement screen first, and press  (ON/OFF button) for more than one second.


5-3. Select a measurement mode

The force gauge offers 2 modes; Real time mode or Peak mode.

DSV offers Continuous peak mode in addition to the 2 modes above.


For further information, see page 14-19 {6.} “Select a measurement mode”.

5-4. Reset to zero

Press  (ZERO button) to reset the measurement to zero.

The force gauge can sense force when you mount an attachment on its shaft or tilt it. Therefore, make sure to press ZERO button right before measurement after you are all ready. In detail, mount an attachment before pressing ZERO button, and do NOT tilt it after the ZERO.

5-5. Transfer the measurement from the force gauge to a PC or a printer.

Press  (SEND button) to transfer the measurement to external devices such as a PC.

Measurement mode determines the type of the measurement which is transferred to external devices.

In Continuous peak mode,  (SEND button) is invalid.


In Real time mode: Real time value is transferred.

In Peak mode: Peak value is transferred.

For further information of measurement mode, see page 14-19 {6.} “Select a measurement mode”.

5. Basic Operation

5-6. Store the measurement in internal memory (DSV series only)

Press  (SEND button) to transfer the measurement to an external device and store it in internal memory at the same time.

DSV automatically stores peak values in internal memory while Continuous peak mode is valid.


For further information, see page 18 {6-4} “Continuous peak mode (DSV only)”.

You can store the measurements up to 1,000. When the stored measurements reach 1,000, the message “Memory Full” shows up, and you cannot store the current measurement.

If you need the measurements stored in internal memory, transfer them to a PC using the supplied USB cable and the supplied software (Force Logger).

If you need to delete the measurement stored in internal memory, see page 25 {8-3} “Delete the measurement in internal memory”.

A measurement mode determines the type of the measurement stored in internal memory.

In Continuous peak mode, you cannot use  (SEND button) to store the measurement in internal memory.

In Real time mode: Real time value is stored.

In Peak mode: Peak value is stored.

For further information of measurement mode, see page 14-19 {6.} “Select a measurement mode”.



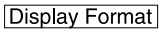







6. Select a Measurement Mode

The force gauge offers 2 modes; Real time mode or Peak mode.


Moreover, DSV offers Continuous peak mode in addition to the 2 modes above.

Continuous peak mode is very useful if you need to measure peak value repeatedly. Once you select a measurement mode, it will remain in memory even if the power is turned off. In addition, the force gauge can indicate both peak value and real time value at the same time as required.


6-1. How to select a measurement mode


1. Press  (Information button) while the power is on, then you will see .
2. Select  (using   (up/down button) as required), and press  (right button), then you will see “Main” and “Footer” (<A> display on page 15). Next to “Main”, you will see “Real Time Value”, “Peak Value”, or “Continuous Peak”. The value next to “Main” means the measurement mode.
e.g.) Look at <A> display. Next to “Main”, you can see “Real Time Value”, then now Real time mode is ON.
3. Select “Main” (using   (up/down button) as required), and press  (right button). Then you will see “Main Display” (display on page 15).
4. Select one from Real Time Value, Peak Value, or Continuous Peak* using (up/down button), and press  (right button) to confirm. Once it is confirmed, you will see the previous display, “Main” and “Footer”.

* You can select Continuous Peak in DSV only.

To cancel changes for the setting, press  (left button). Then you can go back to previous page without any changes.

6. Select a Measurement Mode

5. Press  (left button) at <A> display, then you can go back to Information from Display Format.

Press  (left button) again to go back to the measurement screen.

<A> display






 display




Footer

When you change the settings for “Footer”, you can handle it by the similar button operations as the “Main”.

Press   (up/down button) to go up/down and highlight the desired item.

Press  (right button) to go next or confirm it.

Press  (left button) to go back.

PEAK mark

While Peak mode or Continuous peak mode is ON, the force gauge indicates peak mark to notify you that Peak mode or Continuous peak mode is ON.

In Peak mode, you will see **PEAK** or **P**.

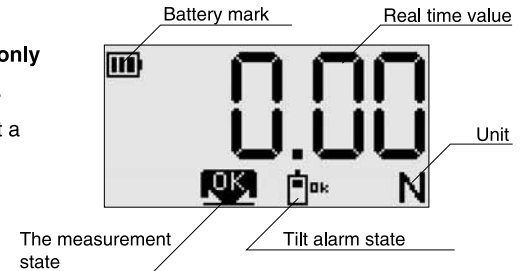
In Continuous peak mode, you will see **PEAK** or **P**.

6-2. Real time mode

6-2-1. Indicate real time value only

Configure the settings as follows according to {6-1} “How to select a measurement mode”.

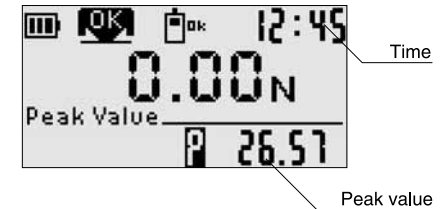
Main Display: Real Time Value
Footer: None



6-2-2. Indicate both real time value and peak value

Configure the settings as follows according to {6-1} “How to select a measurement mode”.

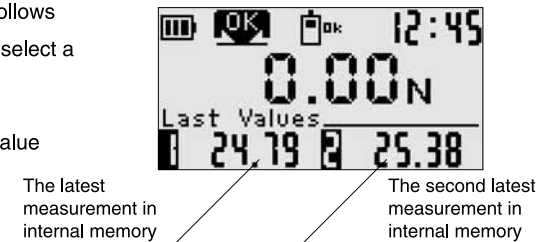
Main Display: Real Time Value
Footer: Peak Value




6-2-3. Indicate real time value and last values

Configure the settings as follows according to {6-1} “How to select a measurement mode”.

Main Display: Real Time Value
Footer: Last Values



At the “Last Values”, it indicates the measurement which is stored in internal memory* by pressing  (SEND button). At [1], it indicates the latest value. At [2], it indicates the second latest value.

* DSV series can store the last values in internal memory, however, DST series cannot store the last values. In DST series, you can just see the latest and the second latest values at the footer, and once you turn off DST, the values are deleted.

6. Select a Measurement Mode

6-3. Peak mode

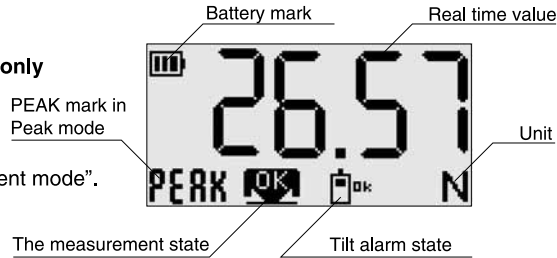
6-3-1. Indicate peak value only

Configure the settings as follows according to {6-1} “How to select a measurement mode”.

“How to select a measurement mode”.

Main Display: Peak Value

Footer: None

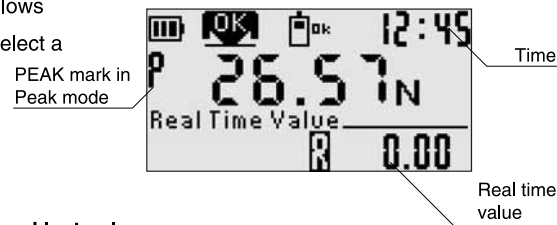


6-3-2. Indicate both peak value and real time value

Configure the settings as follows according to {6-1} “How to select a measurement mode”.

Main Display: Peak Value

Footer: Real Time Value

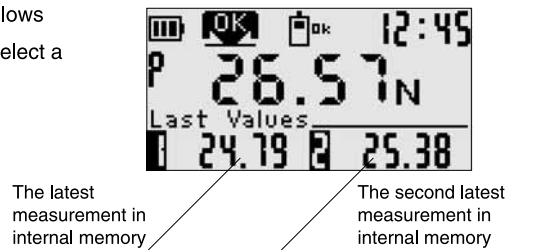


6-3-3. Indicate peak value and last values

Configure the settings as follows according to {6-1} “How to select a measurement mode”.

Main Display: Peak Value

Footer: Last Values



At the “Last Values”, it indicates the measurement which is stored in internal memory* by pressing **SEND** (SEND button). At [1], it indicates the latest value. At [2], it indicates the second latest value.

* DSV series can store the last values in internal memory, however, DST series cannot store the last values. In DST series, you can just see the latest and the second latest values at the footer, and once you turn off DST, the values are deleted.

6-4. Continuous peak mode (DSV series only)

As you can see the graph below, after the measurement exceeds 10% of the gauge's capacity and fall below 7% of the capacity, the force gauge stores the peak value between the 10% and the 7%, and transfer the peak value to a PC.

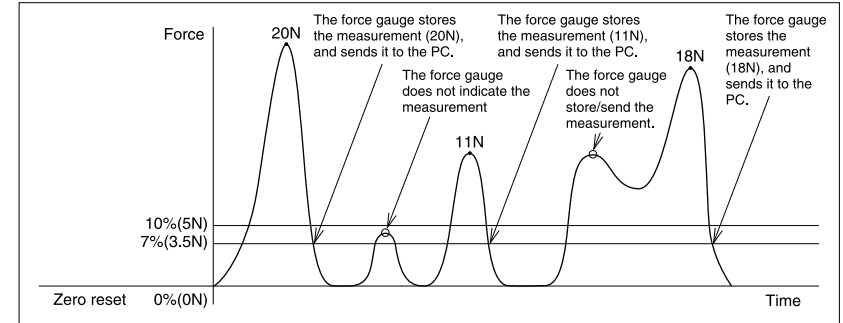
* The measurement means the force transition after **ZERO** (ZERO button) is pressed.

It indicates the peak value until the measurement exceeds 10% of the capacity again. Once the measurement exceeds 10% of the capacity, it updates the indication and shows a new peak value.

If you measure multiple peak values continuously, it automatically stores peak values without pressing **ZERO** (ZERO button) or **SEND** (SEND button), which improves measurement efficiency.

In Continuous peak mode, **SEND** (SEND button) is invalid since it automatically stores peak values.

e.g.) in the case of DSV-50N



- You cannot use Continuous peak mode when the measurement does not reach 10% of the force gauge's capacity. Instead, use Peak mode.
- Continuous peak mode does not fit enough for break tests since the mode could incorrectly recognize continuous fluctuation after break test as multiple peak values.

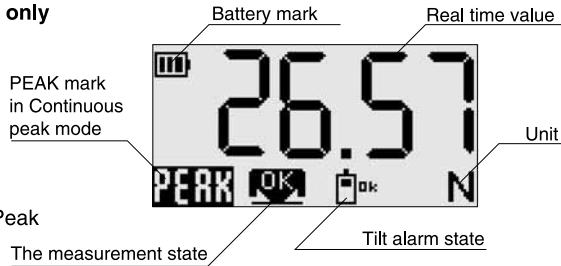
6. Select a Measurement Mode

6-4-1. Indicate peak value only

Configure the settings as follows according to {6-1} "How to select a measurement mode".

Main Display: Continuous Peak

Footer: None

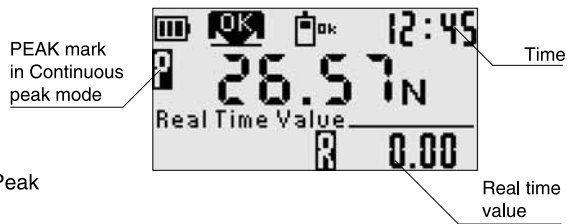


6-4-2. Indicate both peak value and real time value

Configure the settings as follows according to {6-1} "How to select a measurement mode".

Main Display: Continuous Peak

Footer: Real Time Value

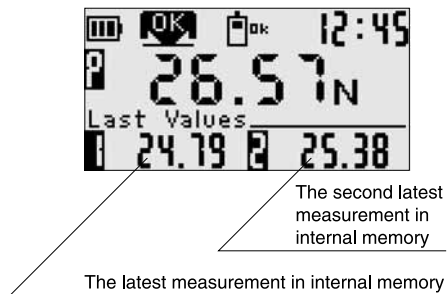


6-4-3. Indicate peak value and last values

Configure the settings as follows according to {6-1} "How to select a measurement mode".

Main Display: Continuous Peak

Footer: Last Values



After the measurement exceed 10% of the gauge's capacity and fall to below 7% of the capacity, the peak value is transferred to Last Values.

At [1], it indicates the latest value. At [2], it indicates the second latest value.

7. Tilt Alarm (DSV series only)

In force measurement, force applying direction should be as constant as possible for reliable measurement results. DSV series are equipped with a tilt-sensor, and it sounds alarms when it senses a tilt from the pre-set position at the moment ZERO button is pressed. Therefore, you can achieve more reliable results even in handheld-use.

7-1. Enable Tilt alarm

Tilt alarm is OFF in the factory default.

Select one from [Strict] / [Normal] / [Loose] according to page 29-31 {10.} "Initial Setting (Setup Menu)" to activate Tilt alarm.


[Strict]: Sound alarm when sensing a tilt angle of over 4 degrees from the pre-set position

[Normal]: Sound alarm when sensing a tilt angle of over 8 degrees from the pre-set position

[Loose]: Sounds alarm when sensing a tilt angle of over 14 degrees from the pre-set position

7-2. Initialize tilt sensor

With Tilt alarm ON, you will see "Reset Tilt Sensor" (<A> display) after the start screen.

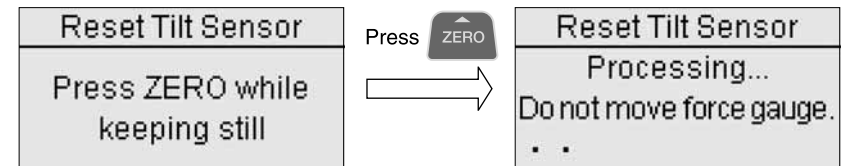
Then, put the force gauge on a flat table or and the like, and press  (ZERO button) with the force gauge at rest.

Once it is completed, it shows the measurement screen. Do not move the force gauge until you see the measurement screen.

Also after you switch Tilt alarm from OFF to ON, you will see "Reset Tilt Sensor".


Again, proceed it in the same way as above.


<A> display



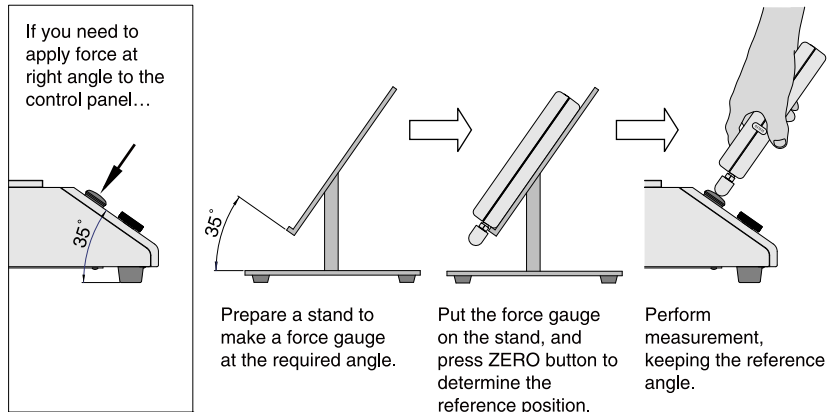
7. Tilt Alarm (DSV series only)

7-3. How to use Tilt alarm

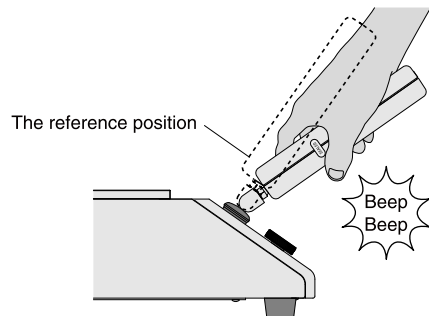
Press  (Zero button) in a measurement starting position, then the force gauge resets the measurement to zero and recognizes the position as the reference (pre-set) position.

When you perform measurement horizontally or vertically, press  (Zero button) in an actual measurement position and direction.

When you perform measurement at arbitrary angles, use a support stand to reproduce an actual measurement position as following picture. (We offer a customized support stand to fit your measurement needs. Feel free to contact us.)




The force gauge sounds alarms when it senses a tilt outside of acceptable limits from the reference (pre-set) position.




7-3-1. Detect an error

When it senses a tilt out of an acceptable angle range with reference to the pre-set position, the force gauge notifies you as following.

- It sounds the alarm twice.
- Screen's backlight flashes while the backlight is ON.
Screen's indication flashes while the backlight is OFF.
(See page 27 {9.} "Program" for further information about backlight.)
- This mark  shows up on the display. The mark's position depends on a measurement mode. See page 16,17,19 {6.} "Select a measurement mode" for further information.


7-3-2. Recover within OK range

When the force gauge recover to an acceptable angle range, the force gauge notifies you as following.

- It sounds the alarm twice.
- Screen's backlight stops flashing while the backlight is ON.
Screen's indication stops flashing while the backlight is OFF.
- This mark  shows up on the display.

7-3-3. Temporarily suspend Tilt alarm




Once the force gauge senses a tilt over 45 degree angle with a reference to the pre-set position, it recognizes that you finished measurement. And then it temporarily suspend Tilt alarm, and notifies you as following.

- It sounds the alarm three times.
- Screen's backlight stops flashing while the backlight is ON.
Screen's indication stops flashing while the backlight is OFF.
- This mark  shows up on the display.


7. Tilt Alarm (DSV series only)

7-4. Tilt state of a peak value


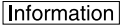
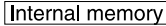



In Peak mode, it records the tilt state at the moment when a peak value is detected.

When it senses an unacceptable tilt, it indicates PEAK mark () and tilt-NG ( or ) alternately.




- To activate Tilt alarm again, press  (zero button) in a measurement starting position to set a reference position. The force gauge recognize the position at the moment the zero button is pressed as the reference. Then, make sure to press the zero button in an actual measurement starting position, otherwise the force gauge recognizes the inappropriate position as the reference (pre-set) position.
- Start measurement as soon as possible after you set the reference position. Make sure to press zero button after each measurement.
- When you move the force gauge fast or in small motions, it could not sense a tilt properly.

8. Internal Memory (DSV series only)

First, press  (information button) with the force gauge turned on, then you will see . Select  and highlight it using   (up/down button), and press  (right button) to recall / delete / print the measurement in internal memory.

8-1. Store the measurement in internal memory

Press  (SEND button) to store the measurement in internal memory. While you select Continuous peak mode in DSV, and the measurement is updated, it stores the previous measurement in internal memory. For further information, see page 13 {5-6.} "Store the measurement in internal memory".

8-2. Recall internal memory data

You can recall the measurement stored in the internal memory of DSV.

Recall the measurement stored in internal memory



You can see the list of all stored data.

To see the details of one data, select the desired data, and press  (right button).

See the statistics



You can see maximum / minimum / average values, the number of the data, the number of the measurement judged as OK.

8. Internal Memory (DSV series only)

8-3. Delete the measurement in internal memory

Delete the latest stored data



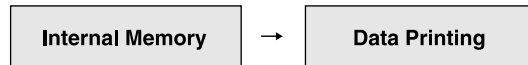
You can delete the latest data.

Delete the all data



You can delete all the data.

8-4. Print data in internal memory



You can print all the data stored in internal memory using a RS-232C printer.

It takes long to print the data if it stores a huge number of data.

See page 37 {11-5} "Connect a printer via RS-232C interface" for further information about printer connection.

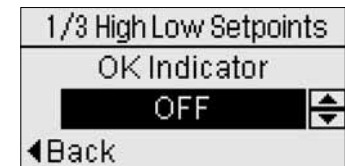
9. Program

1. Press (information button) with the force gauge turned on, then you will see `information`.
2. Select `Program` (using (up/down button) as required), and press (right button), then you will see `1/3 High Low Setpoints` (<A> display).
3. Select a desired item using (up/down button), and press (right button) to go to the setting change screen (display).
4. Select a desired setting using (up/down button), and press (right button) to confirm. Once the setting has been successfully changed, you will see the previous display (<A> display).
5. To cancel changes for the setting, press (left button). Then you can go back to previous page without any changes.
6. Press (left button) at <A> display, then you can go back to `information` from `Program Menu`.
Press (left button) again to go back to the measurement screen.

<A> display



 display














9. Program

Program Menu

Title	Item	Setting	Description	Model	Default
High Low Setpoints	OK Indicator	[ON] / [OFF]	[ON]: The measurement state mark is indicated on the measurement screen. [OFF]: The measurement state mark is not indicated on the measurement screen.	DST/ DSV	OFF
	High Setpoint	[Specify a numerical value] (0000 - 9999)	You can set High Setpoint / Low Setpoint as desired, and then it judges if the absolute value of the measurements is within the desired range or not. When the value is within the desired range, you will see OK mark on the measurement screen. For further information of OK mark, see page 16,17,19 {6.} "Select a Measurement Mode".	DST/ DSV	Capacity
	Low Setpoint	[Specify a numerical value] (0000 - 9999)		DST/ DSV	0
Display Functions	Backlight	[ON] / [Auto OFF] / [OFF]	[ON]: While the force gauge is turned on, the backlight is ON. [Auto OFF]: After 2 minutes without any operations, it turns off the backlight. [OFF]: The backlight is OFF. It consumes less power, then the battery lasts longer.	DST/ DSV	Always ON
	Reverse Display	[ON] / [OFF]	You can reverses the indication on the display upside down.	DST/ DSV	OFF
	Auto Shut Off	[15Min] / [30Min] / [OFF]	It automatically shuts off after the selected time period has passed without any operations.	DST/ DSV	30Min

Title	Item	Setting	Description	Model	Default
Sound	Keypad Beep	[ON] / [OFF]	You can turn ON/OFF the operating sound of buttons.	DST/ DSV	ON
	Overload Alarm	[ON] / [OFF]	You can turn ON/OFF the alarm sound that goes off when the measurement reaches 90% of the force gauge's capacity.	DST/ DSV	ON
	Alarm Tone	[High] / [Middle] / [Low]	You can switch the tones of the alarm sound.	DST/ DSV	Middle

10. Initial Setting (Setup Menu)

1. Turn off the force gauge.
2. Hold down  (information button), and press  (ON/OFF button) to turn on the force gauge at the same time, then you will see 1/4 Setup Menu after the start screen. Keep holding down  (information button) until you see 1/4 Setup Menu (<A> display).
3. Select a desired item using   (up/down button), and press  (right button) to go to the setting change screen (display).
4. Select a desired setting using   (up/down button), and press  (right button) to confirm. Once the setting has been successfully changed, you will see the previous display (<A> display).
5. To cancel changes for the setting, press  (left button). Then you can go back to previous page without any changes.
6. Press  (left button) at <A> display, then you can go back to the measurement screen from 1/4 Setup Menu.

<A> display

◀ 1/4 Setup Menu ▶	
Units	: N
+ /- Indicator	: Reverse
Sensitivity	: Low

 display

1/4 Setup Menu	
Units	
N	
◀ Back ▶	

Setup Menu

Item	Setting	Description	Model	Default
Units	[N] / [kN] / [mN] [gf] / [kgf] / [ozf] [lbf] (*1)	You can switch the unit of force.	DST/ DSV	N basis
+/- Indicator	[Normal] / [Reverse]	You can switch +/- signs of the measurement. [Normal]: (+) compression, (-) tensile [Reverse]: (+) tensile, (-) compression	DST/ DSV	Normal
Sensitivity	[High] / [Middle] / [Low]	You can select a desired sensitivity level of force measurement. [High] is the highest level of the sensitivity. * [High] is ideal for rapid force change, such as a break test and the like.	DST/ DSV	High
Language	[日本語] / [English]	English and Japanese are available.	DST/ DSV	English
RS-232C Output	[Printer] / [PC, PLC]	You can select a device to connect with the force gauge via RS-232C.	DST/ DSV	Printer
Tilt Alarm	[OFF] / [Strict] / [Normal] / [Loose]	You can switch the OK range of Tilt alarm function. If you do not use this function, select OFF.	DSV	OFF
Date Format	[YYYY/MM/DD] / [MM/DD/YYYY] / [DD/MM/YYYY]	You can select date format. Y: year M: month D: date	DST/ DSV	YYYY / MM / DD
Date Set	[Y] / [M] / [D]	You can set the date.	DST/ DSV	--- / -- / --
Time Set	[H] : [M] : [S]	You can set the time.	DST/ DSV	-- : -- : --
Calibration Reminder	[ON] / [OFF]	With it ON, the force gauge indicates a reminder message on the start screen.	DST/ DSV	OFF

* 1 Available units varies by the force gauge's capacity.

(Note that the available units are different from Japanese domestic model and international one.)

10. Initial Setting (Setup Menu)

Setup Menu

Item	Setting	Description	Model	Default
Calibration Schedule	[Y] / [M] / [D]	You can set up the desired date for the next calibration.	DST/ DSV	---- / -- / --
Setting Lock	[ON] / [OFF]	This function prevents unintentional changes of settings. With it ON, you can view only all the setting except Program Menu, Internal Memory, and Setup Menu. Select OFF to unlock it.	DST/ DSV	OFF

11. Connect External Devices

11-1. Connect the force gauge with a PC via USB

The force gauge allows for communications with a PC using a supplied USB cable, enabling you to manage data in the PC easily. Here you can read about a data-logging software in the supplied CD-ROM, Force-Logger.

11-1-1. Operating Environment

See the label on the CD-ROM for the details of its operating environment.

11-1-2. Connect the force gauge

Using the supplied USB cable, connect USB interface connection part of the force gauge to a USB connection port of a PC.



- The current consumption of the force gauge is 500mA at maximum. At the mention of a USB hub, use only self-powered USB hub since the self-powered USB hub can draw the power directly through the AC adaptor, which enables supplying power to the force gauge stably.

11-1-3. Install the driver from the supplied CD-ROM

Make sure to install the driver first to use the data-logging software, Force-Logger. Before installing software, install the driver according to "The Installation Instruction for Device Driver and Force-Logger" in CD-ROM.

11. Connect External Devices

11-1-4. Install the data-logging software, Force-Logger from the supplied CD-ROM

After you complete installation of the driver, install Force-Logger.

You can see how to install it in “The Installation Instruction for Device Driver and Force-Logger” in CD-ROM.



- You could not install the driver or Force-Logger in some PCs due to operating environment issues. Contact us or the dealer where you purchased it for assistance.

11-2. RS-232C / USB output

Using the supplied USB cable or an optional RS-232C cable, you can connect the force gauge to external devices such as a PC. Then, you can transfer the measurement or internal memory (DSV only) to a PC, or change the settings from the PC.

* Via USB, you can access the force gauge from PC as COM port.

Communication conditions

	RS-232C	USB
Data length	8 bit	8 bit
Stop bit	1 bit	1 bit
Parity	N/A	N/A
Transferring speed	19200bps	256000bps
Flow control	N/A	Hardware flow control

The commands are common among RS-232C and USB interface.

The force gauge basically responses after receiving commands.

The commands and responses are composed of ASCII code.

Commands and responses are followed by code [CR].

The force gauge responses when it receives code [CR].

The force gauge sends E[CR] when it receives a wrong command.

The force gauge returns a response when it receives a command+[CR].

See the page 35 {11-3} “Command list (RS-232C & USB)”.

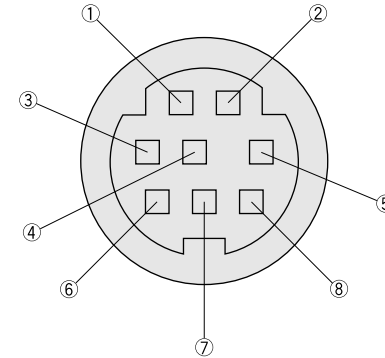
11. Connect External Devices

11-3. Command list (RS-232C & USB)

Command	Function	Format in response
D	Gain the measurement.	[Indicator] [the measurement] [Unit] [Measurement mode] [the measurement state] Indicator: + or - The measurement: Force with a decimal point (4-digit) Unit: N= N-basis K= kg-basis Measurement mode: T= Real time mode P= Peak mode Continuous peak mode * The measurement state: L= Fall below the low setpoint O= Within the pre-set OK range H= Exceed the high setpoint E= Overloading < Response Example > +123.4NTO
Z	Reset to zero	R
T	Switch to Real time mode	R
P	Switch to Peak mode *	R
N	Switch to N-basis in unit	R
K	Switch to kg-basis in unit	R
EHHHLLLLL	Change high setpoint (HHHH) and low setpoint (LLLL). Specify four digits number in decimal integer, followed by E.	R
OM	Store the measurement in internal memory	R
OC0	Delete the latest measurement in internal memory	R
OC1	Delete all the measurement in internal memory	R
Q	Turn off the power	R

* You can select Continuous peak mode using DSV body. (You cannot select Countinuous peak mode by command.)

11-4. RS-232C interface connector



Connector pin arrangement

Pin number	Signal	Description
1	Serial signal GND	RS-232C signal
2	Serial signal TXD	RS-232C signal
3	NC	Do not connect anything.
4	NC	Do not connect anything.
5	Serial signal RXD	RS-232C signal
6	NC	Do not connect anything.
7	NC	Do not connect anything.
8	NC	Do not connect anything.

11. Connect External Devices

11-5. Connect a printer via RS-232C interface

The force gauge allows for communication with RS-232C printer, enabling you to print the measurement.

For further information of RS-232C output, see page 29-30 {10.} "Initial Setting (Setup Menu)".

11-5-1. RS-232C Connect a Printer

Connect the force gauge's I/O connector to RS-232C printer using an optional RS-232C cable.

The verified printers

BL2-58 series, SD3-21 series by SANEI ELECTRIC INC.


CT-S601 series by CITIZEN SYSTEMS JAPAN CO.,LTD

* RS-232C interface only



• Turn off the force gauge and RS-232C printer, connect them.

11-5-2. Print the measurement

Press  (SEND button) on the measurement screen, the measurement is printed through the RS-232C printer.

Depending on a measurement mode, printed contents differ.

For further information of measurement mode, see page 14-19 {6.} "Select a Measurement Mode".

In Real time mode: Real time values are printed.

In Peak mode: Peak values are printed.

Printing format is as follows.

[Indicator] [The measurement] [Unit] / [Measurement mode] /

[The measurement state] / [Tilt alarm state]

Indicator: + or -

The measurement: Force with a decimal point (4-digit)

Unit: The unit used during measurement

Measurement mode:

T= Real time mode

P=Peak mode or Continuous peak mode

The measurement state:

OK= Within the range

NG= Out of the range

OVL= Overload

The tilt alarm state:

DISABLE =OFF, OK=Normal

NG=Error, SUSPEND =Temporary halt

* DST series cannot print the tilt alarm state.

Print image

+12.58N /P/OK /OK

+13.46N /P/OK /OK

+09.23N /P/NG /NG

+16.88N /P/NG /NG

+11.26N /T/OK /SUSPEND

+1580mN /P/NG /DISABLE

+1.285kN /P/OVL/SUSPEND

11. Connect External Devices

11-5-3. Print the measurement in internal memory (DSV series only)

You can print all the data stored in internal memory of the force gauge.

For further information of the printing procedure, see page 25 {8-4.} "Print data in internal memory".

Printing format is as follows.

[Memory No.]: [Indicator] [The measurement] [Unit] / [Measurement mode] /
[The measurement state] / [The tilt alarm state]

Memory No.: No. 1 to 1000

Indicator: + or -

The measurement:

Force with a decimal point (4-digit)

Unit: The unit used during measurement

Measurement mode:

T= Real time mode

P=Peak mode

The measurement state:

OK= Within the range

NG= Out of the range

OVL= Overload

The tilt alarm state:

DISABLE= OFF

OK= Normal

NG= Error

SUSPEND= Temporary halt

Print image
<p>Memory Data</p> <p>0001:+12.58N /P/OK /OK</p> <p>0002:+13.46N /P/OK /OK</p> <p>0003:+09.23N /P/NG /NG</p> <p>0004:+16.88N /P/NG /NG</p> <p>0005:+11.26N /T/OK /SUSPEND</p> <p>0006:+1580mN /P/NG /DISABLE</p> <p>0007:+1.285kN /P/OVL/SUSPEND</p> <p>.</p> <p>.</p> <p>.</p> <p>0872:+11.61N /P/OK /OK</p> <p>END</p>

12. Specifications

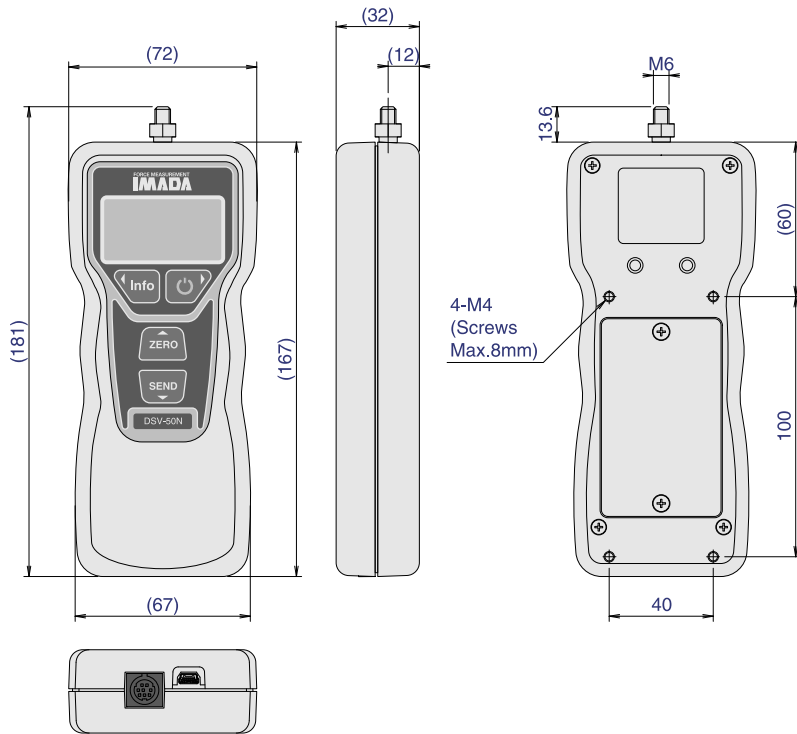
Model	DSV	DST
Features	Advanced model equipped with Tilt-alarm, Internal memory etc.	Standard model equipped with less functions.
Accuracy	±0.2%F.S.±1digit	
Unit	N(mN, kN), kgf(gf), lbf (*1)	
Display	4-digit LCD	
Display update rate	8/sec	
Sampling rate	Max.1000 data/sec	
Battery	Approx.30 hours (when back light is off) Approx.14 hours (when back light is on) (need 4.5 hours for full charge)	
Overload	Approx. 200%	
Operating environment	Temperature: 0 - 40°C, Humidity: 20 -80%RH	
Function	Peak hold (Tensile or compression) / Comparator (OK Judgement) / Sensitivity (3 steps) / Reversible display / Sign inversion / Setting lock / Date & Time / Off timer (Auto power-off) / Reminder for calibration schedule / Overload alarm	
	Tilt alarm / internal memory (1000 data) / Continuous peak mode (*2)	—
Output	USB / RS-232C	
Power consumption	2.5W (When charged through AC adaptor)	
Overload alarm	Alarm to notify "near-overload state": Approx. 90%F.S. (Alarm sound) Alarm to notify "overloaded state": Approx.110%F.S.(Alarm sound/Indication blinking)	
Weight	Approx. 460g(*2)	
Dimensions	Approx. W75 x D34 x H187	
Accessory	Force-Logger(Data capturing software) / USB cable / AC adaptor / Attachments (The types of attachments vary by models) / Carrying case / Instruction manual / Inspection certificate	

* 1 These are the specifications for International model. Note that the available units are different from Japanese domestic model and international one. kN is available at 1000N, mN and gf is available at 2N and 5N ranges.

* 2 You cannot use Continuous peak mode when the measurement does not reach 10% of the force gauge's capacity. Instead, use Peak mode. Continuous peak mode could not fit enough for measurement with a shock such as break tests. Contact us for further details.

* 3 The weights are slightly different by the model.

13. Dimensions



14. Option

Test Stands				
Combine a test stand with a force gauge for greater accuracy and repeatability.				
				
SVH-1000N Manual Test Stand	HV-500N II Manual Test Stand	MX2-500N Motorized Test Stand	MX2-1000N Motorized Test Stand	
Optional Attachments				
We offer a wide range of attachments to fit your measurement needs.				
				
FP-50 Fine Point Chuck	GR-30 Knurled Cam Grips	KC-1001 Wedge Grips	FC-20 Film Grips	GT-30 Vise Grips
RS-232C cable: CB-203		Handle: FOH-1	Battery: BP-403	
				
This cable connects a PC to the force gauge, enabling to record the measurement and transmit command signal from the PC to the gauge.		This handle enables you to apply force stably, combined with the force gauge.		This is a replaceable battery.

15. Maintenance

15-1. Battery Replacement

The force gauge has rechargeable battery inside. If the battery is empty soon after charging or not charged at all, the battery is dying. Thus, change the batteries according to the following direction. (Battery model: BP-403)

Turn off the force gauge. Loosen the two screws on the back of force gauge and remove the battery cover. Take the battery out and disconnect the connector. (Pull off the connector with tweezers and needle nose pliers.)

* Do not pull the connector forcefully. Otherwise it gets damaged.

Connect the connector of the new battery. Put the new battery into the case and fix the battery cover with the screws. Make sure to store the cable of battery inside.



- Do not use any battery except BP-308. Other battery may lead break down and fire.
- The date and time setting is reset when battery is disconnected.

15-2. Calibration and Repair

We offer calibration service with charge. To maintain the best accuracy and reliable measurement, the periodical calibration is recommended. Please ask your local distributor about fee and lead time. The function setting (Program Menu) and stored data may be erased in a repair or calibration process, thus make sure to store the setting or data in external storage. When you ship DST/DSV to us or your dealer for calibration/repair services, make sure to put the force gauge in the carrying case to protect the gauge.

In addition to normal calibration services, we can perform calibration activities faithfully in accordance with ISO/IEC17025, a global standard for testing/calibration laboratories, to reduce uncertainty and provide highly reliable calibration services. Then we can offer a calibration certificate with ilac/MRA mark, which is globally guaranteed.

15-2-1. Calibration reminder

You can set up the desired date for the next calibration, then from 30 days before the due date, it reminds you of the next calibration by a message on the start screen. After the force gauge's date passed the due date, it notifies you by a message on the start screen saying "Calibration is overdue".

To turn on Calibration Reminder, select [ON] of "Calibration Reminder" according to page 29-30 {10.} "Initial Setting (Setup Menu)". Then set up "Cal. Schedule".

While the force gauge's date is 1 - 30 days before the due date of the next calibration

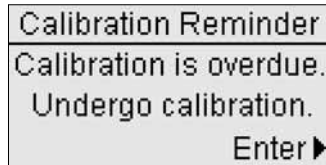
After the start screen, you will see the screen below for one second. Then, be ready for the next calibration since it is close to the due date.


Calibration Reminder
Calibration Schedule
20 18/08/ 15

15. Maintenance

After the force gauge's date passed the due date

After the start screen, you will see the screen below. Calibrate the force gauge as soon as possible since the due date has already passed.



To go to the measurement screen, press  (ON/OFF button).

After calibration, update Calibration Schedule again for the next calibration.



- Set the date and time of the force gauge correctly, otherwise, it would notify you the wrong calibration schedule. The date and time show up on the start screen, then check regularly if the shown date and time is correct or not.
- If the battery dies, the date and time set may be reset. Once the date and time is reset, calibration reminder function does not work appropriately.
- The date and time set of the force gauge is reset when its battery is removed. Set the date and time again.
- Define a calibration period in according to your company's rule or the frequency of use.

16. Warranty

We warrant the products to be free from defects in workmanship and material under normal use and proper maintenance for one year from original purchase.

* Read through the supplied warranty card for warranty information.

* Without the valid warranty card, any defects is not covered by the warranty.