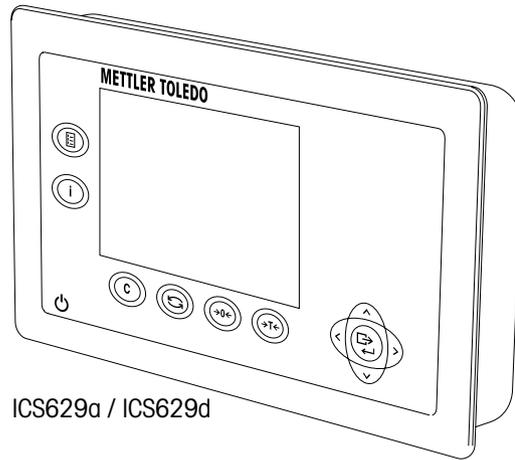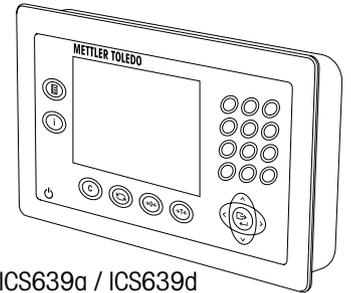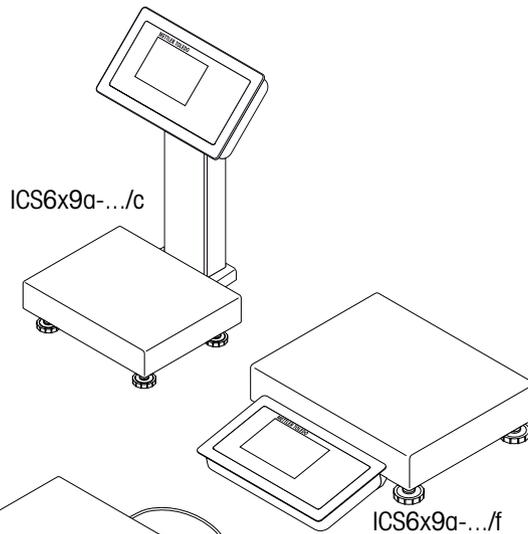# ICS6x9
Weighing terminals
Terminal and platform combinations

ICS629a / ICS629d
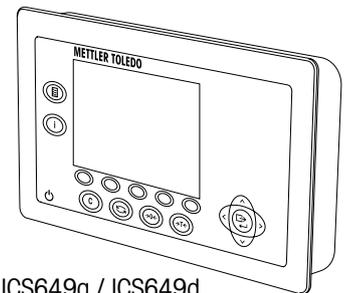
ICS639a / ICS639d

ICS6x9a-.../c

ICS649a / ICS649d
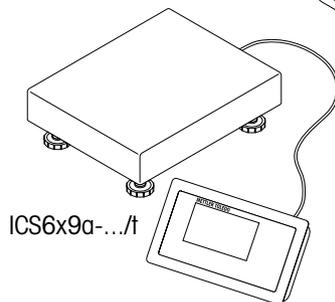
ICS6x9a-.../f

ICS6x9a-.../t
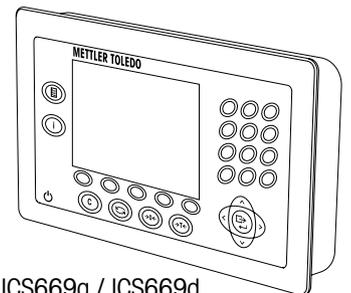
ICS669a / ICS669d

METTLER TOLEDO

Congratulations on choosing the quality and precision of METTLER TOLEDO. Proper use according to these instructions and regular calibration and maintenance by our factory-trained service team ensure dependable and accurate operation to protect your investment. Contact us about a ServiceXXL agreement tailored to your needs and budget.

We invite you to register your product at

www.mt.com/productregistration

so we can contact you about enhancements, updates and important notifications concerning your METTLER TOLEDO product.

Contents

1 General information

1.1 Overview of the ICS6x9 series

The ICS6x9 series offers weighing terminals to connect a customer weighing platform as well as complete terminal/platform combinations.

1.1.1 ICS6x9 weighing terminals

There are two versions of the ICS6x9 weighing terminals, depending on the scale interface SCALE 1:

- ICS6x9**a**   weighing terminal with analog scale interface for SCALE 1
- ICS6x9**d**   weighing terminal with digital scale interface (IDNet) for SCALE 1

1.1.2 ICS6x9 terminal and platform combinations

The complete name of a terminal and platform combination also indicates the type, size and capacity of the connected analog weighing platform. E.g., ICS629a-QA6/c stands for

ICS629a   type of weighing terminal and type of weighing interface
QA   design and size of the weighing platform
6   weighing platform capacity in kg
c   mechanical design

By default the weighing platforms are equipped with a hermetically sealed stainless steel load cell and a readability setting of 2 x 3000 divisions, non-approved.

ICS6x9a-.../f	ICS6x9a-.../t	ICS6x9a-.../c
Weighing terminal mounted in front of the weighing platform	Fixed cable connection between weighing terminal and weighing platform	Weighing terminal and column seamlessly welded together
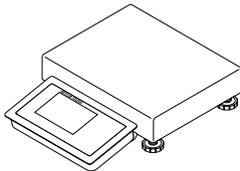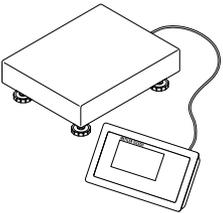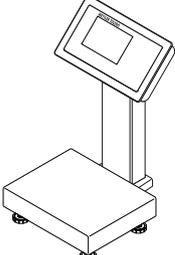
1.1.3 Options

The following options are available for the ICS6x9:

	ICS629a, ICS669d, ICS629a-.../f, ICS629a-.../t	ICS629a-.../c
Built-in storage battery	✔	✔
Optional scale interface (SCALE 2)	• analog • digital	–
Optional communication interface (COM 2)	• RS232 • RS422/RS485 • Ethernet • WLAN	• RS232 • RS422/RS485 • Ethernet • WLAN • USB • Digital I/O
Optional communication interface (COM 3)	• RS232 • RS422/RS485 • USB • Digital I/O	–
Desk mounting plate	✔	–

1.2 Documentation

The device is supplied with a CD containing the complete documentation on the ICS6x9 series.

This Installation information contains information on installing and commissioning the entire series.

1.3 Safety instructions

▲ Do not use the device in hazardous environment!
  Special devices are available in our range of products for hazardous environments.
▲ Ensure that the power socket outlet for the device is earthed and easily accessible, so that it can be de-energized quickly in emergencies.
▲ Ensure that the supply voltage at the installation site lies within the range of 100 V to 240 V.
▲ The safety of the deviced cannot be ensured if it is not operated in accordance with the operating instructions and if it is not installed in accordance with this installation information.
▲ Only authorised personnel may open the device.
▲ Check the power cable regularly for damage. If it is damaged, disconnect the device immediately from the power supply.
▲ Ensure that there is a space of at least 3 cm (1.25") at the rear in order to prevent the power cable from being bent too strongly.

1.4   Tightening torques

▲   For safe operation make sure that all screws and nuts are tightened with the correct tightening torque.

M3	M4	M5	M6	M12x1.5	M16x1.5 (nut)	M16x1.5 (screw)
0.55 Nm	1.5 Nm	2.5 Nm	5.5 Nm	0.7 Nm	2.5 Nm	3.75 Nm
4.9 Lb-In	13.3 Lb-In	22.1 Lb-In	48.7 Lb-In	6.2 Lb-In	22.1 Lb-In	33.2 Lb-In

2 Commissioning

2.1 Connecting two scales

Except for the column version the ICS6x9 series provide two scale connections: SCALE 1 and SCALE 2.

- Analog and digital scale interfaces can be combined in one terminal.
- SCALE 1 and SCALE 2 identify themselves by the scale connection on the mainboard and thus by the scale connection on the housing.
- When connecting two scales you do not need to take care of the order.
- When connecting only one scale use the SCALE 1 connection.

Rear view   Inner view
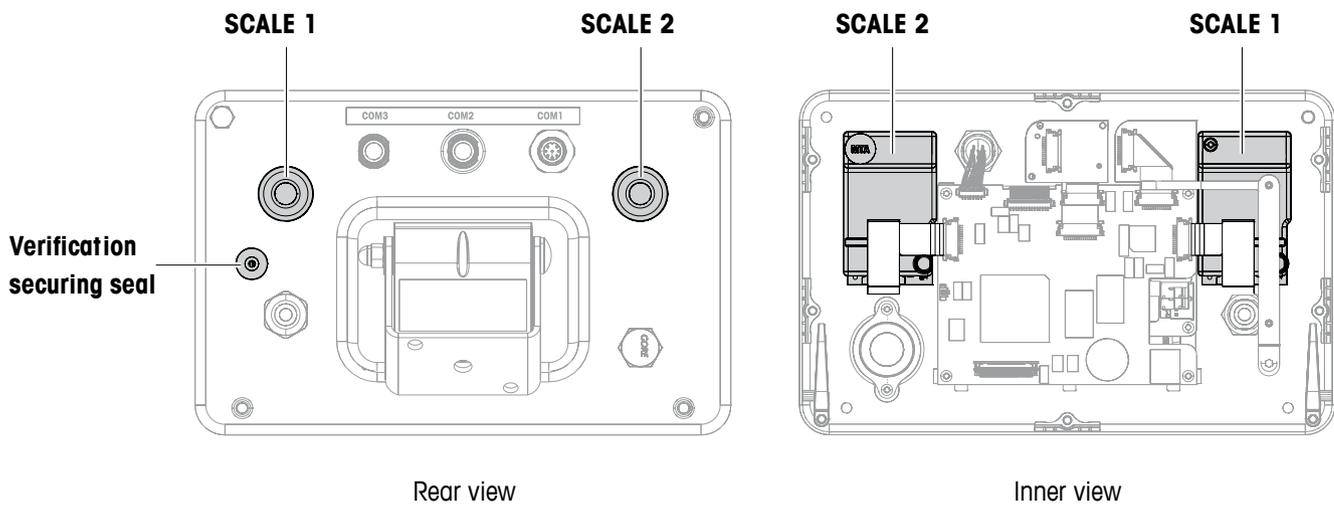
2.2 Connecting analog weighing platforms

Any analog weighing platforms that fulfil the required specifications can be connected to weighing terminals with an analog weighing interface, see Technical data.

2.2.1 Information on the weighing cells

Weighing cells with or without SENSE cables

➜ In the case of cells without SENSE cables short-circuit the connections +Ex (Excitation) and +Se (Sense) as well as −Ex and −Se at the connector or at the connection terminal.
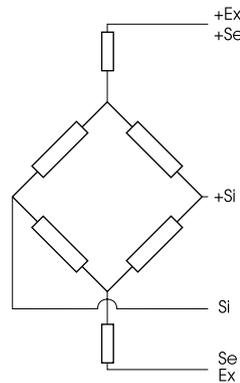
Cells without SENSE cables   **Cells with SENSE cables**
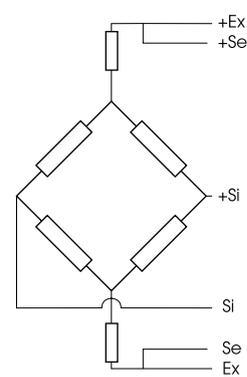
2.2.2 Connection of weighing platforms with several weighing cells

Up to four weighing cells can be connected to a weighing terminal in parallel. A junction box is usually used to connect several weighing cells.

The sum of the nominal capacities of the individual cells correspond to the total capacity of the weighing system. When entering the scale capacities in the menu, select values in such a way that the individual cells cannot be overloaded.

2.2.3 Preparation of the weighing platform connection cable
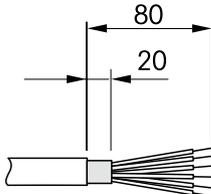
1. Strip the cell cable in accordance with the figure.
2. Apply wire end ferrules.
3. Bend the shield.

2.2.4   Connection of an analog weighing platform to the weighing terminal

RISK OF ELECTRIC SHOCK

➜ Disconnect the weighing terminal from the power supply before beginning installation work.

Terminal version

1. Turn over the terminal and loosen the 4 screws. Do not remove the screws.
2. Unscrew the verification screw underneath the verification seal (1).
3. Return the terminal to its normal position and lift off the cover.
4. Lay down the cover in front or leave it hanging down with the plastic hinges.
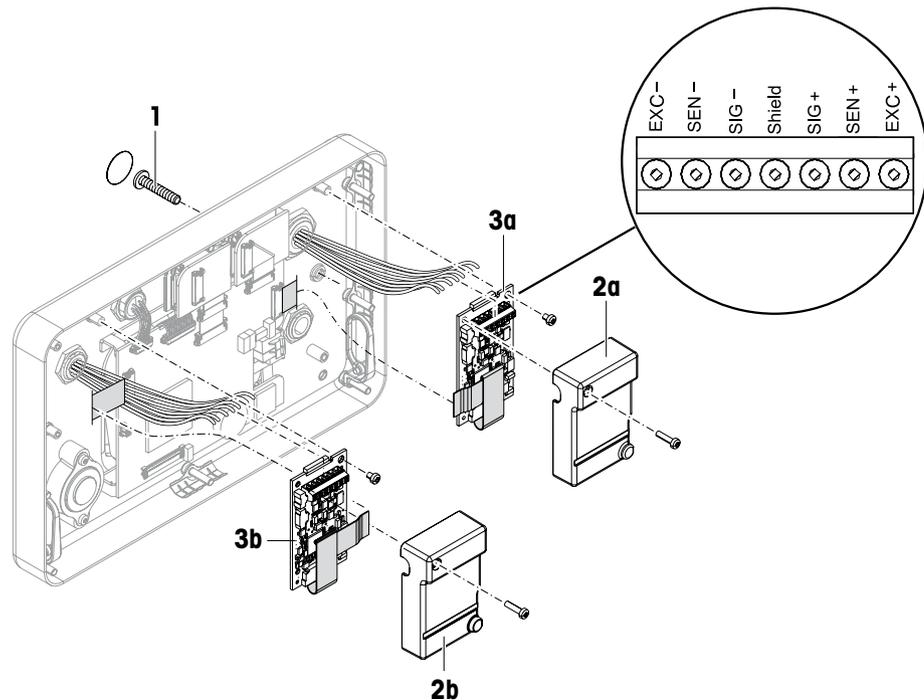
5. Remove the verification cover (2a/b) by unscrewing the screw.
6. Remove the Digicell PCB (3a/b) by unscrewing the two screws.
7. Unscrew the corresponding cable gland and feed in the weighing platform cable.
8. Fasten the cable gland. For the tightening torque refer to the table on page 6.
9. Connect the weighing platform cable to the terminals on the corresponding Digicell PCB (3a/b).
10. Reassemble Digicell PC and verification cover in reverse order.
11. Close the terminal with 4 screws. For the tightening torque refer to the table on page 6.
12. Screw in the verification screw.

Colours with METTLER TOLEDO weighing platforms

Weighing platform	EXC–	SEN–	SIG–	Shield	SIG+	SEN+	EXC+
PBA226 / PBA430	Black	Brown	Red	–	White	Blue	Green
PBA426 / PBA429	Black	Grey	Red	Yellow	White	Green	Blue

2.3   Connecting IDNet weighing platforms

Alternatively to the analog scale connection the weighing terminals can also be equipped with an IDNet scale interface.

1. Set up the weighing platform, refer to the installation information of the weighing platform.
2. Lay the weighing platform cable to the weighing terminal.
3. Ensure that the weighing terminal is switched off.
4. Plug the weighing platform connector into the weighing terminal (SCALE 1 or SCALE 2) and tighten the screw.

3 Scale configuration

Scale configuration takes place in the SCALE menu block of the technician menu.

3.1 Calling up the technician menu

Access to the technician menu is secured by means of the sealing screw underneath the verification securing seal.

1. Switch on the terminal.
2. Loosen the sealing screw.
   On verified scales, verification is no longer valid.
   – or –
→ Enter the technician menu with password →0← ⊑→ →0← ⊑→.

The technician menu is displayed.

ℹ **Verified scales**

After configuration has been completed, the device has to be recalibrated by an authorised company and a new verification seal has to be attached before the device may be used again as a verified scale.

3.2 Technician menu operation

Operation in the technician menu is the same as in the user and supervisor menu, see the corresponding User manual.

3.3 SCALE menu block

After the technician menu has been called up, the entire menu is available, also the user and supervisor menu. The following overview shows the SCALE 1 / SCALE 2 menu block, the remaining menu is described in the User manual.

The SCALE menu block depends on the connected weighing platform – analog or IDNet.

3.3.1 Overview of the analog SCALE menu block

Factory settings are printed in **bold** in the following overview.

Level 1	Level 2	Level 3	See ...
Metrology	Approval	**Not Approved**, OIML, NTEP	page 15
	Class	Class I, Class II, **Class III**, Class IIII	
	Ver. interval	e = d, e = 10d (Class II only)	
	Display	Off, **On**	
Ramp value			page 15
Serial number	Indicator		page 16
	Scale		
Scale build	Ranges	Single range, 2 Multi int., 2 Multi range, 3 Multi int., 3 Multi range	page 16
	Calibrated unit	g, kg, oz, lb, t	
	Capacity 1		
	Resolution 1		
	Capacity 2		
	Resolution 2		
	Capacity 3		
	Resolution 3		
GEO value			page 16
Linearisation	3 Point, 5 Point		page 17
Calibration	Perform calibration?		page 17
Control			page 17
Display/Units	Unit 1	g, kg, oz, lb, lb-oz, t	User manual
	Unit 2	g, kg, oz, lb, lb-oz, t	
	Resolution	1200 d ... 175000 d	
	Unit roll	**Off**, On	

Level 1	Level 2	Level 3	See ...
Zero	Zero capture	-2 to +2%, **-2 to +18%**	page 18
	Set zero		
	AZM	Off, **0.5d**, 1d, 2d, 5d, 10d	User manual
	Pushbutton zero	Off, **On**	page 18
	Center of Zero	**Off**, On	
Tare	Auto tare	**Off**, On	User manual
	Chain tare	Off, **On**	
	A-Clear tare	**Off**, On, 9d	
	Pushbutton tare	Off, **On**	page 18
Restart	**Off**, on		User manual
Filter	Vibration	Low, **Medium**, High	User manual
	Process	**Universal**, Dosing	
	Stability	Fast, **Standard**, Precise	
MinWeigh	Function	**No**, Yes	User manual
	Value		page 18
Reset	Perform reset ?		User manual

3.3.2 Overview of the IDNet SCALE menu block

Factory settings are printed in **bold** in the following overview.

Level 1	Level 2	Level 3	See ...
Metrology	Approval *	**Not Approved**, OIML, NTEP	page 15
	Class	Class I, Class II, **Class III**, Class IIII	
	Ver. interval *	e = d, e = 10d (Class II only)	
	Display	Off, **On**	
Service mode	See Service manual of the connected weighing platform.		
Serial number *			page 16
Display/Units	Unit 2	g, kg, oz, lb, lb-oz, t	User manual
	Unit roll	**Off**, On	
Zero	AZM	Off, **0.5d**, 1d, 2d, 5d, 10d	User manual
	Pushbutton zero	Off, **On**	page 18
	Center of Zero	**Off**, On	
Tare	Auto tare	**Off**, On	User manual
	Chain tare	Off, **On**	
	A-Clear tare	**Off**, On, 9d	
	Pushbutton tare	Off, **On**	page 18
Restart	**Off**, on		User manual
Filter	Vibration	Stable, **Normal**, Unstable	User manual
	Process	**Universal**, Absolute, Finefil	
	Stability	ASD = 0, 1, **2**, 3, 4, 5	
Update	6, 10, 15, 20 UPS		User manual
MinWeigh	Function	**Off**, On	User manual
	MinWeigh value		page 18
Reset	Perform reset ?		User manual

* = read only

3.3.3 Description of the SCALE menu block

METROLOGY – admissibility for verification

Approval *	Setting the admissibility for verfication
Not approved	Scale not verifiable
OIML	Verify scale to OIML
NTEP	Verify scale to NTEP, valid for USA
Class	Setting the verification class, displayed only if approved
Class I ... Class IIII	Select the verification class
Ver. interval *	Setting the verification interval, for Class II only
e = d	Verification interval = display resolution
e = 10d	Verification interval = 10 x display resolution
Display	
Off	No metrological data in the display
On	Metrology data line enabled
Notes	• If a scale is verified, various scale settings are no longer available or are only available to a limited extent. Direct access to the menu for service personnel is, furthermore, blocked subsequently for some menu items. • With verification interval e = 10 d the last (not approved) digit is displayed smaller.

* read only for IDNet scales

RAMP VALUE – querying the value of the A/D converter (analog scales only)

Ramp value	
Ramp 20	Display of the percentage deflection of the analog/digital converter (ramp) Possible values: 0 … 100 The empty scale has a lower ramp value than the scale with load.
Note	This value can be used to determine whether the weighing cell operates correctly. Scales with identical weighing cells that function correctly have more or less the same ramp values. The value is dynamic and changes when the load changes.

SERIAL NUMBERS * – querying the serial number of terminal and scale

Indicator	Display or modification of the serial number of the weighing terminal
Scale	Display or modification of the serial number of the scale
Note	The serial number should not be changed except, e.g., after a new main PCB has been installed.

* read only for IDNet scales

SCALE BUILD – entering configuration data (analog scales only)

Ranges	Defining the scale type
Single range	Single range scale
2 Multi int.	Scale with rough range and 1 shiftable fine range. Automatic switching between the ranges in both directions.
2 Multi range	Scale with rough rang and 1 fixed fine range. Automatic switching to the rough range. Return to the fine range at zero pass.
3 Multi int.	Scale with rough range and 2 shiftable fine ranges. Automatic switching between the ranges in both directions.
3 Multi range	Scale with rough rang and 2 fixed fine ranges. Automatic switching to the rough range. Return to the fine range at zero pass.
Calibrated unit	Select the basic unit for entering in the service menu Possible units are: g, kg, oz, lb, t
Capacity 1/2/3	Enter capacity of the first/second/third range in the calibrated unit
Resolution 1/2/3	Select resolution of the first/second/third range in the calibrated unit
Note	• Capacity 2/3 and Resolution 2/3 are only displayed if they are supported by the scale. • Capacity and resolution are displayed in the following order: Capacity 1, Resolution 1, Capacity 2, Resolution 2, Capacity 3, Resolution 3 • The units g, kg and t are permissible in accordance with verifiable operation to OIML. The units kg and lb are permissible in accordance with verifiable operation to NTEP.

GEO VALUE – setting the GEO value (analog scales only)

0 ... 31	The Geo value is used to adapt the weighing system to the local gravity conditions. Setting range: 0 … 31, see table in the Appendix.

LINEARISATION – linearisation with simultaneous calibration (anlaog scales only)

A basic calibration must have been carried out at least once for linearisation with simultaneous calibration.

3 Point	3-point linearisation (by default at 0 %, 50 % and 100 % of the full load)
5 Point	5-point linearisation (by default at 0 %, 25 %, 50 %, 75 % and 100 % of the full load)
Procedure	1. If existent, apply the preload. 2. Confirm the type of linearisation. The display begins to flash, the scale determines the zero point automatically. The scale next requires the first weight. 3. If appropriate, change the displayed weight value. 4. Place the displayed weight on the scale and confirm with ⇨. 5. Repeat steps 3 and 4 for each additional weight. After all the weights have been applied, done is displayed.
Note	• Determining the zero point can be skipped by pressing →T←. In this case the existing zero point is used as the reference. • Linearisation/calibration can be cancelled at any time with ⏻.

CALIBRATION – basic calibration (analog scales only)

Procedure	1. When Preload is displayed, load the desired preload and confirm with ⇨. The scale next requests the calibration weight corresponding to the full load. 2. If appropriate, change the displayed weight value. 3. Place the displayed weight on the scale and confirm with ⇨. After calibration has been carried out, done is displayed.
Note	• Determining the preload can be skipped by pressing →T←. In this case the existing zero point is used as reference. • Calibration can be cancelled at any time with ⏻. • In order to achieve particularly high precision, carry out calibration under full load.

CONTROL – activating the control mode (analog scales only)

Note	• With control mode enabled, the current weighing result is displayed with high resolution and without weight unit. This allows the scale to be checked, e.g., after calibration and/or linearisation. • To leave the control mode press ⏻.

ZERO – Settings for the zero point

Zero capture	Select the zero capturing range. Possible zero capturing ranges: −2 % to +2 % or −2 % to +18 %
Set zero	Move the calibration zero point. This is necessary if an auxiliary preload is used or if the preload (e.g. roller conveyor) cannot be used for calibration or if they are outside the zero capturing range. 1. Apply the preload and confirm with ⇨. The query `Sure ?` is displayed. 2. Confirm moving of the zero point with ⇨ or cancel with →T←. 3. If underload or overload is displayed after the menu has been exited, switch the device off and on again.
AZM	Setting for the automatic zero compensation mode, refer to the User manual.
Pushbutton zero	Enabling/disabling manual zeroing using the →0← key.
Center of Zero	Switching on/off indication of **>0<** when zero setting is within the zero capturing range.
Note	• The zero capturing range limits the nominal capacity of the scale. If the capacity of a weighing cell is to be used to its complete extent, the zero capturing range can be limited to −2 % to +2 %. • The new zero point is not activated until the scale is restarted. • No changes to Zero capture and Set zero should be carried out when the restart function is activated.

TARE – Settings for the tare function

Auto Tare	Supervisor menu, refer to the User manual
Chain Tare	
A-Clear Tare	
Pushbutton Tare	Enabling/disabling manual taring using the →T← key.

MIN WEIGH – specifying the minimum weighing-in quantity

Function	Supervisor menu, refer to the User manual
Value	Entry of the minimum weighing-in quantity in the selected base unit. When the minimum weighing-in quantity is activated, ⬓ is displayed if the weight on the scale drops below the stored minimum weight.

4   Technical data

4.1   Technical data of the analog scale interface

4.1.1   Analog scale interface

Resolution	300,000 points for non-verifiable applications 7,500 points for verifiable applications
Weighing ranges	up to 3 weighing ranges can be defined in the technician menu, incl. shiftable or fixed fine ranges In the case of verifiable/verified applications the minimum voltage per calibration value (0.5 μV/e) has to be ensured or 7,500 e may not be exceeded.
Calibration	Basic calibration and calibration during linearisation
Zero setting range (key)	2 % of the defined max. useable load, cannot be modified
Autozero range	2 % of the defined max. useable load, cannot be modified
Activation zero set range	-2 % ... 18 % or -2 % ... +2 % referenced to the defined max. useable load, can be selected in the menu
Linearity	0.01 % of the defined max. useable load
Units	g, kg, oz, lb, t, lb-oz
Numerical steps	1, 2, 5 x 10^n, can be selected in the menu
Cell power supply	8.2 V

4.1.2   Requirements for the weighing cell

Nominal load	0.1 ... 999,999.9 (g, kg, lb, oz, t, lb-oz)
Permissible impedance	$\geq 80\ \Omega$
Differential signal	-1 mV ... 25 mV (see the following example)

Calculation example for the differential signal
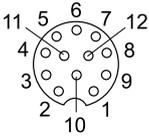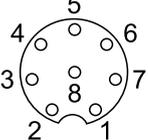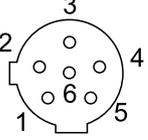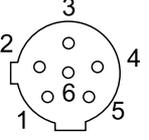
Data of the weighing cell: Sensitivity 2 mV/V, cell capacity 100 kg

- Differential signal for nominal load (60 kg)
  2mV/V * 8.2 V * 60 kg/100 kg = 9.84 mV
- Differential signal for half load (30 kg)
  2mV/V * 8.2 V * 30 kg/100 kg = 4.92 mV

Prerequisites for verifiable scales

- Verifiable weighing cell with SENSE cables (6 leads), cell sensitivity 2 mV/V or 3 mV/V
- Scale configured as verifiable
- Labelling in accordance with regulations by the plant engineer, if the complete weighing system was not supplied by METTLER TOLEDO.

4.2 Assignment of the interface connections

	Digital I/O	RS232	RS422	RS485	USB Device	Ethernet	Power
Socket							
Pin 1	In 0	CTS	TxD+	T/RxD+	+5 V	TD+	+12 V
Pin 2	In 1	TxD	TxD–	T/RxD–	D–	RD+	+12 V
Pin 3	In 2	RTS	RxD+	–	GND	TD–	GND
Pin 4	In 3	RxD	+12 V	+12 V	D+	RD–	GND
Pin 5	In_GND	+12 V	GND	GND			
Pin 6	Out 0	+5 V	RxD–	–			
Pin 7	Out 1	–					
Pin 8	Out 2	GND					
Pin 9	Out 3						
Pin 10	Out_GND						
Pin 11	+12 V						
Pin 12	GND						

4.3 Drilling template

Important

The drilling template shown below is scaled up.

→ Read the dimensions from the drilling template and copy them to the mounting location.
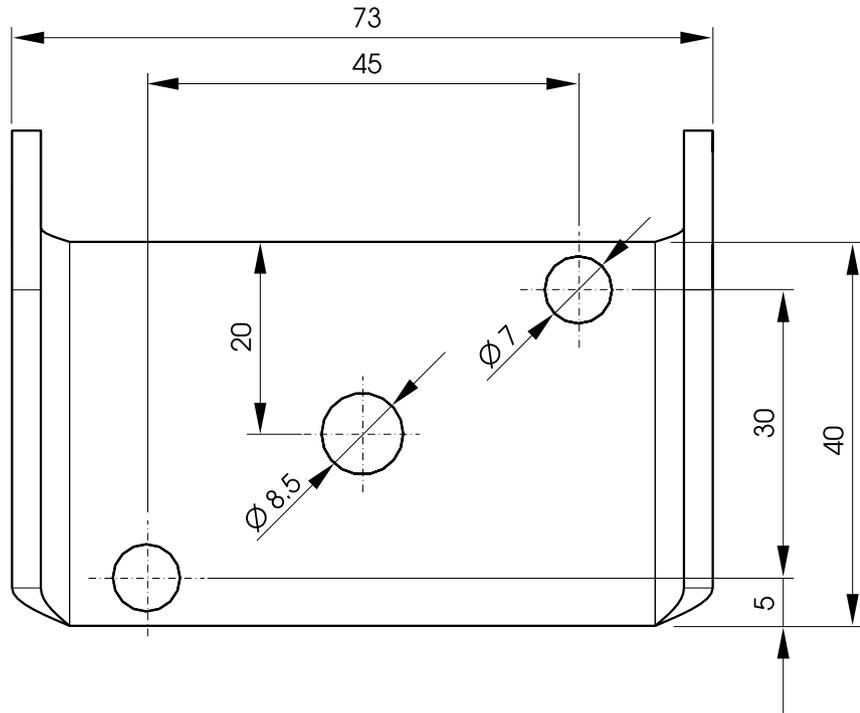
5 Appendix

5.1 Table of Geo values

Northern or southern latitude in degrees and minutes	Height above sea level in meters										
	0 325	325 650	650 975	975 1300	1300 1625	1625 1950	1950 2275	2275 2600	2600 2925	2915 3250	3250 3575
	Height above sea level in feet										
	0 1060	1060 2130	2130 3200	3200 4260	4260 5330	5330 6400	6400 7460	7460 8530	8530 9600	9600 10660	10660 11730
0° 0' – 5° 46'	5	4	4	3	3	2	2	1	1	0	0
5° 46' – 9° 52'	5	5	4	4	3	3	2	2	1	1	0
9° 52' – 12° 44'	6	5	5	4	4	3	3	2	2	1	1
12° 44' – 15° 6'	6	6	5	5	4	4	3	3	2	2	1
15° 6' – 17° 10'	7	6	6	5	5	4	4	3	3	2	2
17° 10' – 19° 2'	7	7	6	6	5	5	4	4	3	3	2
19° 2' – 20° 45'	8	7	7	6	6	5	5	4	4	3	3
20° 45' – 22° 22'	8	8	7	7	6	6	5	5	4	4	3
22° 22' – 23° 54'	9	8	8	7	7	6	6	5	5	4	4
23° 54' – 25° 21'	9	9	8	8	7	7	6	6	5	5	4
25° 21' – 26° 45'	10	9	9	8	8	7	7	6	6	5	5
26° 45' – 28° 6'	10	10	9	9	8	8	7	7	6	6	5
28° 6' – 29° 25'	11	10	10	9	9	8	8	7	7	6	6
29° 25' – 30° 41'	11	11	10	10	9	9	8	8	7	7	6
30° 41' – 31° 56'	12	11	11	10	10	9	9	8	8	7	7
31° 56' – 33° 9'	12	12	11	11	10	10	9	9	8	8	7
33° 9' – 34° 21'	13	12	12	11	11	10	10	9	9	8	8
34° 21' – 35° 31'	13	13	12	12	11	11	10	10	9	9	8
35° 31' – 36° 41'	14	13	13	12	12	11	11	10	10	9	9
36° 41' – 37° 50'	14	14	13	13	12	12	11	11	10	10	9
37° 50' – 38° 58'	15	14	14	13	13	12	12	11	11	10	10
38° 58' – 40° 5'	15	15	14	14	13	13	12	12	11	11	10
40° 5' – 41° 12'	16	15	15	14	14	13	13	12	12	11	11
41° 12' – 42° 19'	16	16	15	15	14	14	13	13	12	12	11

	Height above sea level in meters										
	0 325	325 650	650 975	975 1300	1300 1625	1625 1950	1950 2275	2275 2600	2600 2925	2915 3250	3250 3575
Northern or southern latitude in degrees and minutes	**Height above sea level in feet**										
	0 1060	1060 2130	2130 3200	3200 4260	4260 5330	5330 6400	6400 7460	7460 8530	8530 9600	9600 10660	10660 11730
41° 19' – 43° 26'	17	16	16	15	15	14	14	13	13	12	12
43° 26' – 44° 32'	17	17	16	16	15	15	14	14	13	13	12
44° 32' – 45° 38'	18	17	17	16	16	15	15	14	14	13	13
45° 38' – 46° 45'	18	18	17	17	16	16	15	15	14	14	13
46° 45' – 47° 51'	19	18	18	17	17	16	16	15	15	14	14
47° 51' – 48° 58'	19	19	18	18	17	17	16	16	15	15	14
48° 58' – 50° 6'	20	19	19	18	18	17	17	16	16	15	15
50° 6' – 51° 13'	20	20	19	19	18	18	17	17	16	16	15
51° 13' – 52° 22'	21	20	20	19	19	18	18	17	17	16	16
52° 22' – 53° 31'	21	21	20	20	19	19	18	18	17	17	16
53° 31' – 54° 41'	22	21	21	20	20	19	19	18	18	17	17
54° 41' – 55° 52'	22	22	21	21	20	20	19	19	18	18	17
55° 52' – 57° 4'	23	22	22	21	21	20	20	19	19	18	18
57° 7' – 58° 17'	23	23	22	22	21	21	20	20	19	19	18
58° 17' – 59° 32'	24	23	23	22	22	21	21	20	20	19	19
59° 32' – 60° 49'	24	24	23	23	22	22	21	21	20	20	19
60° 49' – 62° 9'	25	24	24	23	23	22	22	21	21	20	20
62° 9' – 63° 30'	25	25	24	24	23	23	22	22	21	21	20
63° 30' – 64° 55'	26	25	25	24	24	23	23	22	22	21	21
64° 55' – 66° 24'	26	26	25	25	24	24	23	23	22	22	21
66° 24' – 67° 57'	27	26	26	25	25	24	24	23	23	22	22
67° 57' – 69° 35'	27	27	26	26	25	25	24	24	23	23	22
69° 35' – 71° 21'	28	27	27	26	26	25	25	24	24	23	23
71° 21' – 73° 16'	28	28	27	27	26	26	25	25	24	24	23
73° 16' – 75° 24'	29	28	28	27	27	26	26	25	25	24	24
75° 24' – 77° 52'	29	29	28	28	27	27	26	26	25	25	24
77° 52' – 80° 56'	30	29	29	28	28	27	27	26	26	25	25
80° 56' – 85° 45'	30	30	29	29	28	28	27	27	26	26	25
85° 45' – 90° 0'	31	30	30	29	29	28	28	27	27	26	26

To protect your METTLER TOLEDO product's future:

METTLER TOLEDO Service XXL assures the quality, measuring accuracy and preservation of value of all METTLER TOLEDO products for years to come.

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