Service Manual

Sartorius Midrics Series

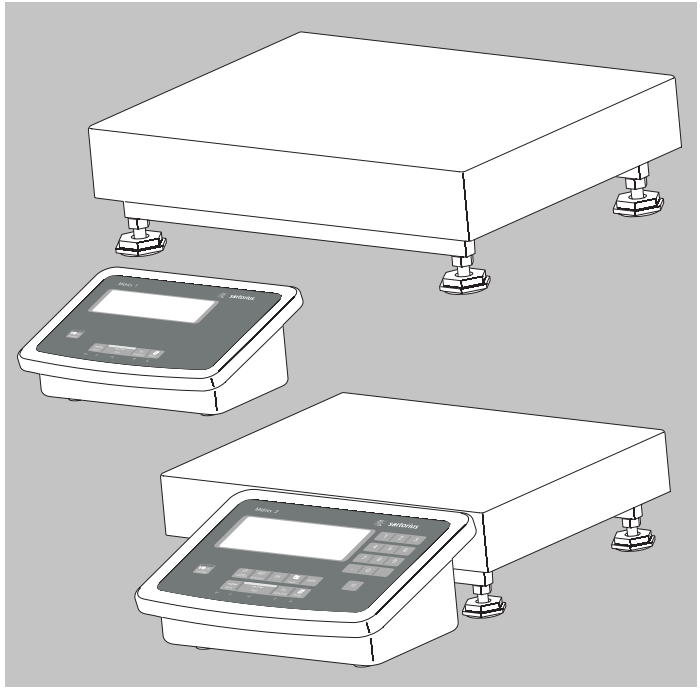
Models MW1P | MW2P | MW1S | MW2S
for Complete Midrics Scales

Models MIS1 | MIS2
for Midrics Indicators

and

Models MAPP1 | MAPS1
MAPP4 | MAPS4
for Midrics Weighing Platforms

including Service Specifications



WMI5005-e07113

Contents

General Information

Service Concept

Prerequisites for performing maintenance and repair work on Sartorius Midrics scales requires considerable experience with both indicators and weighing platforms. In case of defects, repairs are performed on site. Generally, the equipment is not replaced.

- Do not connect or disconnect cables to or from the equipment; always disconnect the power cable from the wall socket (mains supply) first!

Information

- To ensure safety, an isolating transformer must be installed between the indicator and the power supply before performing work that entails opening the Midrics indicator housing.

On complete Midrics scales, check and adjust as necessary:

- Repeatability (standard deviation)
- Off-center load
- Span
- Linearity

(The procedure is the same as for all scale and weighing platform models.)

Overview of the Models

The hardware configuration consists of either a Midrics 1 or 2 indicator and Sartorius weighing platform(s), or a Midrics 1 or 2 indicator and weighing platform(s) (strain-gauge load cells) from another manufacturer.

Important:

Mechanical and electrical service or repair work on the complete Midrics scale requires considerable experience, and for this reason should be performed only by Sartorius technicians trained at the factory. Any attempt to perform repair work can result in damage to the equipment.

Auxiliary Service Tools and Equipment

In addition to standard tools, you will need the following special tools to work on the complete Midrics scale:

Qty.	Designation
1	Isolating transformer
1	Flintec LCT-01 load cell tester
1	Socket wrench, double hexagon, 10-32 mm, square driver (1/2")
1	Torque wrench, 10-120 Nm 14x18, stainless steel

Qty.	Designation
1	Torque wrench, 60-320 Nm 14x18, stainless steel
1	Set of open-ended wrenches with sockets
1	Set of sockets, up to 30 mm (hexagonal, stainless steel)
2	Transport belt (to move load plates or weighing platforms; available from specialist suppliers)
2	Ring lugs (stainless steel; for moving the load plates or weighing platforms; available from specialist suppliers)
1	Set open-ended wrenches (spanners) (up to 24 mm, stainless steel)
1	Threaded rod, M 16x120, for lifting the weighing platform (available from specialist supplier)
1	Set of screwdrivers (slotted)
1	Set of screwdrivers (Phillips head)
1	Set of Allen wrenches
1	Strain gauge simulator

Accompanying Literature

Operating instructions for Complete Midrics 1 | 2 Scales	WMW6004-e06101	98648-014-94
Operating instructions for Midrics 1 | 2 Indicators	WMI6001-e06101	98648-014-89
Operating instructions for Painted or Stainless Steel Weighing Platforms	WMA6037-e06101	98648-015-33

The complete Midrics scales from Sartorius are primarily used in industry. Because there are a number of hardware configurations to choose from, Midrics models are constructed according to customer requirements.

The complete Midrics scale consists of:

– A choice of weighing platforms with capacities from 3 kg to 3000 kg (in stainless steel or steel) and indicators

The Midrics 1 / 2 indicators consist of:

– Front panel with keypad and digital display (Midrics 2 has additional keys)

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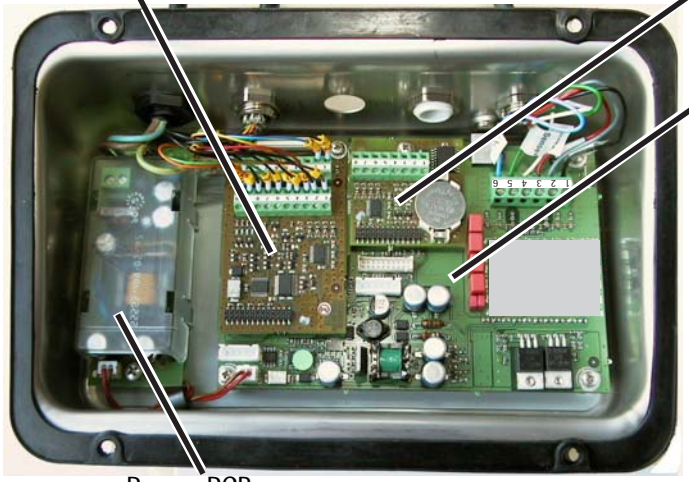
– Midrics indicators are equipped with either cable glands or D-Sub 25 connectors.

UniCOM ports in several variants*



COM1 interface in 2 versions*

Main PCB with H8S processor, analog/ digital converter and DC/DC converter

* Optional

Power PCB

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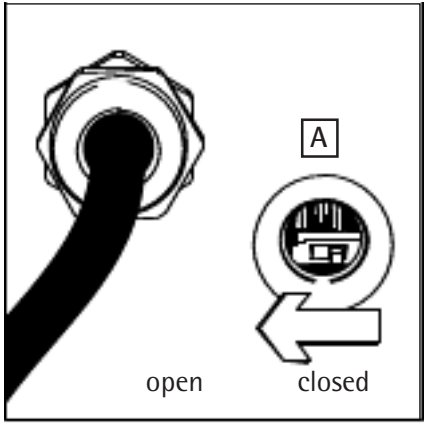
Note: Additional electronic subassemblies are optional.

Function of the Switches



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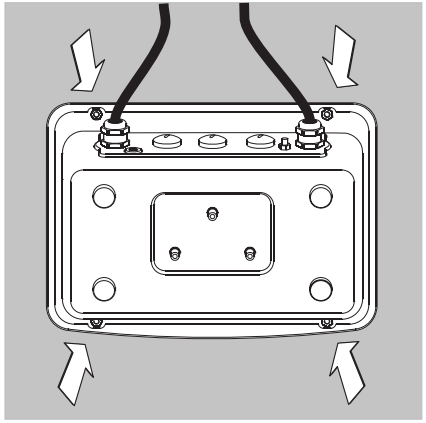
This switch must be open to work with the service software or to configure the A/D converter (e. g., "Trade" configuration). If the menu access switch is closed, the error message "ACCESS SWITCH LOCKED" is displayed in the service program and the indicator shows "L" (underload) or "H" (overload). In this case, the A/D converter cannot be configured. If adjustment is necessary (span, linearity), the "± 2%" window is active.



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Indicator

Important:

An isolating transformer must be installed between the indicator and mains before performing work that entails opening the Midrics indicator housing.

To open the Midrics indicator, remove the four nuts as shown in the illustration on the left.

After completing maintenance or repair work, check the seal between the front panel and the housing body for damage and replace if necessary. If the Midrics indicator in question has an IP65 protection rating, a special test procedure is used to check the IP65 protection after the housing has been closed.

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Replacing the Front Panel

In the case of a defective key, keypad overlay, or display, the entire front panel must be replaced.

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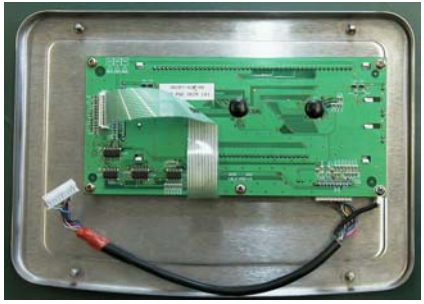

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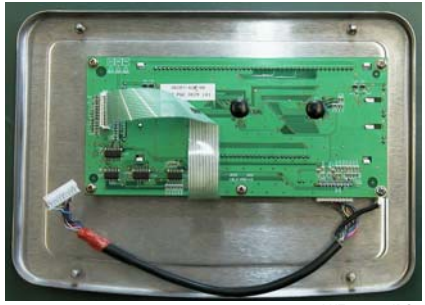
There are two front panel variants, Midrics 1 and Midrics 2. The only difference between the two is the range of operating keys.



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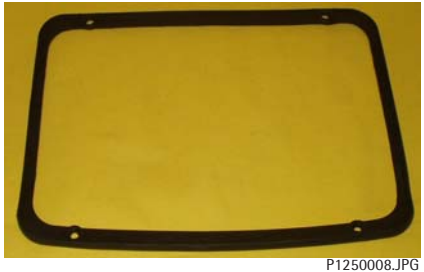

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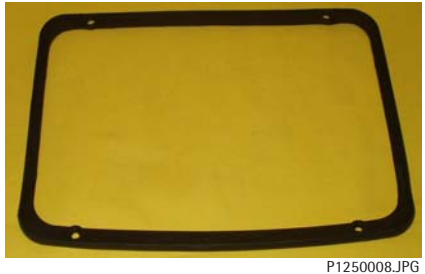
If the indicator housing seal is defective, it must be replaced. When installing a new seal, make sure it rests entirely within the housing and is not caught between the upper and lower housing parts when you close the indicator.



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Blank Display

If the display is blank (dark), disconnect the equipment from mains, open the housing and disconnect all cables and wires from the subassemblies.
Then connect the equipment to power again through an isolating transformer and connect all subassemblies again, measuring the supply voltage in each case.

- The voltage at the power supply output (connector A; see page 12) is 15V ± 0.3 V direct current.
- The output voltages of the DC/DC converter are listed on page 13.

Replacing the Power Cable

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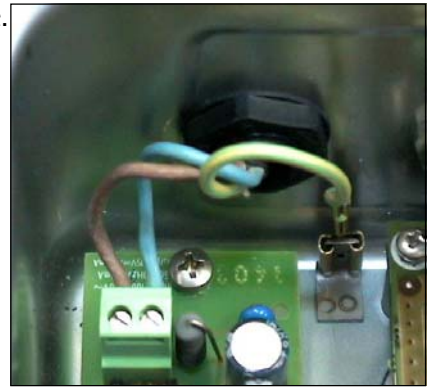
- Disconnect the cable from the power source.
- Open the housing.
- Replace the cable

After replacing the power cable, use a torque wrench to tighten the cable gland to **3 Nm**.



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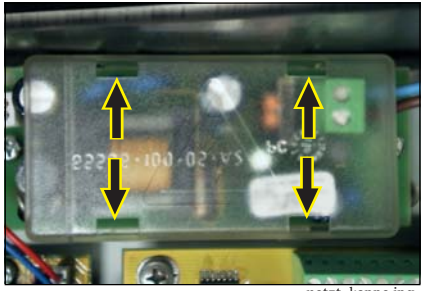
Replacing the Power PCB



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- Disconnect the cable from the power source.

- Pry the protective cap from the power PCB.
  To do this, insert the end of a slotted-head screwdriver into each of the four openings on the protective cap and carefully push the retainer clips, located further down, to one side.

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- Remove the protective cap and disconnect the two wires (blue/brown).

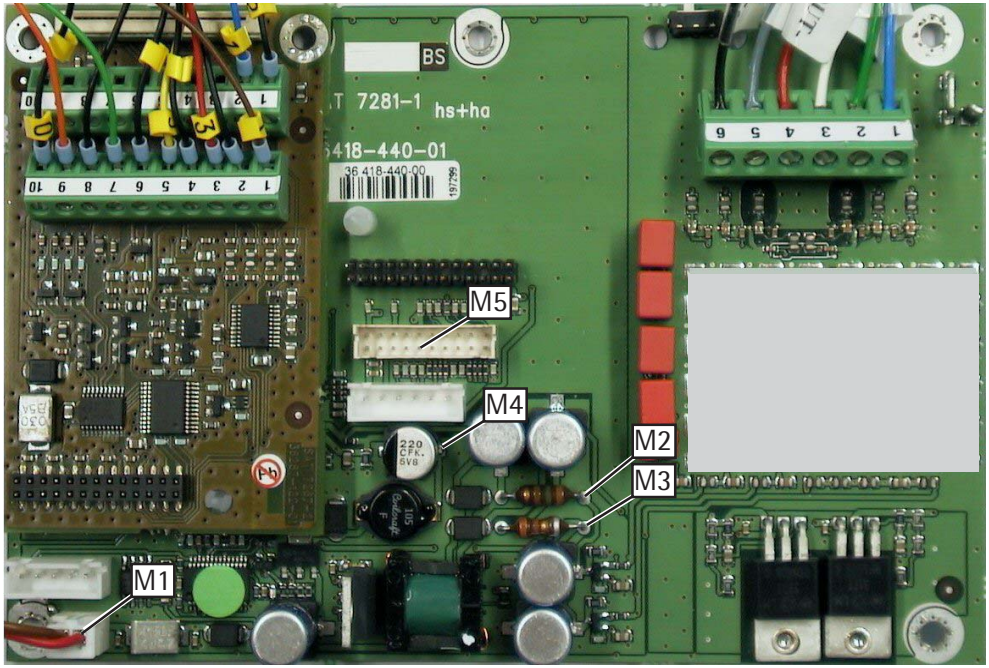
- Unplug connector A, remove the 2 screws and replace the power supply. After replaceing the PCB, make sure to return the protective cap to its original position.

Points of Measurement

Note:

Use a digital voltmeter (DC setting) to measure voltages against ground (earth). No particular points of measurement are defined for this procedure; for this reason, use a thin test pin and exercise extreme caution to avoid short-circuiting the equipment.

The various supply voltages delivered by the DC/DC converter can be measured at the following points.



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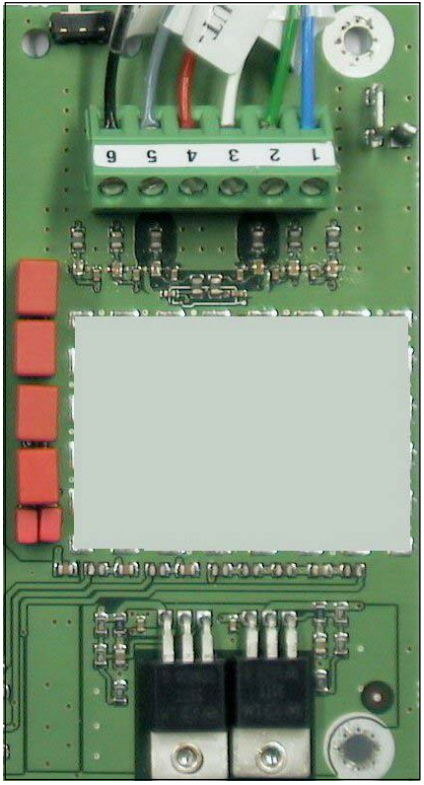
M 1:	15 V	±	5%	Input voltage for the DC/DC converter.
M 2:	–9.2 V	±	5%	Supply voltage for the A/D converter
M 3:	+9.2 V	±	5%	Supply voltage for the A/D converter
M 4:	5 V	±	5%	Supply voltage for the digital PCB
M 5:	3.3 V	±	5%	Supply voltage

Replacing the Main PCB

- Before replacing the main PCB, try to read out the data from the main PCB controller using the service software; if this is successful, you can load the adjustment data in the controller of the new main PCB once it is installed. In many cases, this precludes the need to adjust the weighing system.



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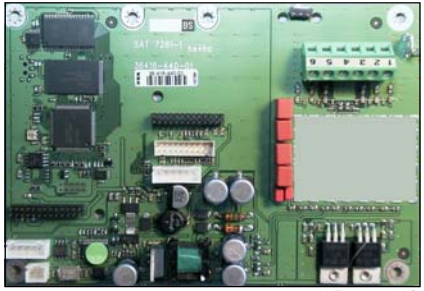
Quick-test of the A/D Converter

Pin Assignment Chart

No.	Signal designation	Meaning	Voltage
1	BR_POS	Bridge supply voltage (+)	4.5V ± 0.18V
2	SENSE_POS	Sense (+) Bridge supply voltage	
3	OUT_POS	Measuring voltage positive	
4	OUT_NEG	Measuring voltage negative	
5	SENSE_NEG	Sense (-) Bridge supply voltage	
6	BR_NEG	Bridge supply voltage (-)	−4.5V ± 0.23V

Main PCB



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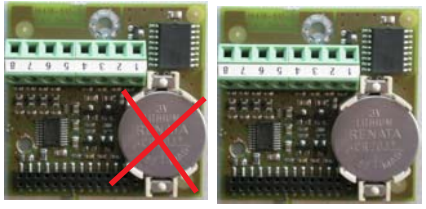
YDO01M-232
without clock chip

YDO01M-232CLK
with clock chip



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1. Connect the strain-gauge simulator and turn the switch to simulate different input signals. The weight readout should be stable.

Replacing the Main PCB

Note: If communcation problems occur during communication with connected devices (such as a printer), check the cable connections and the data transfer parameters first; if the error source is not found, start the internal test program.

- Switch off the indicator.
- Press and hold the Fn key while switching the indicator on again. All segments are displayed.
- In case of defect, replace the main PCB.
- After replacing the main PCB, use the **PpLoadWH8.exe** program to load the software.

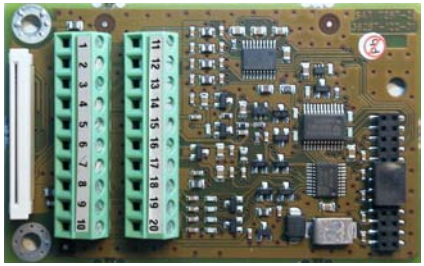
Note: To load the software, COM PCB model YDO01M-232 or YDO01M-232CLK is required.

Following installation and commissioning of the new main PCB, the display backlighting should blink on and off.

Terminal Assignments in Midrics Indicators

	COM1 with Variant:			UniCOM with Option:		
Pin	Standard data output YDO01M-232	Data output Clock YDO01M-232CLK	RS232 YDO01M-232CO	RS485 YDO01M-485	4-20mA YDO01M-20MA	Digital I/0 YDO01M-IO
1	LOAD_PRINTER	LOAD_PRINTER	CTS	TXD+	I_out (+)	OUT5_LOW
2	RESET_OUT	RESET_OUT	DTR	TXD-	I_in (-)	OUT5_HIGH
3	5V_OUT	5V_OUT	RXD	RXD+	V_out (+)	OUT4_LOW
4	GND	GND	TXD	RXD-	V_in (-)	OUT4_HIGH
5	CTS	CTS	GND	GND elec. isol.	GND elec. isol.	OUT3_LOW
6	DTR	DTR	Universal In	GND elec. isol.	GND elec. isol.	OUT3_HIGH
7	RXD	RXD	MINOR (<)			OUT2_LOW
8	TXD	TXD	PARES (=)			OUT2_HIGH
9			MAJOR (>)			OUT1_LOW
10			SET			OUT1_HIGH
11			LOAD_PRINTER	LINE_OUT *		IN5_LOW
12			RESET_OUT	LINE_OUT *		IN5_HIGH
13			GND	GND *		IN4_LOW
14			GND	GND *		IN4_HIGH
15			5V_OUT			IN3_ LOW
16			5V switched			IN3_HIGH
17			GND			IN2_ LOW
18			GND			IN2_HIGH
19			n.c.			IN1_ LOW
20			LINE_OUT			IN1_HIGH

* not electrically isolated



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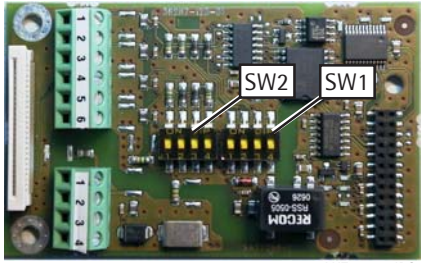

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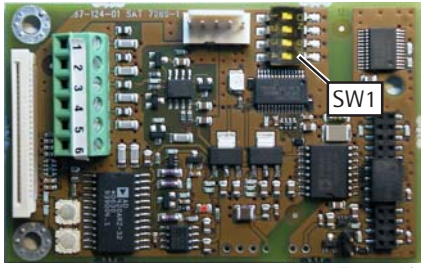

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Interface Description

RS-232 Interface

- For RS-232 interface pin assignments, see page 16.

RS-485 Interface

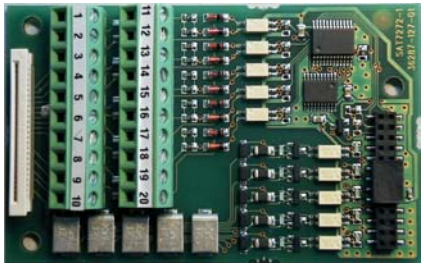
- For RS-485 interface pin assignments, see page 16.

Switch	Function when switch closed
SW1-1	Terminating resistor, transmitting 120 Ω
SW1-2	Bias resistor, , transmitting side (TxD+, pull-up) 680 Ω
SW1-3	Bias resistor, , transmitting side (TxD-, pull-down) 680 Ω
SW1-4	RS-422 mode (open: RS-485 mode)
SW2-1	Terminating resistor, receiving side 120 Ω
SW2-2	Bias resistor, receiving side (RxD+, pull-up) 680 Ω
SW2-3	Bias resistor, receiving side(RXD-, pull-down) 680 Ω
SW2-4	Not used

Analog Interface

- For analog interface pin assignments, see page 16.

Switch		Function
SW1-1	SW1-2	
open	open	4-20mA
closed	open	0-10V
open	closed	0-20mA
closed	closed	0-24mA
SW1-3	For future applications	
SW1-4	For future applications	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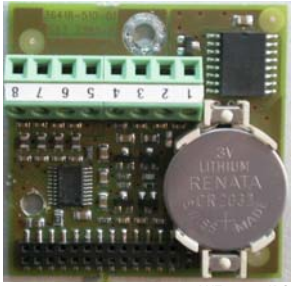
Digital I/O Interface

- For digital I/O interface pin assignments, see page 16.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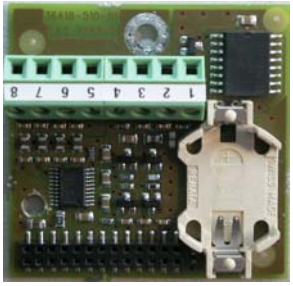
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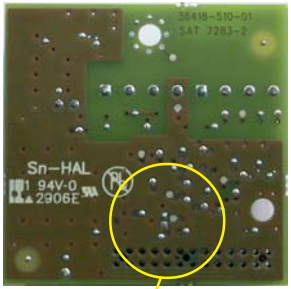
COM1 Interface With and Without Clock Chip

- For COM1 variant pin assignments, see page 16.

- The COM1 interface is required for loading software.
- To enable loading of software, a solder bridge must be closed on the back of the COM1 interface (see illustration on the right).

Note: Before commissioning the COM ports, the PCBs (and any required DIP switches) must be checked for correct installation and settings.



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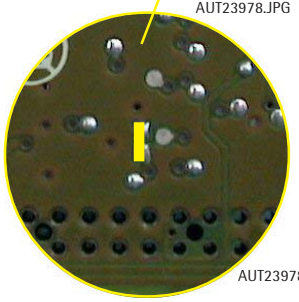
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Adjusting the Weighing Platform

Version with the junction box (5)
Part no. 57004-428-01
The illustration on the left shows
GF frame 650x500

1. Load cell 1
2. Load cell 2
3. Load cell 3
4. Load cell 4
5. Junction box

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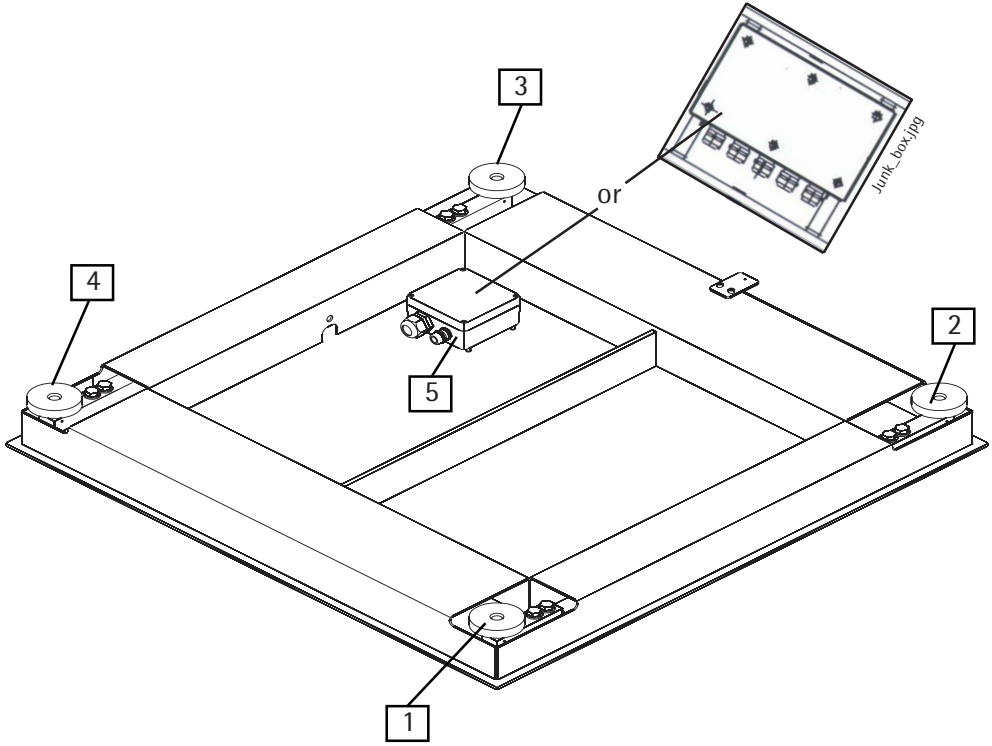
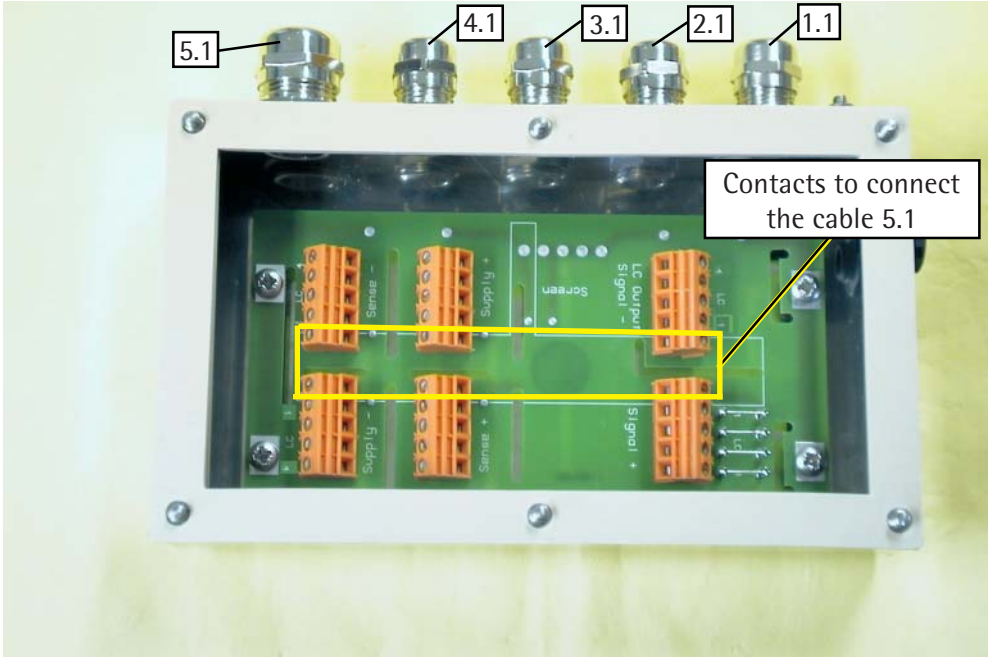


Junction Box 1

Junction box; open.

1.1 Cable to load cell 1
2.1 Cable to load cell 2
3.1 Cable to load cell 3
4.1 Cable to load cell 4
5.1 Connecting cable for A/D converter / indicator



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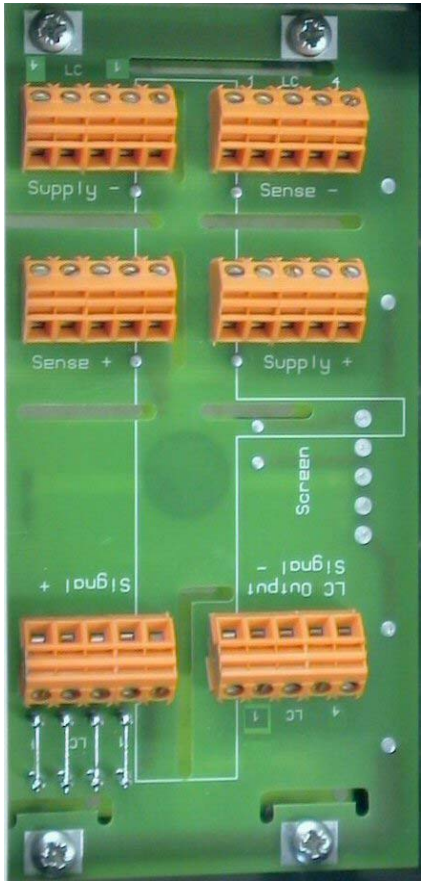

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Pin Assignments in the Junction Box 1

Color Coding

Connecting cable 5.1 from the junction box (terminals) to the A/D converter/ indicator.
See page 33 for the colors of the wires; the casing is gray and black.

Function:	Terminal:
Shield	*
BBR_POS (Bridge supply voltage +)	Supply +
BR_NEG (Bridge supply voltage -)	Supply -
SENSE_POS (Sense +)	Sense +
SENSE_NEG (Sense -)	Sense -
OUT_POS (Measuring voltage positive)	Signal +
OUT_NEG (Measuring voltage negative)	Signal -

* The shield is connected to the housing by means of the cable gland (see page 29).

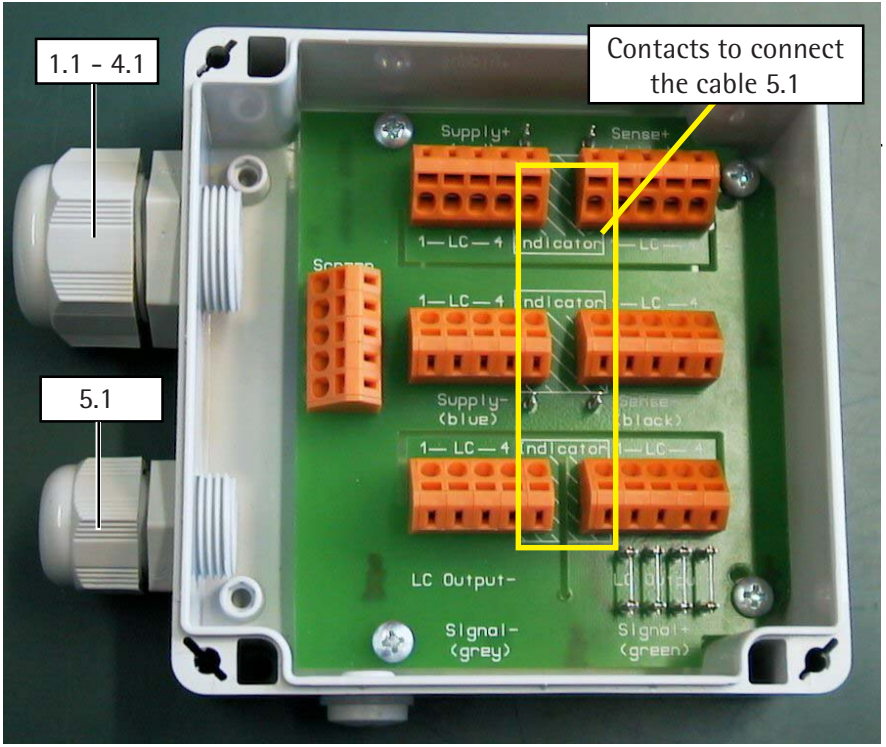
To connect the cable, the wires must be connected to the inner terminals (marked in the illustration on page 19).

Note: The color coding of the connecting cable (A/D converter / indicator to junction box) might be different when connecting a non-Sartorius platform to the Midrics indicator.

Junction Box 2

Junction box; open.

1.1 Cable to load cell 1
2.1 Cable to load cell 2
3.1 Cable to load cell 3
4.1 Cable to load cell 4
5.1 Connecting cable for A/D converter / indicator



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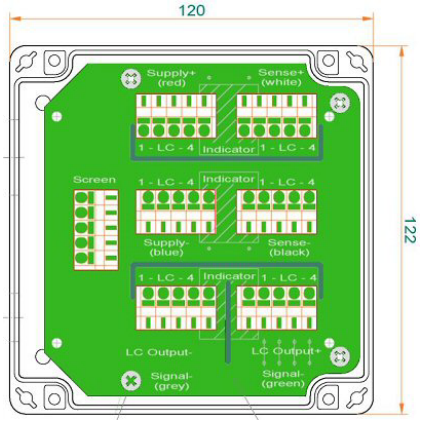

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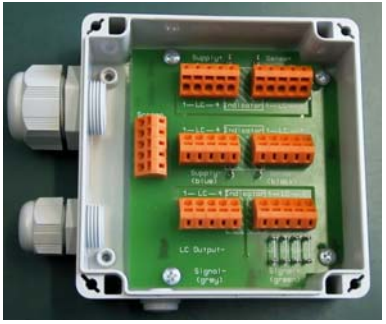

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Cable from the Load Cell to the Junction Box 2 (Terminals)

Color Coding

See page 33 for the colors of the wires; the casing is gray or black.

Function:	Terminal:
Screen (Shield)	
BBR_POS (Bridge supply voltage +)	Supply +
BR_NEG (Bridge supply voltage -)	Supply -
SENSE_POS (Sense +)	Sense +
SENSE_NEG (Sense -)	Sense -
OUT_POS (Measuring voltage positive)	Signal +
OUT_NEG (Measuring voltage negative)	Signal -
OUT_POS (Measuring voltage positive)	Signal +

To connect the cable, the wires must be connected to the inner terminals (marked in the illustration on page 20/22).

Note: The color coding of the connecting cable (A/D converter / indicator to junction box) might be different when connecting a non-Sartorius platform to the Midrics indicator.

Cable from the Load Cell to the Junction Box (Terminals).

See below for the colors of the wires; the casing is gray.

AUT24000.JPG

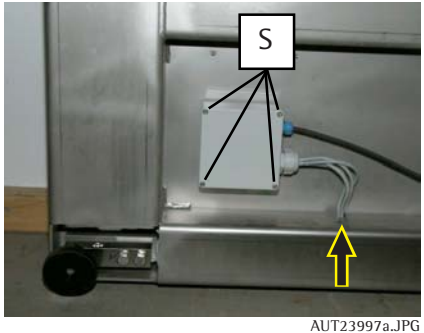
Colors:		Function:	Terminal:
Ye (yellow)	=	Shield	
Bl (blue)	=	BR_POS (Bridge supply voltage +)	Supply +
Blk (black)	=	BR_NEG (Bridge supply voltage -)	Supply -
Gn (green)	=	SENSE_POS (Sense +)	Sense +
Gr (gray)	=	SENSE_NEG (Sense -)	Sense -
Rd (red)	=	OUT_NEG (Measuring voltage negative)	Signal -
Wh (white)	=	OUT_POS (Measuring voltage positive)	Signal +

The terminal strip designations and the order of the terminals (1 - 4) are marked on the PCB.
The sequence of the pin assignments of the terminals (1 - 4) should run from the outside to the inside.

Procedure for Off-center Load Adjustment

Proceed as follows to adjust the off-center load using the junction box:

AUT23995b.JPG



AUT23997a.JPG

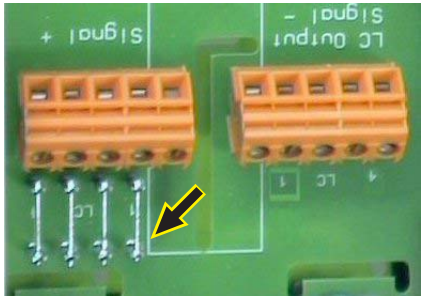
- Stand the weighing platform (with 4 load cells) on its side and secure it in this position.
- Remove the four screws (S) from the junction box.
- Pull approximately 20 to 30 cm of the load cell cables out of the platform (see arrow).
- Return the weighing platform to the horizontal and position it next to the junction box.
- The junction box is now accessible for adjustment of the resistors.
- At the conclusion of off-center load adjustment, follow the instructions above in reverse order to reassemble the weighing platform.

Important:

Make sure to push the cables back into the weighing platform.

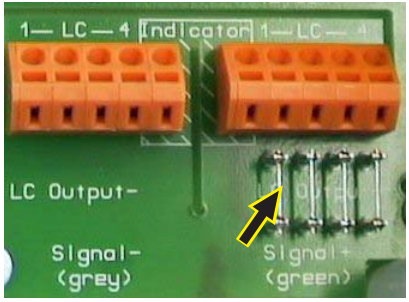
Adjusting the Off-center Load

Junction Box 1



Aut15158c.jpg

Junction Box 2



AUT23982b.JPG

If the weighing platform has only 1 load cell, the off-center load is not adjusted in case of error. The load cell must be replaced.

The off-center load is adjusted only in weighing platforms that have 4 load cells. Mechanical asymmetries can result in off-center loading errors that exceed permissible tolerance limits. Such errors must be compensated by soldering resistors to the PCB in the junction box.

The 4 solder bridges for the resistors are short-circuited at the factory (see the illustration on the left; note the 4 solder bridges and the sequence of the load cells).

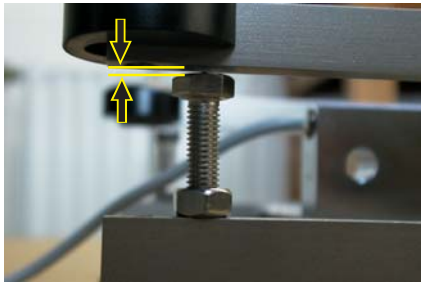
Note: The off-center load is adjusted only in weighing platforms that have 4 load cells.
Mechanical asymmetries can result in off-center loading errors that exceed permissible tolerance limits. Such errors must be compensated by soldering resistors to the PCB in the junction box.

The 4 solder bridges for the resistors are short-circuited at the factory (see the illustration on the left; note the 4 solder bridges and the sequence of the load cells).

To minimize the off-center loading error, use the load cell with the lowest readout value as a reference. Then adjust the other load cells to this value by adding resistors.

Setting the Overload Stops

1. Weighing Platforms with One Load Cell: Steel



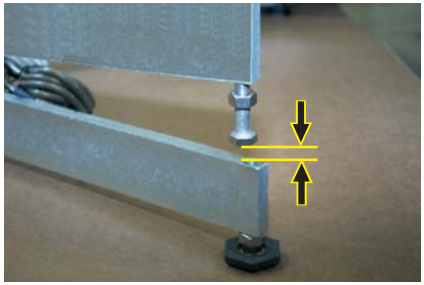
AUT24013.JPG

Platform nominal capacity in kg	Test weight for middle stops in kg	Test weight for corner stops in kg
3	–	3 + 10%
6	–	6 + 10%
15	–	15 + 10%
30	–	30 + 10%
60	–	60 + 10%
150	–	150 + 10%
300	–	300 + 10%

2. Weighing Platforms with Four Load Cells: Steel

AUT24003a.JPG

Platform nominal capacity in kg	Test weight for middle stops in kg	Test weight for capacity in corner stop in kg	Nominal load cell measurement path in mm (in kg)
150	–	–	0.4 (MP58T-91kg)
300	–	–	0.4 (MP58T-227kg)
600	–	–	0.6 (MP58T-454kg)
1500	–	–	0.6 (MP58T-1134kg)
3000	–	–	1.0 (MP58T-2268kg)



AUT23706.JPG

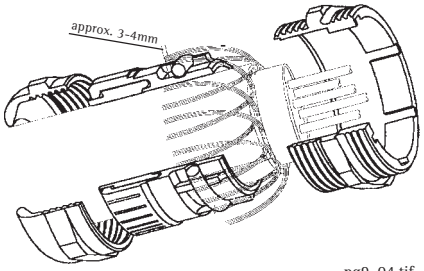
3. Weighing Platforms with One Load Cell: Stainless Steel

Platform nominal capacity in kg	Test weight for middle stops in kg	Test weight for corner stops in kg
3	–	3 + 10%
6	–	6 + 10%
15	–	15 + 10%
30	–	30 + 10%
60	–	60 + 10%
150	–	150 + 10%

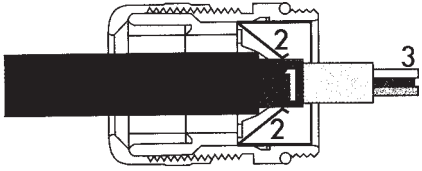
AUT24003a.JPG

4. Weighing Platforms with Four Load Cells: Stainless Steel

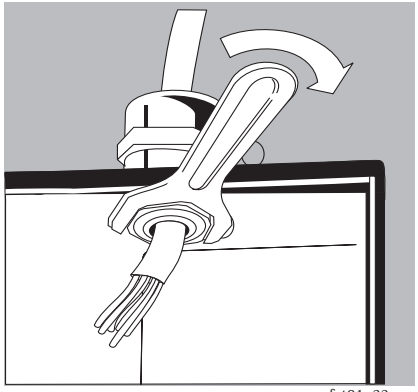
Platform nominal capacity in kg	Test weight for middle stops in kg	Test weight for capacity in corner stop in kg	Nominal load cell measurement path mm (in kg)
150	–	–	0.4 (MP58T-91kg)
300	–	–	0.4 (MP58T-227kg)
600	–	–	0.6 (MP58T-454kg)
1500	–	–	0.6 (MP58T-1134kg)
3000	–	–	1.0 (MP58T-2268kg)



pg9_04.tif



pg9_01.tif



fct01_23.eps

Replacing the Connecting Cable

If the connecting cable (from junction box to Midrics indicator) needs to be replaced on a weighing platform with four load cells, or if the load cell needs to be replaced on a platform with only one load cell , open the Midrics indicator and disconnect the cable from the terminal strip of the A/D converter.
Unscrew the cable gland; the cable or load cell can now be replaced.

Remove the isolation and connect the new cable:

- Expose approx. 6 cm (2.4 in.) of the wires (3) in the cable.
- Remove the isolation from approx. 1 cm (0.5 in.) of the wires and affix ferrules to the wire ends.
- Thread the cable through the cable gland.
- The shielding (1) must have contact with the clamps (2). Connection to ground via the shield.

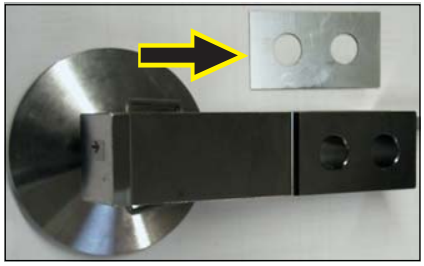
- After replacing the cable or load cell, use a torque wrench to tighten the cable gland to 5 Nm.

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

Replacing Load Cells

AUT23998JPG

AUT23999a.JPG / 6740-81a.jpg



lastz_1.jpg

If an off-center load error is detected (platforms with one load cell), or if the output signal from the load cell is too high or too low (InF 02 is displayed during span adjustment), replace the load cell.

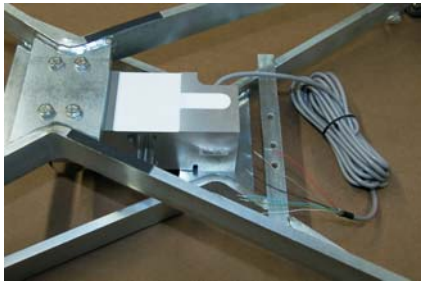
Because the mechanical construction of the platforms is basically uncomplicated, no detailed description of the disassembly procedure is included here.

Important:

To replace a load cell in a platform with four load cells, use two eye bolts (6740-81) in two corners and then lift the weighing platform. Remove the plastic caps from the bore holes before inserting the eye bolts.

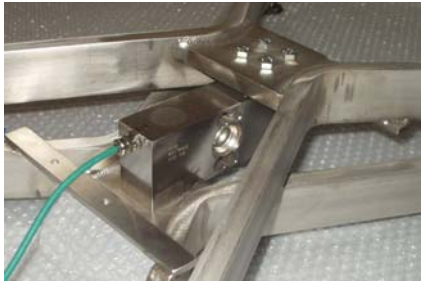
The eye bolts can be ordered under spare part number 6740-81.

- When reassembling the weighing platform, make sure to replace any plates that were under the platform frame.



AUT23705.JPG

AUT24012.JPG



P2020003.JPG

– Tighten the load cells with the required torque.

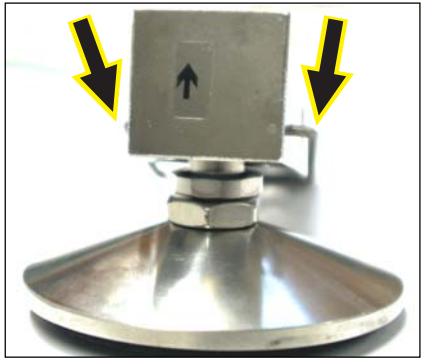
Torque Values

Load cell designation	Torque value
SAG type 011469/220kg C3	130Nm
SAG type 011231/550kg C3	130Nm
SAG type 011232/1100kg C3	130Nm
SAG type 011233/1760kg C3	130Nm
MP58T / 91kg C3	130Nm
MP58T / 227kg C3	130Nm
MP58T / 454kg C3	130Nm
MP58T / 1134kg C3	130Nm
MP58T / 2268kg C3	130Nm
SAG type 011241/7.5 kg C3	10Nm
SAG type 011242/15 kg C3	10Nm
SAG type 011243/30 kg C3	10Nm
SAG type 011244/50 kg C3	14Nm
SAG type 011245/100 kg C3	14Nm

Load cell designation	Torque value
SAG type 011246/50 kg C3	14Nm
SAG type 011247/100 kg C3	14Nm
SAG type 011248/200 kg C3	14Nm
SAG type 011252/150 kg C3	35Nm
SAG type 011253/250 kg C3	35Nm
SAG type 011290/500 kg C3	35Nm
SAG type 011293/7,5 kg C3	14Nm
SAG type 011294/15 kg C3	14Nm
SAG type 011295/30 kg C3	14Nm
SAG type 011296/50 kg C3	14Nm
SAG type 011297/100 kg C3	14Nm
SAG type 011298/200 kg C3	20Nm
TEDEA 1510 / 100 kg	35Nm
TEDEA 1510 / 250 kg	35Nm
TEDEA 1510 / 500 kg	35Nm

lastz_drehm071206.xls

– After replacing load cells, you need to check the overload stops and adjust them if necessary (see page 27-28).



lastz_2.jpg

AUT24001a.JPG

Replacing the Load Cell Foot

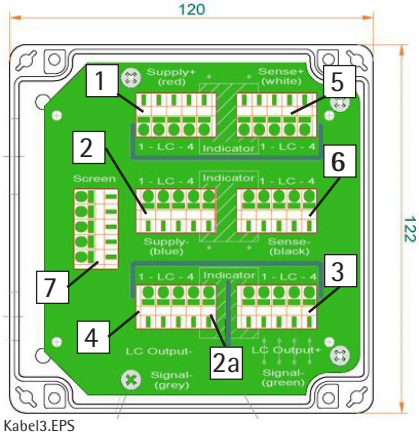
– To replace a load cell foot, use a screwdriver to pry the retainer spring free and push it out, or loosen the nut and remove the screw (see arrow in the lower illustration on the left).

Color Codes of the Wiring for Weighing Platforms, Models MAPS...

Platform size in mm No.:	Verdrahtungsdiagramm für den **Indicator** (siehe Seite 33) 1	2	3	4	5	6
320 x 240	blue	green	white	red	gray	black
400 x 300	blue	green	white	red	gray	black
500 x 400	blue	green	white	red	gray	black
650 x 500 [1]	blue	green	white	red	gray	black
650 x 500 [2]	green	black	red	white	blue	brown
800 x 600 [1]	blue	green	white	red	gray	black
800 x 600 [2]	green	black	red	white	blue	brown
1000 x 1000	blue	green	white	red	gray	black
1250 x 1000	blue	green	white	red	gray	black
1500 x 1250	blue	green	white	red	gray	black
1500 x 1500	blue	green	white	red	gray	black
2000 x 1500	blue	green	white	red	gray	black

[1] MAP**P**1 [2] MAP**S**1

Wiring Diagram for the Load Cells (Junction Box 2)



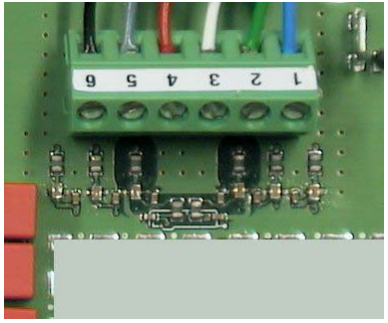
Kabel3.EPS

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

Pin assignment		Designation		Variant 1 [1]	Variant 2 [2]
1	Supply v. pos. (in+)	(V +)	+ Supply	red	blue
2	Supply v. neg. (in-)	(V -)	- Supply	blue	black
3	Test signal pos. (out+)	Signal +	+ Output	green	white
4	Test signal neg. (out-)	Signal -	- Output	gray	red
5	Schirmleitung +	Sense +	+ Sense	white	green
6	Schirmleitung -	Sense -	- Sense	black	gray
7	Shield	GND	screen gr.	(Shield)	(Shield)

[1] Sartorius Hamburg MP58T, green cable [2] Midrics (011...), gray cable

A/D Converter



AUT24016_a.JPG

Connections in the Junction Box for the A/D Converter

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

[3] MAPP4 / MAPS4... [4] MAPS1... GF / IG

Service Specifications MW...-L / MAP...-L

Example for the order number of a Midrics full range scale: MW1P4-1500RR-LCE

Applications	Material | Design	Number of load cells		Weighing capacity (kg)	Platform size mm | order code		Resolution
MW1	P	4	-	1500	RR	-	L
MAP	P	4	-	1500	RR	-	L

			Reproducibility (Repeatability)		Off-center load (Eccentricity)		Span				Linearity			TCS	iso CAL
Model	Weighing capacity	Readability	Test weight	Permissible tolerances	Test weight	Permissible tolerance (±)	Class	Adjustm. weight	Test weight	Permissible tolerance (±)	Tare weight	Test weight	Permissible tolerance (±)	ppm /K	K
MW.../MAP...-L	3 kg	0.0002 kg	1 kg	0.0006 kg	1 kg	0.001 kg	M1	1 kg	3 kg	0.002 kg	— (1) kg	0.7/1.5/2.2/3 kg	0.001 kg	10	n
MW.../MAP...-L	6 kg	0.0005 kg	2 kg	0.0015 kg	2 kg	0.002 kg	M1	2 kg	6 kg	0.004 kg	— (2) kg	1.5/3/4/6 kg	0.002 kg	10	n
MW.../MAP...-L	15 kg	0.001 kg	5 kg	0.003 kg	5 kg	0.005 kg	M1	5 kg	15 kg	0.01 kg	— (5) kg	3/7/11/15 kg	0.005 kg	10	n
MW.../MAP...-L	30 kg	0.002 kg	10 kg	0.006 kg	10 kg	0.01 kg	M1	10 kg	30 kg	0.02 kg	— (10) kg	7/15/22/30 kg	0.01 kg	10	n
MW.../MAP...-L	60 kg	0.005 kg	20 kg	0.015 kg	20 kg	0.02 kg	M1	20 kg	60 kg	0.04 kg	— (20) kg	15/30/45/60 kg	0.02 kg	10	n
MW.../MAP...-L	150 kg	0.01 kg	20 kg	0.03 kg	50 kg	0.05 kg	M1	50 kg	150 kg	0.1 kg	— (50) kg	30/70/110/150 kg	0.05 kg	10	n
MW.../MAP...-L	300 kg	0.02 kg	50 kg	0.06 kg	100 kg	0.1 kg	M1	100 kg	300 kg	0.2 kg	— (100) kg	70/150/220/300 kg	0.1 kg	10	n
MW.../MAP...-L	600 kg	0.05 kg	500 kg	0.15 kg	200 kg	0.2 kg	M1	200 kg	600 kg	0.4 kg	— (200) kg	150/300/450/600 kg	0.2 kg	10	n
MW.../MAP...-L	1500 kg	0.1 kg	500 kg	0.3 kg	500 kg	0.5 kg	M1	500 kg	1500 kg	1 kg	— (500) kg	300/700/ 1100/1500 kg	0.5 kg	10	n
MW.../MAP...-L	3000 kg	0.2 kg	500 kg	0.6 kg	1000 kg	1 kg	M1	1000 kg	3000 kg	2 kg	— (1000) kg	700/1500/ 2200/3000 kg	1 kg	10	n

just_midrics_e.xls

Service Specifications MW...-LCE / MAP...-LCE

Example for the order number of a Midrics full range scale: MW2P1-300FE-LCE

Applications	Material | Design	Number of load cells		Weighing capacity (kg)	Platform size mm | order code		Resolution
MW2	P	1	-	300	FE	-	LCE
MAP	P	1	-	300	FE	-	LCE

			Reproducibility (Repeatability)		Off-center load (Eccentricity)		Span				Linearity			TCS	isoCAL
Model	Weighing capacity	Readability	Test weight	Permissible tolerances	Test weight	Permissible tolerance (±)	Class	Adjustm. weight	Test weight	Permissible tolerance (±)	Tare weight	Test weight	Permissible tolerance (±)	ppm /K	K
MW.../MAP...-LCE	3 kg	0.001 kg	1 kg	0.001 kg	1 kg	0.001 kg	M1	1 kg	3 kg	0.002 kg	— (1) kg	0.7/1.5/2.2/3 kg	0.002 kg	10	n
MW.../MAP...-LCE	6 kg	0.002 kg	2 kg	0.002 kg	2 kg	0.002 kg	M1	2 kg	6 kg	0.004 kg	— (2) kg	1.5/3/4/6 kg	0.004 kg	10	n
MW.../MAP...-LCE	15 kg	0.005 kg	5 kg	0.005 kg	5 kg	0.005 kg	M1	5 kg	15 kg	0.01 kg	— (5) kg	3/7/11/15 kg	0.01 kg	10	n
MW.../MAP...-LCE	30 kg	0.01 kg	10 kg	0.01 kg	10 kg	0.01 kg	M1	10 kg	30 kg	0.02 kg	— (10) kg	7/15/22/30 kg	0.02 kg	10	n
MW.../MAP...-LCE	60 kg	0.02 kg	20 kg	0.02 kg	20 kg	0.02 kg	M1	20 kg	60 kg	0.04 kg	— (20) kg	15/30/45/60 kg	0.04 kg	10	n
MW.../MAP...-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
MW.../MAP...-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
MW.../MAP...-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
MW.../MAP...-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
MW.../MAP...-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

just_midrics_e.xls

Service Specifications MW...-NCE / MAP...-NCE

Example for the order number of a Midrics full range scale: MW2P1-6DC-NCE

Applications	Material | Design	Number of load cells		Weighing capacity (kg)	Platform size mm | order code		Resolution
MW2	S	1	-	6	DC	-	NCE
MAP	S	1	-	6	DC	-	NCE

			Reproducibility (Repeatability)		Off-center load (Eccentricity)		Span				Linearity			TCS	iso CAL
Model	Weighing capacity	Readability	Test weight	Permissible tolerances	Test weight	Permissible tolerance (±)	Class	Adjustm. weight	Test weight	Permissible tolerance (±)	Tare weight	Test weight	Permissible tolerance (±)	ppm /K	K
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 2	1.5 kg 3 kg	0.0005 kg 0.001 kg	1 kg	0.001 kg	1 kg	0.001 kg	M1	1 kg	1.5 kg 3 kg	0.001 kg 0.002 kg	— *(1)* kg *(0.5)*	0.3/0.7/1.1/1.5 1.5/3 kg	0.001 kg 0.002 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 2	3 kg 6 kg	0.001 kg 0.002 kg	2 kg	0.002 kg	2 kg	0.002 kg	M1	2 kg	3 kg 6 kg	0.002 kg 0.004 kg	— *(2)* kg *(1)*	0.7/1.5/2.2/3 3/6 kg	0.002 kg 0.004 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 2	6 kg 15 kg	0.002 kg 0.005 kg	5 kg	0.005 kg	5 kg	0.005 kg	M1	5 kg	6 kg 15 kg	0.004 kg 0.01 kg	— *(5)* kg *(2)*	1.5/3/4/6 7/15 kg	0.004 kg 0.01 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 2	15 kg 30 kg	0.005 kg 0.01 kg	10 kg	0.01 kg	10 kg	0.01 kg	M1	10 kg	15 kg 30 kg	0.01 kg 0.02 kg	— *(10)* kg *(5)*	3/7/11/15 15/30 kg	0.01 kg 0.02 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 2	30 kg 60 kg	0.01 kg 0.02 kg	20 kg	0.02 kg	20 kg	0.02 kg	M1	20 kg	30 kg 60 kg	0.02 kg 0.04 kg	— *(20)* kg *(10)*	7/15/22/30 30/60 kg	0.02 kg 0.4 kg	10	n

just_midrics_e.xls

Service Specifications MW...-NCE / MAP...-NCE

Example for the order number of a Midrics full range scale: MW2P4-3000RR-NCE

Applications	Material | Design	Number of load cells		Weighing capacity (kg)	Platform size mm | order code		Resolution
MW2	P	4	-	3000	WR	-	NCE
MAP	P	4	-	3000	WR	-	NCE

			Reproducibility (Repeatability)		Off-center load (Eccentricity)		Span				Linearity			TCS	isoCAL
Model	Weighing capacity	Readability	Test weight	Permissible tolerances	Test weight	Permissible tolerance (±)	Class	Adjustm. weight	Test weight	Permissible tolerance (±)	Tare weight	Test weight	Permissible tolerance (±)	ppm /K	K
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 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 kg 70/150 kg	0.04 kg 0.1 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 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 kg 150/300 kg	0.1 kg 0.2 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 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 kg 300/600 kg	0.2 kg 0.4 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 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 kg 700/1500 kg	0.4 kg 1 kg	10	n
MW.../MAP...-NCE Weighing Capacity 1/ Weighing Capacity 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 kg 1500/3000 kg	1 kg 2 kg	10	n

just_midrics_e.xls

Load Cell Connection (Color Assignments)

	Bridge supply voltage Brückenspeisespannung		Test voltage Messspannung				
Load cell manufacturer Wägezellen Hersteller	+Excitation/ +Supply/ +Eingang	-Excitation/ -Supply/ -Eingang	+Signal/ +Ausgang +Output	-Signal/ -Ausgang -Output	+Sense	-Sense	**Cable construction** **Anmerkung zur Kabelausführung**
Sartorius Hamburg (z.B.: MP58T/...)	**red** **rot**	**blue** **blau**	**green** **grün**	**gray** **grau**	**white** **weiß**	**black** **schwarz**	d 5mm, 6 wires, **green**, shield grounded d 5mm, 6 adrig, grün, Abschirmung geerdet
Combics (011...)	**blue** **blau**	**black** **schwarz**	**white** **weiß**	**red** **rot**	**green** **grün**	**gray** **grau**	d 5mm, 6 wires, **green**, shield grounded d 5mm, 6 adrig, grün, Abschirmung geerdet
TEDEA 1510	**green** **grün**	**black** **schwarz**	**red** **rot**	**white** **weiß**	**blue** **blau**	**brown** **braun**	

GWT-TEDEA_12.12.06.xls

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: $\mathbf{R} = \mathbf{R}(0) \times \mathbf{G}(D) / \mathbf{G}(T)$

R = required resistance (in ohms)

R(0) = Initial resistance in the load cell being adjusted (in ohms), (if not specified in the specification sheet) 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 Diagram 2

Initial resistance in the load cell: 1000 ohms.

- Test weight: 500 kg
- Readout for reference load cell = 498 kg (load cell with the lowest readout value).
- Readout for load cell being adjusted = 501.1 kg
- **G**(D) = 2.3 kg

$$\mathbf{R} = \frac{R(0) \times G(D)}{G(T)} \qquad \mathbf{R} = \frac{1000 \text{ ohms} \times 2.3 \text{ kg}}{500 \text{ kg}} \qquad \mathbf{R} = 4.6 \text{ ohms}$$

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 42)).

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 IP65 protection must be checked after closing the junction box.

Selecting the Adjustment Resistor

Adjusting Off-center Load with 1000 Ohms 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

Important: These are calculated (estimated) values

Selecting the Adjustment Resistor:

Diagram 1 — Adjusting Off-center Load with 350 Ohms Initial Resistance

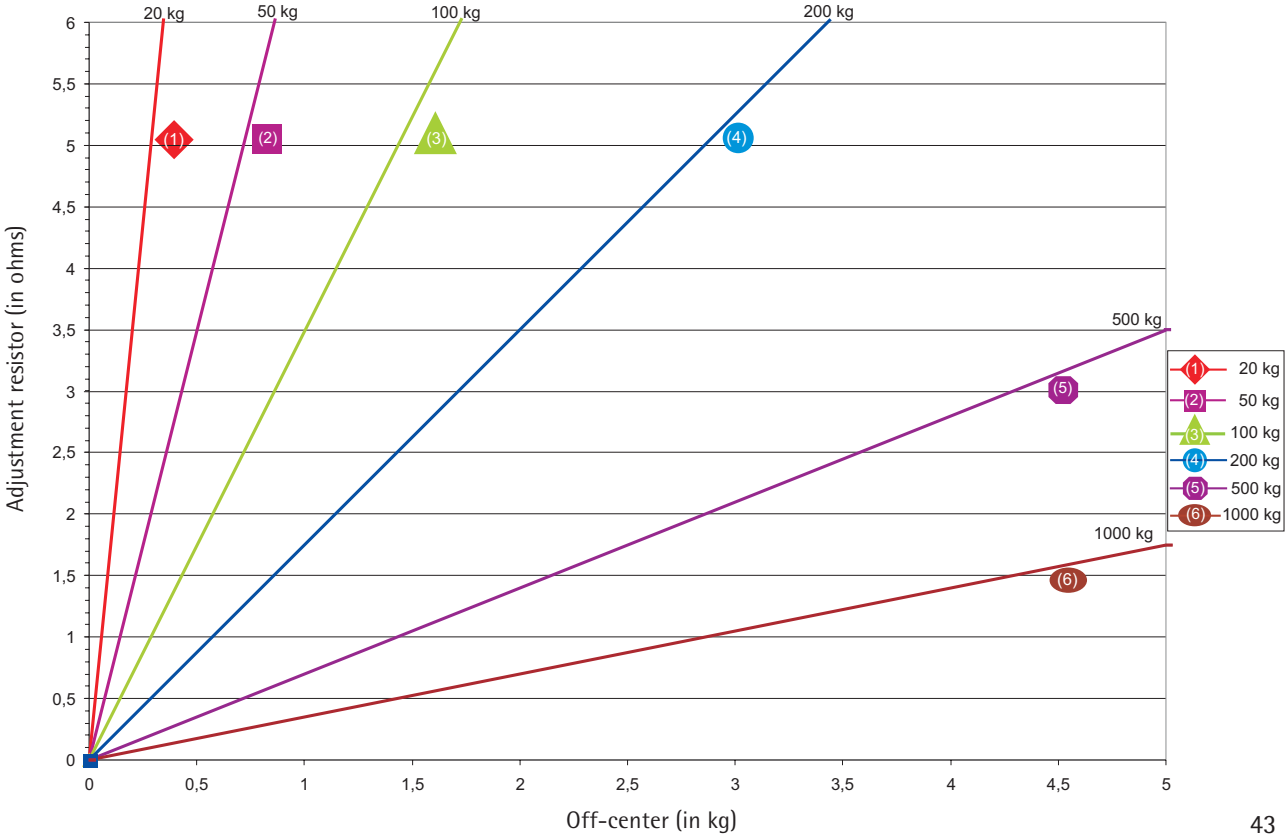
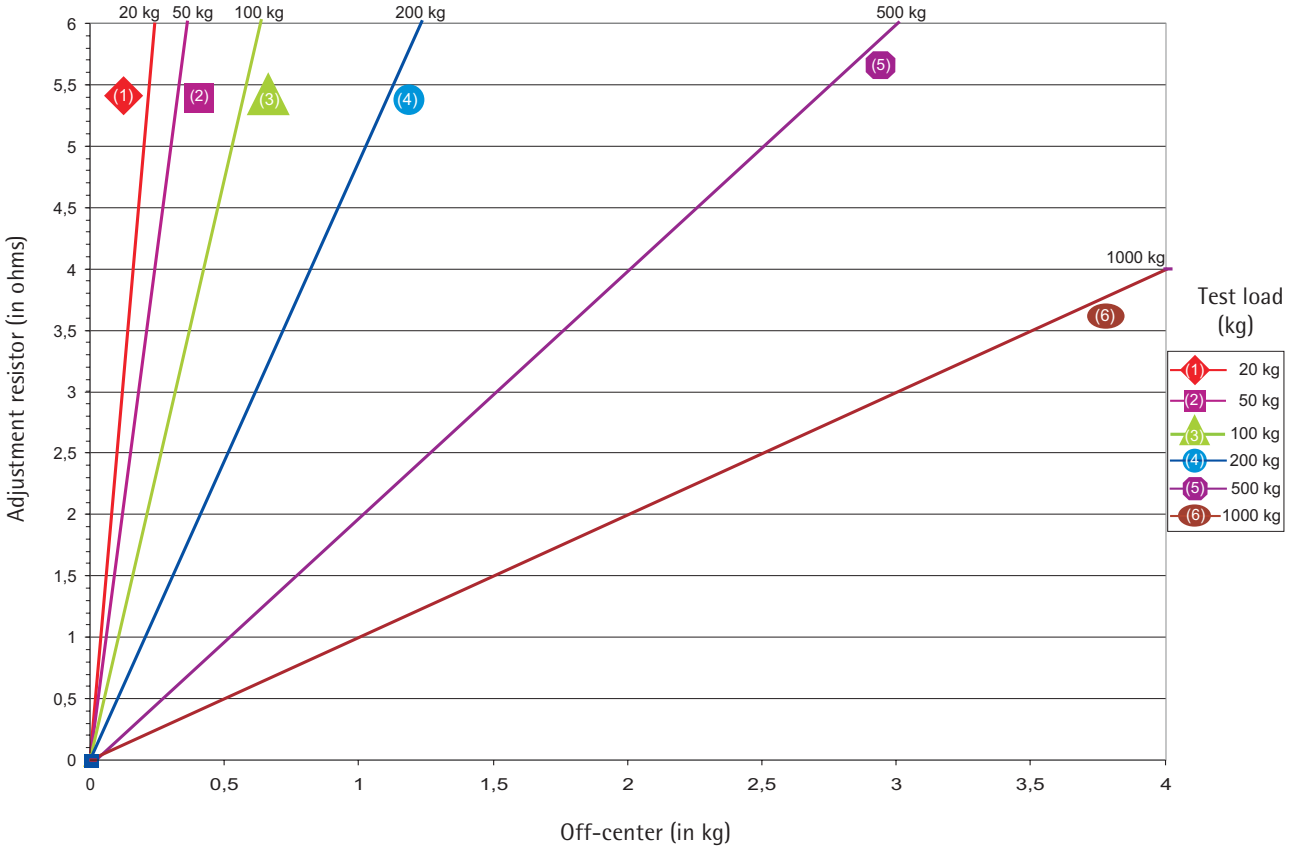


Diagram 2

Adjusting Off-center Load with 1000 Ohms Initial Resistance



Error Codes

Error codes are shown on the main display. Err codes are shown continuously; Inf messages are shown for 2 seconds, after which the program returns automatically to the weighing mode.

Display	Cause	Solution
Err 101 - 104	Key is stuck Key pressed at power on	Release key or contact your local Service Center
Err 320	Program memory defective	Contact your local Service Center
Err 335	Verified weighing platform not compatible with the connected terminal	Connect a compatible weighing platform
Err 340	Operating parameter memory (EEPROM) defective	Turn the scale off and then on again. If Err 340 is still displayed, contact your local Service Center
Err 341	Flash lost data	Turn the scale off and then on again If Err 340 is still displayed, contact your local Service Center
Err 343	Data lost from the memory module for transaction numbers in external alibi memory	Contact your local Service Center
Inf 01	Data output not compatible with output format	Change the menu settings
Inf 02	Calibration/adjustment condition not met; for example, not tared or there is a load on the weighing pan	Calibrate only when zero is displayed. Press →T← to tare Unload the scale
Inf 03	Adjustment could not be completed within a certain time	Allow the scale to warm up again and then repeat the adjustment process
Inf 06	Built-in calibration weight defective	Contact your local Service Center

Display	Cause	Solution
inF 07	Function not allowed in scales verified for use in legal metrology	Contact your local Service Center for details on changing settings
inF 08	The load on the scale is too heavy to zero the readout	Check whether "Tare/zero at power on" is set (1.12)
inF 09	Taring is not possible when the gross weight is a minus value	Zero the scale
inF 22	Error in storing reference value, load is too light	Put a heavier weight on the scale
inF 23	Error in initializing an application	Contact your local Service Center
inF 29	Minimum load not reached	Define a lower value for the minimum load (in the Application settings, menu item 3.6)
inF 30-31	Indicator is in XBPI mode	Change menu setting or perform "Close" function. Check the interface and cable. Contact your local Service Center.
inF 71	Cannot store the current weight value (e.g., if control limits are too low or too high)	None
inF 72	Cannot store the current weight value (e.g., the transaction counter has reached its limit)	None
inF 73	Data not found or unreadable	Contact your local Service Center

Display	Cause	Solution
inF 74	Function is blocked (e.g., menu is locked)	None
inF 98	No weighing platform connected	Connect weighing platform
inF 99	No weighing platform connected	Connect weighing platform
no IIP	No weighing platform connected	Connect weighing platform

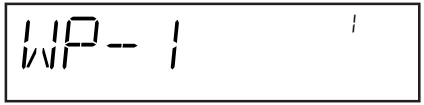
Activating the Service Mode

I/⏻ Switch the device on and immediately (during the initialization of the device) press

→T← briefly to display the menu

Fn Fn Click on the menu item SETUP

→T← Select Device parameter SETUP [1])



Fn Click on the menu item CODE
(press key Fn until the CODE appears in the display)

[1]) If a password is requested at this point, enter the service password (see Appendix) and continue once the service password has been accepted.

→T←

Select the menu item CODE and enter the service password » 202 122 «
Use keys →0← →T← Fn (=)

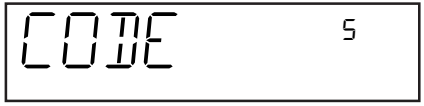
→T←

Saving the service password

When the service mode is activated an »S« appears in the top right-hand corner of the display.

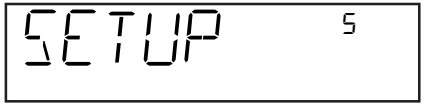
→0←

Return to „Code“ in the service mode.

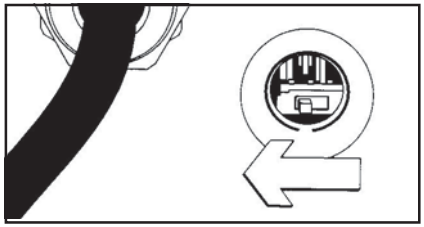


→0←

Return to „Setup“ in the service mode.



Configuring the A/D Converter

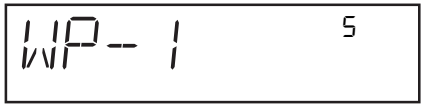


Menuws-li.JPG

Open the menu access switch

- Remove the cap that covers the menu access switch on the left-hand side of the back of the indicator
- To do this, move the switch to the left (towards the interface connectors). („open position")

– Activate the service mode (see page 48-49)



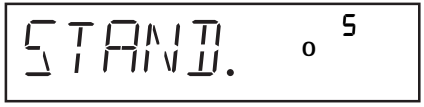
– Select weighing platform and confirm

→T←

– Menu item » 10 2 1«
– Menu item » 10 2 2« to enter

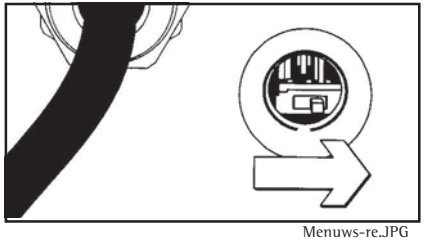
→T←

- Select the menu item ADC configuration and confirm



- Select whether a standard configuration (STAND) or a verifiable configuration (VERIF.) should be carried out (in this example, standard configuration).
- See (98648-014-89) WMI6001-d07063 Operating Instructions for a detailed description of the procedure

- Once you have completed the configuration, save the data using the menu item SAVE.
- The A/D converter can now be treated like any standard weighing platform in connection with the load sensor.



Menuws-re.JPG

Note:

Once ADC configuration has been completed, an adjustment of the weighing platform (calibration/adjustment and linearization) must be carried out

- Close the menu access switch

Sartorius AG
Weender Landstrasse 94–108
37075 Goettingen, Germany
Internet: http://www.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.

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