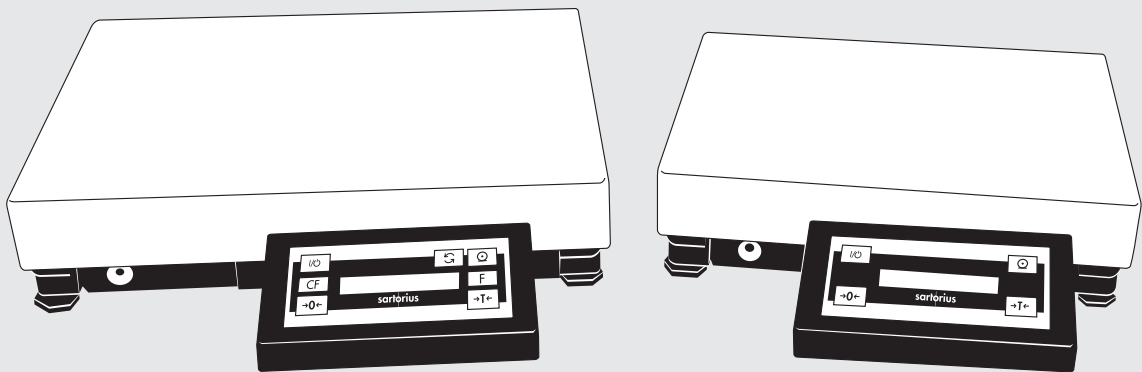


Sartorius Economy Series Sartorius Express Series

Industrial
Weighing Technology

Electronic Precision Scales
Service Manual
for EA / EB Models

incl. Spare Parts List and Service Specifications



Sartorius AG, Weighing Technology

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General Information

Important:

Prerequisites for working on the Sartorius EA / EB Scales include considerable experience, completion of a Service Course at the main office in Goettingen, and the special tools and equipment described below. Please do not attempt or permit any unauthorized repair work!

If you remove the seal (warranty sticker), the scale is no longer covered under the warranty.

Overview of Economy/Express Models

EA/EB scales consist of a weighing cell with a strain-gauge load cell and a display and control unit.

Models

Standard:

EA/EB6DCE-L, EA/EB15DCE-L, EA/EB35EDE-L, EA/EB60EDE-L,
EA/EB60FEG-L, EA/EB150FEG-L

OCE:

EA/EB6DCE-L, EA/EB15DCE-L, EA/EB30EDE-L, EA/EB35EDE-L,
EA/EB60EDE-L

US:

EA/EB6DCE-LOUR, EA/EB12DCE-L, EA/EB30EDE-LOUR, EA/EB60EDE-
LOUR, EA/EB60FEG-LOUR, EA/EB120FEG-LOUR

The EB models have the following features in addition to those of the EA models:

- 3 additional keys (gray) on the display and control unit (see page 4) for controlling application programs
- Expanded application functions
- Expanded scale operating menu

Auxiliary Service Tools and Equipment

You will need the service software for adjusting overload stops, linearity and span adjustment if the error in any of these adjustments is > 2%, and for resetting the display and control unit after replacing one or more PCBs.

In addition to standard tools, you will need the following special tools:

Qty.	Designation	Order no.
1	SARTOCAS service software, version 1.30 or later, or	6740-33
1	PSION Server, complete, version 4.6 or later	6739-98
1	RS 232 cable for connecting the scale to PC	7357 312
1	4 mm torque wrench (1 to 5 Nm) with attachment	6737-04 6737-37
1	8 mm torque wrench (up to 30 Nm)	
1	19 mm torque wrench (up to 60 Nm)	

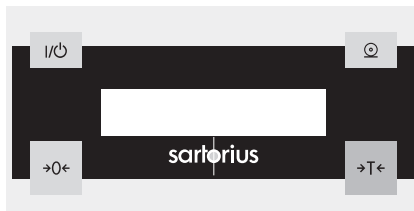
Accompanying Literature

Spare Parts List for the EA/EB scales (see page 19).
 Installation and Operating Instructions for EA/EB scales
 Sartorius SARTOCAS program description
 Sartorius PSION Server program description
 Sartorius Tool List - Status: 9/91





Operating the Scale

Function of Keys

EA Scales







EA_bedie.EPS

	On/off.	The scale remains in the standby mode.
	Data output.	The displayed data is output to the interface port.
	Tare.	Zeroes the display.
	Zero.	Zeroes the display. (Load must be $\pm 2\%$ of the max. capacity)

U.S./Canadian keypad version:



Bed1_us.EPS




	On/off.	The scale remains in the standby mode.
	Data output.	The displayed data is output to the interface port.
	Tare.	Zeroes the display.
	Zero.	Zeroes the display. (Load must be $\pm 2\%$ of the max. capacity)

EB Scales

Additional Keys:



EA_bedie.EPS




	Toggle.	Toggles the display between weight and calculated value; also for changing Reference sample quantity/reference percentage/numbers of subweighing operations.
	Function key.	Starts an application program.
	Clear function.	Used to interrupt/cancel functions, delete input.

U.S./Canadian keypad version:

Additional Keys:



Bed2_us.EPS

	Toggle.	Toggles the display between weight and calculated value; also for changing Reference sample quantity/reference percentage/numbers of subweighing operations.
	Function key.	Starts an application program.
	Clear function.	Used to interrupt/cancel functions, delete input.

Scale Operating Menu



Vorein01.EPS



Vorein02.EPS

Accessing the Scale Operating Menu and Changing the Settings

- Press / (ON/OFF) to turn the scale off and press again to turn it back on.
- Press / (TARE) briefly while all segments are lit (self-test).
- " 1." is displayed.

Important:

You can configure software settings to block access to the scale operating menu (menu code: 8 1 2). If menu access is blocked, this is indicated by a minus sign preceding the menu code number (e.g., "- 1." rather than "1."). To make the menu accessible, select the menu code 8 1 1 (the only menu code that can be selected when menu access is blocked). This setting can be changed again the next time you activate the scale operating menu.

Selecting a Menu Code



Vorein03.EPS

- To select a certain menu code, press / (TARE) to change the number of the digit displayed to the desired code number. Numbers change in a cyclical sequence, starting at 1 again after 9 is reached.
- To select the next digit (menu level), press / (PRINT)
- Once the first 2 digits are selected, the entire 3-digit code setting is displayed, with a small superscript "o" indicating that this is the current setting.
- Press / (PRINT) to return to the higher menu level

Changing a Menu Code Setting



Vorein04.EPS

- Once you have selected the desired code setting as described above, press / (PRINT) for >2 seconds to confirm the setting.
- The superscript "o" is now displayed to indicate that this is the current setting.

Exiting the Scale Operating Menu with or without Storing the New Settings



Vorein01.EPS

- To exit the scale operating menu and store the new settings: Press / (TARE) for > 2 seconds.
- To exit the scale operating menu without storing any changes to the settings: Press / (ON/OFF).

Overview of the Scale Operating Menu Codes

See pages 15 - 16 for an overview of the scale operating menu codes.

Menu Access Switch

All PCBs are equipped at the factory with a menu access switch.

Menu Access Switch Function

- Toggling between 2 different menu code lists
- Changing the position of this switch may result in changes to the display and/or scale functions.

Setting the Menu Access Switch

On standard models, set the menu access switch to "open" (standard menu active), if this was not already done at the factory. To do this, move the switch on the main PCB towards the outer edge of the PCB (see also "Replacing PCBs", page 10).

Activating the BPI Mode


BPI = Binary Processor Interface (special Sartorius data transfer protocol)

SBI = Sartorius Balance Interface (RS-232 communication)

The scale must be in the BPI mode in order to use the CAS programs with the MC-1 server (version 4.6 or later) or a personal computer (Sartocas version 1.30 or later). These programs are required especially for:

- adjusting linearity and/or span when the adjustment error is > 2%,
or
- replacing the main PCB.

Important:

After working in the BPI mode, make sure to set the write-protect again (using the "Close" function) so that the scale returns to the standard data transfer protocol (SBI mode). Otherwise you will not be able to operate peripheral devices with the scale; when  / (PRINT) is pressed, the error code "E 30" is displayed.

Procedure:

- Disconnect the equipment from the power supply
- Open the electronics module (see page 11)
- Re-connect the equipment to the power supply
- Plug in the mode adapter
The black protective cap points toward the outer edge of the scale.
Turning the adapter will not damage the electronics.
- The scale now performs its self-test (display segment check) repeatedly.
Wait until the segment check has lit up at least 3 times; the scale electronics are now in the BPI mode.
- Remove the mode adapter
- Close the scale housing (see page 11)
- You can now use the scale with the service software.

Calibrating/Adjusting the Scale

Calibration/Adjustment Sequence

Check and, if necessary, adjust the following factors:

1. Overload stops
2. Zero-point offset value
3. Off-center load
4. Linearity
5. Span adjustment

Adjusting the Overload Stops

The overload stops must be checked after the strain-gauge load cell is replaced or damaged. Weight readouts greater than the scale's maximum capacity must be read off. The service software is required for this procedure.

- Activate the BPI mode (see page 6)
- Service software: Select the "Diagnostics" program; then select the "High Resolution" subprogram
- When adjusting the overload stops, read off the weight value shown on the Pision server or PC display
- After adjusting the overload stops, activate the "Close" function in the service software to reset the scale to the SBI mode.

Test Weights

	Center-load stop	Off-center-load stop
...DCE models	16 kg	16 kg
...EDE models	65 kg	65 kg
...FEG models	160 kg	160 kg

Setting the Center-Load Stops

DCE and EDE Models

You cannot see the center-load stop while checking or adjusting the stop. The correct position can only be determined by reading the display while adjusting the stop.

- Place the scale on a stable, even surface in a position that allows access to the stop screw from the bottom of the scale
- Adjust the stop screw so far inward that a weight on the scale cannot reach the overload limit.
- Center the test weight (see table above) on the load plate
- The service software display shows a stable weight readout
- Adjust the stop screw outward again until the overload limit is just reached
- The weight readout is no longer stable
- Adjust the stop screw 1/2 turn inward
- Place the scale on a normal surface
- The center-load stop is now properly adjusted

FEG Models

- Place the scale on a stable, even surface
- Center the test weight (see table above) on the load plate
- The service software display shows a stable weight readout
- Adjust the stop bolt outward until the overload limit is just reached
- The weight readout is no longer stable
- Fix the position of the stop bolt by tightening the nut
- The center-load stop is now properly adjusted

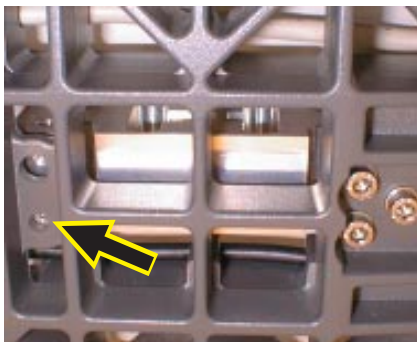


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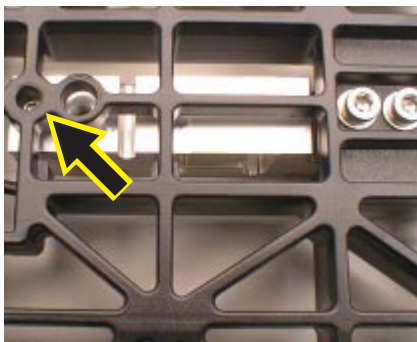


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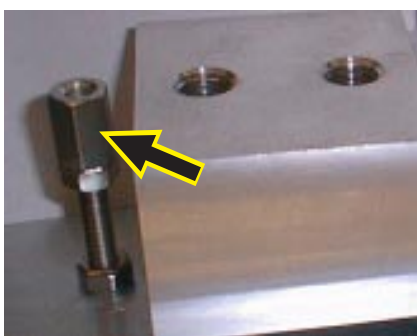


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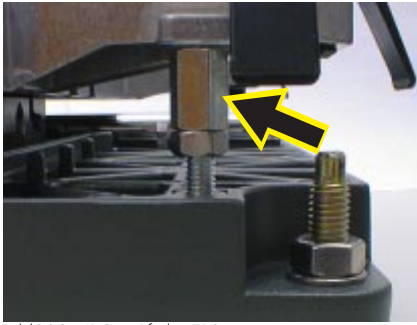
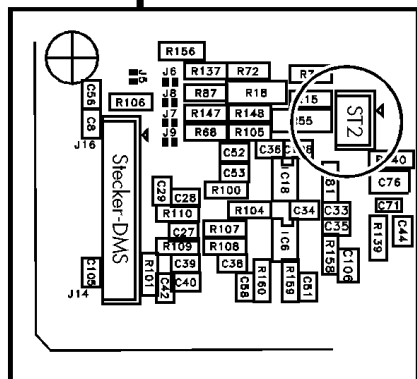
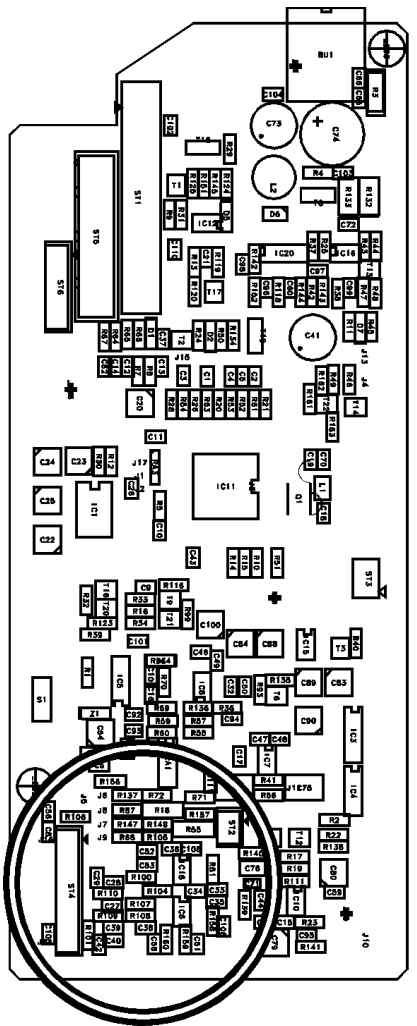


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Setting the Off-Center-Load Stops

- Place the scale on a stable, even surface
- Remove the load plate and place it upside-down on the pan support so that the edges face upward
- Place the test weight (see table on page 7) on the load plate, at the very outer edge of one corner
- Adjust the corresponding stop bolt so that it just reaches the pan support. Then tighten the nut to fix the position of the stop bolt
- Follow the same procedure to adjust the other 3 stop bolts
- Replace the load plate right-side-up on the pan support
- The off-center-load stops are now properly adjusted



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Zero-Point Offset Value

The zero-point offset value is necessary for adapting the bridge voltage of the strain-gauge load cell to the operating range of the scale electronics. This may be necessary:

- after replacing the strain-gauge system
- after replacing the main PCB
- if the span cannot be adjusted (even with the service software) and the error code "E 02" is displayed
- when the zero-point offset voltage has changed and is outside the tolerance limit (e.g., due to the strain-gauge load cell being "bent")

Adjusting the Zero-Point Offset Value

Adjust the zero-point offset value using a digital voltmeter.

- Open the electronics module (see page 11)
- Connect the cable from the digital voltmeter (DVM) to plug ST2, pins 1 and 2 (Pin 1: measuring voltage (OP output IC6 / pin 6), pin 2: ground)
- Replace the pan support on the scale and fasten it with the screws, place the load plate on the pan support and re-connect the scale to the power supply
- Use the DVM to check the preload voltage with no load on the scale

	Target (mV)
PCB installed at the factory	-120 to -1,600
Replacement PCB	
(with menu access switch):	-120 to -350

- Adjustment when the preload voltage does not equal the target:
 Factory PCB: Check the strain-gauge load cell; replace if necessary
 Replacement PCB: Solder or de-solder the bridges
 (with menu access switch): on the main PCB as indicated below

Zero-Point Offset Voltage	J5	J6	J7	J8	J9
< -580 mV	Check the strain-gauge load cell; replace if nec.				
-580 mV ... -350 mV	open	close	open	open	open
-350 mV ... -100 mV	open	open	open	open	close
-100 mV ... +120 mV	open	open	open	close	open
+120 mV ... +360 mV	open	open	close	open	close
> +360 mV	Check the strain-gauge load cell; replace if nec.				

- Check the zero-point offset voltage again; re-adjust if necessary

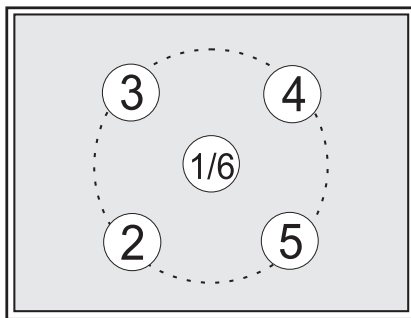
After the zero-point offset voltage is reset, the span must be adjusted (using the service software, if necessary).

Off-Center Load

Checking the Off-Center Load

- Center the test weight (see "Service Specifications," page 17) on the load plate (position 1) and press $\rightarrow T \leftarrow$ (TARE)
"0.000" is displayed (depending on model and settings)
- Place the test weight on positions 2, 3, 4 and 5 in sequence
- The absolute values displayed for all 4 positions must be within the limits listed in the service specifications (see page 17)
- If the off-center load error exceeds the tolerance listed in the service specifications in any of these 4 positions, the off-center load should be adjusted with the greatest positive error value (see "Adjusting the Off-Center Load" below)

Adjusting the Off-Center Load



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- Remove the load plate
- On ...DCE and ...EDE models:
Pull the adhesive shock-absorbing pad off of the pan support and place it to one side, adhesive side up, until you are ready to reassemble the scale
- Remove the pan support from the strain-gauge load cell (2 Allen screws in the lower part of the pan support) and place it to one side
- Correct the off-center load by filing on one of the thin parts. Always file the thin part that corresponds to the greatest off-center load error.
- Place the pan support on the load cell and fasten it (torque: ...DCE: 4.3 Nm, ...EDE: 25 Nm, ...FEG: 55 Nm), align the pan support arms approximately with the off-center load bolts, affix the pad to the pan support (not on ...FEG models) and place the load plate on the pan support.
- Check the off-center load (see "Checking the Off-Center Load" above) and adjust if necessary

Linearity

Adjust the linearity using the service software

- Activate the BPI mode (see page 6)
- Connect the scale to the PC and start the linearity program in the service software
- Reset the scale to the SBI mode by activating the "Close" function in the service software
- Check the span adjustment and adjust if necessary (see "Span Adjustment" below)

Span Adjustment

Note:



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Vorein10.EPS

Important:



Vorein11.EPS

There are two ways to perform span adjustment:

1. As described in the manual
 2. Using the service software
- Select the menu code "External adjustment accessible" (code 1 5 2)
 - If necessary, set the weight unit for the calibration weight (code 1 4 x) (factory setting: "kg" – code 1 4 2)
 - Unload the scale and, if necessary, press $\rightarrow 0 \leftarrow$ to zero the display
 - Press and hold the $\rightarrow T \leftarrow$ key for >3 sec. to activate the calibration routine
 - The weight value of the required calibration weight is displayed without weight unit; e.g., "+ 5.000"
 - Center the prompted weight on the load plate (here: 5.000 kg)

The scale will only accept a weight that is within a tolerance range of approximately 2% of the nominal weight. Any greater error can only be adjusted using the service software.

- After the adjustment procedure, the weight is displayed with weight unit (e.g., "+ 5.000 kg")
- Remove the calibration weight
- Check the span again and adjust it if necessary
- Block the external adjustment function by setting the menu code 1 5 1, or by resetting the menu to factory settings (code 9 1)

Replacing PCBs

In the case of defects, do not attempt to make any repairs at the component level, but replace the entire subassembly.

Replacing the Main PCB

Note:

Before replacing the main PCB, use the service software to read out and store the scale's data record, if possible. If this is not possible, order a pre-programmed PCB, indicating the scale model and serial number.

- Open the electronics module (see below)
- Disconnect the cables that lead to the strain-gauge load cell and the display and control unit
- Remove the 3 Phillips screws and remove the old PCB

Important:

Make sure the solder bridges on the new PCB are the same as those on the old PCB; change the solder bridges on the new PCB if necessary. The menu access switch on the new PCB must be in the "accessible" position; this is the position when the switch is moved toward the outer edge of the PCB (see also: "Menu Access Switch" on page 5)

- Follow the above instructions in reverse order to install the new main PCB
- Activate the BPI mode, if necessary (see page 6)

Note:

The scale must now be programmed with the required data record.

The following factors must be checked and, if necessary, adjusted:

- Zero-point offset value
- Linearity
- Span

Opening the Electronics Module

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Bild024b.JPG + Pfeil-g.EPS

- Disconnect the scale from the power supply
- Remove the load plate
- On ...DCE and ...EDE models: Pull the adhesive shock-absorbing pad off of the pan support and place it to one side, adhesive side up, until you are ready to reassemble the scale
- Remove the pan support from the strain-gauge load cell (2 Allen screws in the lower part of the pan support) and place it to one side
- Opening the electronics module on ...DCE and ...EDE models: Push the cover down and carefully bend the retaining tabs outward. Make sure the tabs do not break off.
- Remove the cover
- Opening the electronics module on ...FEG models: Remove the nuts from the cover and place to one side
- Remove the cover
- The main PCB is now accessible
- Follow the above instructions in reverse order to close the electronics module
- When re-installing the pan support, align the pan support arms approximately with the off-center load bolts (see upper illustration)
- Use a torque wrench to fasten the pan support to the strain-gauge load cell (torque: ...DCE: 4.3 Nm, ...EDE: 25 Nm, ...FEG: 55 Nm)
- On ...DCE and ...EDE models: Affix the shock-absorbing pad to the pan support (see illustration)

Replacing the Display PCB

The display PCB must be replaced if:

- the display is defective
- data output is defective

When replacing the display PCB, replace the cable connecting the display PCB to the main PCB at the same time.

- Disconnect the scale from the power supply
- Remove the load plate
- Remove or cut the wire tie holding the cable that connects the electronics module to the display and control unit
- Open the electronics module (see page 11)
- Unplug the display PCB cable from the main PCB
- On ...DCE and ...EDE models:
Release the strain-relief clamp in the electronics module (2 Phillips screws) and remove the cable. Save the 2 rubber cable guides for later reassembly
- On ...FEG models:
Remove the seal around the electronics module; save it for later reassembly
- Tip the scale towards the rear to access the bottom of the housing
- Guide the end of the cable through the opening in the base plate
- On ...DCE and ...EDE models:
Remove the strain-relief clamp holding the display unit cable (2 Phillips screws) and remove the display and control unit from the from the base plate of the housing (2 Phillips screws)
- On ...FEG models:
Remove or cut the wire tie(s) holding the display unit cable on the front-mounted display unit retainer and remove the display and control unit from the retainer (2 Phillips screws)
- Open the display and control unit (3 Phillips screws on the bottom of the unit)
- The display PCB is fastened to the housing of the display and control unit by 5 Phillips screws
- Replace the display PCB and connecting cable
- Follow the above instructions in reverse order to install the new PCB

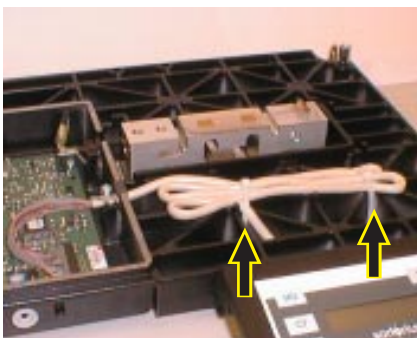


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Note: With ...DCE and ...EDE models, make sure to guide the display unit cable through the opening in the base plate in the housing. Unused cable length can be wound in loops and fixed to the upper part of the base plate using wire ties (expendable materials). On ...FEG models, the cable can be guided through in a large loop and fixed to the front-mounted display unit retainer and at 3 points on the base plate using wire ties (expendable materials). There are holes drilled in the base plate for this purpose. Make absolutely certain that the display unit cable does not touch the pan support or the load plate.

Replacing the Strain-Gauge Load Cell

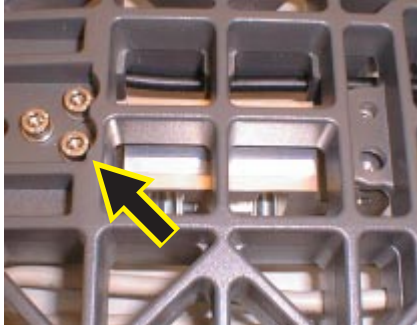


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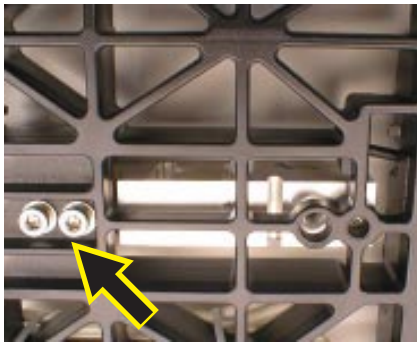


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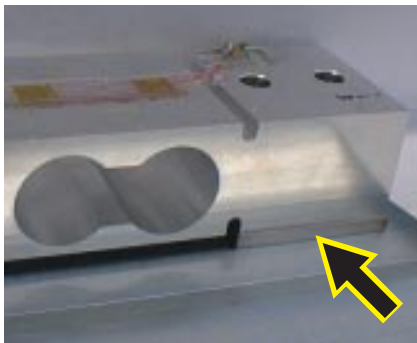


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- Open the electronics module (see page 11)
- Unplug the load-cell cable from the main PCB
- On ...DCE and ...EDE models:
 - Remove the strain-relief clamp in the electronics module (2 Phillips screws) and remove the connecting cable. Save the 2 rubber cable guides for later reassembly.
- On ...FEG models:
 - Remove the seal around the electronics module, save it for later reassembly, and remove the connecting cable
- Tip the scale towards the rear to access the bottom of the housing
- On ...DCE models:
 - Remove the 3 Allen screws from the bottom of the scale housing (see upper illustration) and remove the strain-gauge load cell along with the cable
- On ...EDE models:
 - Remove the 2 Allen screws from the bottom of the scale housing (see the illustration on the left) and remove the strain-gauge load cell along with the cable
- On ...FEG models:
 - Remove the 2 Allen screws from the bottom of the scale housing and remove the strain-gauge load cell along with the cable and the shim. Save the shim for later reassembly.
- Use a torque wrench to fasten the new strain-gauge load cell to the base plate (torque: ... DCE: 4.3 Nm, ...EDE: 25 Nm, ...FEG: 55 Nm).
 - On ...FEG models: place the shim between the base plate and the load cell as a spacer (see illustration).
- Guide the connecting cable into the electronics module, replace the strain-relief clamp (not on ...FEG models) and plug the cable into the main PCB
- Adjust the overload stops
- Check the zero-point offset value and adjust, if necessary
- Check the off-center load and adjust, if necessary
- Adjust the linearity
- Adjust the span
- Reassemble the scale (close the electronics box, fasten the pan support using a torque wrench (torque: ... DCE: 4.3 Nm, ...EDE: 25 Nm, ...FEG: 55 Nm), affix the shock-absorbing pad (not on ...FEG models) and place the load plate on the scale)
- Connect the scale to the power supply
- The scale is now ready to operate

Error Messages

Display	Cause	Solution
H	Scale capacity exceeded	Unload the scale
L	No load plate on the scale Something is touching the load plate	Place the load plate on the scale Remove whatever is touching the load plate
E 01	Display overflow; i.e., the value to be output cannot be displayed	Reduce the load on the scale
E 02	Calibration parameter not met; e.g.: – scale not zeroed – load on scale	Only start calibration when zero is displayed Press →0← to zero the scale Unload the scale
E 08	Scale is not within the zero range	Scale can only be zeroed setting within the zero-setting range ($\pm 2\%$ of max. load)
E 09	Scale cannot be tared when the gross value is ≤ 0	Press →0← to zero the scale
E 10	→T← key is blocked when there is data stored in the 2nd tare memory	Press CF to clear the 2nd tare memory
E 11	Value cannot be stored in the 2nd tare memory	Press →0←
E 22	Weight too light, or no load on the scale	Increase the weight on the scale
E 30	⊗ key pressed while BPI mode active	Set the scale to the SBI mode (e.g., by activating the “Close” function in the MC1 server)
E 50	Overflow or underflow in the temperature compensation converter	TK sensor or main PCB is defective (replacement required)
E 53	Temperature compensation converter is not functioning. The processor is not receiving any measured data from the TK switch	TK sensor or main PCB is defective (replacement required)
E 54	A/D converter output is below the minimum limit	The scale is underloaded; either the load plate is not on the scale or there is a mechanical defect or a defect in the main PCB
E 55	A/D converter output is above the maximum limit	Either the scale is overloaded or there is a mechanical defect or a defect in the main PCB

Overview of the Scale Operating Menu

1	Scale Functions	
1 1	Adapt Filter	
1 1 1	Minimum vibration	
1 1 2 •	Normal vibration	
1 1 3	Strong vibration	
1 1 4	Extreme vibration	
1 2	Application Filter	
1 2 1 •	Weighing	
1 2 2	Filling mode	
1 3	Stability Range	
1 3 1	¼ digit	
1 3 2	½ digit	
1 3 3	1 digit	
1 3 4 •	2 digits	
1 3 5	4 digits	
1 4	Weight Unit for Calibration Weight	
1 4 1	Grams	
1 4 2 •	Kilograms	
1 4 3	Pounds	
1 5	Calibration/Adjustment *	
1 5 1	Accessible	
1 5 2 •	Blocked	
1 6	Auto Zero	
1 6 1 •	On	
1 6 2	Off	
1 7	Weight Unit 1	
1 7 2	Grams	g
1 7 3 •	Kilograms	kg
1 7 4	Carats *	ct
1 7 5	Pounds *	lb
1 7 6	Ounces *	oz
1 7 7	Troy ounces *	ozt
1 7 8	Hong Kong taels *	tl
1 7 9	Singapore taels *	tl
1 7 10	Taiwanese taels *	tl
1 7 11	Grains *	GN
1 7 12	Pennyweights *	dwt
1 7 13	Milligrams	mg
1 7 14	Parts per pound *	o
1 7 15	Chinese taels *	tl
1 7 16	Mommes *	m
1 7 17	Austrian carats *	k
1 7 18	Tola *	t
1 7 19	Baht *	b
1 7 20	Mesghal *	m

1 7 21	Tons	
1 7 22	Pounds+ounces (no decimal display)	
1 8	Display resolution 1	
1 8 1 •	Standard resolution	
1 8 2	10x higher resolution **	
1 8 3	2x higher resolution (PolyRange)*	
2	Application Programs ¹⁾	
2 1	Program Selection	
2 1 1 •	Basic weighing function	
2 1 2	Toggle weight units	
2 1 3	Net-total (tare memory)	
2 1 4 •	Counting	
2 1 5	Weighing in percent	
2 1 7	Calculation by a factor	
2 1 8	Totalizing	
2 1 9	Gross/net toggling	
2 1 10	Tare memory incl. autom. container tare function	
2 1 11	Weighing in percent with differential display	
2 1 12	Averaging	
3	Application Parameters ¹⁾	
3 1	Weight Unit 2	
3 1 2	Grams	g
3 1 3 •	Kilograms	kg
3 1 4	Carats *	ct
3 1 5	Pounds *	lb
3 1 6	Ounces *	oz
3 1 7	Troy ounces *	ozt
3 1 8	Hong Kong taels *	tl
3 1 9	Singapore taels *	tl
3 1 10	Taiwanese taels *	tl
3 1 11	Grains *	GN
3 1 12	Pennyweights *	dwt
3 1 13	Milligrams	mg
3 1 14	Parts per pound *	o
3 1 15	Chinese taels *	tl
3 1 16	Mommes *	m
3 1 17	Austrian carats *	k
3 1 18	Tola *	t
3 1 19	Baht *	b
3 1 20	Mesghal *	m
3 1 21	Tons	
3 1 22	Pounds+ounces (no decimal display)	

* = not applicable for verified balances

** = only for EA/EB ...OUR models

• = Factory setting

¹⁾ = EB models only

3 2		Display resolution 2
3 2 1	•	Standard resolution
3 2 2		10x higher resolution **
3 2 3		2x higher resolution (PolyRange)*

3 3		Preset reference sample quantity / reference percentage / number of subweighing operations for averaging ¹⁾
3 3 1		5
3 3 2	•	10
3 3 3		20
3 3 4		50
3 3 5		100

3 3 1		5
3 3 2	•	10
3 3 3		20
3 3 4		50
3 3 5		100

5 Interface

5 1		Baud rate
5 1 1		150 baud
5 1 2		300 baud
5 1 3		600 baud
5 1 4	•	1,200 baud
5 1 5		2,400 baud
5 1 6		4,800 baud
5 1 7		9,600 baud

5 2		Parity
5 2 1		Mark
5 2 2		Space *
5 2 3	•	Odd
5 2 4		Even

5 3		Number of Stop Bits
5 3 1	•	1
5 3 2		2

5 4		Handshake Mode
5 4 1		Software handshake
5 4 2		Hardware handshake, 1 char. after CTS
5 4 3	•	Hardware handshake, 2 char. after CTS

5 5		Communication Mode
5 5 1	•	PC, YDPO3 printer (SBI)
5 5 2		YDPO11S printer

6 Print in Weighing Mode

6 1		Manual/auto print mode
6 1 1		Manual without stability
6 1 2	•	Manual with stability
6 1 3		Automatic without stability
6 1 4		Automatic at stability







7 Print in Application Mode

7 1		Line Format
7 1 1		W/o data ID codes
7 1 2		With data ID codes
7 1 3	•	With data ID codes, N/T/G values and 2 header lines

8 Extra Functions

8 1		Menu Access
8 1 1	•	Parameter settings can be changed
8 1 2		Read only

8 2 External Switch Function

8 2 3		 key ¹⁾
8 2 4	•	 key
8 2 5		 key
8 2 6		 key ¹⁾
8 2 7		 key ¹⁾
8 2 8		 key

8 3 Power-on Mode

8 3 1		Off > on
8 3 2	•	Stand-by > on

9 Reset Menu

9 1		Factory Settings
9 - 1		Restore factory settings
9 - 2		Do not restore factory settings

* = not applicable for verified balances

** = only for EA/EB ...OUR models

• = Factory setting

¹⁾ = EB models only

Service Specifications

Model	Weighing capacity	Readability	Repeatability		Off-center load Eccentricity		Class	Span			Tareweight <i>Attention: italics only Germany</i>	Linearity		TCS ppm/K
			Test weight	Permissible tolerances	Test weight	Permissible tolerance (±)		Adjust. weight	Test weight	Permissible tolerance (±)		Testweight <i>Attention: italics only Germany</i>	Permissible tolerance (±)	
EA6DCE-I	6000 g	0,2 g	5000 g	0,2 g	2000 g	0,3 g	F2	5000 g	5000 g	0,2 g	--- (2000) g	1500/3000/ 5000/6000 g	0,4 g	10
EA15DCE-I	15 kg	0,5 g	10 kg	0,5 g	10 kg	1,5 g	F2	5 kg	10 kg	2 g	--- (5) kg	3/7/11/15 kg	1 g	50
EA35EDE-I EB35EDE-I	35 kg	1 g	10 kg	1 g	10 kg	2 g	F2	10 kg	30 kg	4 g	--- (10) kg	7/15/22/30 kg	2 g	10
EA60EDE-I	60 kg	2 g	20 kg	2 g	20 kg	4 g	F2	20 kg	50 kg	6 g	--- (20) kg	15/30/45/60 kg	4 g	10
EA60FEG-I EB60FEG-I	60 kg	2 g	20 kg	2 g	20 kg	4 g	F2	20 kg	50 kg	6 g	--- (20) kg	15/30/45/60 kg	4 g	10
EA150FEG-I EB150FEG-I	150 kg	5 g	30 kg	5 g	50 kg	10 g	F2	50 kg	100 kg	20 g	--- (50) kg	30/70/110/150 kg	10 g	10
EA6DCE-L EB6DCE-L	6000 g	2 g	5000 g	2 g	2000 g	4 g	M1	2000 g	5000 g	2 g	--- (2000) g	1500/3000/ 4000/6000 g	2 g	100
EA6DCE-L0UR EB6DCE-L0UR	6000 g	1 g	5000 g	1 g	2000 g	4 g	M1	2000 g	5000 g	2 g	--- (2000) g	1500/3000/ 4000/6000 g	1 g	50
EA12DCE-L0UR	12000 g	2 g	10000 g	2 g	5000 g	4 g	M1	5000 g	10000 g	4 g	--- (5000) g	3000/6000/ 10000/12000 g	2 g	50
EA15DCE-L EB15DCE-L	15000 g	5 g	10000 g	5 g	10000 g	15 g	M1	5000 g	10000 g	50 g	--- (5000) g	4000/7000/ 11000/15000 g	5 g	100
EA30EDE-L0UR	30 kg	5 g	10 kg	5 g	10 kg	5 g	M1	10 kg	30 kg	10 g	--- (10) kg	7/15/22/30 kg	5 g	50
EA35EDE-L EB35EDE-L	35000 g	10 g	10000 g	10 g	10000 g	20 g	M1	10000 g	30000 g	10 g	--- (10000) g	7000/15000/ 22000/30000 g	10 g	100
EA60EDE-L EB60EDE-L	60 kg	20 g	20 kg	20 g	20 kg	40 g	M1	20 kg	50 kg	20 g	--- (20) kg	15/30/40/60 kg	20 g	100
EA60EDE-L0UR	60 kg	10 g	20 kg	10 g	20 kg	20 g	M1	20 kg	50 kg	20 g	--- (20) kg	15/30/45/60 kg	10 g	50
EA60FEG-L EB60FEG-L	60 kg	20 g	20 kg	20 g	20 kg	40 g	M1	20 kg	50 kg	20 g	--- (20) kg	15/30/40/60 kg	20 g	100
EA60FEG-L0UR	60 kg	10 g	20 kg	10 g	20 kg	20 g	M1	20 kg	50 kg	20 g	--- (20) kg	15/30/45/60 kg	10 g	50
EA120FEG-L0UR	120 kg	20 g	30 kg	20 g	50 kg	40 g	M1	50 kg	100 kg	40 g	--- (50) kg	30/60/90/120 kg	20 g	50
EA150FEG-L EB150FEG-L	150 kg	50 g	50 kg	50 g	50 kg	100 g	M1	50 kg	150 kg	50 g	--- (50) kg	40/70/110/150 kg	50 g	100

Eaeb_deq.xls

Description	Spare Part No.	EA60EDE-10UR	EA60EDE-L0UR	EA60EDE-L	EA35EDE-L	EA60FEG-I	EA60FEG-10UR	EA60FEG-L0UR	EA60FEG-L	EA150FEG-L	EA6DCE-I	EA6DCE-10UR	EA6DCE-L0UR	EA6DCE-L	EA15DCE-L	EA120FEG-L0UR	EA150FEG-10UR	EA12DCE-L0UR	EA15DCE-10UR	EA150FEG-I	EA15DCE-I	EA30EDE-L0UR	EA35EDE-10UR	EA35EDE-I	EA60EDE-I	
		EA Models																								
Portable power supply 230/115V	6971172	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Portable power supply 120V	6971173	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AC adapter, 240V, ZA	6971410	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AC adapter, 240V, AUS	6971411	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AC adapter,230V Europe	6971412	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AC adapter, 120V USA/CDN	6971413	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AC adapter, 240V, GB	6971414	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Poad plate	69EA0004	1	1																				1	1	1	
Load plate	69EA0011										1	1	1				1				1					
Load plate	69EA0017					1	1	1								1				1						
Display head, compl.	69EA0003		1	1			1	1					1							1	1			1	1	
Display head, compl.	69EA0018																									
Display head, compl.	69EA0031	1					1					1				1	1						1			
Display head, compl.	69EB0001																									
Keyboard overlay with key caps	69EA0001		1	1			1	1					1							1	1			1	1	
Keyboard overlay with key caps	69EA0019																									
Keyboard overlay with key caps	69EB0002																									
Keyboard overlay with key caps	69EA0032	1					1					1				1	1						1			
Main PCB	69EA0030	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Set of gaskets	69EA0007	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gasket	69EA0023					1	1	1								1				1						
Gasket	69LP0019	1	1								1	1	1				1			1		1	1	1	1	1
Strain-gauge load cell	69EA0013												1													
Strain-gauge load cell	69EA0014		1																							
Strain-gauge load cell	69EA0015							1																		
Strain-gauge load cell	69EA0024										1	1														
Strain-gauge load cell	69EA0025																	1			1					
Strain-gauge load cell	69EA0026																						1	1		
Strain-gauge load cell	69EA0027	1																								1
Strain-gauge load cell	69EA0028					1	1																			
Strain-gauge load cell	69EA0029																1			1						
Set of levelling feet (4pcs)	69EA0020	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Set of shock absorbers (4pcs)	69EA0022					1	1	1									1			1						
Shock absorber (1pc)	69QS0038	4	4								4	4	4				4			4		4	4	4	4	4
Damping plate 60 x 114 mm	69EA0033	1	1								1	1	1				1			1		1	1	1	1	1
Set of bushings	69EA0009	1	1								1	1	1				1			1		1	1	1	1	1
Support (for display)	69EA0021					1	1	1									1			1						
Cap (in base plate)	69LC0048	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover for data interface	69LC0084	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cover- electronic box	69EA0008	1	1								1	1	1				1			1		1	1	1	1	1

EB150FEG-I	EB150FEG-10UR	EB150FEG-L	EB60FEG-L	EB15DCE-I	EB15DCE-10UR	EB15DCE-L	EB6DCE-L	EB35EDE-I	EB35EDE-10UR	EB35EDE-L	EB60EDE-L	EB60EDE-I	EB60EDE-10UR	EB60FEG-I	EB60FEG-10UR	EB6DCE-I	EB6DCE-10UR
EB Models																	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
								1	1	1	1	1				1	1
1	1	1		1	1									1	1		
1		1	1		1	1		1	1		1	1		1		1	
	1			1				1			1			1		1	
1		1	1		1	1		1	1		1	1		1		1	
	1			1				1			1			1		1	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1												1	1		
			1	1	1	1	1	1	1	1	1	1				1	1
						1											
											1						
												1	1				
								1	1					1	1		
												1	1				
1	1																
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1												1	1		
			4	4	4	4	4	4	4	4	4	4				4	4
			1	1	1	1	1	1	1	1	1	1				1	1
			1	1	1	1	1	1	1	1	1	1				1	1
1	1	1												1	1		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			1	1	1	1	1	1	1	1	1	1				1	1

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