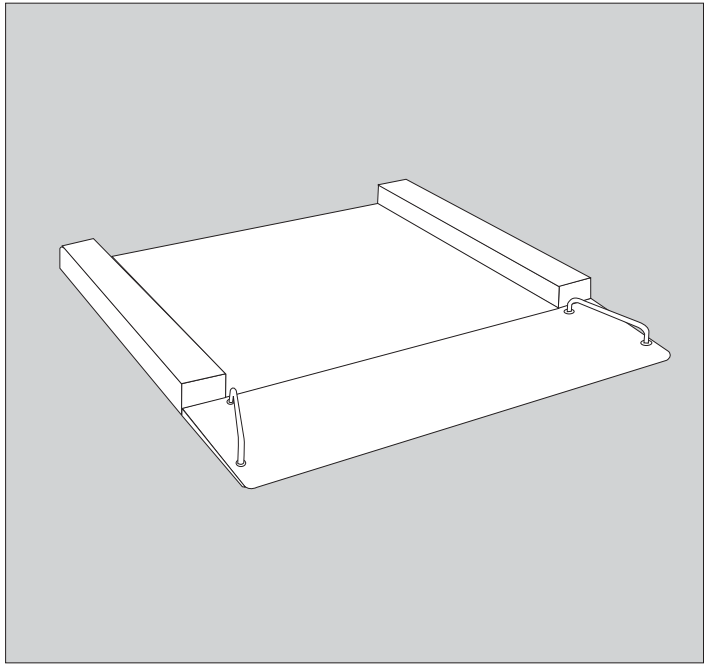
Service Manual

Sartorius Industry Series

Flat-bed Scales IF-Models
Electronic Precision Scales

Including Service Specifications Sheets



WIF5035-e06039

Contents

General Information

Repairs

Important:

Prerequisites for working on Sartorius Industry Scales include considerable experience, the 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 Flat-bed models

The models consist of a flat-bed scale with strain-gauge load cells, an analog/digital converter and an *isi* industrial terminal.

Models

IF600LIx-L0CEx, IF600NLx-L0CEx; IF600NNx-L0CEx, IF600RNx-L0CEx;
IF1500NLx-L0CEx, IF1500NNx-L0CEx, IF1500RNx-L0CEx, IF1500RRx-L0CEx,
IF1500WRx-L0CEx; IF3000NNx-L0CEx, IF3000RNx-L0CEx, IF3000RRx-L0CEx,
IF3000WRx-L0CEx;
IFP4-1000GGxx, IFP4-1000IGxx, IFP4-1000IIxx, IFP4-1000LGxx,
IFP4-1000LIxx;

Ordering special versions of the models ..

Note:

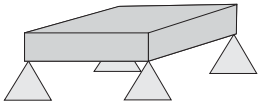
To order special versions, please add the ID code of the special version you need to the last letter of the order number for the standard model. For example, „P" stands for „electropolished," and „P4" for the AISI 316 TI stainless steel standard (German standard 1.4571) that is electropolished.

Ordering examples:

- The order number for a 600-kg flat-bed scale with the dimensions 1,250 x 1,250 mm and in the stainless steel version of AISI 304 (German std. 1.4301) is: IF600NNS-L0CE.
- The order number for a 600-kg flat-bed scale with the dimensions 1,250 x 1,250 mm and in the stainless steel version of AISI 304 (German std. 1.4301) with an electropolished finish is IF600NNS-L0CE**P.**
- The order number for a 600-kg flat-bed scale with the dimensions 1,250 x 1,250 mm and in the special-grade stainless steel (AISI 316 TI, German std. 1.4571) and with an electropolished finish is IF600NNS-L0CE**P4.**

Current model descriptions for IF weighing platforms

Example of the ordering code for a IF weighing Platform: **IFP4-1500RR-LCE** (Descriptions just like those of the combics series)

Platform	Material | Design	Number of load cells		Weighing Capacity (kg)	Platform size mm | order code		Resolution
IF	**P**	**4**	**-**		**RR**	**-**	**LCE**
	P = Painted steel S = Stainless steel XS= EX protected, Stainless steel	 Wäze01.eps		 Gew1500.jpg	 **RR = 1500x1500**		not verifiable: 15,000 d = L 30,000 d = I verifiable: 3.000 e = LCE 2x3.000 e = NCE

Auxiliary Service Tools and Equipment

For service and repair work on these scales you will require suitable tools and an appropriate workspace.
In addition to standard tools, you will need the following special tools:

PCS.	Designation	Order no.
1	Kit for resistor de cade WD 10 M	6738-16
1	Resistor-Set for Adjustment of the off-center Load	69CW0106
1	Torque wrench (up to 120 Nm)	
1	Set of Allen wrenches	6739-94
1	Set of open-end wrenches	
1	Soldering equipment, including soldering iron	6737-95
1	Digital voltmeter, 4 ½ digits	6738-62
1	Snap-ring pliers	

Accompanying Literature

Spare Parts List for Flat-bed scales
Sartorius Tool List - Status 9/91
Sartorius Service Manual for the *isi* 10, 20, 30 Industrial Terminals
Sartorius Installation Instructions for the YCO01 IS-0CE A/D converter
Sartorius Installation and Operating Instructions for Flat-bed scales

Service Work on the Load Cell

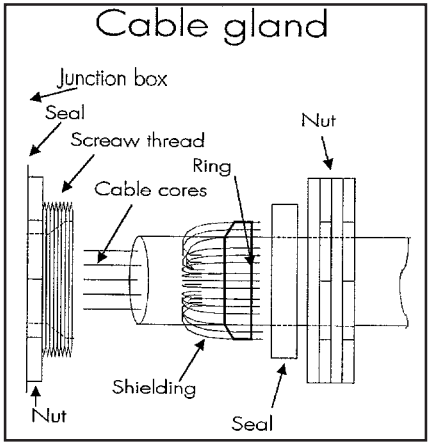
Important

The installation of the display and control unit and of the A/D converter on the scale must be performed by an authorized Sartorius service technician or a weighing equipment dealer trained by Sartorius.

Note:

- Disconnect the equipment from the power supply (unplug the AC adapter) before working on the equipment.
- Installation can only be performed using the special tools listed on page 3.
- Any work that may affect the IP65/68 protection rating must be performed with extreme care.
- If the installation is not performed in accordance with the relevant requirements as listed above, the equipment will not be covered under the warranty.

Initial verification of the weighing system as a whole for use in legal metrology can **only** be performed on equipment that has been released by Sartorius AG for verification and that has been **installed and put into operation** by a technician authorized by Sartorius AG.



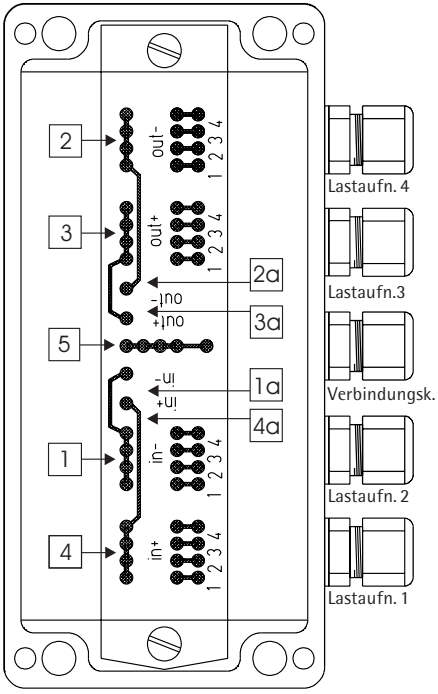
Kabel-0d.EPS

The 6-m connecting cable already installed (6) provides the necessary connection between the A/D converter and the junction box. After connecting the cable from the junction box to the terminal strip on the YCO01IS-0CE A/D converter, you have to connect the A/D converter to the *isi* industrial terminal and use the terminal to configure the A/D converter. See the installation instructions for the YCO01IS-0CE. For information on further settings, refer to the Sartorius Service Manual for the *isi* industrial terminals (publication number (WIS5011-e9504). Make sure that the grounding connection between the A/D converter and the weighing platform is intact (resistance < =1 ohm). The shield must be connected to the cable glands on the A/D converter and the junction box. The connecting cable shield must be connected to the cable glands on the A/D converter and the junction box (see illustration on the left).

The connecting cable shield is soldered to the PCB in the scale junction box. An additional grounding strap connects the cable gland to the junction box plate on the weighing platform frame.

Wiring Diagram

Connections in the Junction Box for the four Load Cells



Kabel3.EPS

Load cell 1

1	Black	Supply v. neg. (in–)
2	Red	Test signal neg. (out–)
3	White	Test signal pos. (out+)
4	Green	Supply v. pos. (in+)
5	Yellow	Shield

Load cell 2

1	Black	Supply v. neg. (in–)
2	Red	Test signal neg. (out–)
3	White	Test signal pos. (out+)
4	Green	Supply v. pos. (in+)
5	Yellow	Shield

Load cell 3

1	Black	Supply v. neg. (in–)
2	Red	Test signal neg. (out–)
3	White	Test signal pos. (out+)
4	Green	Supply v. pos. (in+)
5	Yellow	Shield

Load cell 4

1	Black	Supply v. neg. (in–)
2	Red	Test signal (neg. (out–)
3	White	Test signal pos. (out+)
4	Green	Supply v. pos. (in+)
5	Yellow	Shield

Connections from the Junction Box to the A/D Converter

Note: The power supply lines are twisted together with the shielding and soldered as required.

Junction Box			A/D Converter (*isi* Industrial Terminal)		
1a	Brown	Supply voltage negative (inV–)	1	White	Supply voltage positive
1a	Gray	Supply test voltage negative (in sense –)	2	Pink	Supply test voltage positive (sense+)
2a	Yellow	Test signal negative (out–)	3	Green	Test signal positive
3a	Green	Test signal positive (out+)	4	Yellow	Test signal negative
4a	White	Supply voltage positive (inV+)	5	Gray	Supply test voltage negative (sense–)
4a	Pink	Supply test voltage positive (in sense +)	6	Brown	Supply voltage negative
5		Shield	7		Shield

Calibration / Adjustment of the Flat-bed Scale

Preparation

Connect the scale to the YCO01IS-0CE A/D converter which is connected to the *isi* industrial terminal; then connect the scale to power supply
The weighing platform must be set up on a stable, even surface. Level the scale using the level indicator and allow it to warm up for at least 30 minutes.

Adjustment Sequence

Check and, if necessary, adjust the following factors when the scale is newly installed and after every maintenance or repair work:

1. Zero-point offset value
2. Adjustment of the Off-center load
3. Span adjustment (to test the linearity)
4. Linearity check
5. Then re-adjust span, if necessary

Zero-point Offset Value

Zero-point offset errors are displayed as follows on the *isi* industrial terminal:

- ERR 54/55 when the equipment is put into operation for the first time (or if the A/D converter is incorrectly connected).
- L/H after turning the equipment on (when the menu access switch is closed)

Adjustment of the Zero-point Offset Value

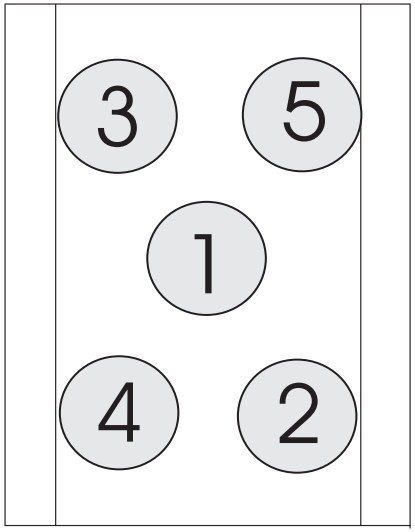
- The offset value cannot be adjusted on the scale at the place of installation (load cells are adjusted at the factory before delivery).

- Re-adjust the span
  (the menu access switch on the A/D converter is opened)

Note: **If the span cannot be adjusted, the defective load cell must be replaced.**

Off-center Load

Checking the Off-center Load



Eck3.EPS

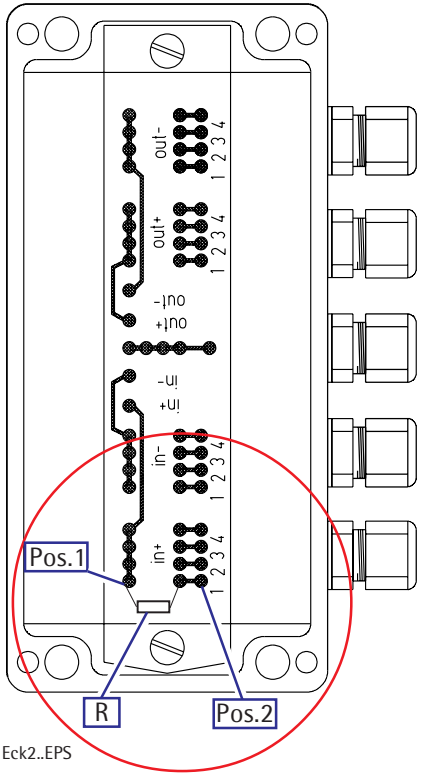
- **Connect the flat-bed scale to the *isi* industrial terminal and turn it on.**
- **Press the [→T←] key on the terminal to tare the unloaded scale.**
- **Center the test weights on the weighing platform (position 1) and press the [→T←] key on the terminal to tare the scale.**
- **Place the test weights on the positions 2, 3, 4 and 5 in sequence and read off the weight, with plus or minus sign, when the scale stabilizes**
- **Compare the error, if there is any, to the tolerance limits listed in the Service Specifications on page 20/23.**

Fine Adjustment of the Off-center Load

You can solder resistance values (< 1 ohm/total capacity: 50ppm) into the power supply lines in the junction box to perform fine adjustment of the off-center load.

Note:

To perform another fine adjustment, short-circuit present adjustment resistors in the junction box.
After having measured the off-center load error, adjust the three corners with the greatest errors to the corner with the smallest error. **Errors can only be adjusted within a few display digits.**



Eck2..EPS

- Turn the pallet scale over.
- Remove the 4 screws from the cover plate.
- Lift the cover plate with the junction box carefully out of the frame.
- Return the scale to the upright position, making sure that the cable to the junction box does not touch the frame (this affects reproducibility).
- Open the junction box.
- Unsolder the power supply line from the load cell position 1 to be adjusted; re-solder it after adding the resistor in position 2 as shown in the example on the left.
- Use a decade resistor box with a very low internal resistance.
- Solder it between positions 1 and 2, and wait until the soldering joints have cooled down to room temperature.
- Find the resistance in the table (see page 36) and adjust it using the decade resistor box.
- Once you have found the appropriate resistor (R), solder it into positions 1 and 2.
- Allow the resistor to cool down to room temperature.

Note: Check the off-center load after each adjustment, because the added resistor (R) affects the output signal of the entire circuit.

- Follow the above instructions in reverse order to close the scale.

Span Adjustment

Adjust the Span

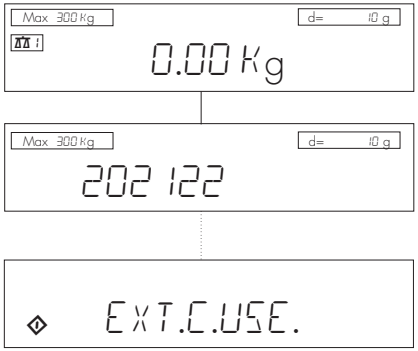
This section describes the procedure for external span adjustment using the *isi* industrial terminal.

Important:

The scale will only accept a weight that is within a tolerance range of approximately ±2% of the nominal weight. If the error is greater, the menu access switch on the A/D converter must be opened before adjustment can be performed (see the installation instructions for the YCO01-0CE).

Note:

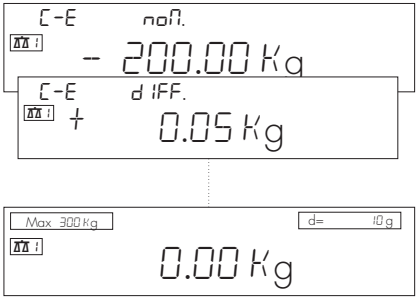
Before you can adjust the span with user weights, the weights have to be configured (see the installation instructions for the YCO01-0CE).



Ex_cal10.EPS

- Connect the flat-bed scale to the *isi* terminal and turn it on.
- Unload the scale (clear the weighing platform); if the display does not show zero, press the [→0←] key on the terminal.
- Once *0.00* kg is displayed (depending on the A/D converter configuration), enter the service password ([2] [0] [2] [1] [2] [2]) and press [ISO TEST].
- The program jumps to the service menu.

- Use the arrow keys (↑ ↓) to select the "External calibration (user weights)" menu item and press ↵.



Ex_cal11.EPS

- The calibration weight is displayed on the terminal (for example, 200 kg).
- Center the required weight on the weighing platform.
- The weight is stored automatically when the scale stabilizes and the difference between it and the last span adjustment is displayed. If this difference is outside the tolerance range indicated in the Service Specifications (see page 20), press ISO TEST to store the new adjustment. If an adjustment is not required (difference is within tolerance limits), press CF to cancel the adjustment routine.

- Remove the calibration weight and press the →0← key.

- This concludes the span adjustment procedure.

Important:

Following span adjustment, always close the menu access switch on the A/D converter and turn the *isi* industrial terminal off/on.

Linearization

Checking the Linearity

- You have to adjust the span before checking the linearity.
- Check the linearity for the entire weighing range under 1/4, 1/2, 3/4 and maximum load conditions.
- Compare the values displayed to the tolerance ranges listed in the Service Specifications (see page 20).
- If the error exceeds the tolerance limits, you need to adjust the linearity.

Adjusting the Linearity with an *isi* Industrial Terminal

Important:

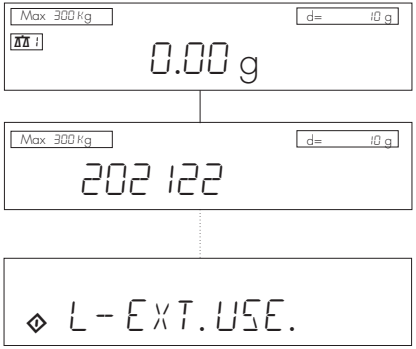
The scale will only accept a weight that is within a tolerance range of approximately ±2% of the nominal weight. If the error is greater, the menu access switch on the A/D converter must be opened before adjustment can be performed (see the installation instructions for the YCO01-0CE)

Note:

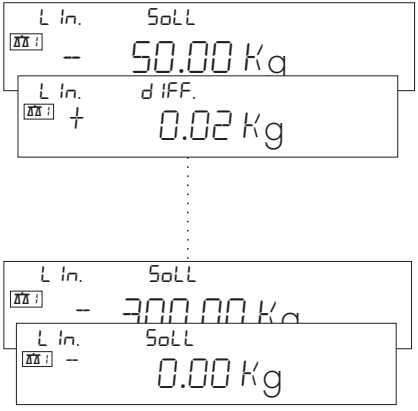
Before you can adjust the linearity with user weights, the weights have to be configured (see the installation instructions for the YCO01-0CE).

- Turn the industrial terminal on to power up the scale.

- Once 0.00 kg is displayed (depending on the A/D converter configuration), enter the service password ([2] [0] [2] [1] [2] [2]) and press [ISO TEST].



Ex_lin10.EPS



Ex_lin11.EPS

- The program jumps to the service menu.

- Use the arrow keys ([^][v]) to select the "External linearization (user weights)" menu item and press [↵].

- The first linearization weight is prompted.
- Center the displayed weight on the weighing platform.

- The difference between this and the last linearization weight for this position is displayed.
- Press [ISO TEST] to store the first linearization weight; the next linearization weight is displayed.

- Each linearization weight is prompted in sequence and then stored by pressing [ISO TEST].

- The zero point is checked last, with the scale unloaded.
  This concludes the linearization procedure.

Note: After adjusting the linearity, it must be checked again for the entire weighing range. If necessory adjust the span again.

Important: Always close the menu access switch on the A/D converter after the linearization and turn the *isi* industrial terminal off/on.

Replacing the Load Cell

- Disconnect the *isi* industrial terminal from the power supply.
- Turn the scale over, remove the cover plate and carefully lift it, together with the junction box, out of the frame.
- Unsolder the individual wires of the load cell cable from the terminal strip; loosen the cable gland and pull it carefully out of the junction box, together with the load cell cable.
- Remove the two M12 screws and take out the load cell.
- Remove the defective load cell from the weighing platform.
- Install the new load cell in the same position.

Note:

Make sure that the surfaces of the load cell and the pallet frame are clean and free of foreign objects (clean if necessary).

- Guide the connecting cable through the tube.
- Tighten the 2 load cell screws to 90 Nm.
- Thread the cable through the cable gland in the junction box.
- Use wire ties to secure the load cell cable.

Important:

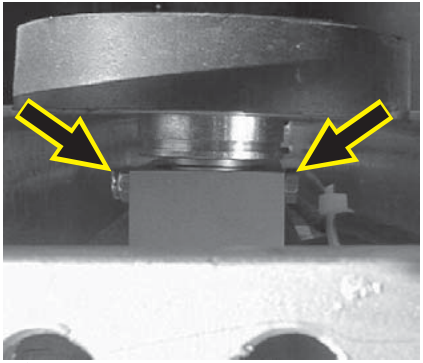
Do not shorten the load cell cable!

- Connect the individual wires of the connecting cable to the PCB (junction box) according to the wiring diagram (see page 5).
- Tighten the cable gland and close the junction box.

Note:

After replacing the load cell:

- Check the off-center load and adjust if necessary.
- Adjust the span.
- Adjust the linearity.
- Re-adjust the span if necessary.



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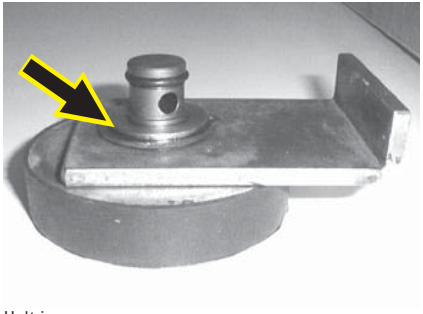
Replacing the Load-bearing Foot

- Turn the flat-bed scale over.
- Remove the load cell.
- Remove the fastening screw (see illustration) and replace the foot.
- Tighten the 2 screws on the load cell to 90 Nm.



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Removing the Drive-on Ramp Brace

- Remove the load-bearing foot
- Remove the snap ring
- Remove the brace

Service Specification IF...-L / IFX...-L

Example for the order number of a IF full range scale: IFXS4-150NL-L (Type Designation see page 4)

Applications	Material | Design	Number of load cells		Weighing Capacity (kg)	Platform size mm | order code		Resolution
IF	P	4	-	600	LI	-	L
IFX	S	4	-	600	NL	-	L

Model	Weighing capacity	Readability	Reproducibility Test weight	Reproducibility Permissible tolerances	Off-center load Eccentricity Test weight	Off-center load Eccentricity Permissible tolerance (±)	Span Class	Span Adjustm. weight	Span Test weight	Span Permissible tolerance (±)	Linearity Tareweight	Linearity Testweight	Linearity Permissible tolerance (±)	TCS ppm /K	iso CAL K
IF...-L IFXS...-L	150 kg	0,01 kg	20 kg	0,03 kg	50 kg	0,05 kg	M1	50 kg	150 kg	0,1 kg	--- kg (50)	30/70/110/150 kg	0,05 kg	10	n
IF...-L IFXS...-L	300 kg	0,02 kg	50 kg	0,06 kg	100 kg	0,1 kg	M1	100 kg	300 kg	0,2 kg	--- kg (100)	70/150/220/300 kg	0,1 kg	10	n
IF...-L IFXS...-L	600 kg	0,05 kg	500 kg	0,15 kg	200 kg	0,2 kg	M1	200 kg	600 kg	0,4 kg	--- kg (200)	150/300/450/600 kg	0,2 kg	10	n
IF...-L IFXS...-L	1000 kg	0,1 kg	500 kg	0,3 kg	500 kg	0,5 kg	M1	500 kg	1000 kg	1 kg	--- kg (500)	300/700/ 1000 kg	0,5 kg	10	n
IF...-L IFXS...-L	1500 kg	0,1 kg	500 kg	0,3 kg	500 kg	0,5 kg	M1	500 kg	1500 kg	1 kg	--- kg (500)	300/700/ 1100/1500 kg	0,5 kg	10	n
IF...-L IFXS...-L	3000 kg	0,2 kg	500 kg	0,6 kg	1000 kg	1 kg	M1	1000 kg	3000 kg	2 kg	--- kg (1000)	700/1500/ 2200/3000 kg	1 kg	10	n

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Service Specification IF...-I / IFX...-I

Example for the order number of a IF full range scale: IFXS4-1000NL-I (Type Designation see page 4)

Applications	Material | Design	Number of load cells		Weighing Capacity (kg)	Platform size mm | order code		Resolution
IF	P	4	-	150	LI	-	I
IFX	S	4	-	150	NL	-	I

Model	Weighing capacity	Readability	Reproducibility Test weight	Reproducibility Permissible tolerances	Off-center load Eccentricity Test weight	Off-center load Eccentricity Permissible tolerance (±)	Class	Span Adjustm. weight	Span Test weight	Span Permissible tolerance (±)	Linearity Tareweight	Linearity Testweight	Linearity Permissible tolerance (±)	TCS ppm /K	iso CAL K
IF...-I IFXS...-I	150 kg	0,005 kg	20 kg	0,03 kg	50 kg	0,05 kg	M1	50 kg	150 kg	0,1 kg	--- kg *(50)*	30/70/110/150 kg	0,05 kg	10	n
IF...-I IFXS...-I	300 kg	0,01 kg	50 kg	0,06 kg	100 kg	0,1 kg	M1	100 kg	300 kg	0,2 kg	--- kg *(100)*	70/150/220/300 kg	0,1 kg	10	n
IF...-I IFXS...-I	600 kg	0,02 kg	500 kg	0,15 kg	200 kg	0,2 kg	M1	200 kg	600 kg	0,4 kg	--- kg *(200)*	150/300/450/600 kg	0,2 kg	10	n
IF...-I IFXS...-I	1000 kg	0,1 kg	500 kg	0,3 kg	500 kg	0,5 kg	M1	500 kg	1000 kg	1 kg	--- kg *(500)*	300/700/ 1000 kg	0,5 kg	10	n
IF...-I IFXS...-I	1500 kg	0,05 kg	500 kg	0,3 kg	500 kg	0,5 kg	M1	500 kg	1500 kg	1 kg	--- kg *(500)*	300/700/ 1100/1500 kg	0,5 kg	10	n
IF...-I IFXS...-I	3000 kg	0,1 kg	500 kg	0,6 kg	1000 kg	1 kg	M1	1000 kg	3000 kg	2 kg	--- kg *(1000)*	700/1500/ 2200/3000 kg	1 kg	10	n

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Service Specification IF...-LCE / IFX...-LCE

Example for the order number of a IF full range scale: IFP4-300IG-LCE (Type Designation see page 4)

Applications	Material | Design	Number of load cells		Weighing Capacity (kg)	Platform size mm | order code		Resolution
IF	P	4	-	300	IG	-	LCE
IFX	S	4	-	300	NL	-	LCE

Model	Weighing capacity	Readability	Reproducibility Test weight	Reproducibility Permissible tolerances	Off-center load Eccentricity Test weight	Off-center load Eccentricity Permissible tolerance (±)	Span Class	Span Adjustm. weight	Span Test weight	Span Permissible tolerance (±)	Linearity Tareweight	Linearity Testweight	Linearity Permissible tolerance (±)	TCS ppm /K	iso CAL K
IF...-LCE IFXS...-LCE	150 kg	0,05 kg	20 kg	0,05 kg	50 kg	0,05 kg	M1	50 kg	150 kg	0,1 kg	--- *(50)* kg	30/70/110/150 kg	0,1 kg	10	n
IF...-LCE IFXS...-LCE	300 kg	0,1 kg	50 kg	0,1 kg	100 kg	0,1 kg	M1	100 kg	300 kg	0,2 kg	--- *(100)* kg	70/150/220/300 kg	0,2 kg	10	n
IF...-LCE IFXS...-LCE	600 kg	0,2 kg	500 kg	0,2 kg	200 kg	0,2 kg	M1	200 kg	600 kg	0,4 kg	--- *(200)* kg	150/300/450/600 kg	0,4 kg	10	n
IF...-LCE IFXS...-LCE	1000 kg	0,5 kg	500 kg	0,5 kg	500 kg	0,5 kg	M1	500 kg	1000 kg	1 kg	--- *(500)* kg	300/700/ 1000 kg	1 kg	10	n
IF...-LCE IFXS...-LCE	1500 kg	0,5 kg	500 kg	0,5 kg	500 kg	0,5 kg	M1	500 kg	1500 kg	1 kg	--- *(500)* kg	300/700/ 1100/1500 kg	1 kg	10	n
IF...-LCE IFXS...-LCE	3000 kg	1 kg	500 kg	1 kg	1000 kg	1 kg	M1	1000 kg	3000 kg	2 kg	--- *(1000)* kg	700/1500/ 2200/3000 kg	2 kg	10	n

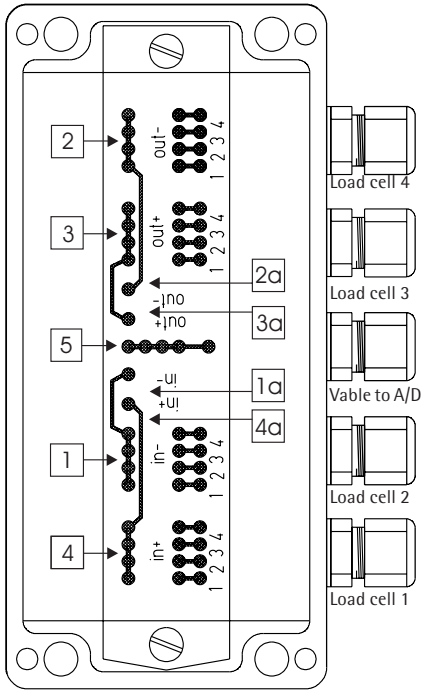
Service Specification IF...-NCE / IFX...- NCE

Example for the order number of a IF full range scale: IFP4-3000NN-NCE (Type Designation see page 4)

Applications	Material | Design	Number of load cells		Weighing Capacity (kg)	Platform size mm | order code		Resolution
IF	P	4	-	3000	NN	-	NCE
IFX	S	4	-	3000	LL	-	NCE

Model	I Weighing capacity	Readability	Reproducibility Test weight	Reproducibility Permissible tolerances	Off-center load Eccentricity Test weight	Off-center load Eccentricity Permissible tolerance (±)	Class	Span Adjustm. weight	Span Test weight	Span Permissible tolerance (±)	Linearity Tareweight	Linearity Testweight	Linearity Permissible tolerance (±)	TCS ppm /K	iso CAL K
IF...-NCE IFXS4-150..- Wägebereich 1/ Wägebereich 2	60 kg 150 kg	0,02 kg 0,05 kg	20 kg	0,05 kg	50 kg	0,05 kg	M1	50 kg	60 kg 150 kg	0,04 kg 0,1 kg	--- *(50)* kg *(20)*	15/30/45/60 70/150 kg *DKD* *30/70/110/150*	0,04 kg 0,1 kg	10	n
IF...-NCE IFXS4-300..- Wägebereich 1/ Wägebereich 2	150 kg 300 kg	0,05 kg 0,1 kg	50 kg	0,1 kg	100 kg	0,1 kg	M1	100 kg	150 kg 300 kg	0,1 kg 0,2 kg	--- *(100)* kg *(50)*	30/70/110/150 150/300 kg *DKD* *70/150/220/300*	0,1 kg 0,2 kg	10	n
IF...-NCE IFXS4-600..- Wägebereich 1/ Wägebereich 2	300 kg 600 kg	0,1 kg 0,2 kg	100 kg	0,2 kg	200 kg	0,2 kg	M1	200 kg	300 kg 600 kg	0,2 kg 0,4 kg	--- *(200)* kg *(100)*	70/150/220/300 300/600 kg *DKD* *150/300/450/600*	0,2 kg 0,4 kg	10	n
IF...-NCE IFXS4-1000..- Wägebereich 1/ Wägebereich 2	600 kg 1000 kg	0,2 kg 0,5 kg	500 kg	0,5 kg	500 kg	0,5 kg	M1	500 kg	600 kg 1000 kg	0,4 kg 1 kg	--- *(500)* kg *(200)*	150/300/450/600 700/1000 kg *DKD* *300/700/1000*	0,4 kg 1 kg	10	n
IF...-NCE IFXS4-1500..- Wägebereich 1/ Wägebereich 2	600 kg 1500 kg	0,2 kg 0,5 kg	500 kg	0,5 kg	500 kg	0,5 kg	M1	500 kg	600 kg 1500 kg	0,4 kg 1 kg	--- *(500)* kg *(200)*	150/300/450/600 700/1500 kg *DKD* *300/700/* *1100/1500*	0,4 kg 1 kg	10	n
IF...-NCE IFXS4-3000..- Wägebereich 1/ Wägebereich 2	1500 kg 3000 kg	0,5 kg 1 kg	500 kg	1 kg	1000 kg	1 kg	M1	1000 kg	1500 kg 3000 kg	1 kg 2 kg	--- *(1000)* kg *(500)*	300/700/1100/ 1500/3000 kg *DKD* *700/1500/* *2200/3000*	1 kg 2 kg	10	n

Wiring Diagram for the IUXS.. or IFXS..



Kabel3.EPS

Connections in the Junction Box for the Load Cells 1-4

Pin assignment	Designation	1. Version	2. Vers.[1)]	3. Vers.[2)]
4 Supply v. pos. (in+)	(V +) [3)]	green	red	blue
1 Supply v. neg. (in-)	(V -) [4)]	black	blue	black
3 Test signal pos. (out+)	Signal +	white	green	white
2 Test signal neg. (out-)	Signal -	red	gray	red
	Sense + [3)]		white	green
	Sense - [4)]		schwarz	gray
5 Shield	GND	yellow	(Shield)	(Shield)

1) Sartorius Hamburg MP58T, green Cable 2) Combics (011...), gray Cable 3) + 3) gets connected 4) + 4) gets connected

Connections in the Junction Box for the A/D Converter

Pin assignment	Designation	1. Version		2. Vers.[1)]
4 Supply v. pos. (in+)	(V +) [3)]	white		blue
1 Supply v. neg. (in-)	(V -) [3)]	brown		black / brown
3 Test signal pos. (out+)	Signal +	green		white
2 Test signal neg. (out-)	Signal -	yellow		red / pink
6 Shield wire +	Sense + [3)]	pink		green
7 Shield wire -	Sense - [3)]	gray		gray
5 Shield	GND			(Shield)

1) Sartorius Hamburg MP58T, grünes Cable 3) gets connected (6 with 4) and (7 with 1)

Load Cell connection (color plate)

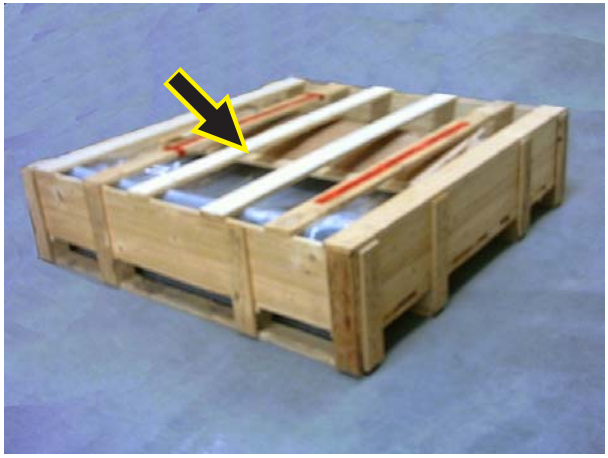
	Bridges supply voltage		Test voltage			
Load cell manufacturer	+Exc/ +Supply/ +Input	-Exc/ -Supply/ -Input	+Signal/ +Output	-Signal/ -Output	+Sense	-Sense
Sartorius Hamburg						
(z.B.: MP58T/...)	**red**	**blue**	**green**	**grey**	**white**	**black**
Combics (011...)	**blue**	**black**	**white**	**red**	**green**	**grey**
Load cell from						
Flintec	**green**	**black**	**white**	**red**		
Cable construction:						
Sartorius Hamburg (GWT)	d 5mm, 6 wires, **green**, screen grounded					
Combics	d 5mm, 6 wires, **grey**, screen grounded					

GWT HBM_12.08.04.xls

Installation instructions T8 folding mechanism

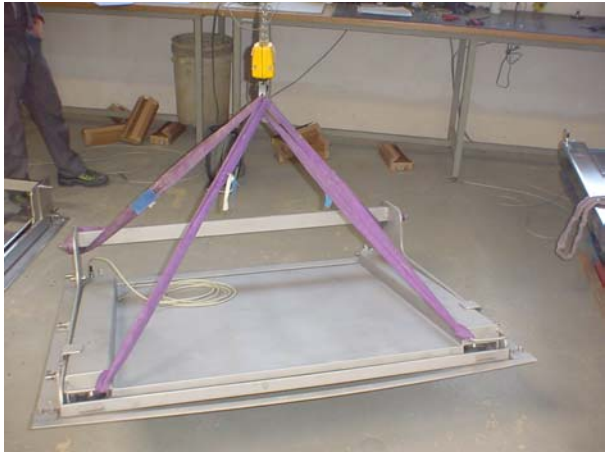
Attention!
Prerequisites for working on industrial scales include experience, the completion of a Service course in Goettingen as well as all special tools. Please do not attempt any unauthorized repair work.

1. Open the wooden pallet at the top



Pict0013a.jpg

2. Hook in the belts as shown in the picture and take the IF platform scale incl. folding mechanism (ground - and lifting frame) out of the wooden pallet.

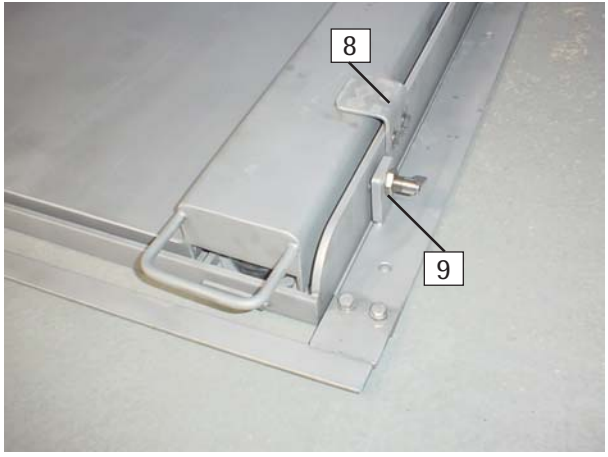


DSC03018.JPG

3. Put the parts carefully down

DSC03020.JPG

4. Screw off one holding down clamp on the left and on the right respectively (4 and 8)
   (see picture on page 33)
5. Loosen one snap-in bolt one the left and on the right respectively (3 and 9)
   (see picture on page 33)



DSC03025.JPG

6. Lift the IF platform scale out as shown on the picture

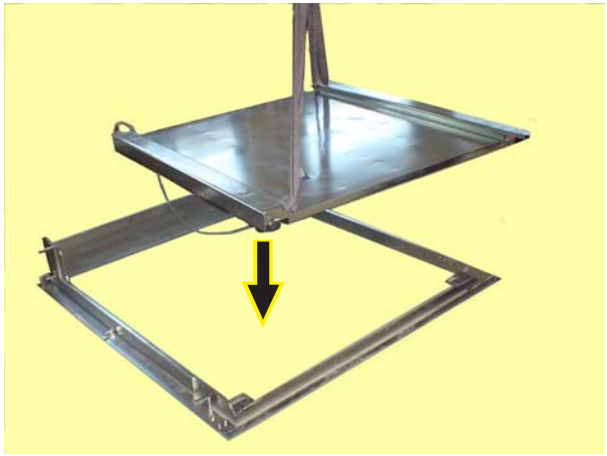
Attention!
While the plate is lifted it is not allowed to knee or to mount something under it.

DSC03027.JPG

7. Level the ground frame and mark out the holes for the dowels on the floor. The floor has to be even. The max. unevenness is 1mm on 1m of length. It is very important that you keep the angularity. Measure the diagonal line to check this.
8. Remove the ground frame again
9. Drill the anchor holes into the floor.
10. Remove the drilling dust.
11. Erect the ground frame again and level it.
12. Fasten the ground frame with the dowels or the ground anchors (depending on the floor conditions) to the floor. (8 ground anchors M10-15/85 are included in delivery)

DSC03036.JPG

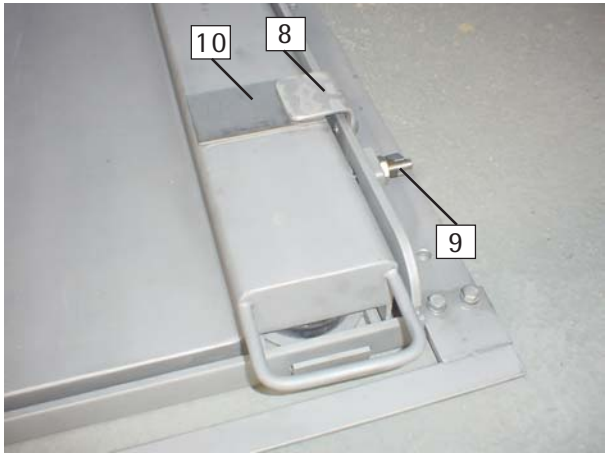
13. Put the IF platform scale carefully into the ground frame and level it.



DSC03027a.JPG

14. Screw on the holding down clamps (4 and 8) again. Underlay the holding down clamps with a 2mm spacer plate (10) while screwing them on.

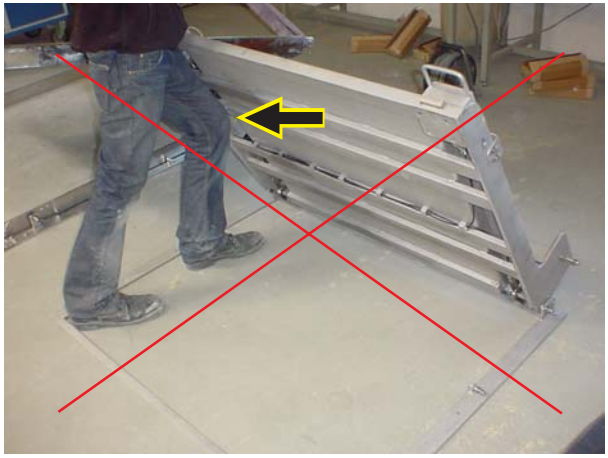
15. Loosen the snap-in bolts (3 and 9) before folding up the platform!



DSC03028.JPG

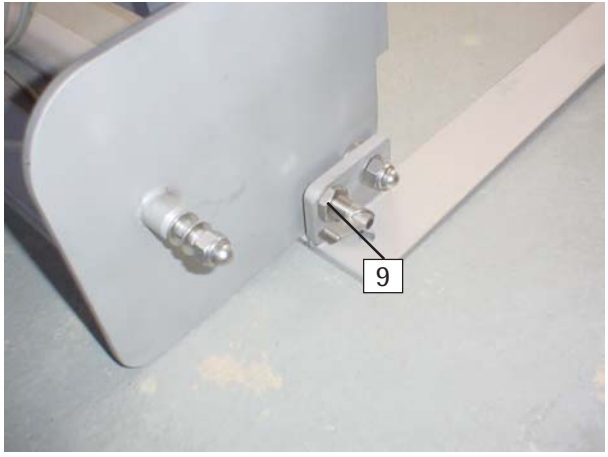
16. Folding up the platform

Attention!
Risk of injury.
Do not step under the platform!



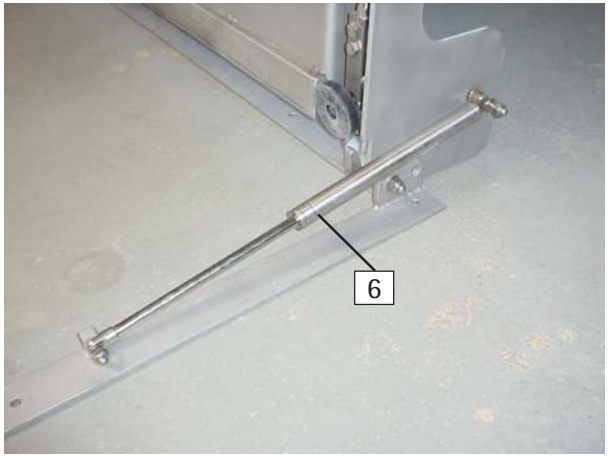
DSC03029.JPG

17. Let the rear snap-in bolt (left or right depending on the place) snap in into the mechanism for the fixing / securing of the vertical position.



DSC03029.JPG

18. Mount the pneumatic springs (6) as shown in the picture.



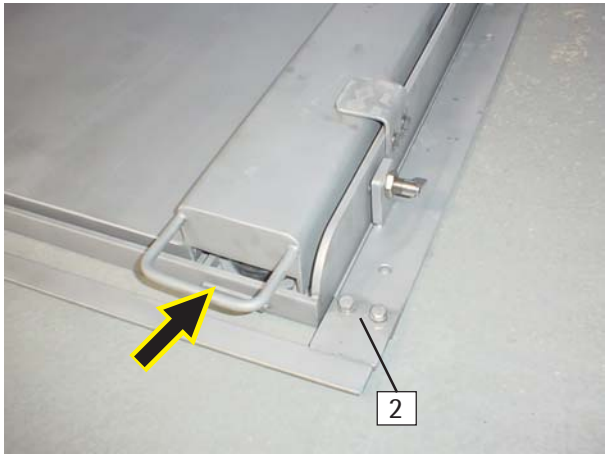
DSC03031.JPG

19. Loosen the snap-in bolts at the back and fold down the platform.

WImportant: The snap-in bolts at the front must not be snapped-in!
Danger of damaging the snap-in bolts!
If the platform is on the ground let the snap-in bolts snap in again!

DSC03021.JPG

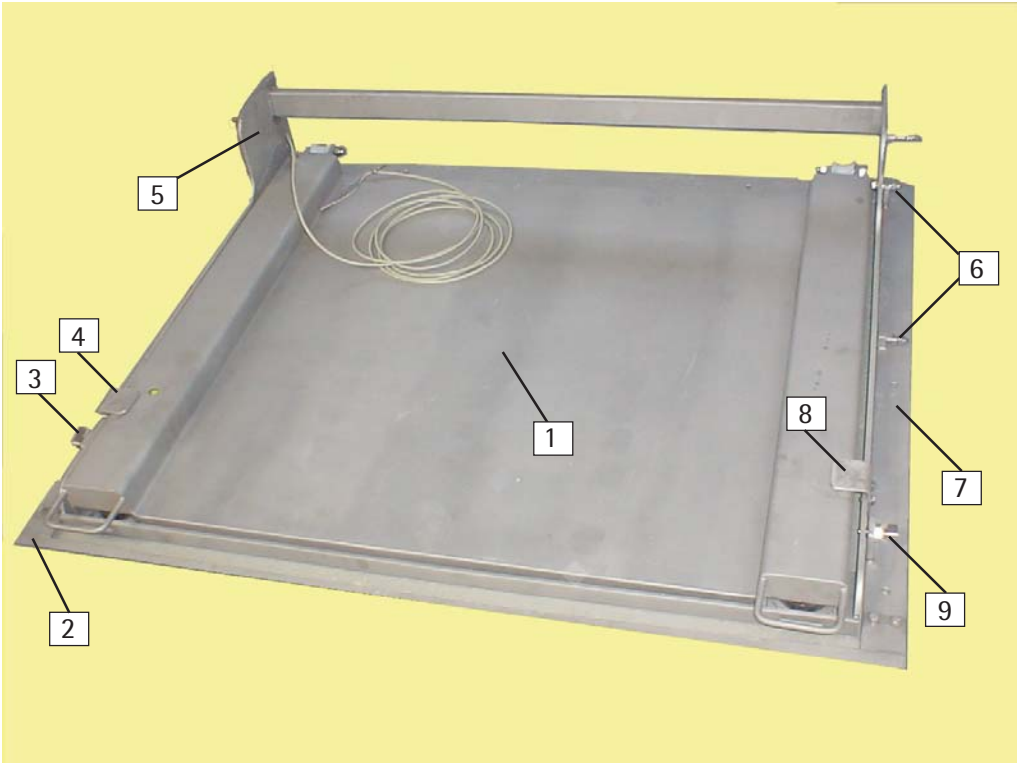
20. Dismantle the fit-up aid (2)
21. Hang the ramp into the fixture. The scale is ready for operation. Improper handling can cause damages at the components, that reduce safety.



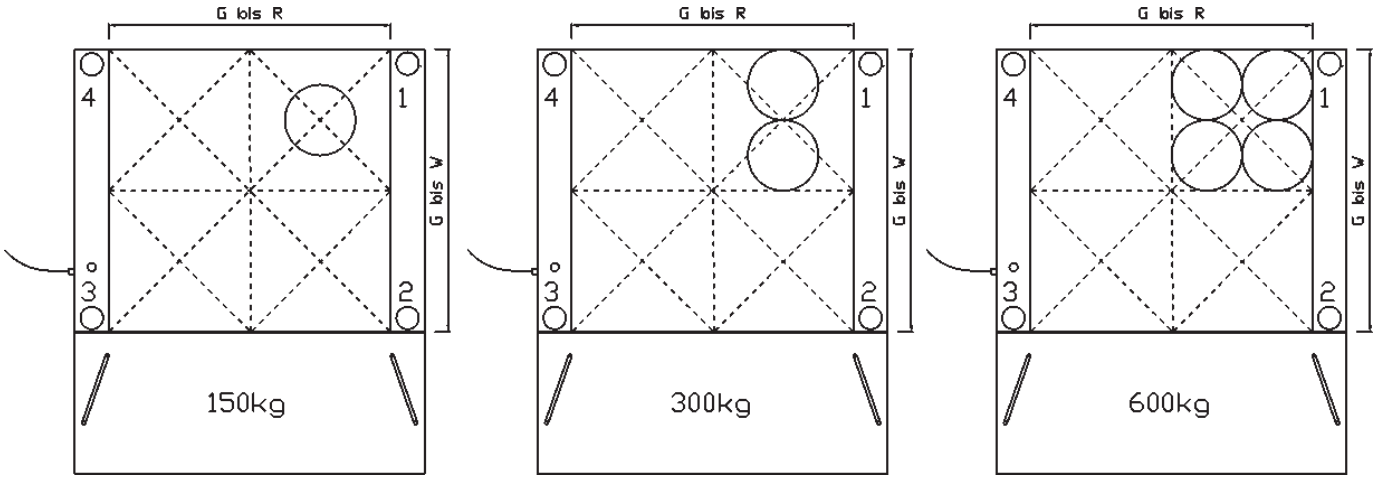
DSC03025.JPG

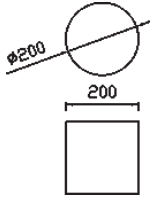
Scope of delivery:

1 IF platform
2 Fit-up aid
3 Left Snap-in bolt
4 Left holding down clamp
5 Lifting frame
6 Supports for pneumatic springs
7 Ground frame
8 Right holding down clamp
9 Right Snap-in bolt



Dsc03021a.jpg





Test with 50 kg stacked weights
1/3 of max. load
Corners 1 through 4 in sequence

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

sartorius

Part Name/Benennung
IF Off-center Load Test: GG through WR
Weighing Capacity: 150 kg to 600 kg

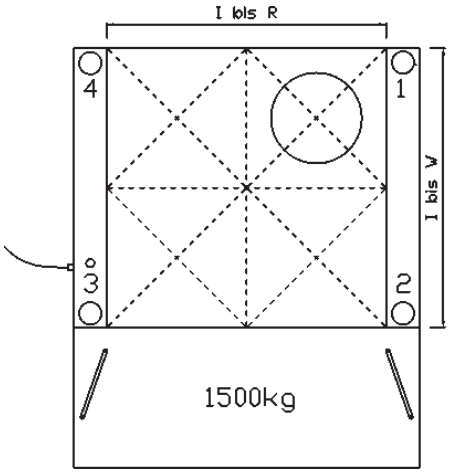
Scale/Maßstab

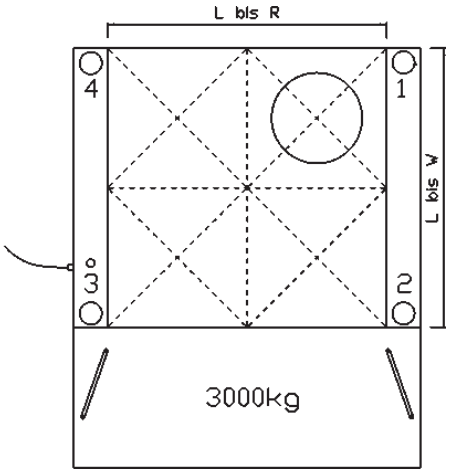
Drawing No./Zeichn.-Nr.
05.B.0501.4

Sheet Blatt

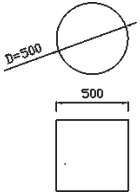
Replaces Ers. f.

Replaced by Ers. d.





2x
gestapelt



Test with 500 kg stacked weights
1/3 of max. load
Corners 1 through 4 in sequence

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

Part Name/Benennung
IF Off-center Loading Test: II through WR
Weighing Capacity: 1500 kg to 3000 kg

Scale/Maßstab

sartorius

Drawing No./Zeichn.-Nr.
05.B.0505.4

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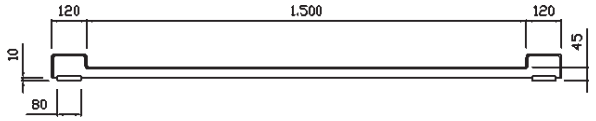
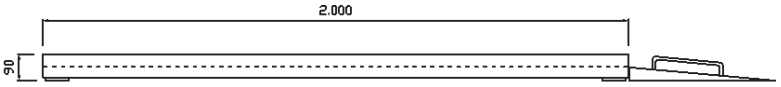
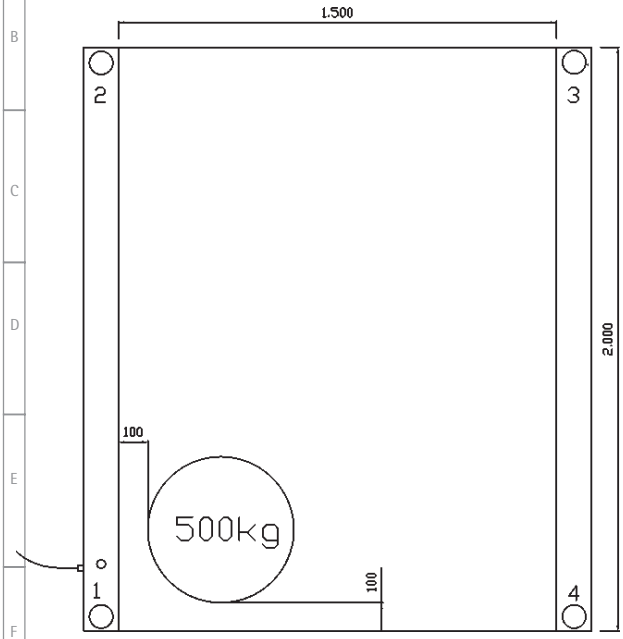
Replaced by Ers. d.







Test with M3 roll weights;
D = 500 mm

Position weights in each of the
4 corners in sequence

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

Part Name/Benennung
IF_3000WR-V3 (45mm)
Off-center Load Test:

Scale/Maßstab

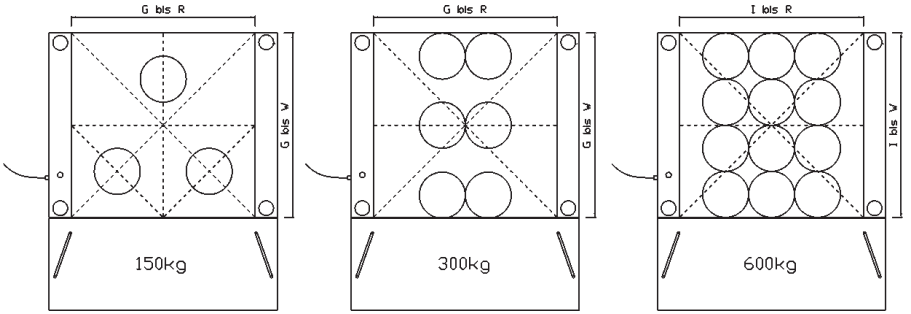
Drawing No./Zeichn.-Nr.
98100-037-62-A4

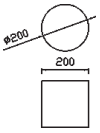
Sheet Blatt

Replaces Ers. f.

Replaced by Ers. d.

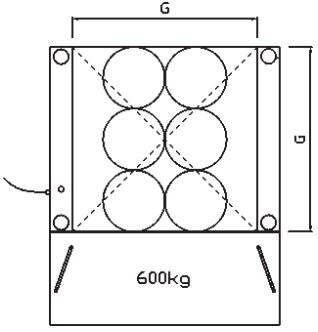
sartorius



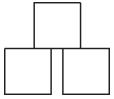


Test with 50 kg
stacked weights

Max. load
(distributed load)



12 x 50kg
stacked



Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

Part Name/Benennung
IF Linearity Test: GG through WR
Weighing Capacity: 150 kg to 600 kg

Scale/Maßstab

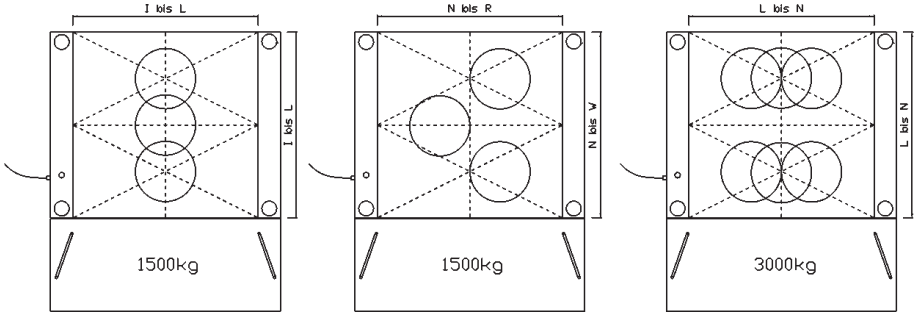
Drawing No./Zeichn.-Nr.
05.B.0502.4

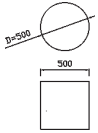
Sheet Blatt

Replaces Ers. f.

Replaced by Ers. d.

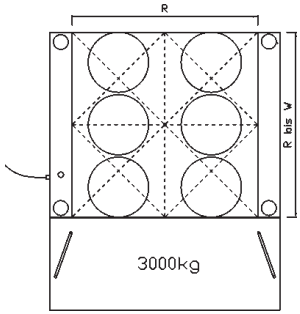
sartorius





Test with 500 kg
stacked weights

Max. load
(distributed load)



Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

sartorius

Part Name/Benennung
IF Linearity Test: II through WR
Weighing Capacity: 1500 kg to 3000 kg

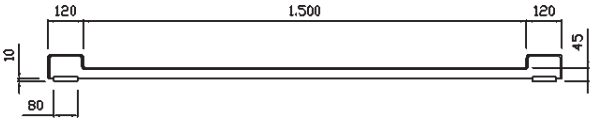
Scale/Maßstab

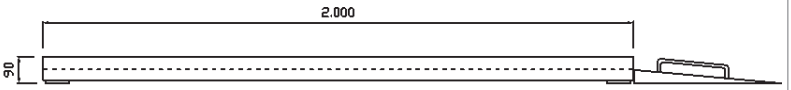
Drawing No./Zeichn.-Nr.
05.B.0504.4

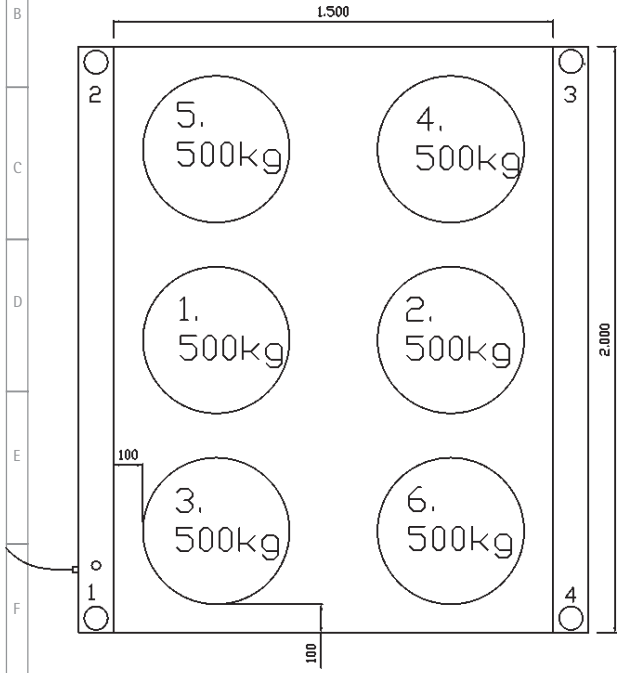
Sheet Blatt

Replaces Ers. f.

Replaced by Ers. d.







Test with M3 roll weights;
D = 500 mm

Position weights max. 100 mm
from edge of platform

Place weights on the weighing platform
in the order given: 1 to 6

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter			
Checked by Geprüft			
Approved by Freigabe			

sartorius

Part Name/Benennung
IF_ 3000WR-V3 (45 mm)
Linearity Test

Scale/Maßstab

Drawing No./Zeichn.-Nr.
98100-037-88-A4

Sheet Blatt

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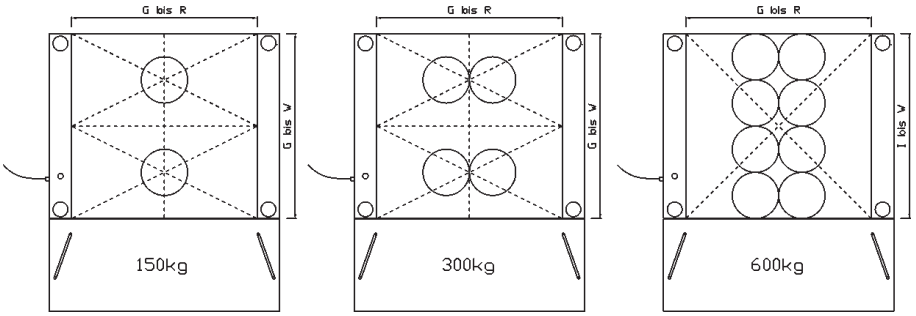
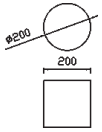
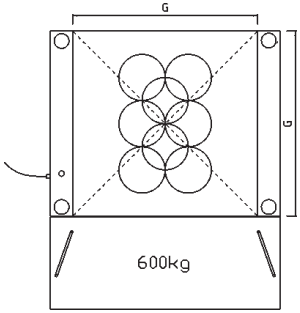
Replaced by Ers. d.





Test with 50 kg stacked weights

2/3 of max. load (centered)



Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

sartorius

Part Name/Benennung
IF Repeatability Test: GG through WR
Weighing Capacity: 150 kg to 600 kg

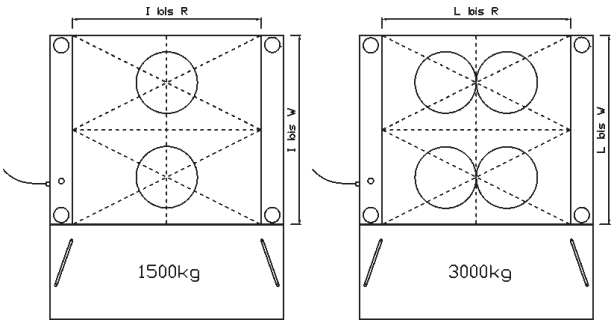
Scale/Maßstab

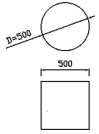
Drawing No./Zeichn.-Nr.
05.B.0500.4

Sheet Blatt

Replaces Ers. f.

Replaced by Ers. d.





Test with 500 kg stacked weights

2/3 of max. load (centered)

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

sartorius

Part Name/Benennung
IF Repeatability Test: II through WR
Weighing Capacity: 1500 kg to 3000 kg

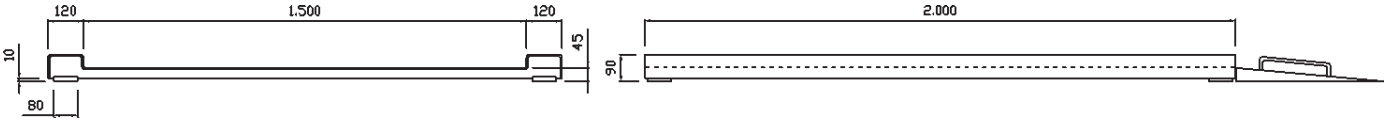
Scale/Maßstab

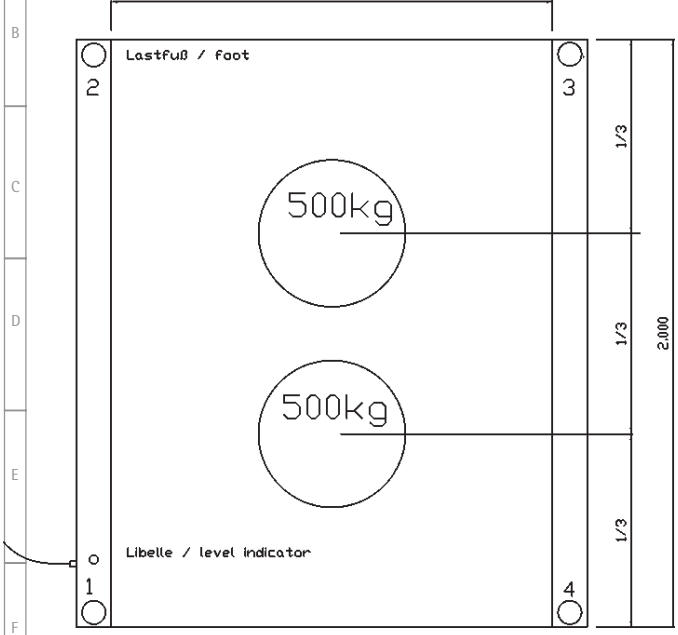
Drawing No./Zeichn.-Nr.
05.B.0500.4

Sheet Blatt
S. Bl.

Replaces Ers. f.

Replaced by Ers. d.





Test with M3 roll weights;
D = 500 mm

Center the required weight on the weighing platform 6 times in sequence.

Test weight: 1/3 max. load

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter			
Checked by Geprüft			
Approved by Freigabe			

Part Name/Benennung
IF_ 3000WR-V3 (45 mm)
Repeatability and Adjustment

Scale/Maßstab

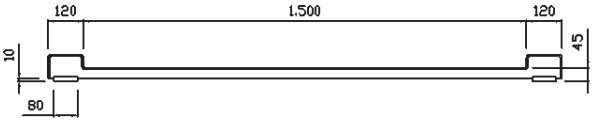
Drawing No./Zeichn.-Nr.
98100-037-88-A4

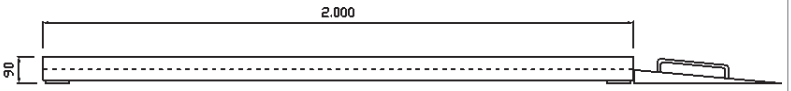
Sheet Blatt

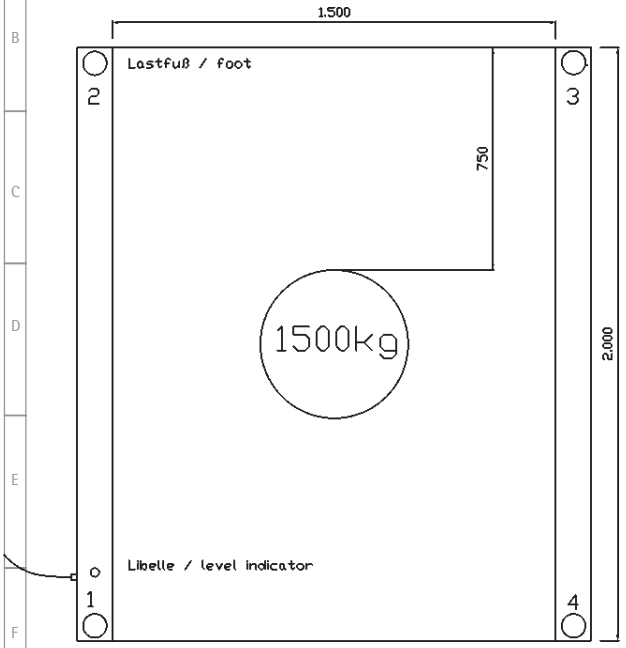
Replaces Ers. f.

Replaced by Ers. d.

sartorius







Test with M3 roll weights;
D = 500 mm

Center a weight equal to the max. cap.
on the weighing platform.

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter		
Checked by Geprüft		
Approved by Freigabe		

Part Name/Benennung
IF_ 3000WR-V3 (45 mm)
Max. Point Load Centered on Scale

Scale/Maßstab

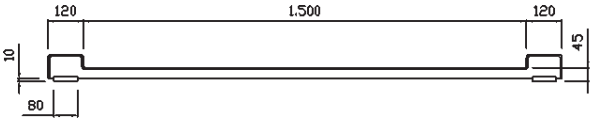
Drawing No./Zeichn.-Nr.
98100-037-88-A4

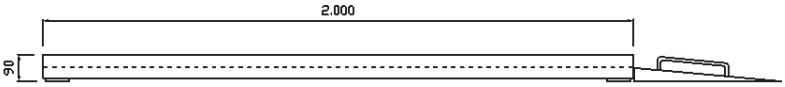
Sheet Blatt
S.
pc.

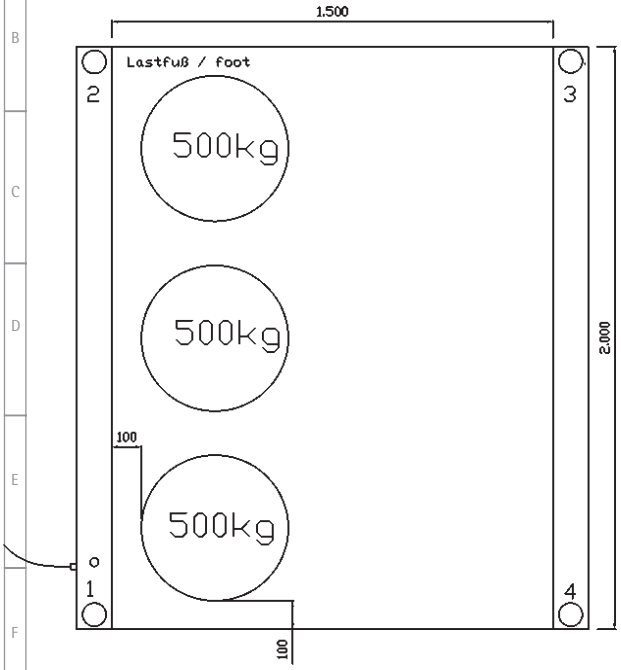
Replaces Ers. f.

Replaced by Ers. d.

sartorius







Test with M3 roll weights;
D = 500 mm

Position weights max. 100 mm from edge of platform

Repeat the test, reversed left to right.

Version	Changes Änd.	Date Datum	Name

Drawn by Bearbeiter
Checked by Geprüft
Approved by Freigabe

Part Name/Benennung
IF_ 3000WR-V3 (45 mm)
Side-loading Test

Scale/Maßstab

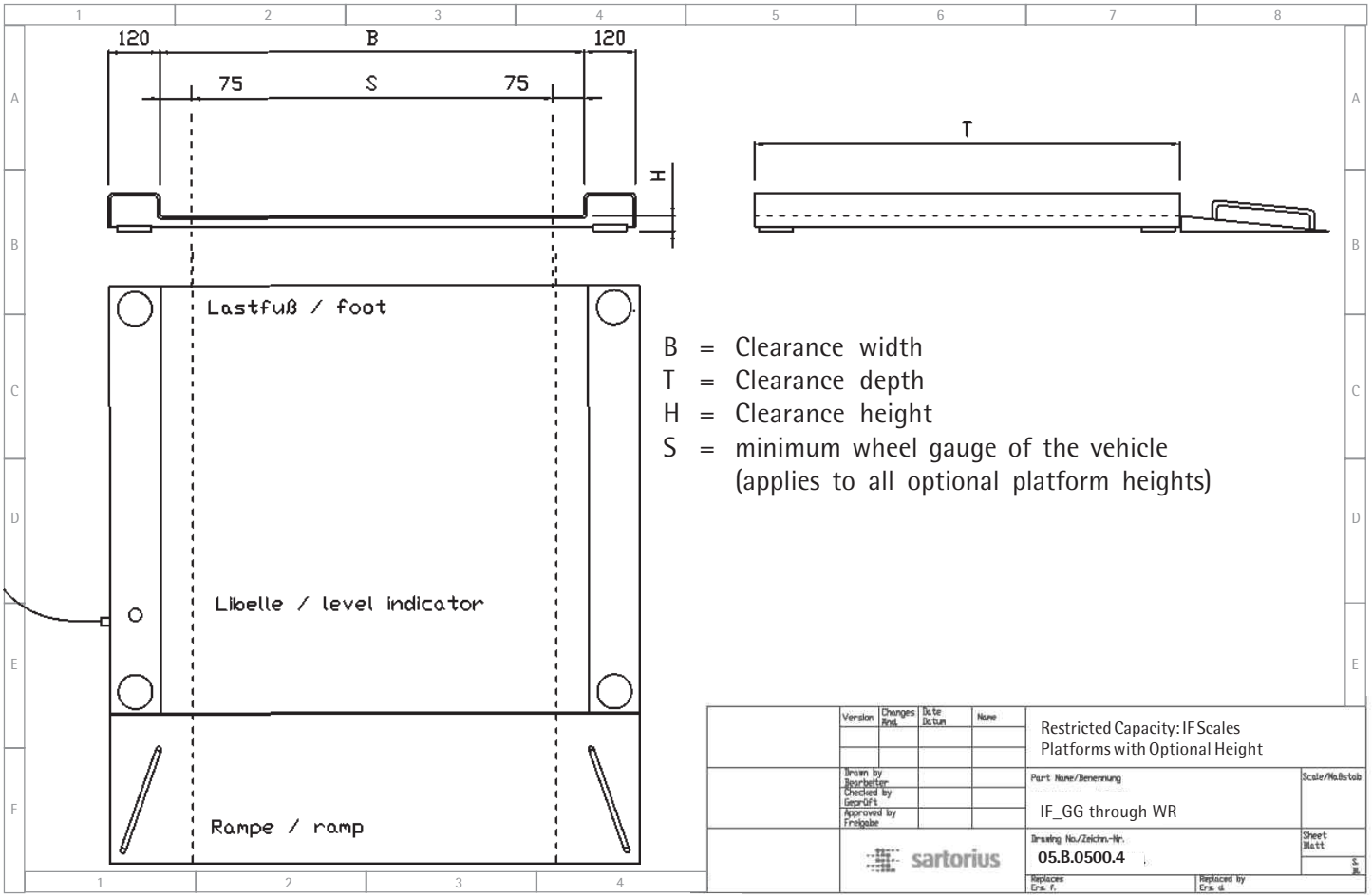
Drawing No./Zeichn.-Nr.
98100-037-88-A4

Sheet Blatt

Replaces Ers. f.

Replaced by Ers. d.

sartorius



B = Clearance width
T = Clearance depth
H = Clearance height
S = minimum wheel gauge of the vehicle
(applies to all optional platform heights)

Version	Changes Änd.	Date Datum	Name	Restricted Capacity: IF Scales Platforms with Optional Height	
Drawn by Bearbeiter				Part Name/Benennung	Scale/Maßstab
Checked by Geprüft				IF_GG through WR	
Approved by Freigabe					
sartorius				Drawing No./Zeichn.-Nr. 05.B.0500.4	Sheet Blatt 1
				Replaces Ers. f.	Replaced by Ers. d.

Determining the Resistance for Adjustment of the Off-center Load

Determining Resistance Values

- Place the test weight on each load cell in turn and write down each displayed value.
- Using the lowest displayed value as the basis, calculated the resistance values for the other load cells in accordance with the following equation:

Equation:

$R = R(0) \times G(D) / G(T)$

R = required resistance (in ohms)

R(0) = Initial resistance in the load cell being adjusted (in ohms), (if not specified in the specification sheed) measured between Signal + (OUT_POS, positive measuring voltage) and Signal - (OUT_NEG, negative measuring voltage).

G(D) = Difference between lowest off-center loading error (from reference load cell) and the off-center load value displayed for the weigh cell (in kg).

G(T) = Test weight applied (in kg)

- Solder the required resistor into the bridge of the load cell being adjusted.
- Then perform calibration/adjustment again.

Sample Calculation Based on Table

Initial resistance in the load cell: 1000 ohms.

- Test weight: 500 kg
- Readout for reference load cell = 498,8 kg (load cell with the lowest readout value).
- Readout for load cell being adjusted = 501,1 kg
- **G**(D) = 2,3 kg

$$R = \frac{R_{(0)} \times G_{(D)}}{G_{(T)}}$$

$$R = \frac{1000 \text{ ohms} \times 2{,}3 \text{ kg}}{500 \text{ kg}}$$

$$R = 4.6 \text{ ohms}$$

In this example, note that the test weight (500 kg) is also distributed over the other load cells, which means that the weight on the load cell being tested is somewhat lighter. To compensate for this effect, always use the next higher resistor value.

R = 4.7 ohms (resistor to be installed see page 36)

Resistors available in the E24 series (+/- 5%):

Part no.	
57004 - 433 - 01	**0.39 ohms**
57004 - 434 - 01	**0.82 ohms**
57004 - 435 - 01	**1.20 ohms**
57004 - 436 - 01	**1.60 ohms**
57004 - 437 - 01	**2.00 ohms**
57004 - 438 - 01	**2.70 ohms**
57004 - 439 - 01	**3.00 ohms**
57004 - 440 - 01	**3.30 ohms**
57004 - 441 - 01	**3.90 ohms**
57004 - 442 - 01	**4.70 ohms**
57004 - 443 - 01	**5.60 ohms**

A set of the resistors listed here (containing 3 of each type) can be ordered under part no. 69CW0106.

Note: On stainless steel models, the IP67 protection must be checked after closing the junction box.

Table

Selecting the Adjustment Resistor

Adjusting Off-center Load with 1000 Ohm Initial Resistance

Adjustment resistor (in ohm)	Test weight 50kg	Test weight 100kg	Test weight 200kg	Test weight 500kg	Test weight 1000kg
	Off-center (in kg)				
0	0,00 - 0,02	0,00 - 0,05	0,0 - 0,1	0,0 - 0,1	0,0 - 0,3
0,39	0,02 - 0,04	0,05 - 0,07	0,1 - 0,1	0,1 - 0,4	0,3 - 0,7
0,82	0,04 - 0,06	0,08 - 0,11	0,1 - 0,2	0,4 - 0,5	0,8 - 1,1
1,2	0,06 - 0,07	0,12 - 0,15	0,2 - 0,3	0,6 - 0,8	1,2 - 1,5
1,6	0,08 - 0,09	0,16 - 0,19	0,3 - 0,4	0,8 - 1,0	1,6 - 1,9
2	0,1 - 0,13	0,20 - 0,26	0,4 - 0,5	1,0 - 1,3	2,0 - 2,6
2,7	0,13 - 0,14	0,27 - 0,29	0,5 - 0,6	1,3 - 1,5	2,7 - 2,9
3	0,15 - 0,16	0,30 - 0,32	0,6 - 0,7	1,5 - 1,6	3,0 - 3,2
3,3	0,16 - 0,19	0,33 - 0,38	0,7 - 0,8	1,6 - 1,9	3,3 - 3,8
3,9	0,19 - 0,23	0,39 - 0,46	0,8 - 0,9	1,9 - 2,3	3,9 - 4,6
4,7	0,23 - 0,27	0,47 - 0,55	0,9 - 1,1	2,3 - 2,7	4,7 - 5,5
5,6	0,20 - 0,33	0,56 - 0,66	1,1 - 1,3	2,8 - 3,1	5,6 - 6,6

Caution! It is calculated values (details values)

Sartorius AG

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E-mail: Int.Service@Sartorius.com

The status of the information, specifications and
illustrations in this manual is indicated by the date
given below. Sartorius AG reserves the right to
make changes to the technology, features,
specifications and design of the equipment
without notice.

Status: March 2006 Sartorius AG, Goettingen, Germany

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Test Procedure for Sartorius Flat-bed Scales

1. Purpose and | or Objective

To create a uniform procedure for performing measurements on Sartorius flat-bed scales.

2. Scope of Validity

Sartorius AG and their authorized representative for EC verification;
Sartorius Group, and employees of associated companies who are authorized by the Metrology Center of Sartorius AG.

3. Responsibilities

Service, Industrial Engineering (ICE), Metrology Center of the Mechatronics Division (MMZ)

4. Description

4.1 Validity

This TOP is valid for verifiable load receptors from Sartorius with the following model designations:

- IFP4.....-...-xCE
- IFS4..-...-xCE
- IFXS4...-xCE

Connected to an indicator all load receptors can be figured as single range (-LCE) or dual range scales (-NCE).

Test Procedure for Sartorius Flat-bed Scales

4.2 Special Features of Flat-bed Scales

If a load receptor or scale in the IF series of flat-bed scales from Sartorius that has large dimensions is used to weigh heavy loads, deflection may cause the middle of the platform to ground, which will distort the results of measurement. For this reason, some restrictions on the use of this equipment must be defined. Ideally these restrictions should be listed on an adhesive label that is affixed to the load receptor itself. It is sufficient, however, to include the restrictions at appropriate positions in the product literature (e.g., instructions manuals and texts for offers).

4.3 Restrictions on Use

To prevent the platform from bearing on the ground and rule out the concomitant distortion of results, the minimum permitted wheel gauge of the vehicle is equal to the clearance width minus 150 mm; i.e., force transmission must not take place more than 75 mm from the edge of clearance width (Fig. 1).

4.4 Performing Test Measurements

There are two test procedures which prevent the platform of the flat-bed scale from bearing on the weighing system:

a) Position all weights along the outside edge of the clearance width. In this case, the diameter of the weights must not exceed 500 mm (Fig. 2).

b) Place the load on an intermediate platform which is supported on spacers to distribute the load to the outer edges (Fig. 3).

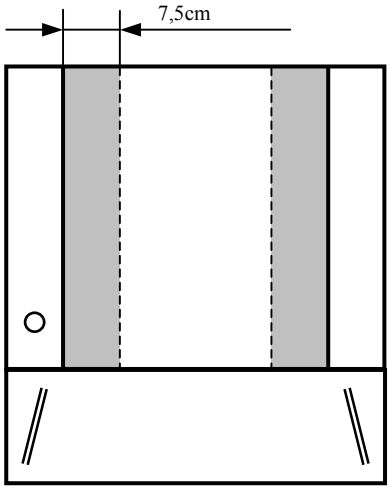

Figure 1

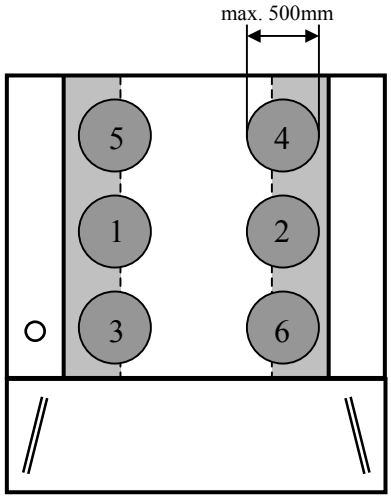

Figure 2

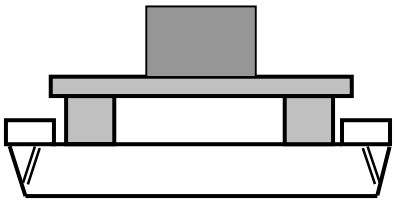

Figure 3

Test Procedure for Sartorius Flat-bed Scales

4.5 Verification of Flat-bed Scales

Observe the following when performing initial verification on flat-bed scales:

a) Verification should be performed only at the place of use, because the characteristic for a flat-bed scale depends to a great extent on the installation.
b) Ideally, the scale should be adjusted with a load equaling 2/3 of the max. cap.
c) Make absolutely sure the place of installation allows sufficient floor clearance.

5. Results

Repeatability of results of measurement; compliance with the device parameters defined in the specifications.

6. Measurands | Measurable Variables and Characteristic Values

None

7. Documentation and Documents Applicable to This Operating Procedure

The Update Service for this Operating Procedure is in the scope of Organization and in the Metrology Center of the Mechatronics Division (MMZ) of SAG.
The original of this TOP is in Organization Department at Sartorius AG.
This TOP will be distributed on the Intranet within the scope of validity stated under Item 2 and in accordance with Standard Operating Procedure ZAV-001.
These instructions may be incorporated in ISSS and SSS-M.