LD557A

SCOREBOARD DISPLAY

OPERATION MANUAL

01JUL2010REV.1.00

UNIPULSE

Introduction

Thank you very much for purchasing our Scoreboard Display LD557A.
To take full advantage of high performance of LD557A, thoroughly read this operating manual first before use and understand the explanations contained herein for correct operating procedures.Also, carefully store this instruction manual so that it can be referred at any time.

Safety Precautions

BE SURE TO READ FOR SAFETY

Installation, maintenance and inspection of the LD557A should be performed by personnel having technical knowledge of electricity.
In order to have an LD557A Weighing Controller used safely, notes I would like you to surely follow divide into " ⚠ WARNING " and " ⚠ CAUTION ", and are indicated by the following documents.
Notes indicated here are the serious contents related to safely.
Please use after understanding the contents well.

⚠ WARNING

This sign forewarns the presence of hazards that could result in serious injury or fatality when incorrectly handled.

⚠ CAUTION

This sign forewarns the presence of hazards that could result in personnel injury or property damage when incorrectly handled.

⚠ WARNING

This sign forewarns the presence of hazards that could result in serious injury or fatality when incorrectly handled.

Warning on design

- For the entire system to function safely when the LD557A becomes faulty or malfunctions, provide a safety circuit outside the LD557A.
- Before using the LD557A as described below, make sure to consult with our sales personnel.
  - Use in environments not described in the operation manual.
  - Use greatly impacting human lives and assets, such as medical devices, transport devices, entertainment devices, and safety devices.

⚠ WARNING

This sign forewarns the presence of hazards that could result in serious injury or fatality when incorrectly handled.

Warning on installation

- Do not disassemble, repair, or modify the LD557A. Doing so may cause a fire or an electric shock.
- Do not install in the following environments.
  - Places containing corrosive gas or flammable gas.
  - Where the product may be splashed with water, oil or chemicals.

Warning on wiring

- Do not connect a commercial power source directly to the signal input/output terminals.
- For connection to the terminal block, make sure to use crimp contacts, and do not connect bare wires.
- Be sure to ground the protective ground terminal.
- Before performing the following, make sure that no power is applied.
  - Wiring/connection of cables to the terminal block
  - Operation of the DIP switches
  - Attachment/detachment of the short-circuit bar
- For connection to the terminal block, check the signal names and pin assignment numbers, and then carry out wiring properly.
- Before applying power, carefully check the wiring, etc.

Warning during startup and maintenance

- Use a power supply voltage and load within the specified and rated ranges.
- Do not damage the power cord. Doing so may cause fire or electric shocks.
- Do not touch any signal input/output terminal while applying power. Doing so may cause electric shocks or malfunctions.
- If the cover of the main body is opened, it may cause an electric shock internally. Even if the power is off, the internal capacitor is charged. Contact us for internal inspection or repair.
- In the case of smoke, an abnormal smell or strange sound, immediately turn off the power, and disconnect the power cable.

⚠ CAUTION

This sign forewarns the presence of hazards that could result in personnel injury or property damage when incorrectly handled.

Caution on installation

- Do not install in the following environments.
  - Where the temperature/humidity exceeds the range of the specifications.
  - Outdoors, or where the altitude exceeds 2000m.
  - Places exposed to direct sunlight
  - Places exposed to direct wind and rain
  - Dusty places
  - Poor-ventilated places
  - Places containing large quantities of salt or iron powder.
  - Where the main body is directly affected by vibrations or shocks.

⚠ CAUTION

This sign forewarns the presence of hazards that could result in personnel injury or property damage when incorrectly handled.

Caution on installation

- Take adequate shielding measures when using at the following locations.
  - Near a power line.
  - Where a strong electric field or magnetic field is formed.
  - Where static electricity, relay noise or the like is generated.
- Install the LD557A as far away from devices generating high frequency, high voltage, large current, surge, etc., as possible. Also, carry out wiring separately from their power lines. Do not carry out parallel wiring and common wiring.
- Do not use it, while it is broken down.
- The LD557A has a drip-proof construction, which is intended for indoor use.
  After wiring to the terminal block, make sure to tighten the connector panel at the specified torque.
  （Tightening torque：0.4N・m（40cN・m））
  For outdoor installation, make sure to consult with our sales personnel as sufficient drip-proof measures should be taken.

Caution on wiring

- Tighten the screws for the power input terminal at the specified torque.
  If they are loose, shorts, fire or malfunctions may occur.
  Tightening torque: 0.5N•m（50cN•m）
- Make sure to wire the power wire and signal wire from separate cord clips, and use cabtyre cables in the applicable wire range. If the LD557A is not used by specified methods, its waterproof performance may be impaired.（Applicable wire：ϕ7～9mm）

Caution during startup and maintenance

- For turning on/off the power, be sure to keep intervals of 5 seconds or more.
- If the LD557A is not used by the specified method, its protective performance may be impaired.
- Maintenance
  - When performing maintenance, disconnect the power.
  - Do not wipe with a wet rag, or with benzine, thinner, alcohol, etc. Doing so may cause discoloration or deformation of the LD557A. In the case of heavy contamination, wipe off the contamination with a cloth after dipping it into a diluted neutral detergent and wringing it well, and then wipe with a soft dry cloth.

Caution during transportation

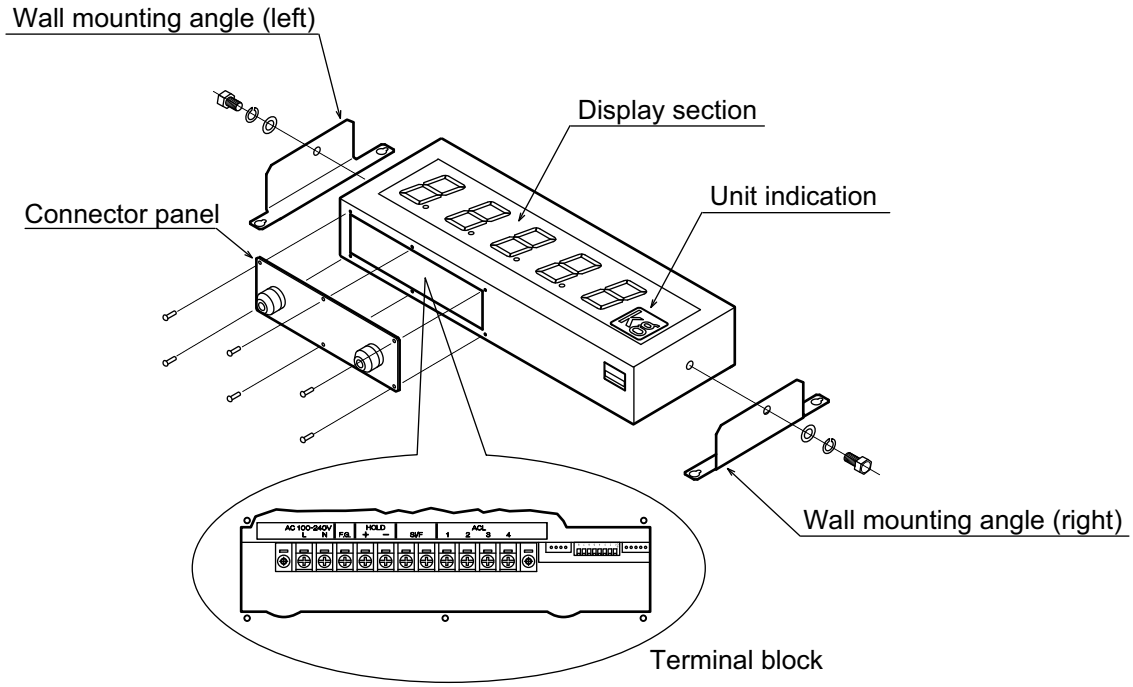
- When the LD557A is shipped, spacers made of corrugated cardboard are used as cushioning materials.
  Though it is factory-designed so that shocks can sufficiently be absorbed, breakage may result if shocks are applied when the spacers are reused for transportation. If you send the LD557A to us for repair, etc., take adequate measures against shocks by using polyurethane materials, etc., separately.

Caution during disposal

If you dispose of the product, handle it as industrial waste.

Contents

1. Part names and functions



Display section

Displays information received from an indicator, such as weight value.

Unit indication

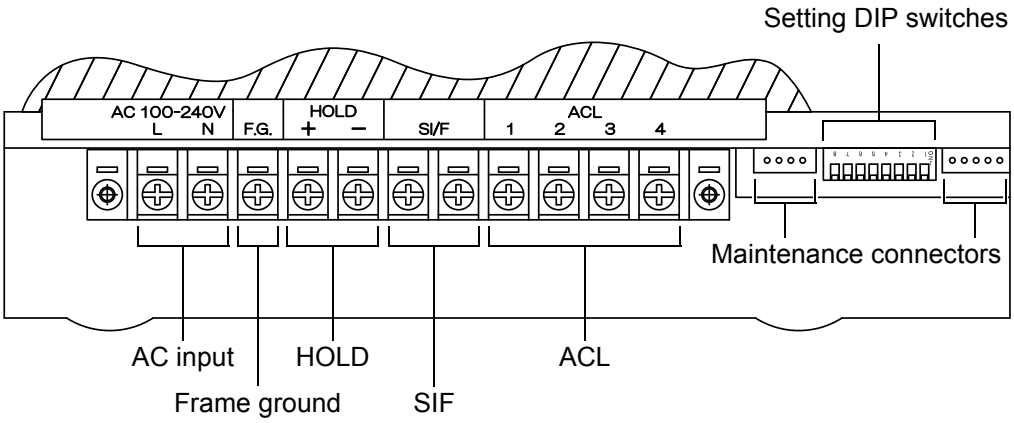
Select an appropriate unit indication from the attached unit labels, and affix it in place.

Connector panel

You can access the internal terminal block and setting DIP switches by removing the six screws.

Terminal block

Connect the power cable and signal wire to this terminal block. The setting of DIP switches is also available here.



AC input

Connect the AC power cord.

The input voltage is 100 - 240V, and the frequency is 50/60Hz.

Frame ground

This is a frame ground (F.G.) for the AC input. (The housing and F.G. terminal are in conduction.)

HOLD

These are hold input terminals. The display can be held by short-circuiting them.

SIF

These are SI/F input terminals to communicate with an indicator.

ACL

These are current loop input terminals to communicate with an indicator.

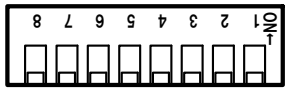
For one-to-one connection with an indicator, connect wiring materials to 1 and 2, and short-circuit between 3 and 4.

（A short-circuit bar is factory-inserted between 3 and 4.）

Setting DIP switches

These are switches to set the operation of the LD557A.

Make sure to always turn off No. 8 because it is intended for maintenance.

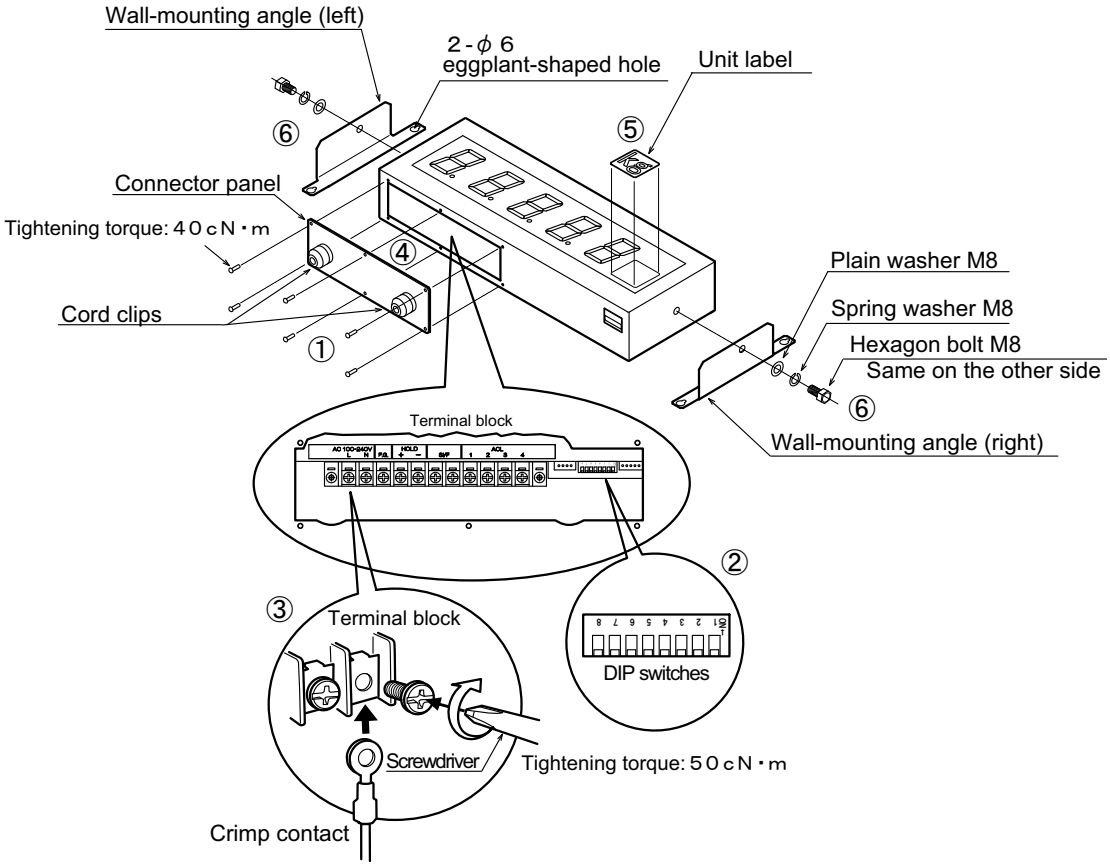


Maintenance connectors

These are connector terminals for maintenance.

2. Connection

● Make sure to work with the power off.



1. Remove the connector panel at the bottom of the main body.

Remove the six screws from the connector panel.

Do not remove other screws. Otherwise, the drip-proof and dust-proof performance will be affected.

2. Set the DIP switches.

Set the operation of the LD557A with the DIP switches as needed.

Regarding how to make settings, see P.5「3.Two-wire serial interface (SI/F)」and see P.8「4.20mA current loop interface (ACL)」 for ACL connection.

3. Connect the power wire and signal wire to the terminal block.

Since there are two cord clips on the connector panel, pass the power wire through one of them and the signal wire through the other.

See P.4「■Connection of the power input terminals」、P.4「■Connection of the HOLD input terminals」、P.5「3.Two-wire serial interface (SI/F)」、P.8「4.20mA current loop interface (ACL)」.

4. Mount the connector panel.

Before mounting the connector panel, check if there is no mistake about the setting of each DIP switch and the connection of each wiring material. (Tightening torque: 40cN・m)

5. Affix a unit label.

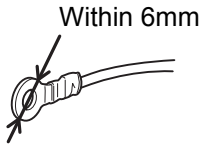
Labels of kg, g, t, lb, and N are attached. Affix an appropriate unit label.

6. Mount the wall-mounting angles.

Mount the wall-mounting angles as shown in the illustration.

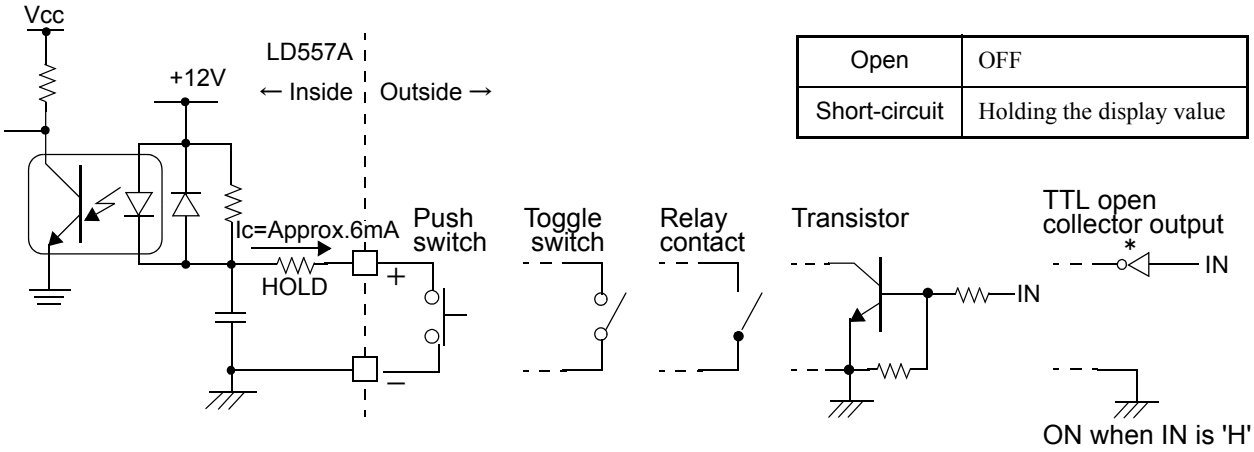
■Connection of the power input terminals

Connect the AC power cord. The input voltage is 100 - 240V, and the frequency is 50/60Hz.
Connect to the terminal block by attaching such a crimp contact (M3) as shown in the illustration on the right-hand side so that the tip of the cable will not spread out.



■Connection of the HOLD input terminals

To hold the display value, short-circuit these two terminals.
The - (minus) terminal serves as a COM terminal.
In the drive circuit, a contact input (relay, switch, etc.) or non-contact input (transistor, TTL open collector output) can be used.



Open	OFF
Short-circuit	Holding the display value

- Do not apply external voltage to the HOLD input circuit.
- The external element should allow passage of 10mA or more.
- The leakage of the external element should be 100 μ A or less.

3. Two-wire serial interface (SI/F)

This is a special-purpose serial interface that can be used for a UNIPULSE-manufactured indicator.

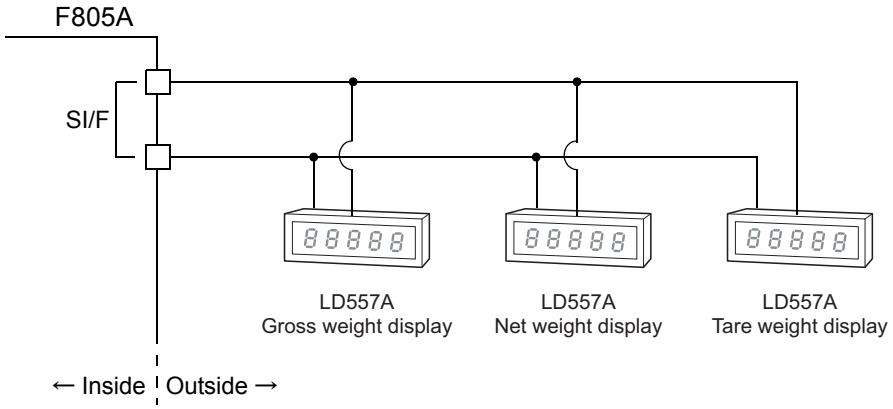
Communication format supported

The LD557A is capable of the SI/F loadcell indicator data format.

■Equivalent circuit and connection

Connect wiring materials directly to the two terminals, which are nonpolar.
Wiring materials to be used can be parallel two-core or cabtyre cables.
However, do not parallel them with any AC line or high-voltage line.

Example）



The above example shows three LD557As connected to an F805A. Each LD557A can independently display data (gross weight, net weight, tare weight).
* The maximum number of external devices connected depends on the indicator.

■How to make settings

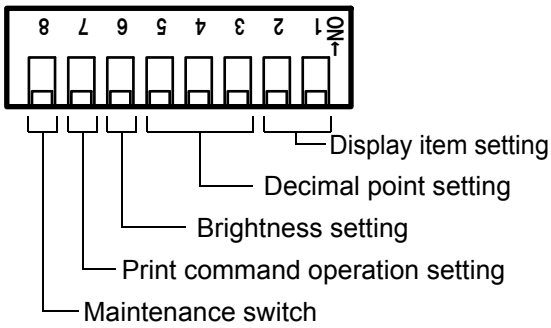
Make various settings with the DIP switches near the terminal block.

Factory-shipped settings are marked with ◎

> **Caution**
>
> Make sure to operate the DIP switches with the power off.
>
> The DIP switch settings are read only when the LD557A is powered on.
> If any setting is changed, turn off the power and then turn it on again.

Display item setting

Display weight value	2	1
Gross weight value	OFF	OFF
Net weight value	OFF	ON
Tare weight value	ON	OFF
Indicator display value ◎	ON	ON



Decimal point setting

Decimal point position	5	4	3
No decimal point	OFF	OFF	OFF
0.0	OFF	OFF	ON
0.00	OFF	ON	OFF
0.000	OFF	ON	ON
Following the indicator ◎	ON	OFF	ON

Brightness setting

Brightness	6
Low brightness	OFF
High brightness ◎	ON

Print command operation setting

Operation performed upon receipt of a print command.	7
The print command is ignored. ◎	OFF
The display is updated only when a print command is received.*	ON

* The display is updated only when a print command is received from the SI/F. "0" is displayed until the first print command is received after power-on.
For the print command from the SI/F, see the operation manual of each indicator connected.

Maintenance switch

Make sure to use with the maintenance switch off.

■About display

The display of the LD557A is updated each time a message is received from the indicator.
The cycle of sending/receiving messages through the SI/F is normally about 3 times a second.
However, while the HOLD signal is ON, the display content is maintained.
If the sign of the received weight value is negative, the highest-order digit is used to display the sign: therefore, the display value ranges from -9999 to 99999.
Also, the following are specially displayed according to the instructions in the messages.

AD converter input over		LoAd
AD converter input minus over		-LoAd
Net weight > Net over		oFL 1
Gross weight > Maximum capacity + 9 scale divisions		oFL2
Gross weight < -20 scale divisions		-oFL2
Gross weight > Gross weight over		oFL3
Tare weight > 99999		oFL4
Display value < -9999		-oFL
Indicator zero alarm		0-AL
SI/F communication blackout	For the first 5 seconds	The previous display continues
	For the next 30 seconds	- - 1 - -
	Afterward	(Off)

4. 20mA current loop interface (ACL)

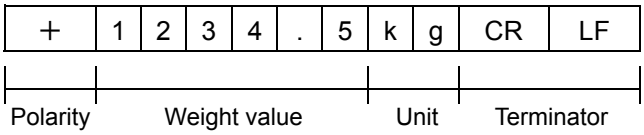
This is a 20mA current loop.

Communication format supported

Logic:	20mA ＝ 1、0mA ＝ 0
Baud rate:	600bps、1200bps、2400bps（automatic detection）
Data bits:	7bit
Parity bit:	Even
Stop bit:	1bit
Character code:	ASCII

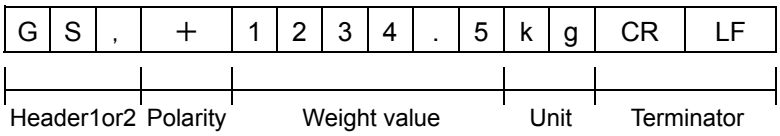
The LD557A is capable of the A&D Company-manufactured indicator format.

1. No-header type



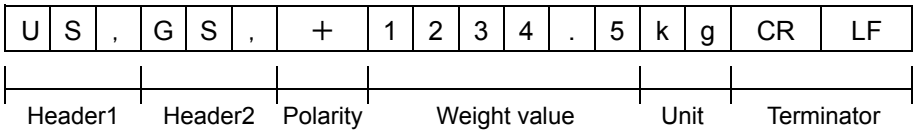
This data format does not include data indicating the type of weight value (gross weight, net weight, or tare weight). In each case of receiving a message in this format, the LD557A displays the weight value irrespective of the display item setting.

2. One-header type



In this data format, header 2 indicating the type of weight value is output only when the weight value is stable.
If the display item setting is other than "Display irrespective of type," LD557A only displays the messages that include the header of the type which is set in the display item setting.

3. Two-header type



The above shows the standard A&D Company-manufactured indicator format. If the display item setting is other than "Display irrespective of type," LD557A only displays the messages that include the header of the type which is set in the display item setting.

Details of the ACL format

Header 1	Indicates the status of weight value.	Stable : [ST] Unstable : [US] Overflow : [OL]
Header 2	Indicates the type of weight value.	Gross weight : [GS], [G] Net weight : [NT], [N] Tare weight : [TR], [T], [PT]
Polarity	Indicates polarity. Essential in all formats.	Positive : [＋] Negative : [－]
Weight value	Decimal weight value. Number of digits : 1 - 12 (no zero suppression) Decimal point : [.] or [,] (*1)	[123.4] [00123456] [00, 0012], etc.
Unit	ASCII character string excluding numbers, decimal point, and polarity signs. (*2)	[kg], [t], [N], etc.
Terminator	Message termination character string	[CR][LF]or [CR]

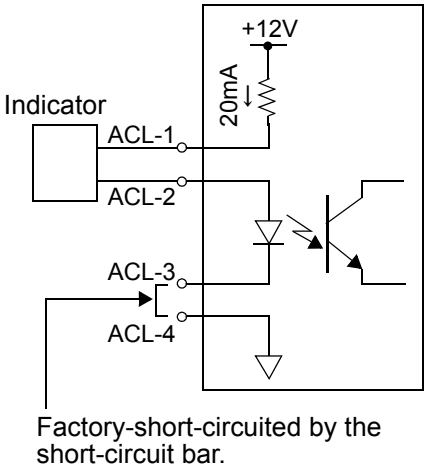
(*1) : The decimal point is positioned as desired, but if the position is undisplayable on the LD557A, the weight value display flashes.

(*2) : The unit is not reflected on the display of the LD557A.

■Equivalent circuit and connection

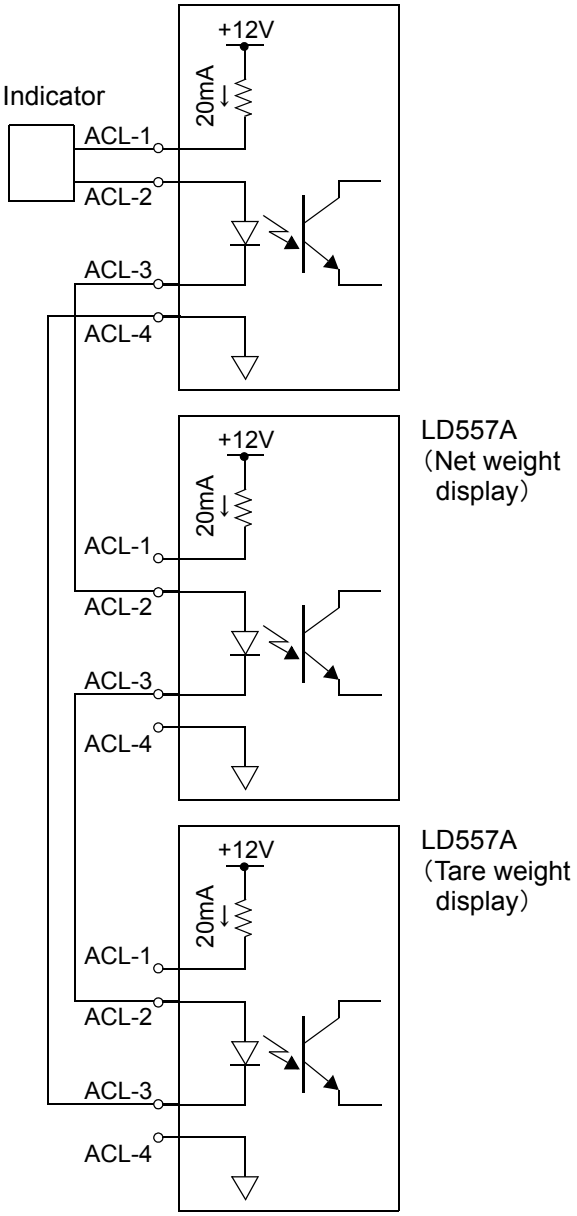
In the case of only one LD557A

For one-to-one connection with an indicator, connect wiring materials to 1 - 2, and short-circuit 3 - 4 with the attached short-circuit bar because the indicator side is nonpolar and has no power source.



In the case of three LD557A

Connect multiple LD557A as shown in the illustration. Connect so that the indicator and displays are arranged in series between the power supply (ACL-1) and the common (ACL-4) of one display.



■How to make settings

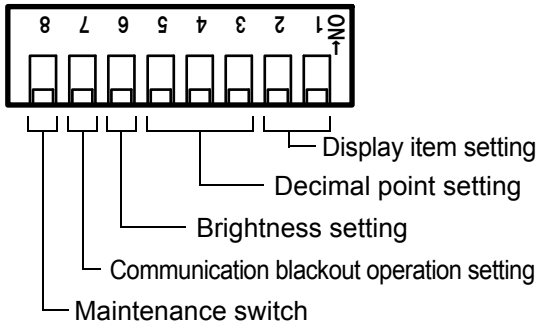
Make various settings with the DIP switches near the terminal block.

Factory-shipped settings are marked with ◎.

> **Caution**
>
> Make sure to operate the DIP switches with the power off.
> The DIP switch settings are read only when the LD557A is powered on.
> If any setting is changed, turn off the power and then turn it on again.

Display item setting

Display weight value	2	1
Gross weight value	OFF	OFF
Net weight value	OFF	ON
Tare weight value	ON	OFF
Display irrespective of type ◎	ON	ON



Decimal point setting

Decimal point position	5	4	3
No decimal point	OFF	OFF	OFF
0.0	OFF	OFF	ON
0.00	OFF	ON	OFF
0.000	OFF	ON	ON
0.0000	ON	OFF	OFF
Following the indicator ◎	ON	OFF	ON

Brightness setting

Brightness	6
Low brightness	OFF
High brightness ◎	ON

Communication blackout operation setting

Operation performed at a communication blackout	7
All-digit bar display ◎	OFF
Last-received data display	ON

Maintenance

Make sure to use with the maintenance switch off.

■About display

Since the display of the LD557A is updated each time a message is received from the indicator, the display update cycle depends on the message sending interval of the indicator.
However, while the HOLD signal is ON, the display content is maintained.
If the sign of the received weight value is negative, the highest-order digit is used to display the sign: therefore, the display value ranges from -9999 to 99999.
Also, the following are specially displayed according to the instructions in the messages.

Display value ＞ 99999 Display value ＜ -9999 Decimal point outside the displayable range (*1)		The display flashes. （The last 5 digits of the received weight value are displayed.）
If the header of the received data includes OL（overflow）		All digits go out excluding the sign and decimal point.
ACL communication blackout (*2)	For the first 5 seconds	The previous display continues.
	For the next 30 seconds	- - - - -
	Afterward	（Off）
ACL set value error (*3)	For the first 5 seconds	The previous display continues.
	For the next 30 seconds	- - 2 - -
	Afterward	（Off）

（*1）: If the decimal point setting is "Following the indicator."
（*2）: If the communication blackout operation setting is "All-digit bar display."
However, "--1--" is displayed if no message has been received after power-on.
（*3）: If a communication blackout occurs after a set value error, priority is given to the set value error.
Check the display item setting, and then turn off the power and then turn it on again.

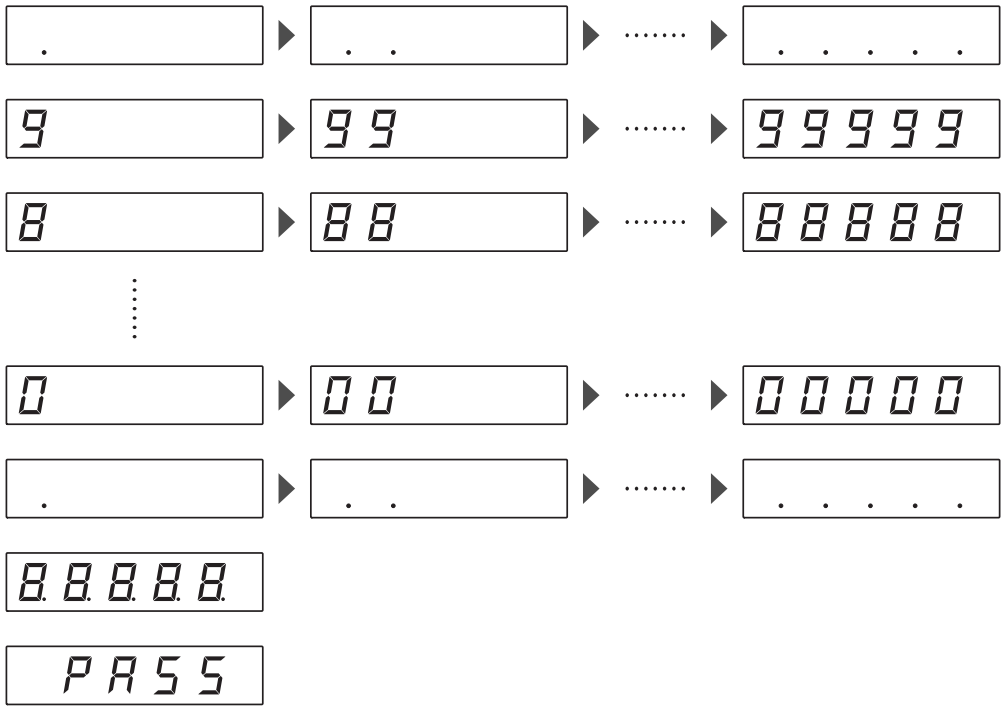
5. Self-check

The LD557A is equipped with the self-check function by which its memory can automatically be checked, and the display can visually be checked.
Turn on the DIP switches from No. 1 to No. 7, and turn on the power to enter the self-check mode.
If the indicator connected through the SI/F carries out a self-check, the LD557A also enters the self-check mode. In this case, the LD557A goes back to its original condition after execution of steps 1 to 3 in the following table.

	Step	Explanation
1	Software version (*1)	Displays the software version. The version display may vary depending on the time of purchase.
2	ROM checksum	Displays the ROM checksum.The display content differs according to version.
3	Sequential 7-segment lighting of the display	See below.
4	Back to step 1	To exit the check mode, turn off the power, and then put the DIP switches back to their original conditions.

Sequential 7-segment lighting

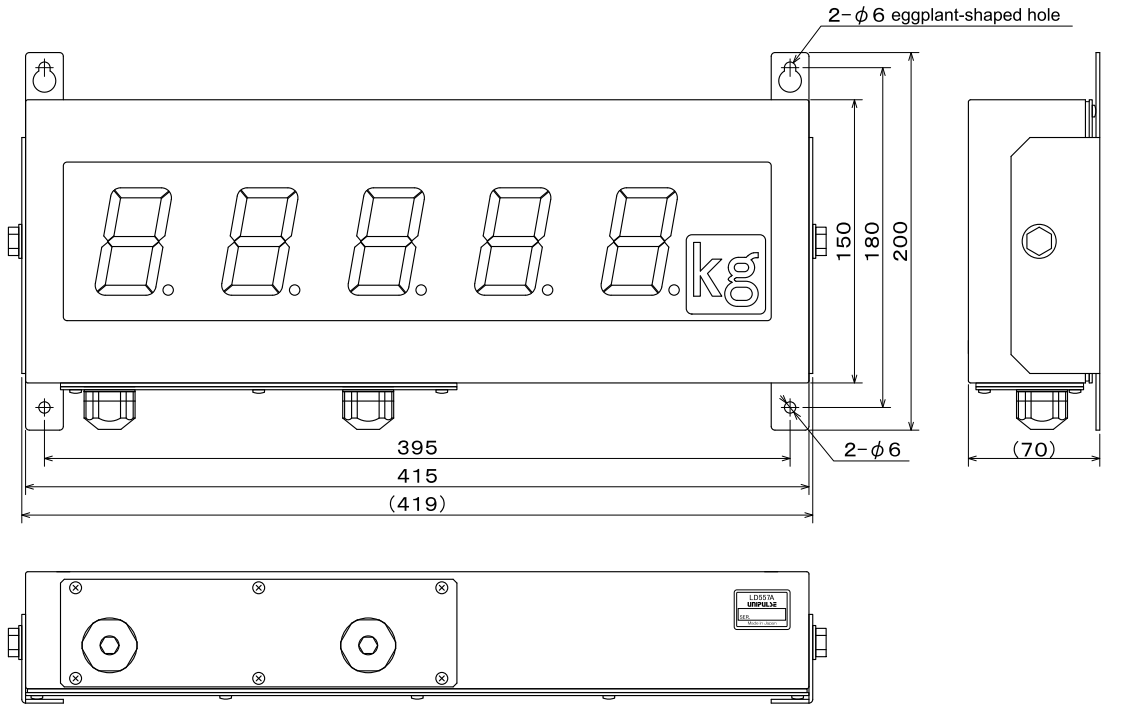
Check to see if the decimal point and numbers from 0 to 9 are normally displayed for each digit on the display.



If the above are displayed, the display is normal.

6. Dimensions

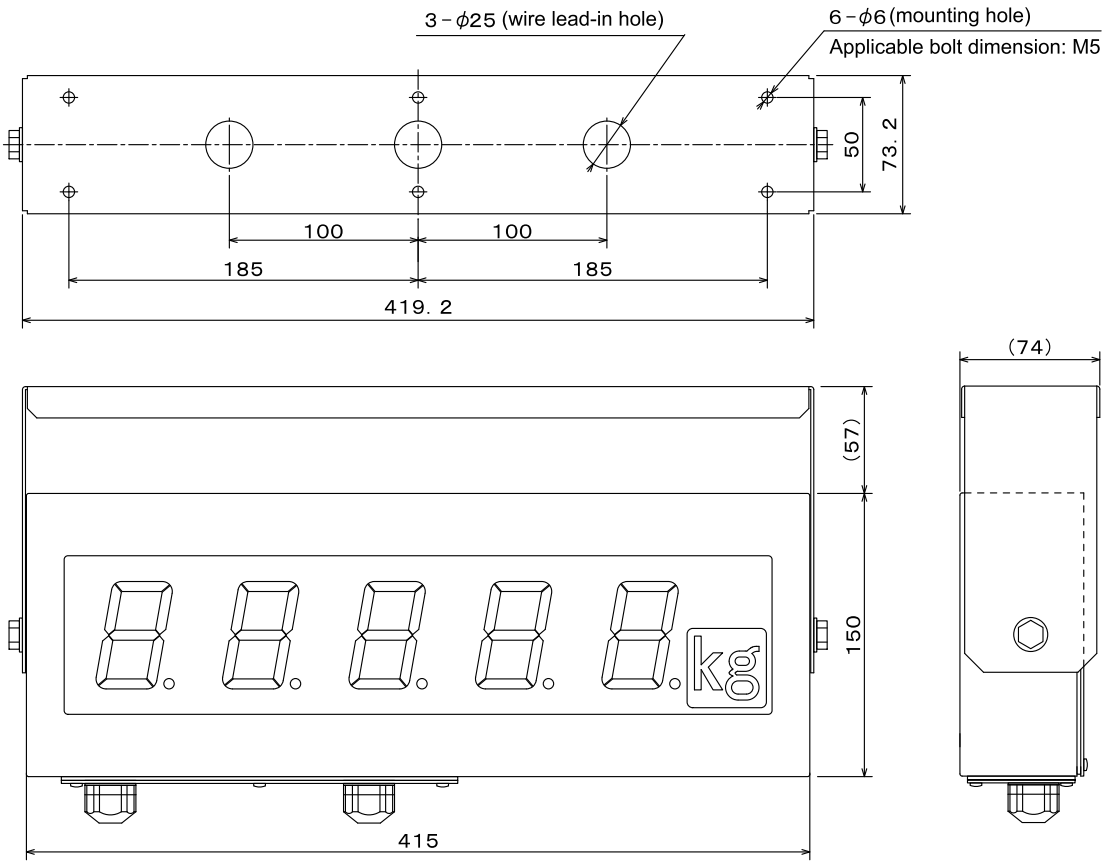
[Unit:mm]



■With a suspension angle mounted

※ The suspension angle is an option.(OP1:ANG)

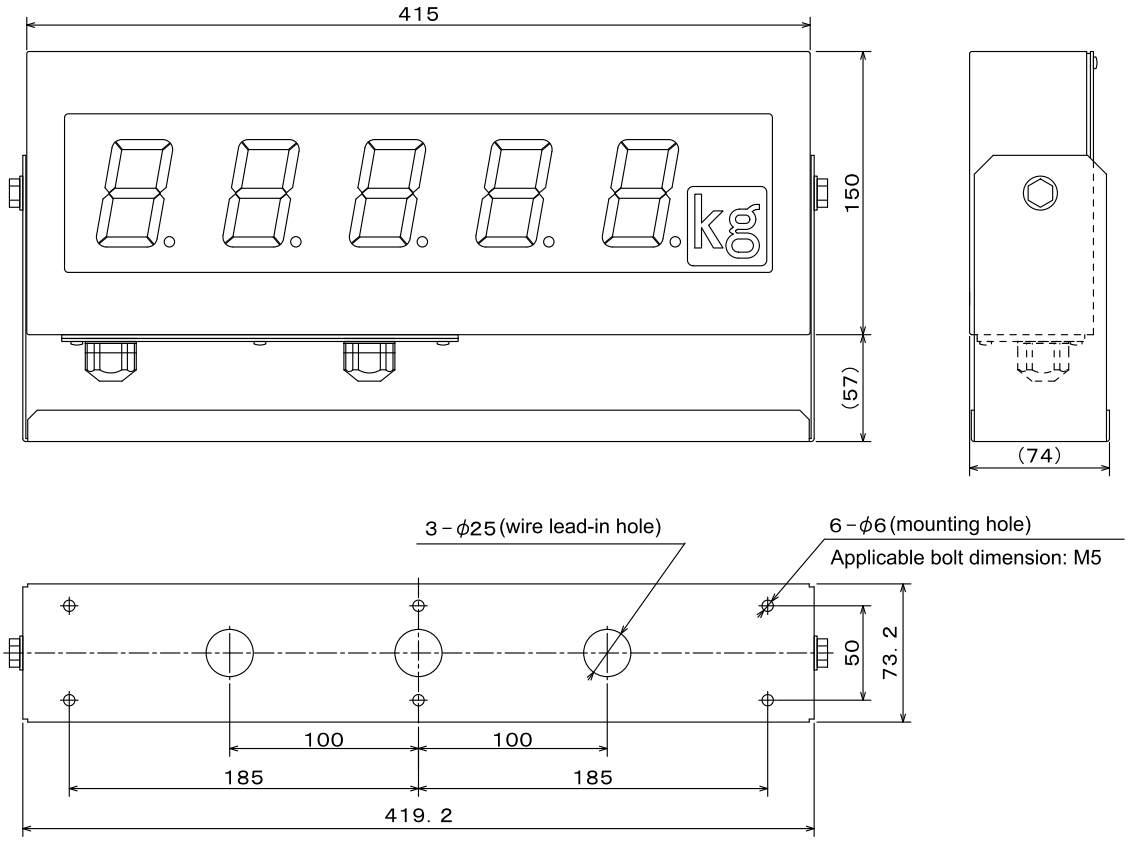
[Unit:mm]



■With a suspension angle mounted (at the bottom)

[Unit：mm]

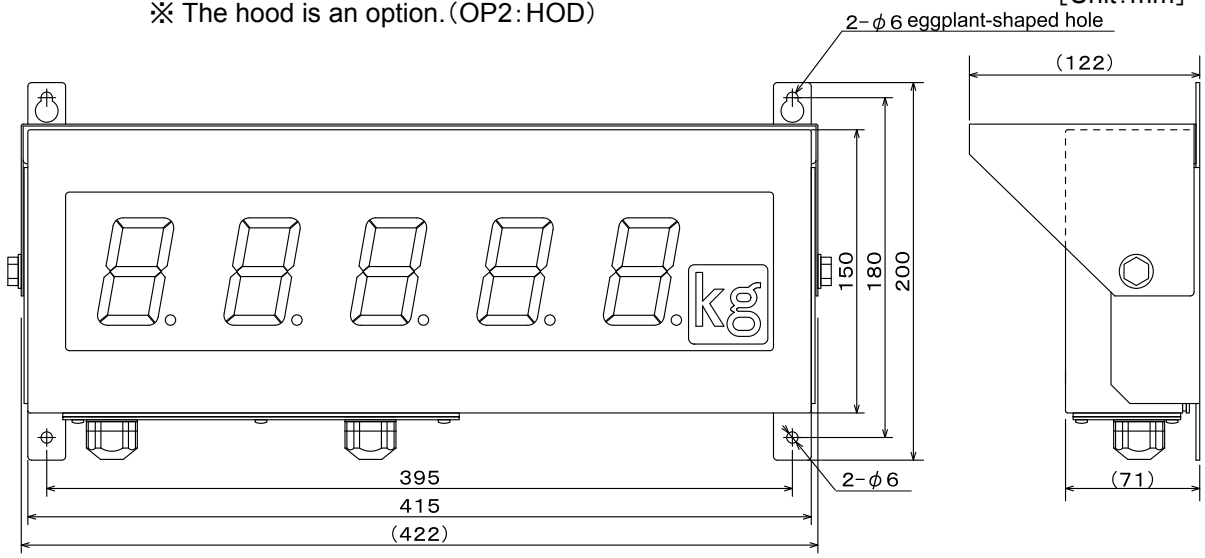
※ The suspension angle is an option.（OP1：ANG）



■ With a hood mounted

[Unit：mm]

※ The hood is an option.（OP2：HOD）



7. Specifications

■Display section

Display element	Red super luminosity LED
Number of display digits	5digits （-9999 to 99999） Character dimensions： 57mm in height Character width： 43mm
Unit	Selectable from t, g, kg, N, lb, and none. （By affixing an accessory unit label.）
Decimal point	Selectable from 0, 0.0, 0.00, 0.000, 0.0000 （0.0000 is usable only in ACL connection.）
Special display(in SI/F connection)	A/D converter input over： LOAD A/D converter input minus over： -LOAD Net weight ＞ Net over： OFL1 Gross weight ＞ Maximum capacity+9scale divisions： OFL2 Gross weight ＜ -20 scale divisions： -OFL2 Gross weight ＞ Gross weight over： OFL3 Tare weight ＞ 99999： OFL4 Display value ＜ -9999： -OFL SI/F communication blackout： --1--
Special display(in ACL connection)	Indicator overflow： Blank display Outside the displayable range： The display flashes ACL communication blackout： ----- ACL set value error： --2--
Display cycle	Dependent on the message sending cycle of the indicator.

■Setting section

Setting method	8-bit DIP switches
Setting items	Display item Decimal point position Brightness Print command operation display（in SI/F connection） Communication blackout operation display (in ACL connection)

■External signal

Input signal（1 point）	HOLD

■Interface

Two-wire serial interface（SI/F）

Serial interface for connection to a UNIPULSE-manufactured indicator

Transmission system	Asynchronous
Transmission rate	600bps

20mA current loop interface（ACL）

Signal level	0mA（OFF），20mA（ON）
Transmission system	Asynchronous
Transmission rate	600，1200，2400bps
Bit configuration	Start bit：1 Character length：7 Parity bit：Even Stop bit：1
Character code	ASCII

■General performance

Power supply voltage	AC100 to 240V（+10%，-15%） [Free power supply 50/60Hz]
Power consumption	Approx. 10W
Rush current	15A，2.5msec：AC100V 30A，2.5msec：AC240V （ordinary temperature, at cold-start time） Average load condition
Operating conditions	Temperature：Operating temperature range -10 to +40℃ Storage temperature range -20 to +75℃ Humidity：85%RH or less （non-condensing）
Outside dimensions	415（W）×150（H）×66（D）mm（not including projections）
Weight	Approx. 3.5kg

■Accessories

Operation manual（this book）.....1

Power cable* 1

Short-circuit bar（factory-inserted between ACL 3 and 4）.....1

Wall-mounting angle （including mounting screws）.....1

* The attached AC input cord is intended for 100V AC power in Japan.