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REMBE® Kersting GmbH

Belt weigher UNIBAND® with ADAM HighEnd

Translation of the original operating manual

GBB-BW_ADAM-17682/1

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1   About this operating manual

This manual is part of the belt weigher UNIBAND® with the mass flow transducer ADAM HighEnd, and describes the safe and correct use in all phases of operation.
Parts or all of this manual may not be copied, disseminated or utilised for the purposes of competition without written authorisation, or distributed to third parties.

1.1   Target group

Target group	Task
Operator	• Keep this manual and the associated documents to hand at the place of use, and also keep it for later use. • Ensure that staff read and follow this manual and the documents that also apply, especially the safety and warning notices. • Observe additional system-specific operating manuals, specifications and regulations.
Expert personnel, installer	• Read, observe and follow this manual and the documents that also apply, particularly the safety and warning notices.

Tab. 1:   Target groups and their tasks

1.2   Warning notices and symbols

Warning symbol	Signal word	Hazard category	Consequences if not avoided
⚠	DANGER	Immediate threat of danger	Death, serious injury
⚠	WARNING	Potential threat of danger	Death, serious injury possible
⚠	CAUTION	Potentially dangerous situation	Minor injury possible
	NOTICE	Potentially harmful situation	Material damage / environmental damage

Tab. 2:   Warning notices and consequences of not observing them

Symbol	Meaning
►	Directions for action
1. , 2. , …	Multi-step directions for action
✓	Prerequisite

Tab. 3:   Symbols and meaning

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2 Safety

2 Safety

2.1 Intended use

- Only use the belt weigher and mass flow transducer for the weighing of belt-conveyed products

2.2 General safety notices

2.2.1 Product safety

This product is manufactured in accordance with recognized technical safety regulations. Nevertheless, dangers to the life and safety of the user or third parties, or possible damage to the product and other property can arise during use.

- Only use the product in a technically flawless condition as well as in accordance with its intended use, with a mind to safety and possible hazards, and in accordance with this manual.
- Installation only as specified in the assembly information.
- Connection of all products with the correct supply voltage.
- Read this manual completely before use and keep this manual and all other relevant documents complete, completely legible and accessible to personnel at all times.
- Prohibit all ways of working that pose a risk to personnel or third parties.
- In addition, also observe the statutory and local safety and accident prevention regulations, as well as the standards and directives that apply in the respective operating country.

2.2.2 The operators' obligations

Safety-conscious working

- Ensure the observance and monitoring:
  – intended use
  – statutory and local safety and accident prevention regulations
  – safety regulations for handling hazardous goods
  – standards and directives that apply in the respective operating country
- Provide sufficient personal safety equipment.

Personnel qualifications

- Ensure that before starting work, personnel tasked with working on the electronics have read and understood this manual and the documents that also apply, particularly the safety, maintenance and repair information.
- Define personnel responsibilities and monitoring.
- Have all work during all operating phases only performed by technical expert personnel.

2.2.3 The obligations of personnel

- If necessary, use personal safety equipment:
  – Safety footwear
  – Protective helmet
  – Hearing protectors
  – Protective gloves
  – Protective goggles

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3   Design and function

3.1   Design

3.1.1   Mass flow transducer design

The mass flow transducer is available in a stainless steel housing, and for switching panel mounting.
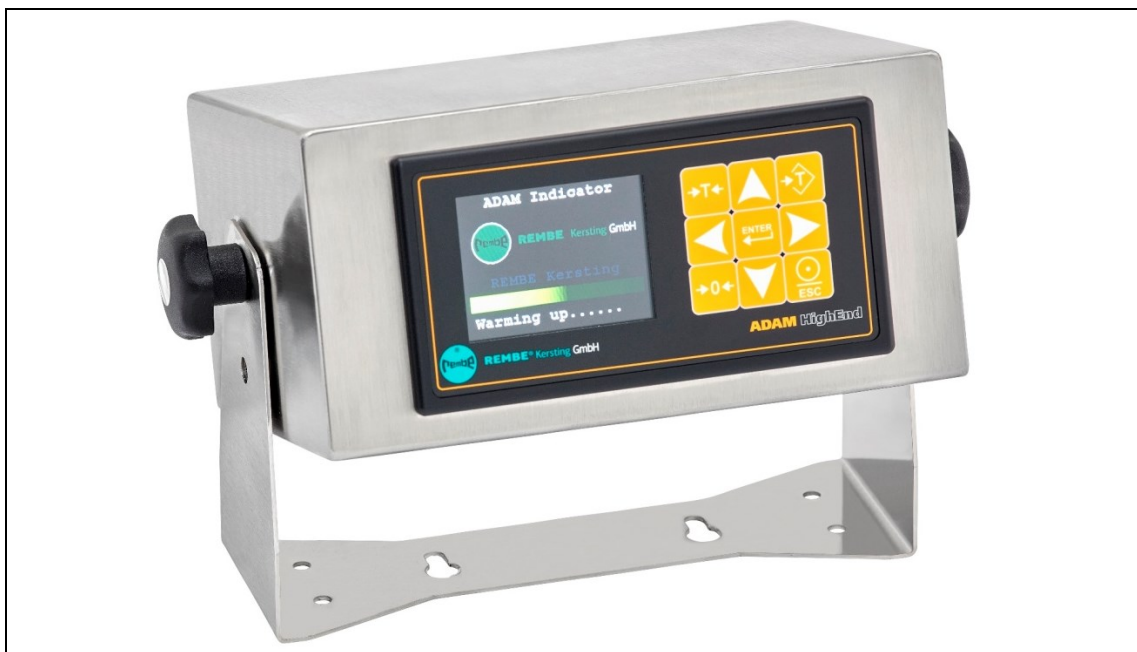
Fig. 1:   Mass flow transducer design as a stainless-steel housing

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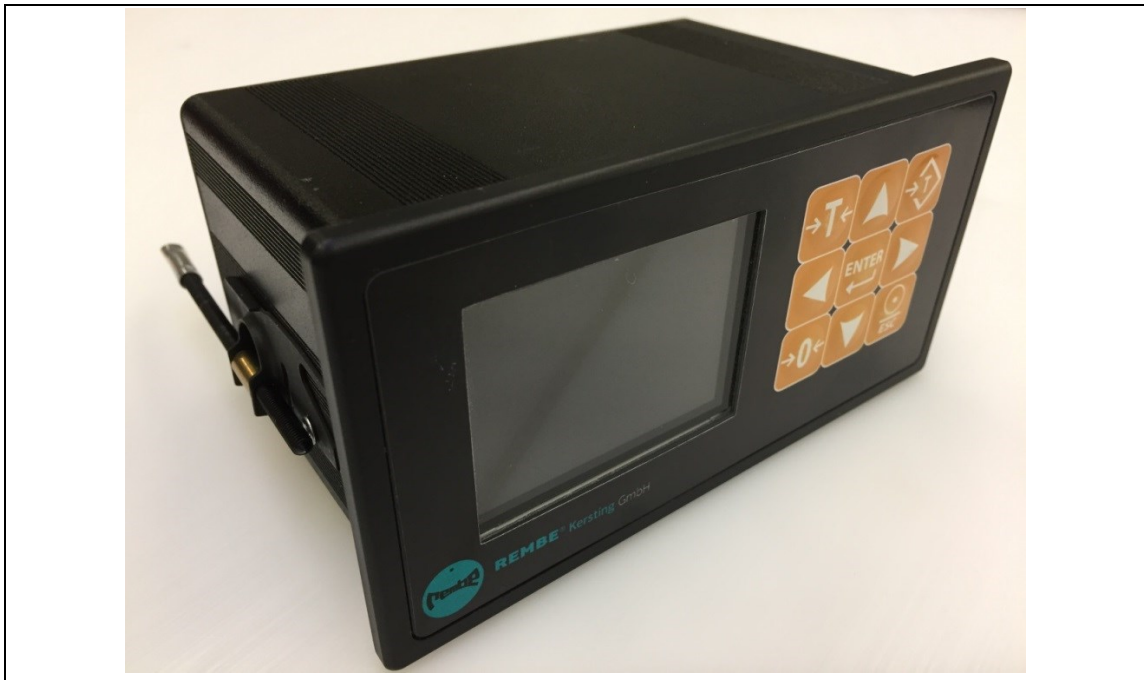
Fig. 2:   Mass flow transducer design for the switching panel installation

3.1.2 Belt weigher design
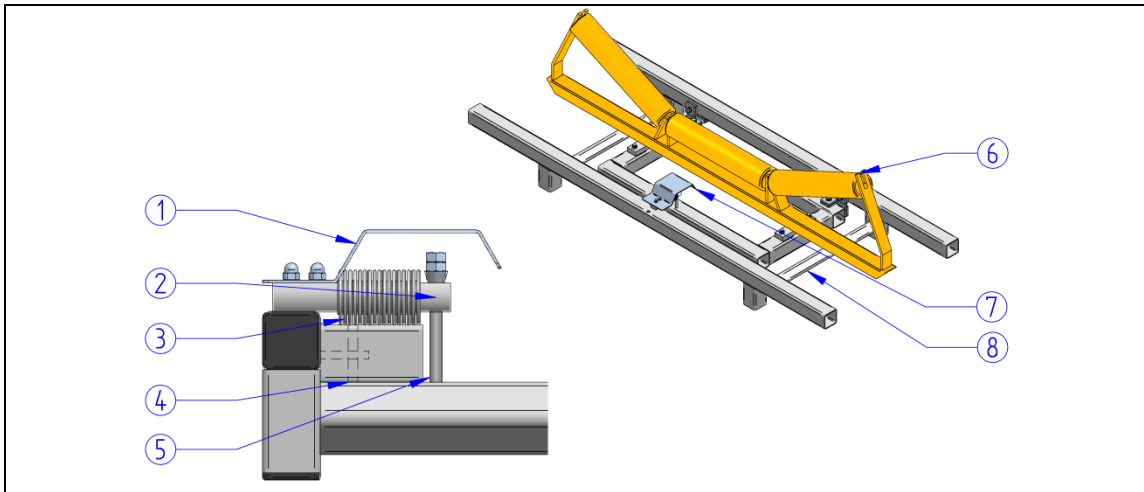
Fig. 3:   Belt weigher design

1	Protective plate	5	Steel wire
2	Load cell	6	Roller chair
3	Transportation locking screw with lock nut, top	7	Weighing unit
4	Transportation locking screw with lock nut, bottom	8	Weighing frame with tag plate

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3 Design and function

3.2   Function

3.2.1   Mass flow transducer

Mass flow transducer for the precise processing of measured data from belt weighers, packaging scales, checkweighers and dosing systems.

3.2.2   Belt weigher

Belt weigher for measuring the conveying capacity of belt conveyed goods

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4 Marking

4 Marking

4.1 Mass flow transducer marking

4.1.1 Tag plate

The tag plate is located on the cover of the mass flow transducer (see Chapter 3.1.1, p. 6).
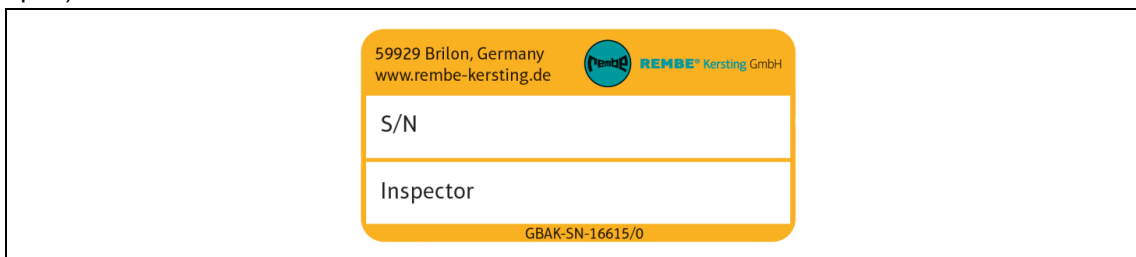
Fig. 4: Tag plate

4.2 Belt weigher marking

4.2.1 Tag plate

The tag plate is located on the cover of the weighing frame (see Chapter 3.1.1, p. 6).
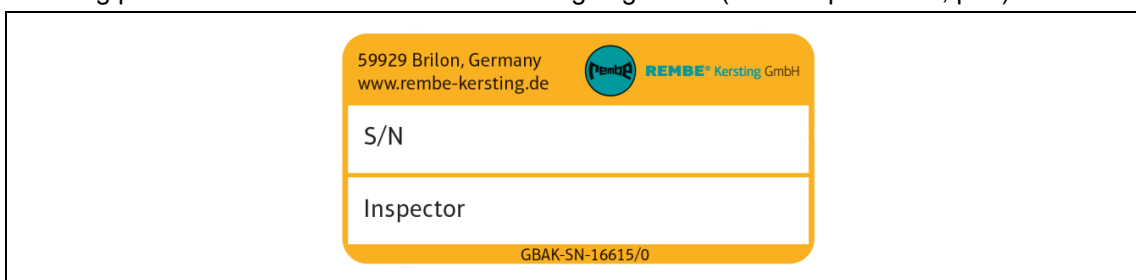
Fig. 5: Tag plate

4.2.2 Warning sticker nominal load

The tag plate is located on the protective plate of the weighing frame (see Chapter 3.1.1, p. 6).

Fig. 6: Warning sticker nominal load

1	Product name	3	Overload notice
2	Nominal load	4	Manufacturer

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4 Marking

4.2.3   Warning sticker weighing area

The warning sticker is glued to the weighing frame after installation (see Chapter 3.1.1, p. 6).

Fig. 7:   Warning sticker weighing area

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5 Transport and storage

5 Transport and storage

5.1 Transporting

⚠ **CAUTION! Material damage due to incorrect transport!**

5.2 Unpacking and checking the condition on delivery

1. Carefully unpack the product on receipt and inspect it for transport damage.
2. Report any transport damage to the carrier immediately.

5.2.1 Lifting

▶ Avoid vibrations when lifting the mass flow transducer.
▶ Properly lift and transport the belt weigher.
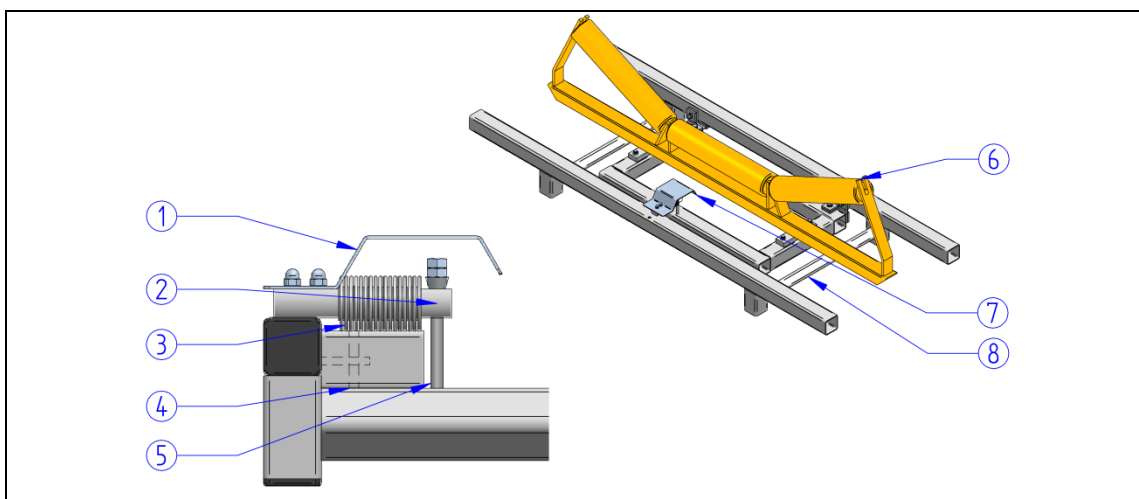
⚠ **DANGER! Death or crushed limbs caused by goods falling while being transported!**
▷ Select the correct lifting gear for the weight being transported.
▷ Do not stand under suspended loads.
▷ Secure the transport route.

⚠ **CAUTION!Damage to the load cell through incorrect transport!**
▷ Transport the belt weigher as vibration-free as possible.
▷ Set down the belt weigher as gently as possible.

5.3 Storage

⚠ **CAUTION! Material damage due to incorrect storage!**
▷ Store the belt weigher and mass flow transducer in the original packaging.

▶ Ensure that the storage room fulfils the following conditions:
– dry
– frost-free
– vibration-free

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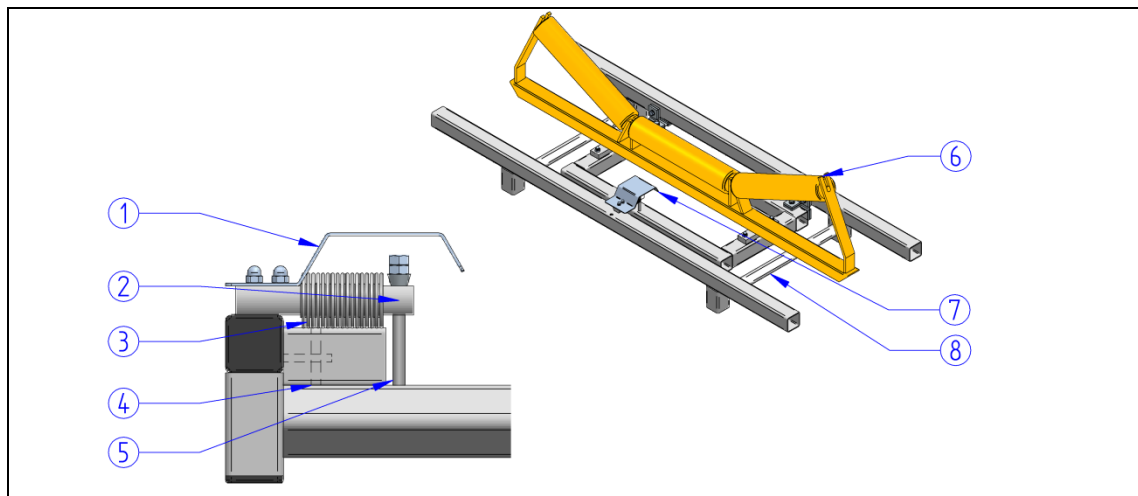Эл. почта: info@tisys.ru info@tisys.kz   info@tisys.by

6 Installation

6 Installation

⚠ **DANGER! Risk of injury when the system is running or starting!**
When the system is running or starting, limbs can be crushed or torn off.

6.1 Checking the ambient conditions

- ✓ The system is shut down
- ✓ The system is secured against unintentional re-activation.
- ✓ Before the deflection or drive roller of the conveyor belt, at least
  2 roller chairs present
- ✓ Belt weigher is not mounted in the direct transfer area of the conveyed material
- ✓ Belt weigher is not mounted in the bend area of the conveyor belt
- ✓ Belt weigher is not mounted under a magnetic separator

6.2 Mounting the belt weigher

⚠ **CAUTION! Welding currents may damage the load cell!**
- ▷ Carry out welding work with extreme caution.
- ▷ Ensure that no welding current can flow across the load cell.

NOTE! Strong vibrations can affect the measurement readings!
- ▷ Provide an adequate mechanical support structure.
- ▷ If necessary, secure the mounting additionally.

NOTE! Roller chairs that are not exactly aligned can influence the measured values!
Align the belt weigher with the roller chair exactly with the other roller chairs.

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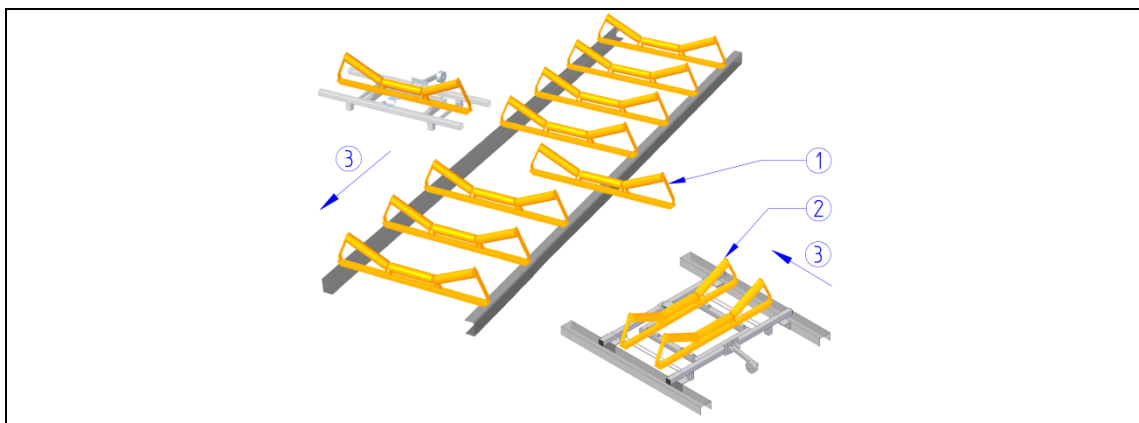
6 Installation

Fig. 8: Mounting the belt weigher

1	Roller chair	3	Running direction
2	Shortened roller chair		

Installation steps

1. Dismantle the present roller chair (1) (s. Fig. 8, p. 13).
2. Shorten the roller chair on the side (2) (s. Fig. 8, p. 13) and attach it to the belt weigher.
3. Place the belt weigher centrally between the adjacent roller chairs, taking into account the running direction (3) (see Fig. 8, p.13) of the belt weigher.
4. Align the belt weigher, for example, check the alignment by tensioning a cord.
5. Fasten the belt weigher with the included clamps.
6. Warning sticker: Attach the rated load visibly in the area of the belt weigher (s. Fig. 6, p. 9)

6.3   Remove the transport protection

To prevent damage to the load cell, the load cell is mechanically equipped with a transport lock and an overload stop.

Secure the load cell by means of the transport securing device during each transport and mechanical work on the conveyor belt.

Fig. 9: Remove the transport protection

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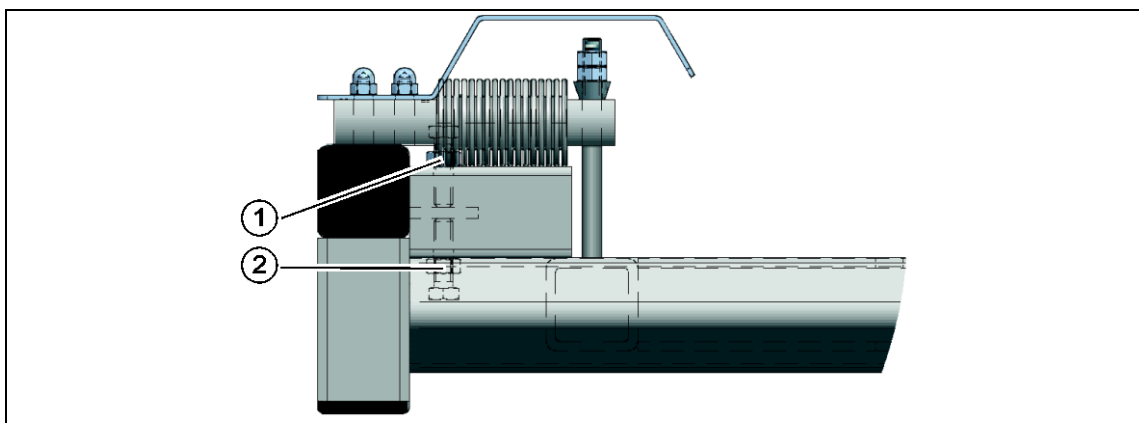
6 Installation

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1. Dismantle the lower transport protection screw (2) (s. Fig. 9, p. 13) and store it for a later transport.
2. Dismantle the upper transport protection screw (1) (s. Fig. 9, p. 13) and store it for a later transport.

6.4   Connect the mass flow transducer

✓ Shielded connection cable between ADAM and measuring cell
✓ Shielded connection cable for power output 0(4) - 20 mA
✓ Shielded connection cable for interface output RS-232/422
✓ Shielded connection cable for relay contacts
✓ Shielding of the connection and connecting cables is connected to the protective ground conductor on the terminal strip of the mass flow transducer.
✓ Proper low-ohmic protective conductor connection is present
✓ Lines in the clamping area should be routed without crossings as far as possible

▶ Connect the mass flow transducer according to wiring diagrams (see chapter 12, p. 26)
▶ Install the mass flow transducer vibration-free.

6.5   Connect the speed adjustment wheel (optional)
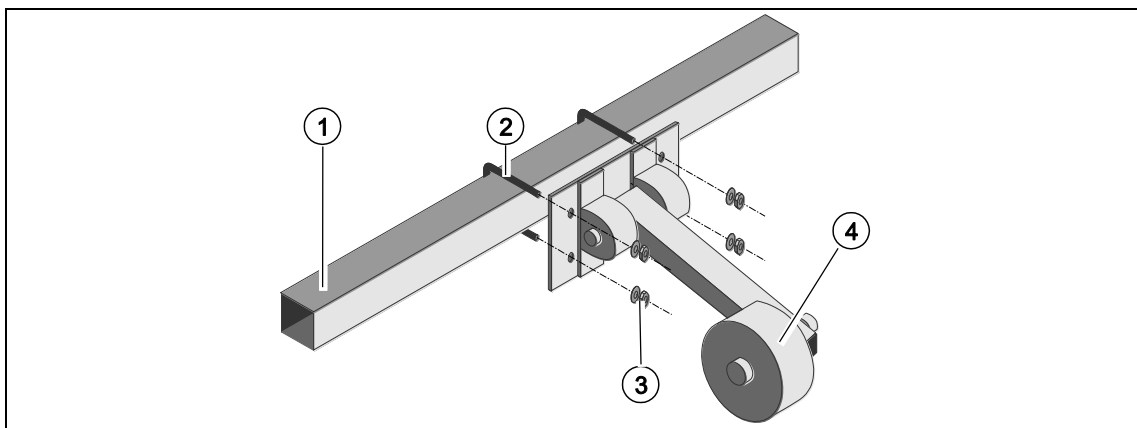
Fig. 10: Connect the speed adjustment wheel (optional)

| 1 | Weighing frame | 3 | Nut and washer |
| 2 | Bracket clip | 4 | Speed measuring wheel |

1. Mount the speed measuring wheel (4) with bracket clip (2) on the weighing frame (1), (see Fig. 10, p 24).
2. Connect the speed measuring wheel (4) according to wiring diagrams (see chapter 12.2, p. 28)

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7 Start-up of the mass flow transducer

7 Start-up of the mass flow transducer

7.1 Checking the ambient conditions

✓ Ambient voltage applied.
✓ Program interface is displayed.

7.2 First application

	Menu → System Setup → Indicator Setup. → Weigher 1. Select increment 2. Enter decimal point 3. Enter maximum load 4. Enter unit

Tab. 4: First application

7.3 Set end of measuring range and unit

The end of the measuring range is dependent on the capacity of the measuring mechanics and should
be based on the maximum flow rate. A change of the measuring range limit affects the signal stroke and the amplification.
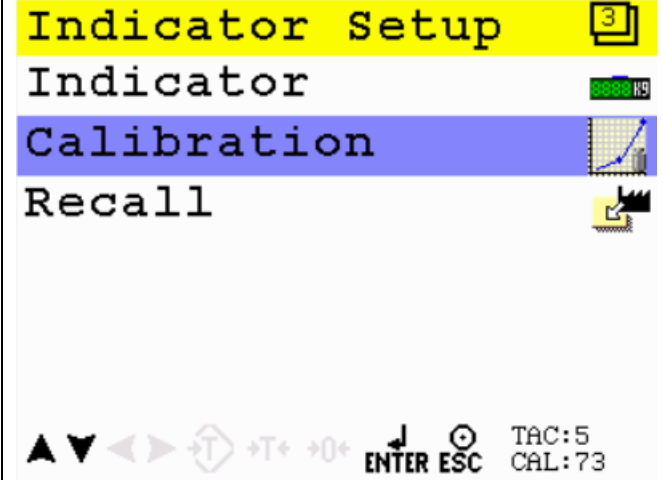
	Menu → System Setup → Indicator Setup. → Weigher

Tab. 5: First application

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7 Start-up of the mass flow transducer

7.4   Perform measuring alignment

	1. Menu → System Setup → Indicator Setup. → Calibration → Choose 2. Select two-point 3. First adjust the zero point: empty scale and confirm with "Enter" 4. 2. Determine the calibration point with fixed weight: Enter fixed weight, lay it on the scale, confirm with "Enter"

Tab. 6: measuring alignment

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8 Start up mass flow transducer with π-Mach software

8 Start up mass flow transducer with π-Mach software

8.1 Connection to the Internet

1. Plug the cable (Ethernet, USB) into mass flow transducer and computer
2. Open π Mach ll software
3. In the task bar, go to environment → communication
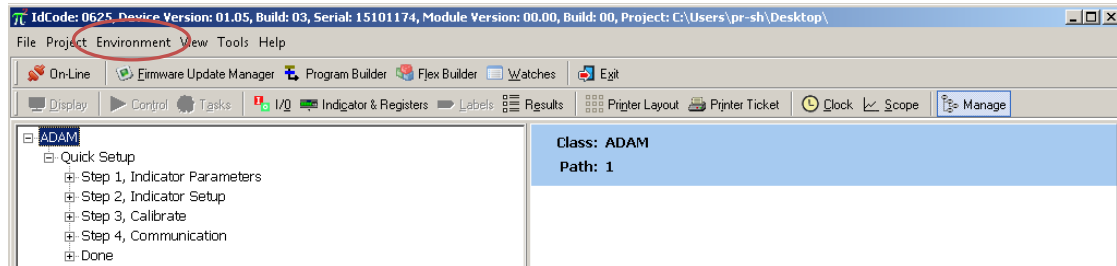
Fig. 11: Connection to the Internet: Environment

4. For Ethernet, enter the IP number, which is listed on the device under interfaces / Ethernet
For USB press on discover so that the USB input can be found.
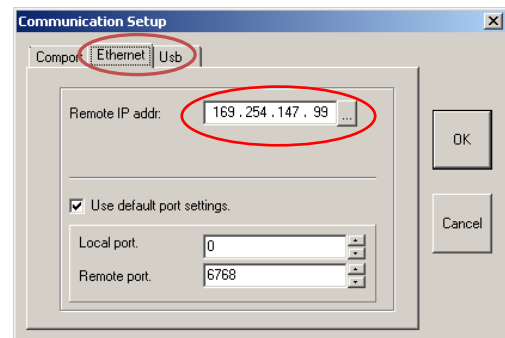
Fig. 12: Connection to the Internet: Communication

8.2 Quick Setup

1. Indicator parameters: Unit, decimal point, increment, maximum weight point-specific)
2. Indicator setup: Request
3. Calibration: The scale must be empty, then click on "Calibrate scale empty", and place a fixed weight on scale, e.g. 5 kg. Enter this weight below in the field "Enter load on scale" and confirm with "Calibrate load on scale".
4. Communication: Settings and logs for the individual interfaces (Ethernet, RS232, RS422, CAN)
5. Done: Confirmation of the Quick Setup settings.

Fig. 13: Quick Setup

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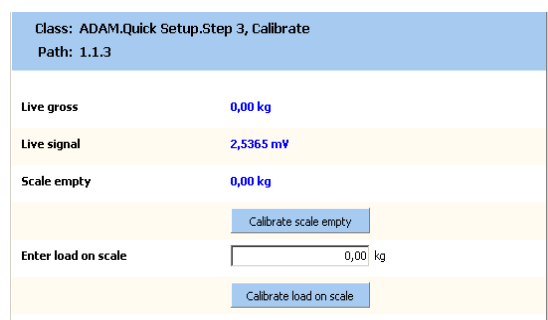
8 Start up mass flow transducer with π-Mach software

8.3   Full Setup

For more settings, click on "Enable Full Setup", a new menu will
open. There you can choose between:
- Live (current display via indicator, inputs, outputs, counter)
- System (system information)
- System Setup (settings regarding service, communication, counter, passwords, screen, time / date, printers, configurations and reset)
- Recipe (select, edit (batch, minimum/maximum volume, target value (flow))
- Control (reset of tare, zero point batch etc.)
- Access (program, alibi, event log)
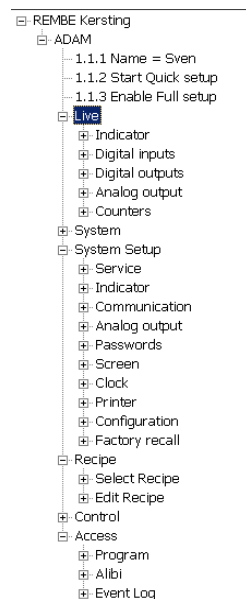
Fig. 14   Full Setup

8.4   Speed adjustment wheel (optional)

1. Enable Full Setup → System Setup → Configuration
2. Set pulse/m:
   a. 200mm- speed adjustment wheel = 32.00 pulse/m
   b. 125mm- speed adjustment wheel = 38.00 pulse/m
3. Set filter time
4. Assume settings with "Discover"

Fig. 15   Set the speed adjustment wheel

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9 Mass flow transducer software

9   Mass flow transducer software

9.1   Program interface
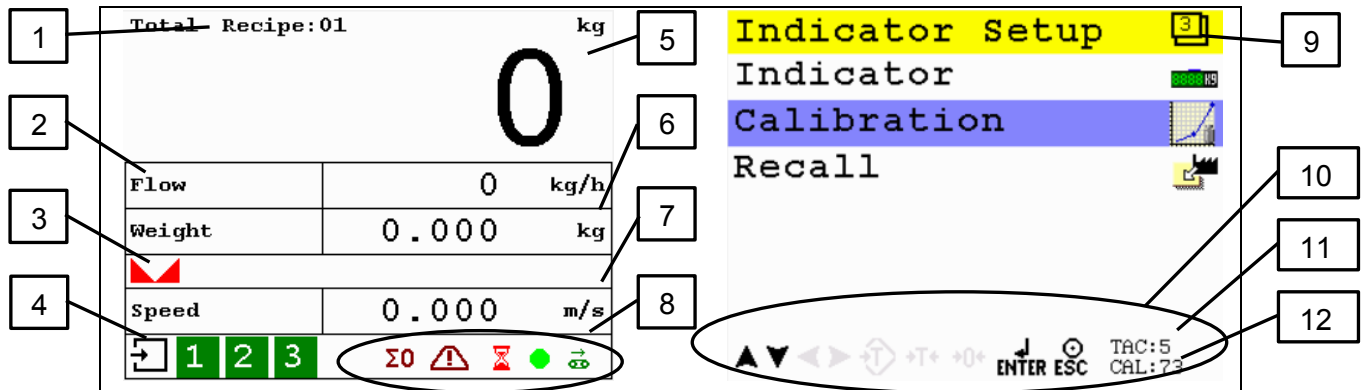
Fig. 16:   Program interface

No.	Function	Meaning
1	Recipe	Currently selected recipe
2	Flow	Measured flow
3	Scale in idle	Scale is in the idle state
4	Inputs	Displays current inputs
5	Counter	Display of measured values (kg, kg/h)
6	Weight	Measured weight on the belt
7	Speed	Current belt speed
8	Display status	Current status messages
8	Menu level	Menu area
9	Active buttons	Displays which buttons / inputs are currently possible
10	TAC	Traceable access code for indicator Settings
11	CAL	Calibration code for calibration settings
12	Recipe	Currently selected recipe

Tab. 7: Program functions

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9 Mass flow transducer software

Push button	Declaration
→T←	T starts the dynamic zero measurement. During this measurement the average weight of the empty belt is determined
ENTER	Input: Confirmation of inputs; press and hold key longer than 2s press to reach the main menu
→0←	Zero: Resetting the weight to zero
ESC	Back: Exit menu item
▲	Resetting the batch weight to zero
▼	Arrow keys to position the cursor
▶	Arrow keys to position the cursor
◀	Arrow keys to position the cursor

Tab. 8: Buttons

Term	Declaration
CAL	"Calibration code" shows how many times the adjustment has been changed.
TAC	"Traceable access code" shows how often the indicator settings have been changed.
Points	Shows how many calibration points are used. (more than 2 points possible for non-linear measuring results)
Value	Shows the raw measurements of the analogue - digital converter.
Weight	Shows the real weight.
Weight x10	Shows the real weight with an extra decimal place, so that the scale is 10-fold more accurate than in the normal range.

Tab. 9: Explanation of terms in the menu

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9 Mass flow transducer software

9.2   Program menu

Menu	Meaning
Main menu Main Menu System Setup Recipe Info Certified Info Event Log Alibi memory	Standard program interface: • System Setup • Recipe • Information • Bureau of Standards information
Interfaces System Setup Port Setup Indicator Setup Configuration In/Outputs Passwords Screen Setup	Menu→ System Setup→ Port Setup All settings and logs for the individual interfaces are selectable → check • Ethernet Setup • RS232 • RS422 port • CAN port • Profibus Setup
Indicator settings Indicator Setup Indicator Calibration Recall	Menu → System Setup→ Indicator Setup. → Indicator • Input TAC Code • Scale setting (name, unit, increment, etc.) • Stable state: Signal stable output if the scale is stable within bandwidth and time • Zero point delay: Zero point back to zero if scale is dirty (range, step by step, time) • Range/interval: Adjustment if weight exceeds a safe level Filter: possible vibrations should be suppressed (total, digital, display)
Configuration Configuration Flow Point pos 0,0 Totals Point pos 0,0 Max Flow 0.0 kg/h	Menu→ System setup→ Configuration • Flow-point / total point • Maximum Flow • Dynamic tare range / time • Suppress zero • Weight per pulse / pulse per meter • Measuring procedure • Specified speed

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9 Mass flow transducer software

Menu	Meaning
Reset Indicator Setup Default settings ENTER = Ok ESC = Cancel	Menu→ System Setup→ Indicator Setup → Default Setting • Enter the TAC code. • Default setting (reset parameter)
Inputs / outputs In/Outputs DAC Setup DAC Calibrate DAC Test	Menu → System Setup→ Inputs/ Outputs • DAC setup: Setting of all DAC parameters • DAC calibration: Adjustment of the DAC using a multimeter or ampere meter • DAC test: DAC can be checked here
Password System Setup Port Setup Password In Co In 1 2 3 4 5 6 7 8 9 0 Pa q w e r t y u i o p So a s d f g h j k l OK z x c v b n m ◄ ►	Menu → System Setup→ Password • System Setup • Select recipe • Edit recipe • Date / time
Date / time Set Clock Time 13:56:54 Date: 10-08-17	Menu → System Setup → Set Clock • Set time • Set date
Printer Printer Printer Settings Header Footer Ethernet printing	Menu→ System Setup → Printer • Printer layout (columns, rows, etc.) • Header • Footer • Ethernet Printer

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9 Mass flow transducer software

Menu	Meaning	
Recipe Recipe Recipe : 1 Recipe Edit ▲▼◄► ⊕ +T+ +0+ ENTER ESC TAC:2 CAL:18	Menu → Receipe • Select recipe (1-10 possible) • Edit recipe (batch weight, minimum volume, maximum volume, target value flow)	
Information Info Software Version: 1.5.6.9.0.1 Serial Number: 03674120 MAC Address: 00 C0 16 02 61 DB ▲▼◄► ⊕ +T+ +0+ ENTER ESC TAC:2 CAL:18	Menu → info • Software • Serial number • MAC address • License Hardware	Menu → Legal Information • Version • Time / date • CRC checksum

Tab. 10: Program menu

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10 Maintenance and servicing

10   Maintenance and servicing

10.1   Check

⚠ **DANGER! Risk of injury when the system is running or starting!**
When the system is running or starting, limbs can be crushed or torn off.

▶   Switch off the system during all work on the belt weigher.

▶   Secure the system against accidental on-switching.

⚠ **CAUTION! Depending on the application the interval can be shortened or lengthened.**

▶   Check the belt weigher quarter-yearly for impurities, and clean if necessary

▶   Calibrate mass flow transducer bi-annually.

10.1.1   Cleaning

CAUTION! Damage due to incorrect cleaning!

▷   Avoid a strong force induction.

▷   Do not use a high-pressure cleaner.

1.   Clean the belt weigher with a broom, brush or water hose.
2.   Vacuum the dust with a vacuum cleaner.

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11   Disposal

11.1   Dismantling

⚠️ **DANGER! Risk of injury when the system is running or starting!**
When the system is running or starting, limbs can be crushed or torn off.

▶   Switch off the system during all work on the belt weigher.

▶   Secure the system against accidental on-switching.

1.   Dismantle the mass flow transducer.
2.   Attach upper transport securing screw (see chapter 3.1.1, p. 6)
3.   Attach the upper transport securing screw (see chapter 3.1.1, p. 6).
4.   Dismantle the bracket clips.
5.   Dismantle the roller chair from the belt weigher.
6.   Transport the belt weigher as vibration-free as possible.
7.   Reinstall the roller chair into the conveying system again.

11.2   Disposing

▶   Recycle materials separately and dispose them in accordance with the local regulations.

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12 Appendix

12   Appendix

12.1   Technical data

12.1.1   Mass flow transducer

Wiring	Full Wheatstone bridge with passive connections (6-wire-system)
Measuring system	Passive
Min. bridge resistance	43.75 ohm at 5V
Sensitivity	0.1 µV/d to 0.4 µV/d
A/D conversion speed	1600 measurements/s
Internal resolution	24 bits
Full deflection area	-16mV- +16mV
Excitation voltage	5V
Digital filter	1-10 Hz
Total filter	0 to -50dB
Interfaces	
3 inputs	18-028Vdc, PNP or NPN
4 outputs	Max. 35V/0.5A, PNP or NPN
1 analogue output (optional)	0/4- 20/24/mA, 10.000d
Power supply	18-32 V, 7.5 W max.
RS 232	Printer, ASCII, TNPV slave
RS 422/ RS 485	Printer, ASCII, NPV slave,
Ethernet	TCP/IP, UDP layer with TP protocol
USB	Printer, ASCII and TP slave, storage
Profibus (optional)	DP Profibus GSD file
Display	
Type	TFT 2.8" 320 x 240 pixels
Display rates	1,2,5,10,20,50,100,200
Size	2.8"; 320 x 240 pixels

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Operating limits	
Operating temperature	-10 °C to +55 °C
Storage temperature	-20°C to +70°C
Relative humidity	Maximum 85% non-condensing
Dimensions	
Field housing	Front WxHxD: 150 x 78 x 5 mm Housing WxHxD: 200 x 100 x 155 mm
Panel mount	Panel cut-out: WxHxD: 150 x 78 x 100 mm
Material	
Field housing	Stainless steel
Panel mount	Extruded aluminium, black powder coating
Weight	
Field housing	2940 g
Panelmount	660 g
Accessories	
Installation clips	2
Protection class	
Built-in wardrobe Integrated into cabinet (front)	IP45 IP65

Tab. 11: Technical data of the mass flow transducer

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12.2   Wiring diagrams

12.2.1   Sensor connection and power supply for transmitter in a stainless steel housing
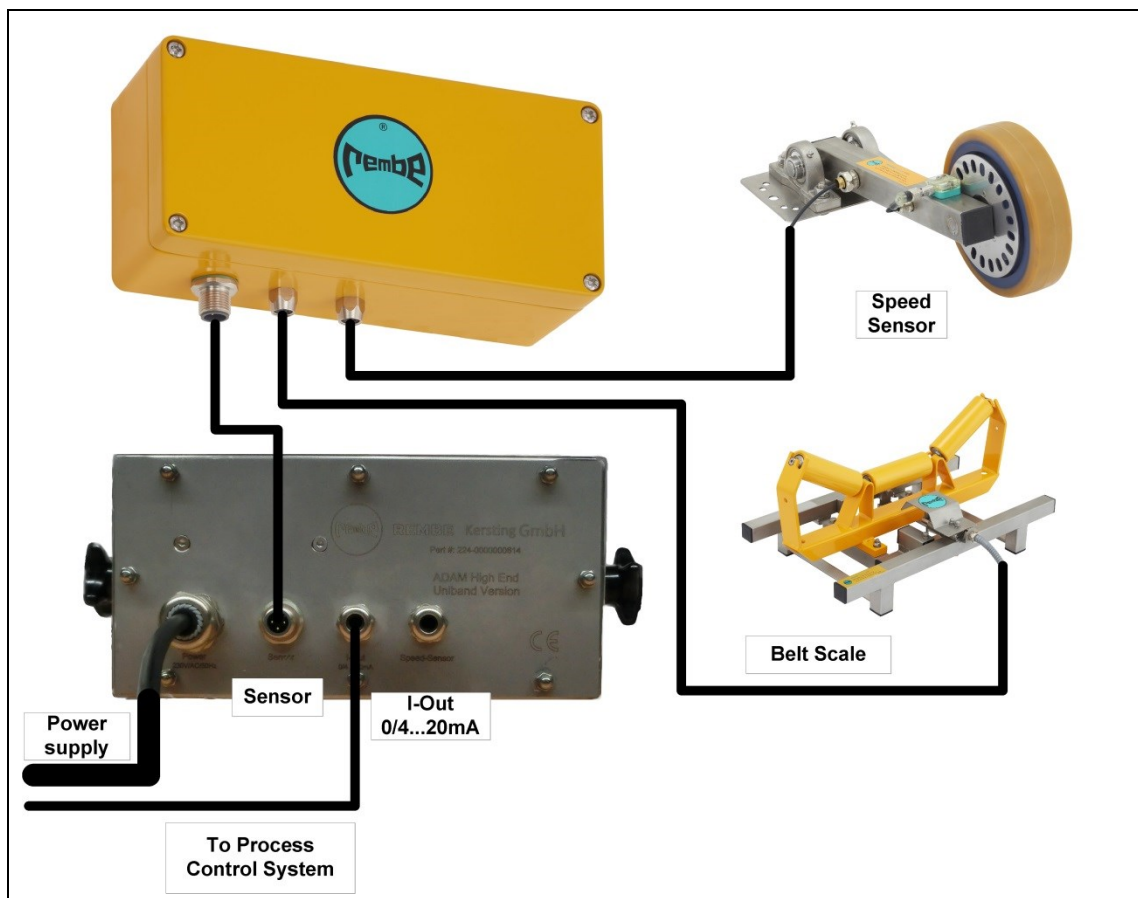
Fig. 17:   Connection of the belt weigher and the measuring wheel with junction box

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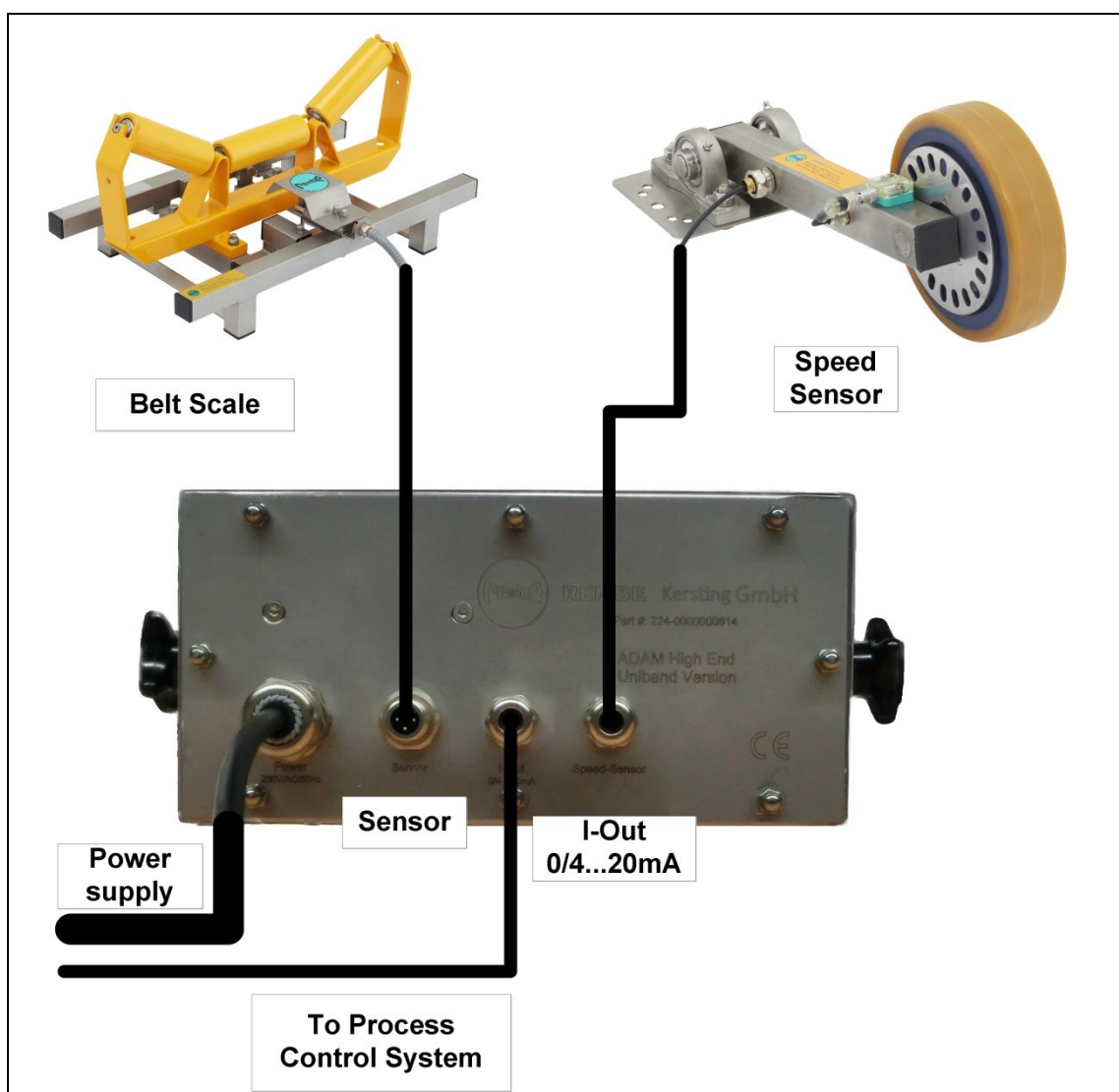
Fig. 18:   Connection of the belt weigher and the measuring wheel without junction box

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12.2.2   Sensor connection and power supply for transmitter as a switching panel installation

Fig. 19: Sensor connection and power supply

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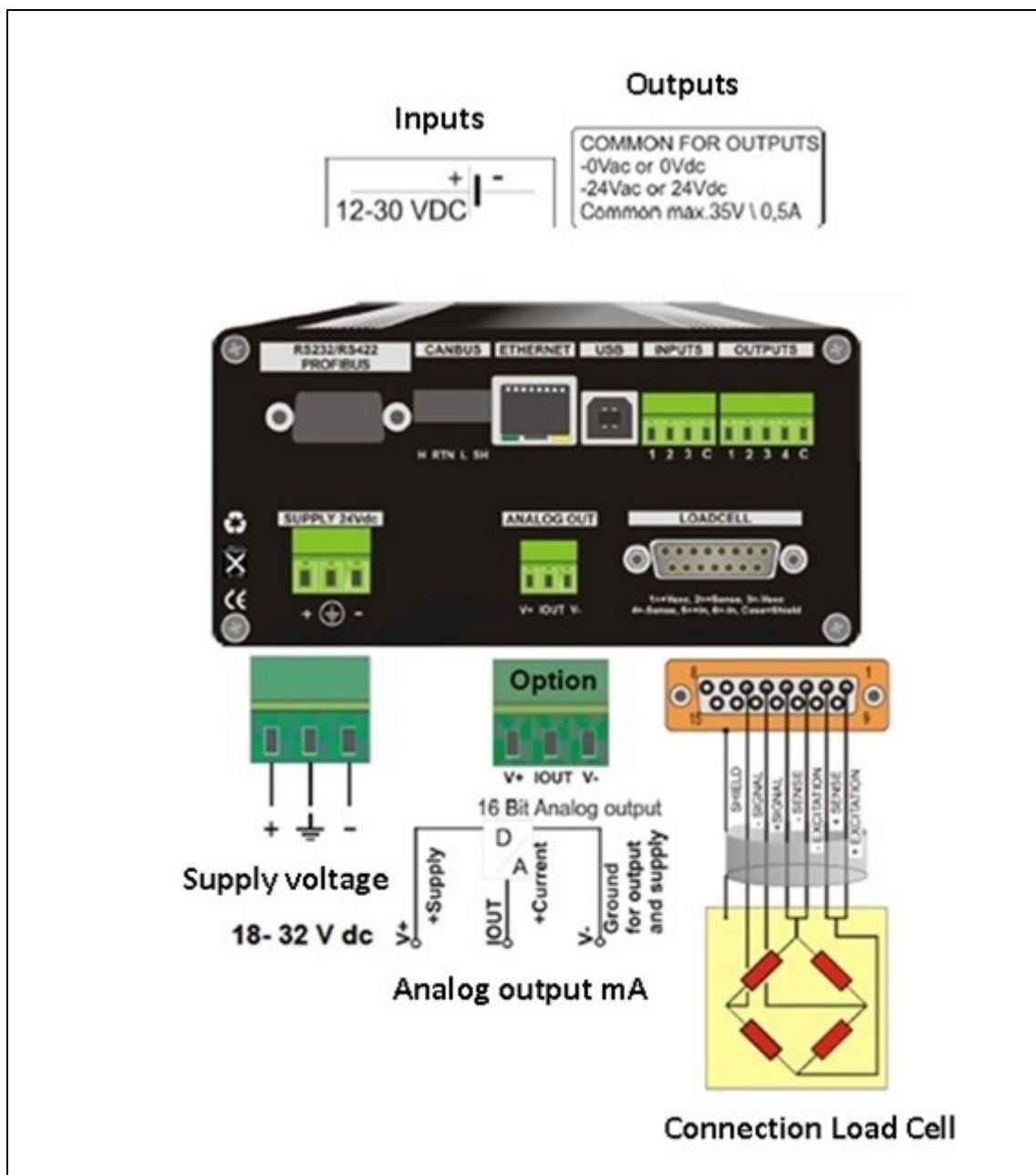
Mass flow transducer connection	4-wire load cell	6-wire load cell*	Description
SHLD	Shield	Shield	Shield
-IN	Blue	Red	Signal -
+IN	Black	White	Signal +
-S	**Wire** bridge to **-VEX**	Grey	Sensor -
-VEX	White	Black	Supply-
+S	**Wire** bridge to **+VEX**	Green	Sensor +
+VEX	Red	Blue	Supply +

Tab. 12:   Colour assignment load cell

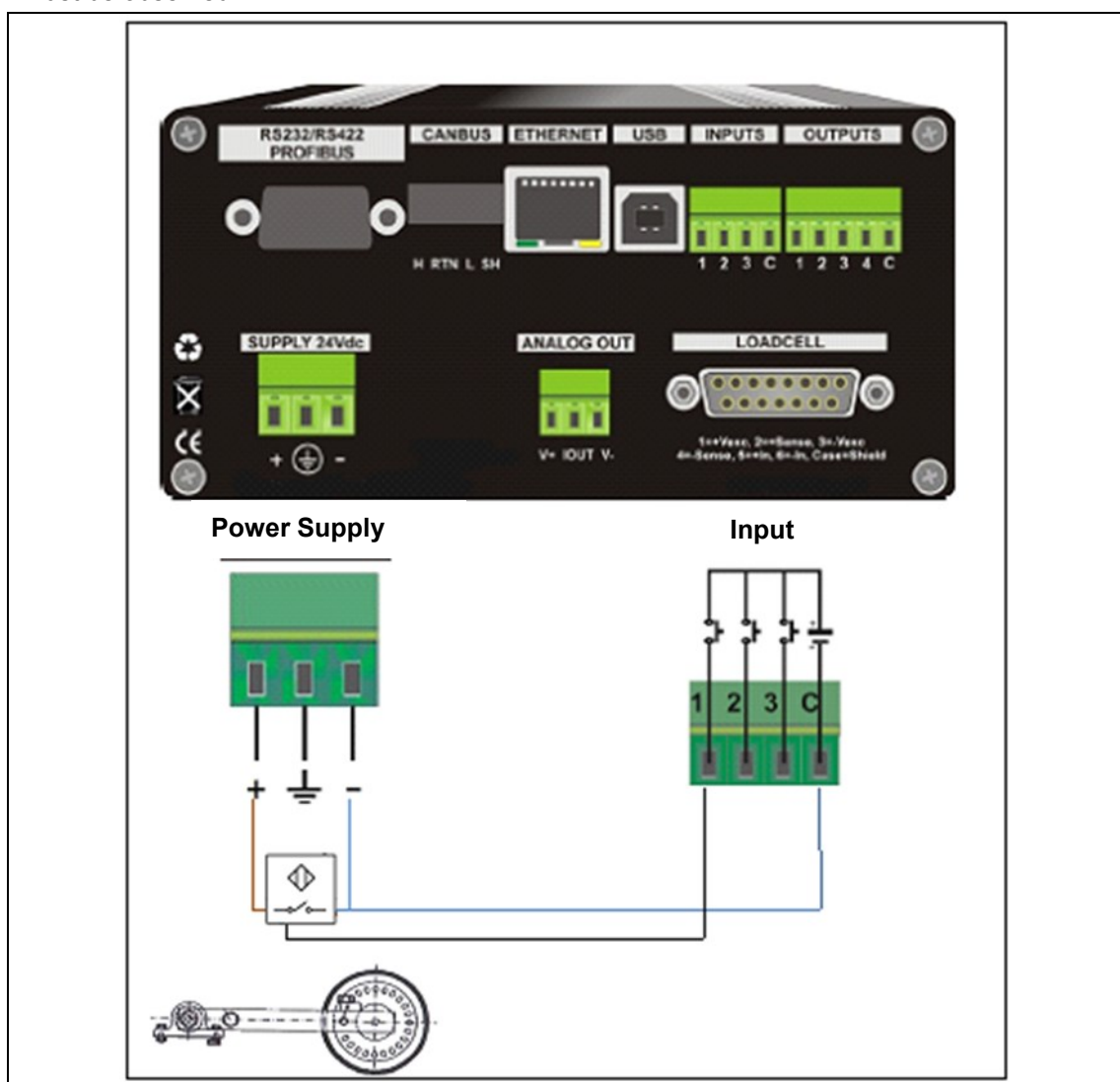NOTE! When connecting a speed measuring wheel, the pin assignment from Fig. 20, p. 31 must be observed.

Fig. 20: Speed measuring wheel

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Colour assignment: brown   = +24 V supply
blue   = - supply
black   = pulse output

When using two load cells, these are must be connected in parallel.

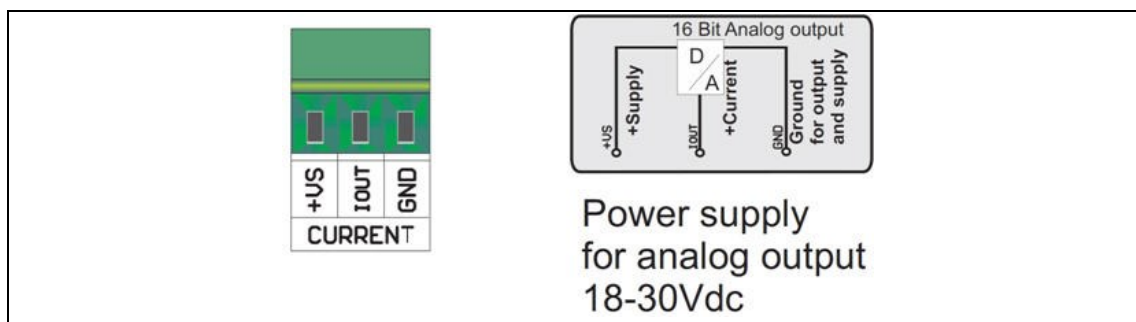### 12.2.3   Current output and bus connection

Fig. 21: Current output and bus connection

NOTE! Passive output: Supply with power for an active output.

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12.3 EC declaration of conformity

INFORMATION

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www.rembe-kersting.de

EC Declaration of Conformity

in compliance with EC Directive 89/336/EEC

The company   **REMBE® Kersting GmbH**
                     Zur Heide 35
                     59929 Brilon, Germany

declares, as being solely responsible, that the product

Belt Weigher
UNIBAND®

to which this declaration refers, complies with the relevant fundamental safety requirements
of EC Directive 89/336/EEC and the requirements of the other relevant EC directives
73/23/EWG and amendments.

For the proper implementation of the provisions named in the EC directives, the following
standard(s) and/or technical specification(s) is/are included:

Standards: **Basic Standards:**   **IEC 801, Sections 2 to 5**
               European Standard: **EN 55101, Sections 2 to 5**
               German Standard: **DIN VDE 0843, Sections 1 to 5**
               Generis Standard: **50082-2**

The CE mark was first applied in: 2008 $C \epsilon$

Brilon, 05 September 2016   **REMBE® Kersting GmbH**
                                         Jochen Eberheim
                                         Managing Director

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Fig. 22: EC declaration of conformity

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12.4   Spare parts

▶   Keep the serial number at hand when placing orders (see chapter 4.2, p. 9).

- Speed measuring wheel
- Load cell

12.5   Optional accessories

▶   Keep the serial number at hand when placing orders (see chapter 4.2, p. 9).

- Profibus connection
- RS232/ RS422
- CANBUS