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Servicemanual
Precision balance

KERN TPDS/TPDT / TADS/TADT

Version 1.0

11/2025

GB



GB

KERN TPDS/TPDT / TADS/TADT

Version 1.0 08/2025

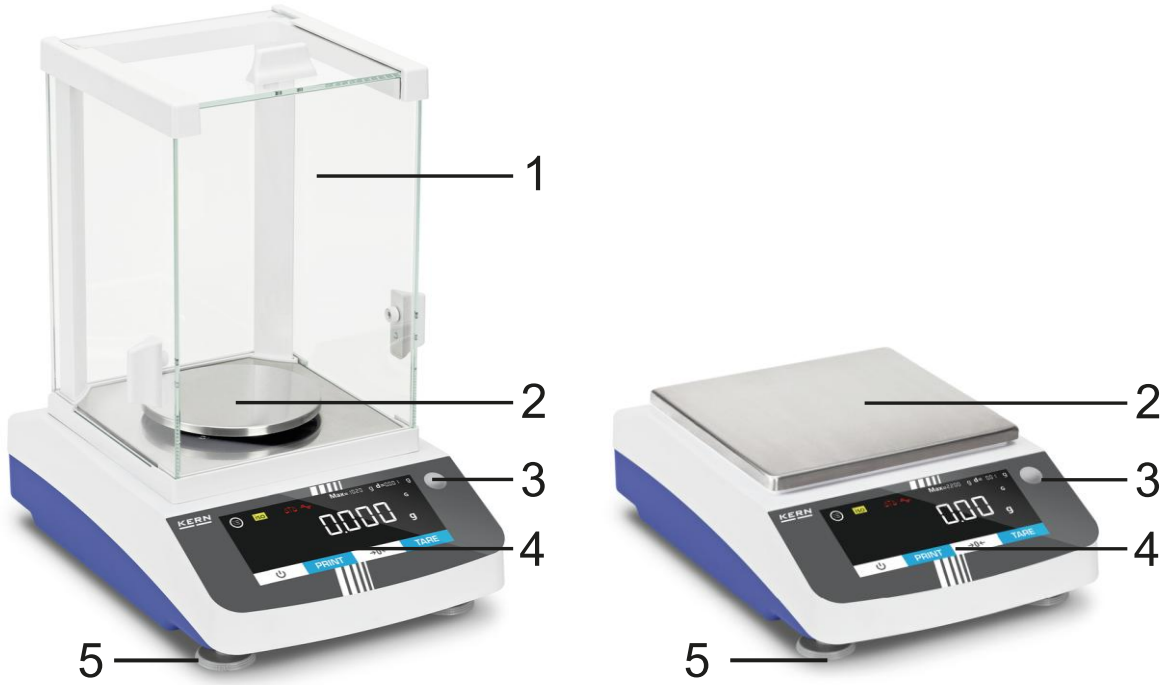
Servicemanual

Contents

1 TOTAL VIEW ..... - 3 -
1.1 Components ..... - 3 -
1.2 Operating elements ..... - 5 -
2 ERROR CODES ..... - 8 -
3 TROUBLE SHOOTING ..... - 9 -
4 SERVICE MENU ..... - 10 -
Navigation in the menu ..... - 10 -
5 INSPECTION ..... - 11 -
5.1 Count value inspection ..... - 12 -
5.1.1 Adjustment of zero count value ..... - 12 -
5.1.2 Adjustment of the full-range count value ..... - 12 -
6 CONFIGURATION AND ADJUSTMENT ..... - 13 -
6.1 Corner error adjustment ..... - 13 -
6.2 Linearity adjustment ..... - 14 -
6.3 Calibration ..... - 15 -
6.3.1 External calibration ..... - 15 -
6.3.2 External adjustment with user-defined adjustment weight ..... - 17 -
6.3.3 Internal adjustment (only on ADT and PDT models) ..... - 20 -
6.3.4 Automatic internal adjustment (isoCAL) ..... - 22 -
6.3.5 Overwriting the internal adjustment weight value (ADT and PDT models) ..... - 24 -
7 HARDWARE REVISION ..... - 25 -
7.1 Magnetic coil ..... - 25 -
7.2 Temperature sensor installation ..... - 26 -
7.3 Optoelectronic components Installation ..... - 26 -
7.4 Limit installation ..... - 27 -
8 EXPLODED VIEW ..... - 28 -
9 SPARE PART LIST ..... - 30 -

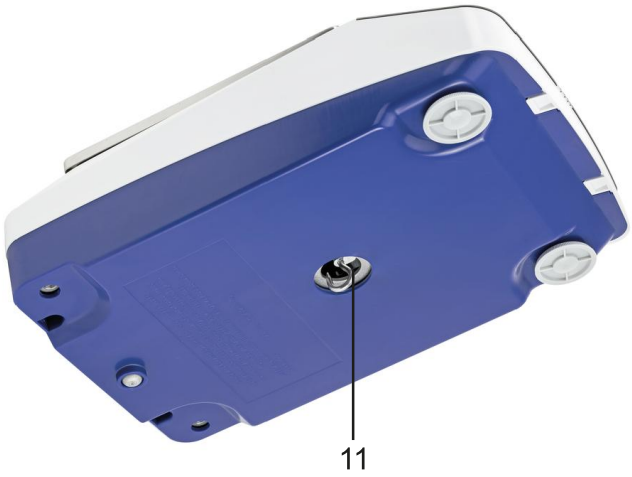
1 TOTAL VIEW

1.1 Components



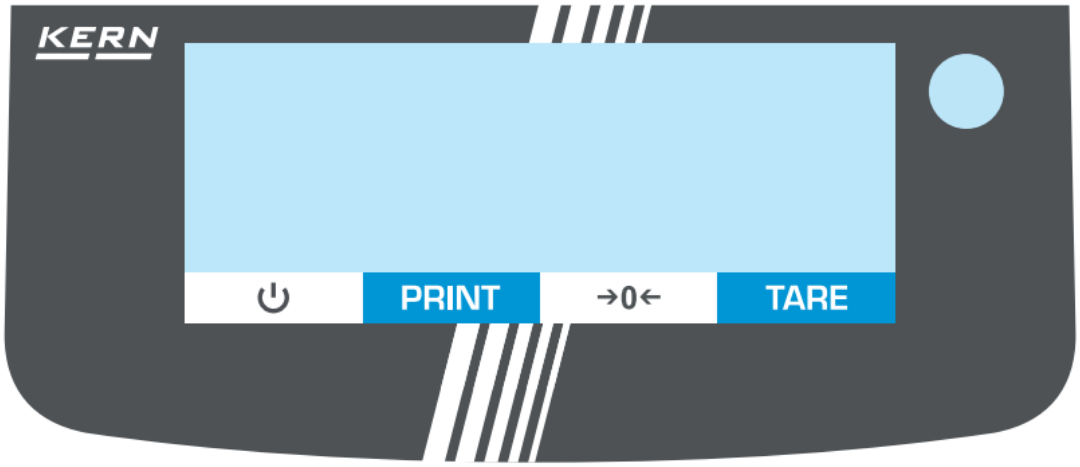
Pos.	Designation
1	Windbreak
2	Weighing plate
3	Bubble level
4	Display with buttons (touchscreen)
5	Levelling feet





Pos.	Designation
7	USB-C connection
8	RS232 / RS485 connection
9	Mains connection
10	Anti-theft device
11	Underfloor weighing system

1.2 Operating elements



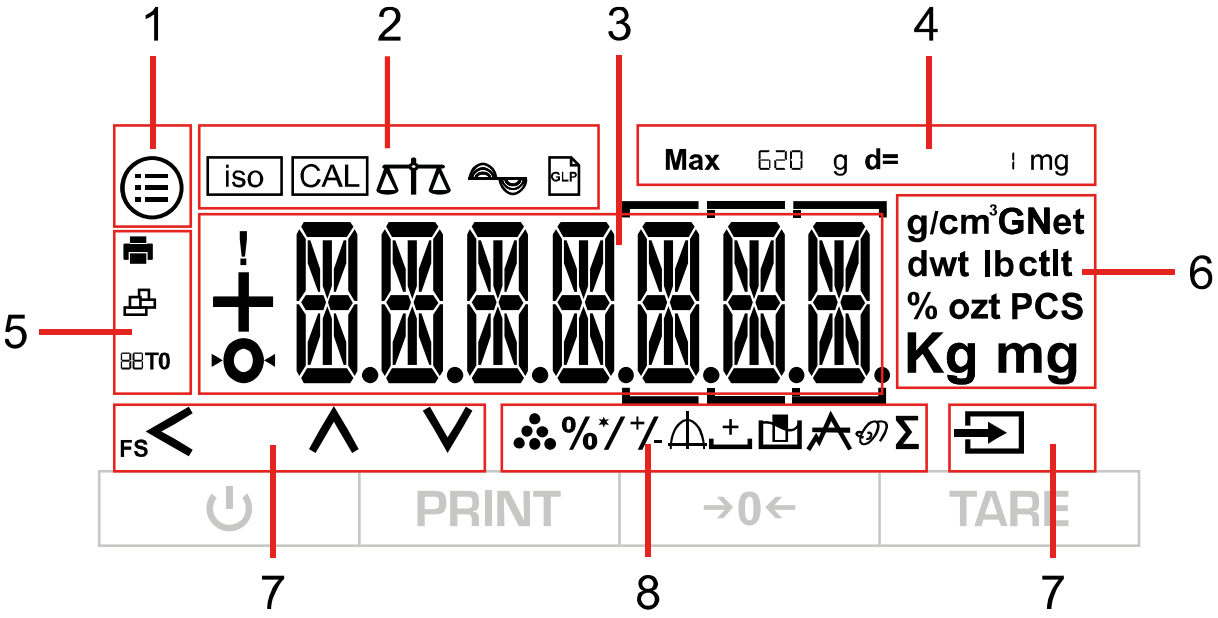
1.2.1 Keyboard overview

Button	Name	Function in operating mode
⏻	ON	➢ Switch on ➢ Stand-by: The time is displayed during stand-by. Press again to switch the scales back on
PRINT	PRINT	➢ Output data
→0←	ZERO	➢ Zeros
TARE	TARE	➢ Taring

1.2.2 Numerical input

Button	Name
∧	• Increase flashing digit (0 - 9) • Move decimal point
∨	• Decrease flashing digit (0 - 9) • Move decimal point
<	• One digit back • Press the button repeatedly to exit the input window and cancel the numerical input
⏎	• Select digit • Confirm entry. Press the button repeatedly for each digit. Wait until the numerical input window disappears.

1.2.3 Display overview



Pos.	Symbol	Description of the
1		Button: [Menu]
2	iso	Button [iso]→ Starts isoCal
	CAL	Button: [CAL]→ Starts external calibration
		Application filter: Weighing or filling
	1.1.1.1 1.1.1.2 1.1.1.3 1.1.1.4	Environment button→ Switches between the environmental conditions: "very stable" (1.1.1.1), "stable" (1.1.1.2), "not stable" (1.1.1.3), "very unstable" (1.1.1.4), see Chap. **Fehler! Verweisquelle konnte nicht gefunden w erden.**
	GLP	Button: Print GLP protocol
3	!	Alarm: The scale is currently executing a command
	+ −	Sign of the weight value: positive or negative
		Indicator: Zero position
		Main display for weighing values or menu designations

Pos.	Symbol	Description of the
4	Max 620 g	Metrological data (depending on model): Maximum load
	d= 1 mg	Metrological data (depending on model): Readability
5		Indicator: Printer connected
		Indicator: Computer connected
	88T0	Additional display (e.g. AUTO)
6	g/cm³GNet dwt lbctlt % ozt PCS Kg mg	• Weighing unit display and button: Displays the current weighing unit and allows you to change it by pressing the button (for available weighing units, see Chap. **Fehler! Verweisquelle konnte n icht gefunden werden.**) • Stability indicator: Unit is only displayed if the value is stable
7		Navigation bar: Description see Chap. 0
8		Application indicator: Counting
		Application indicator: Percentage weighing
		Application indicator: Calculation
		Application indicator: Tolerance weighing
		Application indicator: Statistics function
		Application indicator: Net total
		Application indicator: Density determination
		Application indicator: Peak value function
		Application indicator: Dynamic weighing
		Application indicator: Totalling

2 ERROR CODES

Error message	Explanation
HIGH	Overload
LOW	Underload
PRESS-0	Zero setting error
PRESS-T	Taring error
CAL/ERR	Adjustment error
DISERR	Settings error

3 TROUBLE SHOOTING

Fault phenomenon	Root cause	Solution
Unable to boot Black screen	1. No power supply 2. AC/DC adaptor damaged	1. Plug in the power 2. Replace the power
Display value is unstable	1. Poor working environment 2. The weighing room door is not closed tightly 3. There are foreign objects or scratches between the scale pan and the balance housing 4. The power supply is unstable and exceeds the allowable value 5. The weighing object itself is unstable (such as absorbing moisture or evaporation)	1. Improve the working environment to avoid vibration and air flow interference 2. Close the weighing room door 3. Remove foreign objects and turn the scale plate to prevent scratches 4. Connect to 220V AC power stabilizer
The displayed value does not match the actual weight value	1. The balance was not calibrated 2. It was not reset before weighing 3. The level was not adjusted properly	1. Calibrate the balance 2. Press the reset button 3. Adjust the level foot
HIGH	The equipment is overloaded and exceeds the maximum weighing range of the balance.	Reduce the weight to make it smaller than the maximum weighing range of the balance.
LOW	1. The balance pan is not placed 2. Use the power-on zero function, the balance pan has a load and the pan is emptied after powering on	Install the scale pan and reconnect the power supply
PRESS-T	Out of zero range of balance	1. Remove the balance load and press the button 2. Press the 'T' button to tare the balance
CAL/ERR	Calibration failed: Load weight exceeds calibration weight value by ±2%	Loading standard calibration weights

4 SERVICE MENU

Navigation in the menu

Button	Name
	• Open menu
∧ ∨	• Scroll forwards or backwards through menu items or settings
<	• Return to previous menu or exit menu
	• Confirm current selection

To enter the service menu, open the user menu and scroll to menu item 7. FACTORY

FACTORY	7.	Service menu→ locked (only for specialised personnel)

Then enter the password: **1122334**

Contents of the service menu

7.1	LINEADJ	Starts the linearity adjustment
7.2	CPLDCNT	Shows the A/D value
7.3	TPCOMP	Starts temperature compensation
7.4	TPCFG	Activate or deactivate temperature compensation
7.5	MODEL	Shows the configurated model number
7.6	SERNO	Shows the stored serial number
7.7	MODE	Switch between verified and non-verified mode

5 INSPECTION

1. Eccentric load error test:
Load a test weight of 1/3 of the scale's capacity on the weighing pan and test the balance indication at the center, top, bottom, left, and right of the weighing pan. The test position should be more than 2/3 of the diameter of the weighing pan. The number of eccentric load error measurements for each balance should not be less than 4 times, and the maximum deviation must be ≤3d.

2. Repeatability error test:
No less than 6 tests are required. The weights used must be separate weights and cannot be combined. The weights must be between 80% and 100% of the maximum range of the balance. Zeroing or tare is allowed for each loading test. Maximum deviation must be ≤3d.

3. Linearity error-indication error:
The test points must not be less than 10 points, and must include the following loads: no load, minimum weight, load corresponding to the maximum allowable error conversion point (or close to the maximum allowable error conversion point), maximum weight.

5.1 Count value inspection

Enter the service menu and navigate to **[7.2 CPLD.CNT]**

Click  button to enter the count value display

Slight fluctuations in the count value are normal.
If the fluctuation range exceeds 100d, there is a problem with the balance and the sensor, circuit board, etc. need to be checked.

Model	… 200-4-A	… 600-3-A	… 1020-3-A	… 4200-2-A	… 6200-2-A	… 10200-2-A
Count value at Zero	2800-4000	2400-4000	1500-3000	4500-6000	1500-2500	1500-2500
Count value at full range	22000-23500	19000-21000	8500-11000	1800-20000	16000-18000	16000-18000

5.1.1 **Adjustment of zero count value**

If the zero count value is not within the range of the above table, it is necessary to increase or decrease the additional weight at the front end of the monoblock.

5.1.2 **Adjustment of the full-range count value**

If the full-range count value is not within this range, an external resistance box must be connected at ZR1/ZR2 to adjust the full-scale count value within the above range by connecting the corresponding resistors in parallel.

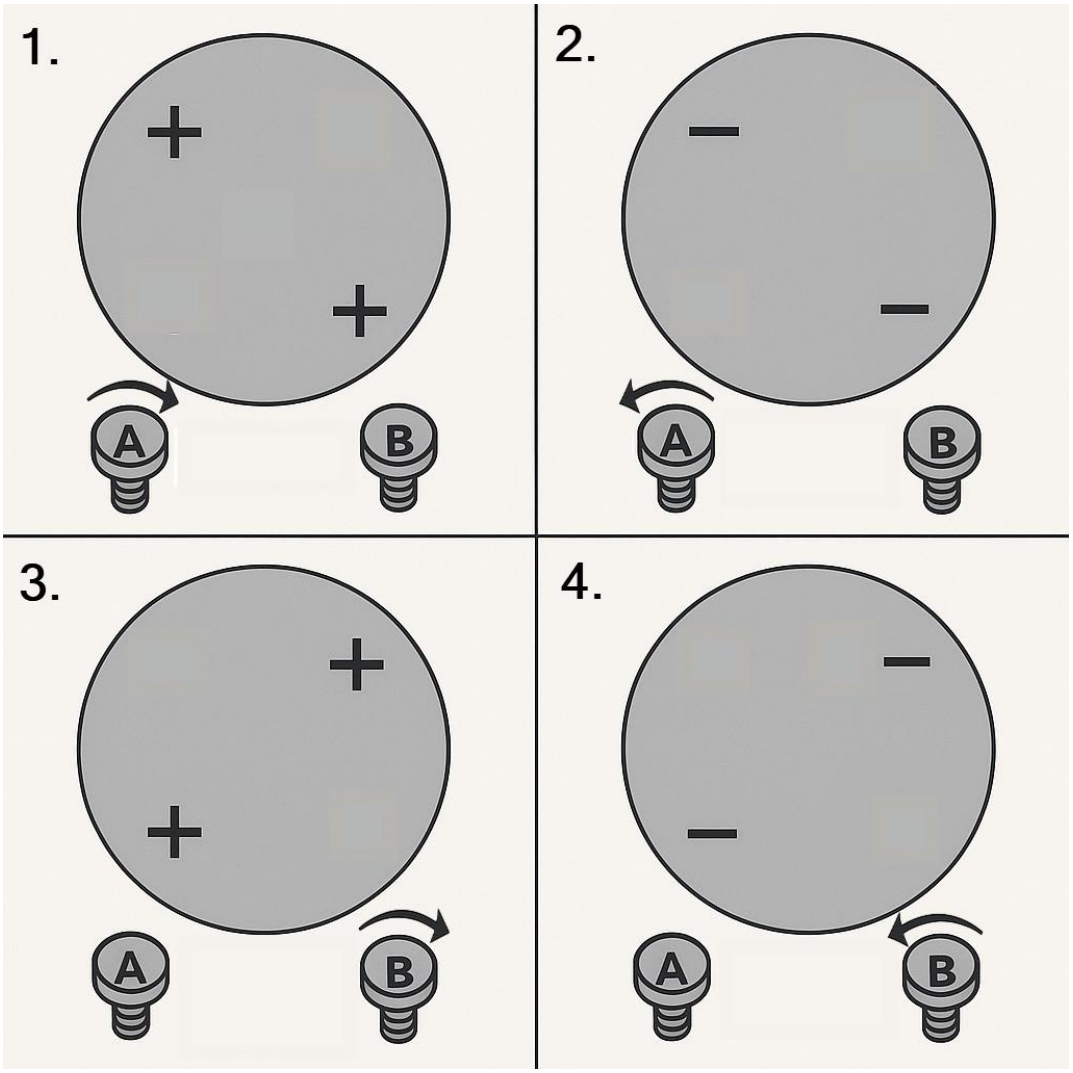
6 CONFIGURATION AND ADJUSTMENT

6.1 Corner error adjustment

Please ensure a warm-up time of at least 1 hour and make sure the level bubble is within the black circle.

If the angular load upper left and lower right corner errors are positive, the left adjustment screw needs to be rotated clockwise;
If the angular load error is negative, the left adjustment screw needs to be rotated counterclockwise.

If the corner load upper right and lower left corner errors are positive, the right adjustment screw needs to be rotated clockwise;
If the corner load error is negative, the right adjustment screw needs to be rotated counterclockwise.



6.2 Linearity adjustment

Enter the service menu and navigate to **[7.1LINE.ADJ]**

Confirm with the  button – "START-L" is displayed

Confirm again with the  button to enter the calibration procedure

When 0g is displayed, confirm with the  to carry out zero-point calibration

Then load the corresponding weight according to the display and confirm with 
"WAITING" is displayed, followed by the next required adjustment weight.

Repeat the loading/unloading process until "CAL OK" is displayed.
The linear calibration is successfully completed.

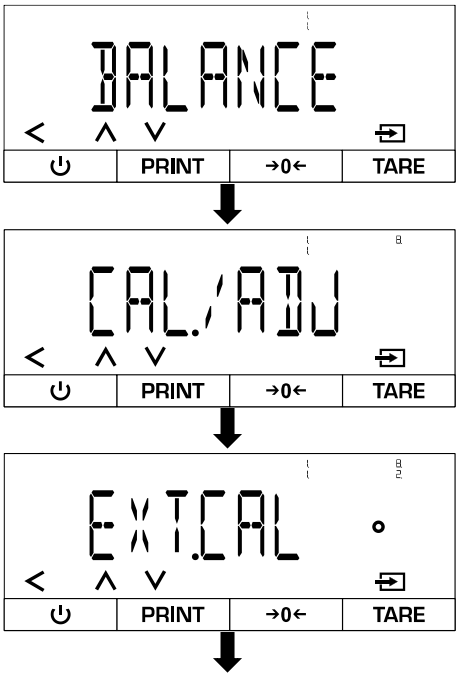
Click  button to return to weighing mode.

6.3 Calibration

6.3.1 External calibration

- The adjustment can be cancelled with [<]
- The following error message appears in the event of an adjustment error: <CAL/ERR>

Activate external adjustment in the menu:



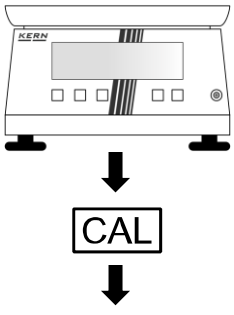
⇨ Open the following menu:
<SETUP>→ <BALANCE>

⇨ <CAL./ADJ> open

⇨ Select <EXT.CAL>

⇨ Exit menu

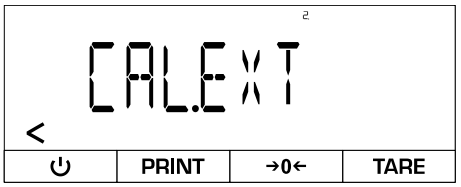
Perform external adjustment:



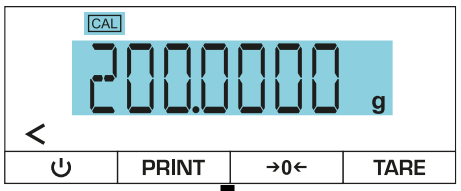
⇨ Unload the scales

⇨ Press [ZERO]

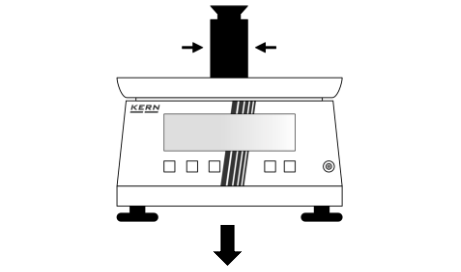
⇨ Press [CAL].



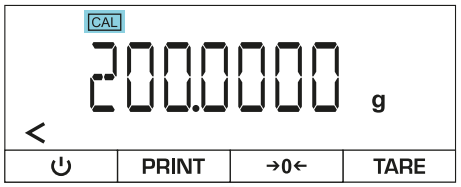
⇨ <CAL.EXT> is displayed



⇨ Required calibration weight in grams is displayed and starts flashing

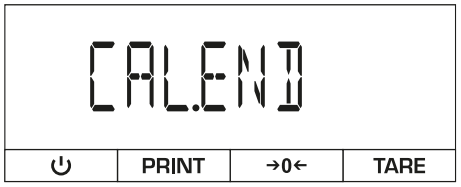


⇨ Place the calibration weight in the centre of the weighing plate

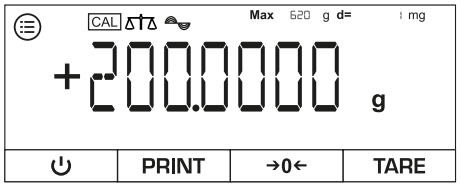


⇨ The calibration weight display stops flashing

⇨ Scale performs the external adjustment



⇨ <CAL.END> is displayed



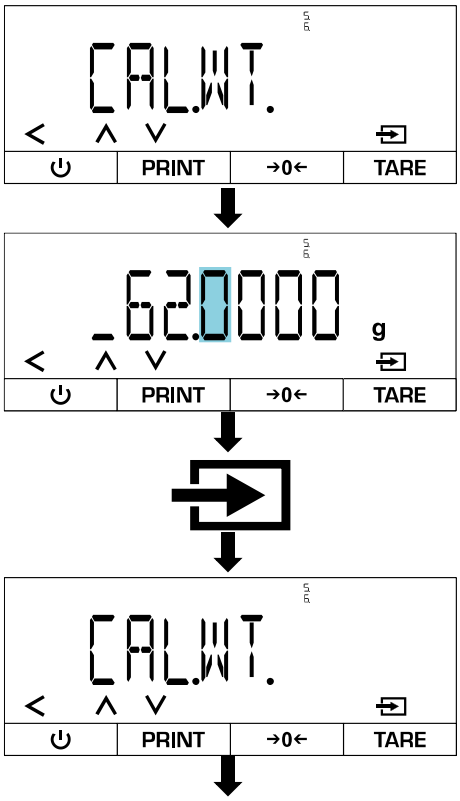
⇨ Scale switches back to weighing mode

⇨ Remove the calibration weight

6.3.2 **External adjustment with user-defined adjustment weight**

- The adjustment can be cancelled with [<]
- The following error message appears in the event of an adjustment error: <CAL./ERR>

Enter user-defined calibration weight:



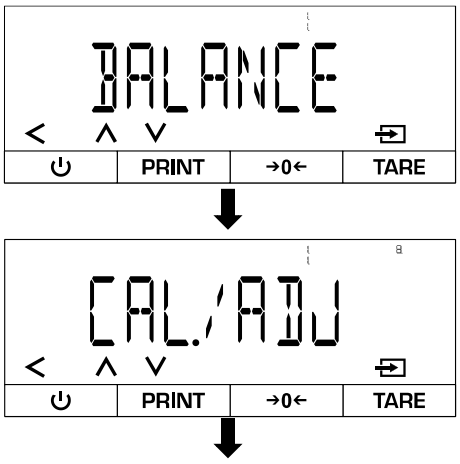
⇨ Open the following menu:
<INPUT>→ <CALWT>

⇨ Enter the weight value of the external calibration weight (for numerical input, see Chap. 1.2.2)

⇨ Confirm input

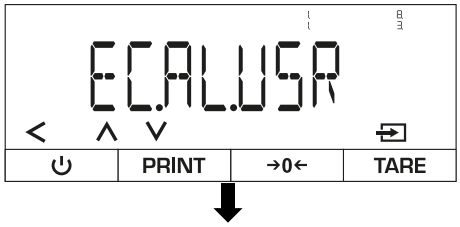
⇨ Scales return to the menu

Activate external adjustment with user-defined weight in the menu:



⇨ Open the following menu:
<SETUP>→ <BALANCE>

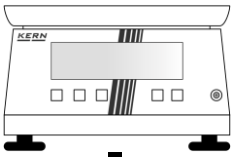
⇨ <CAL./ADJ> open



⇨ Select <ECAL.USR.>

⇨ Exit menu

Perform external adjustment:

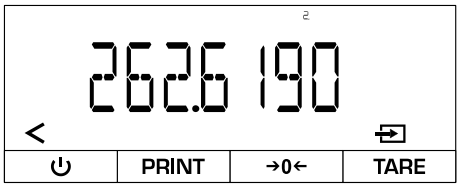


⇨ Unload the scales

⇨ Press [ZERO]

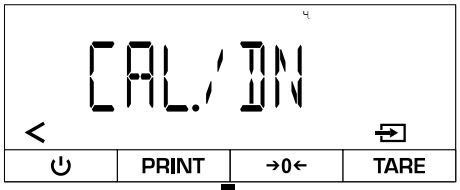


⇨ Press [CAL].

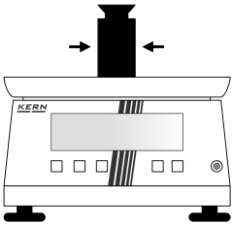


⇨ Required calibration weight in grams is displayed

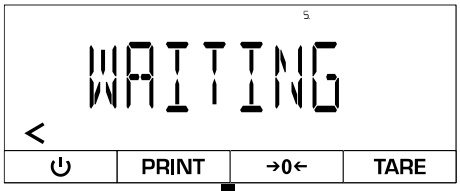
⇨ Confirm



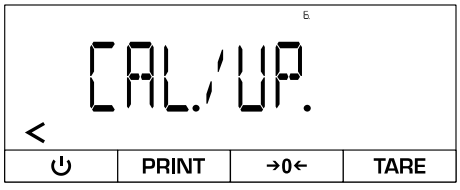
⇨ <CAL./ DN> appears on the display



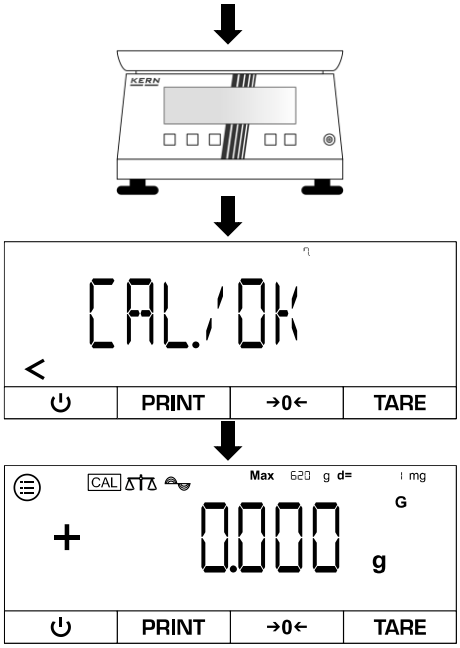
⇨ Place the calibration weight in the centre of the weighing plate



⇨ Scale performs the external adjustment



⇨ <CAL./ UP.> appears on the display



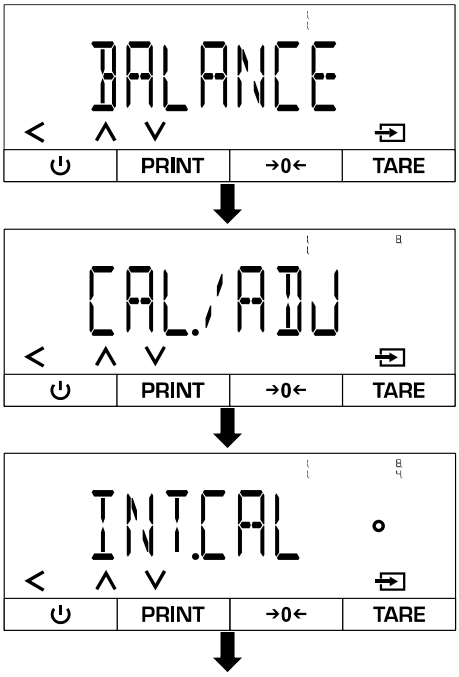
⇨ Remove the calibration weight from the weighing plate

⇨ <CAL.'OK> appears on the display

⇨ The scale switches to weighing mode

6.3.3 **Internal adjustment (only on ADT and PDT models)**

Activate internal adjustment in the menu:

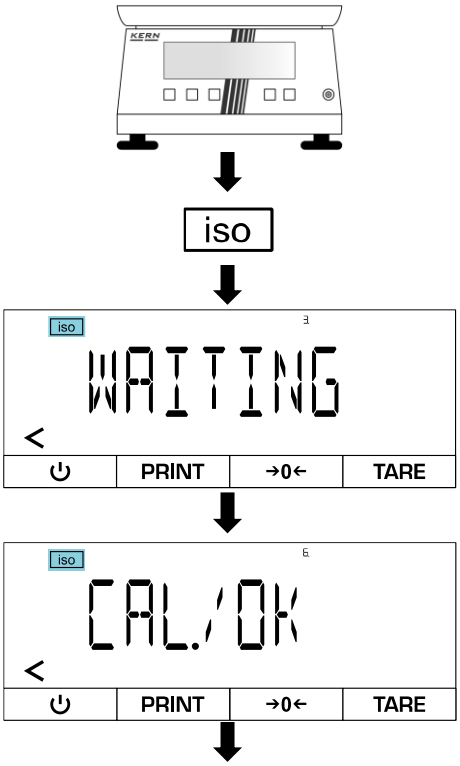


⇨ Open the following menu:
<SETUP>→ <BALANCE>

⇨ <CAL./ADJ> open

⇨ Select <INT.CAL>

Perform internal adjustment:



⇨ Unload the scales

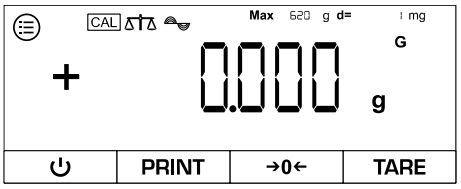
⇨ Press [ZERO]

⇨ Press [iso]

⇨ The internal adjustment is carried out

⇨ During adjustment, [iso] flashes

⇨ When the adjustment is complete, <CAL./OK> appears on the display



⇨ The scale switches to weighing mode

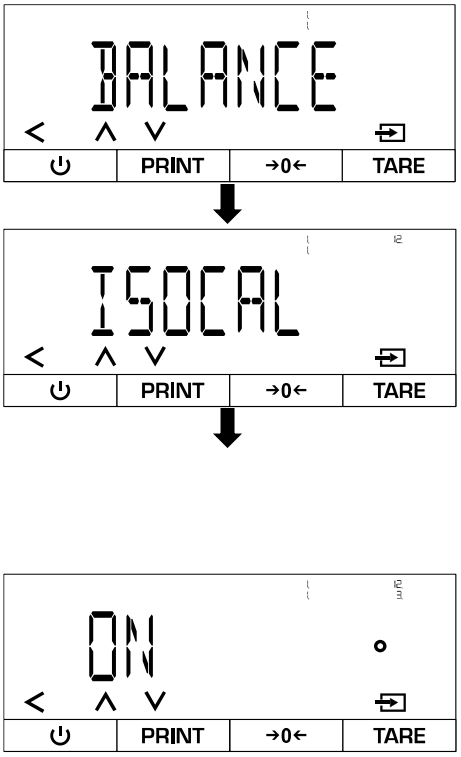
6.3.4 **Automatic internal adjustment (isoCAL)**

The isoCAL function causes the scale to automatically carry out an internal calibration based on the ambient temperature and the running time.



The isoCAL function is always active for the following series and cannot be deactivated: TADT-A

Activate isoCAL in the menu:



⇨ Open the following menu: <SETUP>→ <BALANCE>

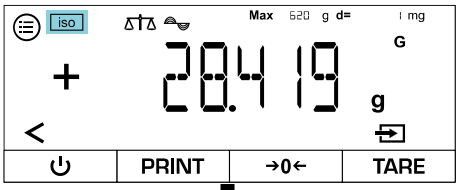
⇨ <ISOCAL> open

⇨ Select the desired setting

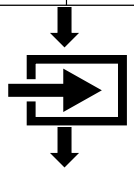
OFF	isoCAL deactivated
NOTE	Manual start of internal adjustment (note in the display)
ON	Automatic execution of the internal adjustment if this is required (depending on <CAL.TEMP> and <CAL.TIME>)

⇨ Exit menu

Variant A - Manual start of internal adjustment when prompted:



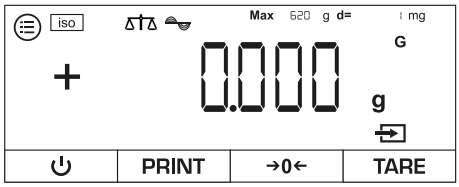
⇨ [iso] flashes



⇨ Confirm

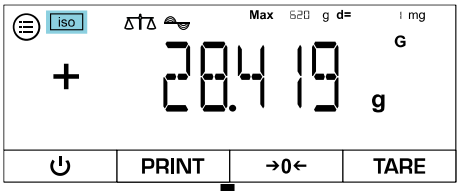
...

⇨ Internal adjustment is carried out



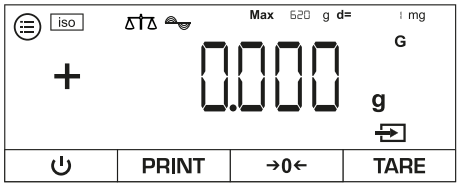
⇨ The scale switches to weighing mode

Variant B - Automatic start of internal adjustment:



...

⇨ Internal adjustment is carried out automatically



⇨ The scale switches to weighing mode

6.3.5 **Overwriting the internal adjustment weight value (ADT and PDT models)**

To overwrite the internal adjustment weight, navigate to [**1.1.8 CAL/ADJ**] and choose the setting [**1.1.8.5 INT.ADJ**].
Now leave the menu and return to weighing mode.
From there start the adjustment with the ISO button in the top left corner.
WAITING is displayed, followed by the required external adjustment weight.
When CAL. and the required weight is displayed, load the external adjustment weight onto the weighing pan.
WAITING is displayed – ensure stable conditions.
When the display changes to CAL./UP. remove the adjustment weight from the weighing pan.
WAITING is displayed again and the motor can be heard carrying out the internal adjustment.
The scale returns to weighing mode and the adjustment is completed.
Navigate to [**1.1.8 CAL/ADJ**] again and change the setting back to [**1.1.8.4 INT.CAL**].

7 HARDWARE REVISION

7.1 Magnetic coil

You can use a multimeter to measure the coil resistance, which is **240Ω ±10Ω**
Note that the coil must not be short-circuited to ground
To test for an insulation error, measure the impedance between the connection board and the top of the sensor yoke board.



Note that the two gold wires should not have any wrinkles and should be evenly C-shaped

Clean the magnetic steel assembly. The surface of the magnetic steel assembly and the yoke plate must be clean and free of foreign matter. In particular, the inner side of the magnetic steel assembly must be thoroughly cleaned to ensure dust-free treatment.



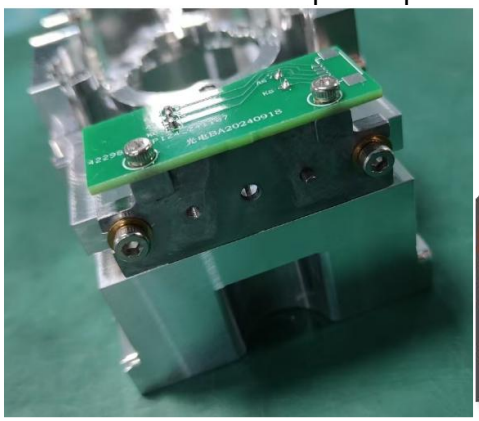
7.2 Temperature sensor installation

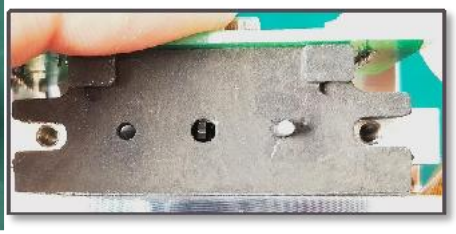
The temperature sensor PT1000 is soldered to the 2P*150mm single-end tinned XH1.25 wire, and the soldered parts are wrapped with heat shrink tube.
Add an appropriate amount of 703 silicone rubber in the hole at the bottom of the magnetic steel and insert the welded PT1000 with wires into it.
Use adhesive strips to secure the leads to the side of the sensor.



7.3 Optoelectronic components Installation

Fix the optoelectronic component on the sensor with 2 sets of hexagon socket head screws M3*8 and copper flat washers. Note that the left and right gaps of the optoelectronic hole are symmetrical, and the beam and the optoelectronic cannot touch each other. The specific position is as shown in the figure.





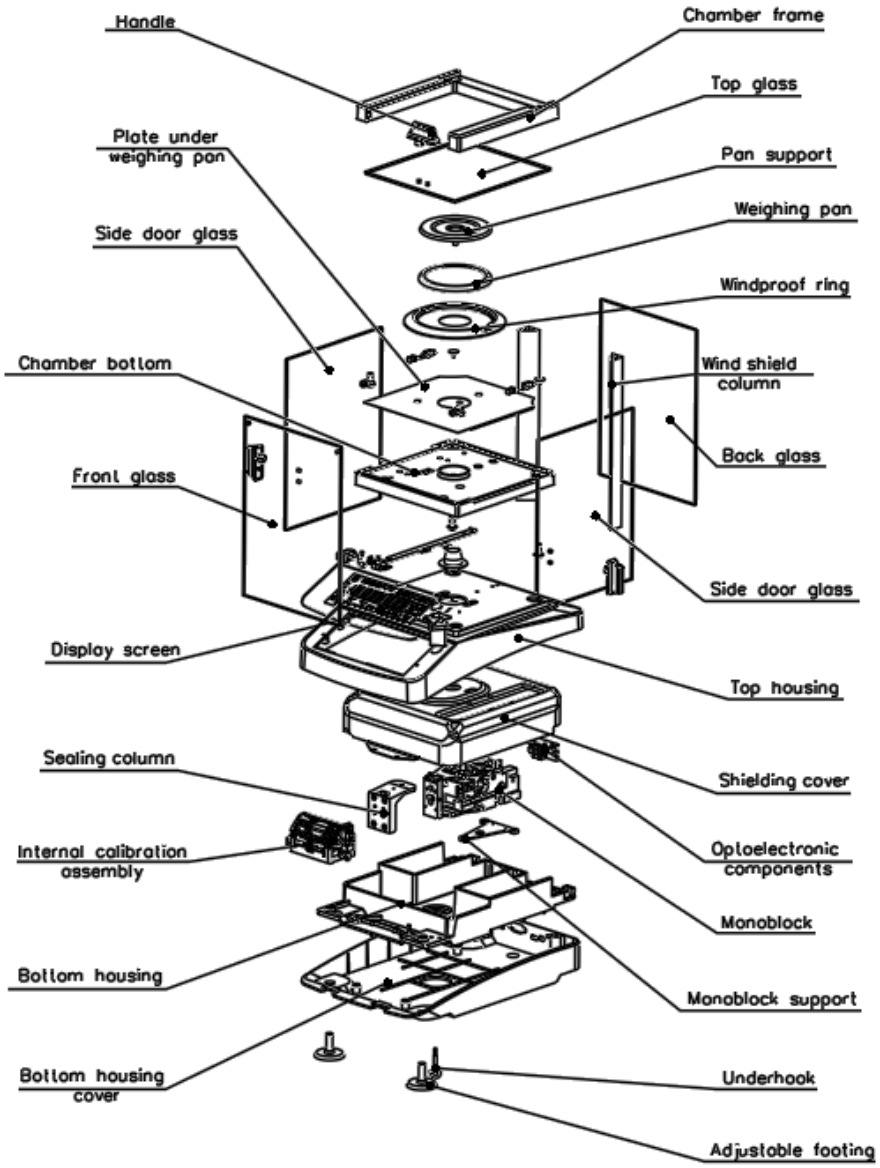
7.4 Limit installation

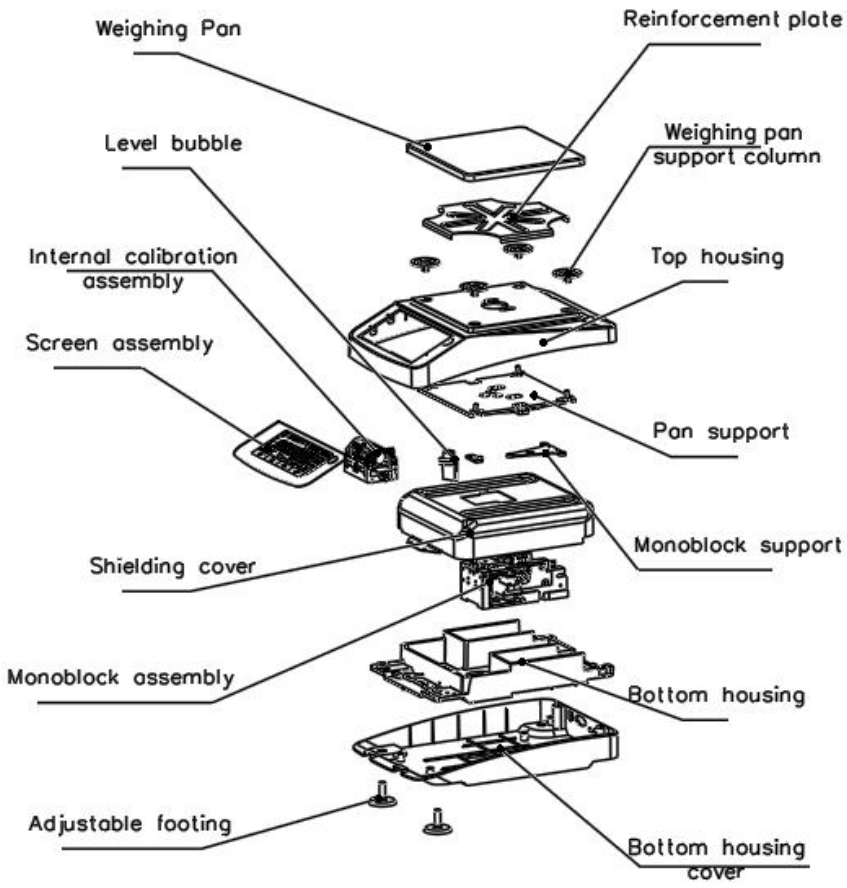
Use a set of cross-recessed hexagon screws M2.5x5 and φ3 spring washers to connect the limit plate and limit column to the optoelectronic component and tighten them gently.
Put the weight close to the full range and then remove it. Observe the loading and unloading process. Make sure the speed is consistent. Otherwise, adjust the height of the limiter until it is qualified. Tighten the screw



After rechecking the count value, install the shielding cover on the bottom housing with two hexagon socket head screws M3x6. During installation, the sealing column and the sealing ring must be concentric.

8 EXPLODED VIEW




Weighing Pan
Reinforcement plate
Level bubble
Weighing pan support column
Internal calibration assembly
Top housing
Screen assembly
Pan support
Monoblock support
Shielding cover
Monoblock assembly
Bottom housing
Adjustable footing
Bottom housing cover

9 SPARE PART LIST

Article no.	Description	
RTADS-1001	Measurement system	for TADS 120-4-A,TADT 120-4-A
RTADS-1002	Measurement system	for TADS 220-4-A,TADT 220-4-A
RTADS-1003	Measurement system	for TADS 320-4-A,TADT 320-4-A
RTADS-6001	Weighing plate 90 mm for TADS-A, TADT-A	for TADS-A,TADT-A
RTADS-6002	Weighingplate carrier for TADS-A, TADT-A	for TADS-A,TADT-A
RTADS-8001	Displayunit Front for TADS-A, TADT-A	for TADS-A,TADT-A
RTADS-8002	Draft shield	not TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTADS-8003	Draft shield - glass	not TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTADS-8004	Draft shield - glass	not TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTADS-8005	Draft shield - glass	not TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTADS-8006	Adjustable foot for TADS-/TADT-/TPDS-/TPDT-A	
RTADS-8007	Level indicator for TADS-/TADT-/TPDS-/TPDT-A	
RTADS-8008	Draft shield - handle	not TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTADS-9001	Automatic adjustment motor for TADT-A	for TADT-A
RTADS-9002	Cover for TADS-/TADT-/TPDS-/TPDT-A	
RTADS-9003	Hook for TADS-A, TADT-A	for TADS-A,TADT-A

RTPDS-1001	Measurement system incl. Mainboard for TPDS 320-3-A	for TPDS 320-3-A,TPDT 320-3-A
RTPDS-1002	Measurement system incl. Mainboard	for TPDS 620-3-A,TPDT 620-3-A
RTPDS-1003	Measurement system incl. Mainboard	for TPDS 1000-3-A,TPDT 1000-3-A
RTPDS-1004	Measurement system incl. Mainboard	for TPDS 2200-2-A,TPDT 2200-2-A
RTPDS-1005	Measurement system incl. Mainboard	for TPDS 4200-2-A,TPDT 4200-2-A
RTPDS-1006	Measurement system incl. Mainboard	for TPDS 6200-2-A,TPDT 6200-2-A
RTPDS-1007	Measurement system incl. Mainboard	for TPDS 10000-2-A
RTPDS-6001	Weighing plate	for TPDS 1000-3-A,TPDS 320-3-A,TPDS 620-3-A,TPDT 1000-3-A,TPDT 320-3-A,TPDT 620-3-A
RTPDS-6002	Weighing plate	for TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTPDS-6003	Weighingplate carrier	for TPDS 1000-3-A,TPDS 320-3-A,TPDS 620-3-A,TPDT 1000-3-A,TPDT 320-3-A,TPDT 620-3-A
RTPDS-6004	Weighingplate carrier	for TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTPDS-8001	Displayunit Front for TPDS-A, TPDT-A	not TADS-A,TADT-A
RTPDS-8002	Draft shield	for TPDS 10000-2-A,TPDS 2200-2-A,TPDS 4200-2-A,TPDS 6200-2-A,TPDT 2200-2-A,TPDT 4200-2-A,TPDT 6200-2-A
RTPDS-9001	Automatic adjustment motor for TPDT-A	for TPDT-A
RTPDS-9002	Hook for TPDS-A, TPDT-A	not TADS-A,TADT-A
YKA-23	Power supply (1 pieces) () 12 V, 2000 mA; Input: 100 V - 240 V, 50 / 60 Hz	