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CERTIFICATE of EU TYPE-EXAMINATION

No. DK 0199.187

EBW 10-xx / EBW 20-xx / Jesbelt xx

CONTINUOUS TOTALISER

Issued by DELTA Danish Electronics, Light & Acoustics
EU - Notified Body No. 0199

In accordance with the requirements for the automatic weighing instruments in Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on Measuring Instruments (MID).

Issued to MTS Messtechnik Sauerland GmbH
Zum Hohlen Morgen 7
59939 Olsberg
Germany

In respect of Continuous totaliser designated 'EBW 10-xx', 'EBW 20-xx' or Jesbelt xx' with variants of modules of load receptors, load cells and peripheral equipment.
Accuracy class 0.5, 1 and 2
Maximum capacity, Max: ≥ 1 kg.
Maximum flow rate, Q_{\max} from 1 kg/h to 100,000 t/h
Totalisation scale interval, $d \geq 0.1$ g
Variants of modules and conditions for the composition of the modules are set out in the annex.

The conformity with the essential requirements in Annex 1 and the specific requirements in Annex MI-006, chapter I & V of the Directive 2004/22/EC is met by the application of OIML R50-1:1997, WELMEC Guide 8.16-4:2006, WELMEC Guide 7.2:2007, and OIML D11:2004 section 12 & 13 level 3.

The principal characteristics and approval conditions are set out in the descriptive annex to this certificate.

The annex comprises 21 pages.

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Signatory: J. Hovgård

Descriptive annex

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1. Name and type of instrument and modules

The continuous totaliser is designated “EBW 10-xx”, “EBW 20-xx” or “Jesbelt xx”. It consists of an electronic controller WC9604-80, a display unit DMK9603 and a belt conveyor with built-in load receptor.

The Instrument is Type P and Risk Class C according to WELMEC Guide 7.2 (2009).

The modules appear from the sections 3.4, 3.5, 3.6 and 3.7; the principle of the composition of the modules is set out in the sections 6.1 and 10.

2. Description of the construction and function

2.1 Construction

The continuous totaliser consists of,

- A conveyor belt having a spring or dead load belt tensioner
- A load receptor with roller(s)
- Strain gauge load cell(s)
- A displacement transducer
- An electronic measuring and processing unit
- A display unit
- Peripheral devices.

2.1.1 Display unit

The display unit is a digital unit in a panel mount enclosure and functioning as the man-machine interface of the weighing controller.

The front panel comprises:

- A 6 digit LED display. This display is used as the primary weight display.
- A 2 lines alphanumeric LCD display used for guidance texts to the operator.
- Indicators for load: **Zero**, below **20 %**, and above **100 %**.
- Sixteen keys keypad (“0” to “9”, decimal point, Clear, Zero setting, Mode, Step and Enter).

2.1.2 Electronic unit

The electronic measuring and processing unit designated WC9604-80 supplies the strain gauge load cell(s) with excitation voltage and amplifies, digitises and converts the output signal of the load cell(s) into a weight value. Simultaneously the pulses from the displacement transducer are processed to determine the belt length that has passed over the load receptor. Based on this, the mass of the material passing over the load receptor is determined.

The software of the WC9604-80 can only be modified by exchanging the memory chip that contains the programme. Exchange can not take place, when the unit is sealed.

The software performs a self test at start up.

2.1.3 Load cells

Set out in section 3.5.

2.1.4 Load receptor

Set out in section 3.6.

2.1.5 Displacement transducer

Set out in section 3.7.

2.1.6 Interfaces and peripheral equipment

Set out in section 4.

2.2 Function

2.2.1 Functions and devices

The automatic weighing instrument has the following permitted functions and devices that are subject to the Measuring Instrument Directive:

- Power up test
- Semi-automatic zero setting device
- Extended indicating device
- Detection of significant fault
- Alibi function (data logging)

2.2.2 Software identification

The approved firmware version is 50075-12.xx, where xx designated the non-legally relevant part of the version no.

The tested firm ware version was 50075-12.14.

3. Technical data

The automatic weighing instruments and its modules are set out as follows:

3.1 Continuous totaliser

Type:	EBW 10-xx / EBW 20-xx / Jesbelt xx
Accuracy class:	0.5 or 1 or 2
Maximum capacity (Max):	0.1 kg to 400 t
Minimum capacity (Min):	$\geq 20\%$ of Max
Maximum flow rate (Q_{\max}):	1 kg/h to 100,000 t/h
Minimum flow rate (Q_{\min}):	$\geq 20\%$ of Q_{\max} for single speed Min $\geq 20\%$ of Max shall be fulfilled at all speeds for multi-speed and variable-speed
Totalisation scale interval (d):	≥ 0.1 g and $\geq Q_{\max} / (90000 \text{ h}^{-1})$
Scale interval for test:	$d / 100$
Belt velocity type:	single-speed, multi-speed, or variable-speed
Maximum belt speed, v_{\max} :	0.01 m/s to 10 m/s
Minimum belt speed, v_{\min} :	$\geq 20\%$ of v_{\max}

Weigh length, L:	0.1 m to 30 m
Temperature range:	-25 °C to 40 °C
Electromagnetic class:	E2
Humidity:	Non-condensing

3.2 Display unit

Type:	DKM9603
Connection to Electronic Controller:	Fibre optic cable
Temperature range:	-25 °C to 40 °C
Power supply:	18 VAC, 50/60 Hz (from electronic controller)

3.3 Electronic controller

The WC9604-80 electronic controller has the following characteristics:

Type:	WC9604-80
Accuracy class:	0.5
Fractional factor:	$p'i = 0.7$
Excitation voltage:	10 VDC
Minimum span range:	2 mV
Minimum input voltage per totalisation scale interval	2.5 μ V
Circuit for remote sense:	Remote sensing using 6-wires in the load cell cable
Minimum load cell input impedance:	43 Ohm
Maximum load cell input impedance:	1100 Ohm
Maximum cable length to junction box:	210 m/mm ² in a 6-wire system
Maximum pulse frequency:	1000 Hz
Minimum pulse frequency:	20 Hz
Operating temperature range:	-25 °C to +40 °C
Power requirements:	230 VAC, 50/60 Hz, or 24 VAC, 50/60 Hz
Peripheral interface:	Set out in section 4

3.4 Connecting cable between the electronic controller and the junction box for load cells

3.4.1 6-wire system

Maximum length:	210 m / mm ² (equivalent to 3.5 Ohm)
Line:	6 wires, shielded

3.5 Load cells

3.5.1 General acceptance of modules

Any load cell(s) may be used for instruments under this type examination certificate provided the following conditions are met:

- 1) There is a respective test certificate (EN 45501) or an OIML Certificate of Conformity (R60) issued for the load cell by a Notified Body responsible for type examination under the Directive 90/384/EEC.
- 2) The certificate contains the load cell types and the necessary load cell data required for the manufacturer's declaration of compatibility of modules (WELMEC 2, Issue 5, 2009), and any particular installation requirements. A load cell marked NH is allowed only if humidity testing to EN 45501 has been conducted on this load cell.
- 3) The compatibility of load cells and indicator is established by the manufacturer by means of the compatibility of modules form, contained in the above WELMEC 2 document, or the like, at the time of EC verification or declaration of EC conformity of type.
- 4) The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

3.6 Load receptor

The following types of load receptors are approved for the continuous totaliser:

- A weighing frame suspended in three or more load cells, mounted with one or more sets of weighing rollers for belt transportation over the weigh table, and equipped with guidance in the longitudinal direction of the belt.
- Made by one or more identical weighing modules placed immediately after each other in a distance of 0.5 - 2 times the width of the belt. Each weighing module consists of one set of weighing rollers suspended in one or two single-point load cell(s).
- Made by one or more identical weighing modules placed immediately after each other in a distance of 0.5 - 2 times the width of the belt. Each weighing module consists of one set of weighing rollers flexible suspended in a shear-beam load cell such that only the vertical force on the rollers can be transferred to the load cell.
- A weighing frame hinged in one end and suspended in one or more load cells in the other end, mounted with one, two, three, four or more sets of weighing rollers for belt transportation over the weigh table, and equipped with guidance in the longitudinal direction of the belt.
- A belt conveyor fixed by hinges to the chassis and with the inlet just above this hinging point. The opposite end of the belt conveyor is suspended in one or two load cells.

3.7 Displacement transducer

The displacement transducer can either be a tacho encoder or an inductive switch placed on one of the end-rollers of the belt conveyor or on a trailing arm.

The following tacho encoders may be used,

Manufacturer Siemens type: MD256-Speed sensor

Manufacturer Scancon type: 2REX-H,
 2REX-H-SR,
 2RHI, and
 2RHIF-SR

The following inductive switches may be used,

Manufacturer IFM

Type	Max frequency
IF5200	1000 Hz
IF5251	1400 Hz
IF5305	800 Hz
IF5321	800 Hz
IF5337	400 Hz
IF5353	400 Hz
IF5492	300 Hz
IF5505	700 Hz
IF5541	1000 Hz
IF5544	1400 Hz
IF5619	800 Hz
IF5623	400 Hz
IF5770	1400 Hz
IF5781	800 Hz
IF5798	400 Hz
IF5860	800 Hz
IF5862	800 Hz
IF5864	400 Hz

Manufacturer Telemecanique

Type	Max frequency
XS2D12NA140	1500 Hz
XS2D18NA140	500 Hz
XS612B1NAM12	2500 Hz
XS612B1NAL2	2500 Hz
XS2M12KN340	2500 Hz
XS2M12KN340D	2500 Hz
XS212AANAL2	2500Hz
XS212AANAM12	2500Hz
XS218AANAL2	1000Hz
XS218AANAM12	1000Hz

The wheel of a trailing arm may only be driven by the inner side of the belt that is not getting in contact with the material to be weighed.

4. Interfaces and peripheral equipment

4.1 Interfaces

The weight control unit has the following interfaces, which all interfaces are characterised “Protective interfaces” according to paragraph 8.1 in annex I of the Directive.

- RS422 / RS485 serial communication
- Current loop serial communication
- Digital inputs
- Relay outputs
- Impulse output (max. 25 pulses/sec)
- Analogue input, 0/4 - 20 mA
- Analogue output, 0/4 - 20 mA

4.2 Peripheral equipment

Connection between the indicator and peripheral equipment is allowed by screened cable.

The instrument may be connected to any simple peripheral device (e.g. a printer) with a CE mark of conformity.

5. Approval conditions

5.1 Connection of cables

All cables shall be shielded, and the shield shall be properly EMC wise connected to the housing / connector in both ends.

5.2 Log printer

A log printer can be connected to the WC9604-80 weight controller.

5.3 Conveyor belt

Exchange of the conveyor belt will require a new legal metrological test of the instrument.

5.4 Compatibility of modules

Compatibility of modules for continuous totalisers - an Excel worksheet developed by DELTA based on the principles in WELMEC 2, Issue 5, July 2009, paragraph 11 shall be satisfied.

An Excel file for calculation of “Compatibility of Modules” can be obtained from DELTA upon email request to legal@delta.dk.

6. Special conditions for verification

6.1 Composition of modules

The environmental conditions should be taken into consideration by the composition of modules for a complete weighing instrument, for example instruments with load receptors placed outdoors and having no special protection against the weather.

The composition of modules shall agree with Section 5.4.

An example of a declaration of conformity document is shown in Section 10.

7. Securing and location of seals and verification marks

7.1 Securing and sealing

Seals shall bear the verification mark of a notified body according to ANNEX F of the Directive 2004/22/EC or alternative mark of the manufacturer according to ANNEX D of the Directive 2004/22/EC.

7.1.1 Mechanical sealing

The identification plate shall be secured against removal with a brittle plastic sticker.

7.1.2 Electronic Controller sealing

The enclosure of the electronic controller shall be sealed against opening with brittle plastic stickers (see figure 16).

The connector of the load cell cable and the cable from the displacement sensor shall be sealed against disconnection of them (see figure 16 & 17).

7.1.3 Junction box for load cells

Access to the junction box, if any, is prevented by means of sealing by plastic stickers or lead seals.

7.2 Verification marks

A sticker with verification marks is to be placed on or partly on the identification plate of the instrument.

8. Location of CE mark of conformity and inscriptions

8.1 Identification plate

All inscriptions for the instrument shall be placed on the identification plate, which is to be located on a visible place on the measuring instrument.

8.1.1 CE mark

A sticker with the CE mark of conformity and the supplementary metrology marking consisting of the capital letter “M”, surrounded by a rectangle, and the last two digits of the year of its affixing shall be located on the identification plate.

8.1.2 Inscriptions

The identification plate shall bear the following inscriptions:

- Manufacturer's trademark and / or name
- Type designation
- Serial number
- Accuracy class
- Maximum flow rate Q_{\max}
- Minimum flow rate Q_{\min}
- Minimum totalised load Σ_{\min}
- Scale interval for totalisation d
- Belt speed v for fixed speed,
 v_1, v_2, \dots for multi-speed, and
 v_{\max}, v_{\min} for variable-speed
- Temperature range: -25 °C to $+40\text{ °C}$
- Electromagnetic class: E2
- Humidity: Non-condensing
- Type examination certificate number

9. Pictures



Figure 1 Display Unit

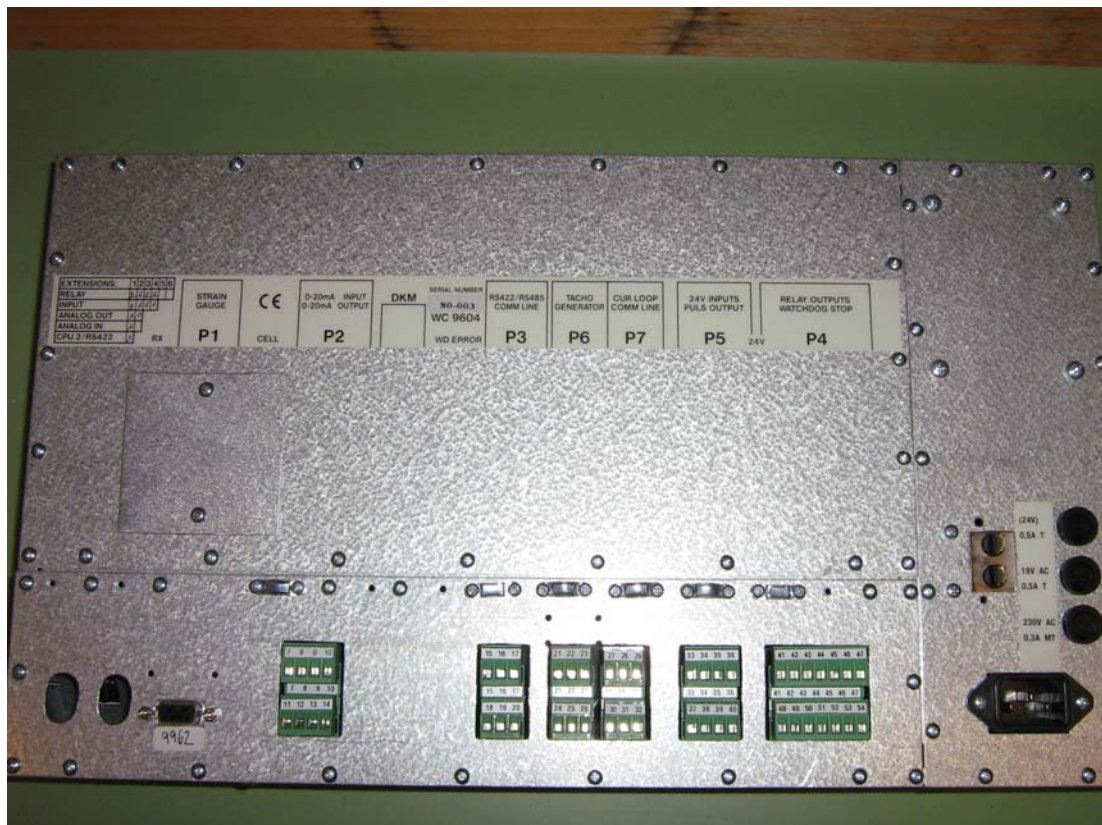


Figure 2 Electronic Controller

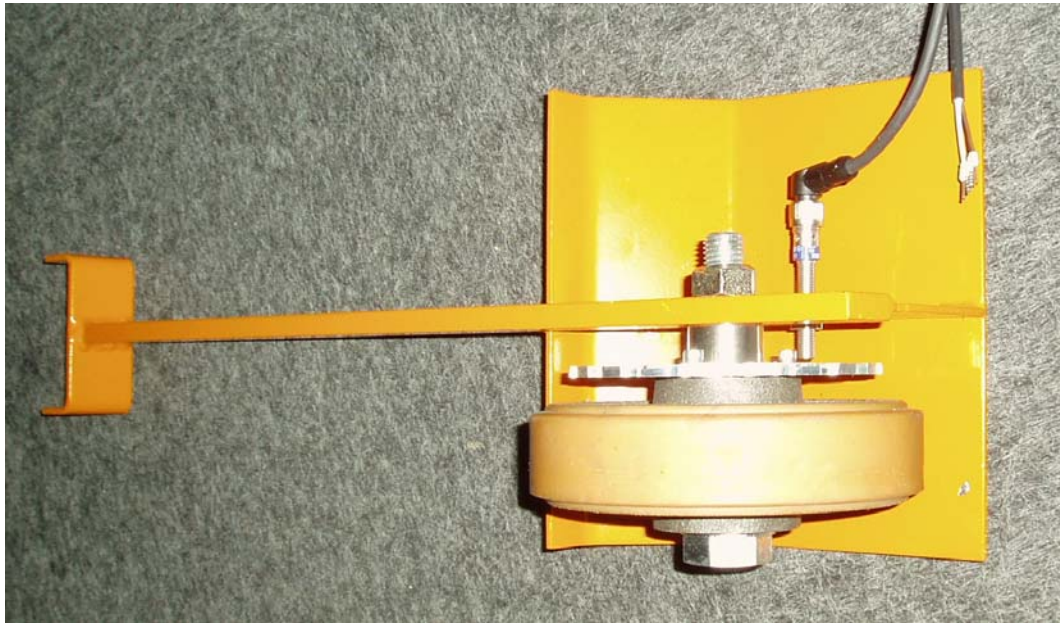


Figure 3 Trailing arm with wheel and inductive switch

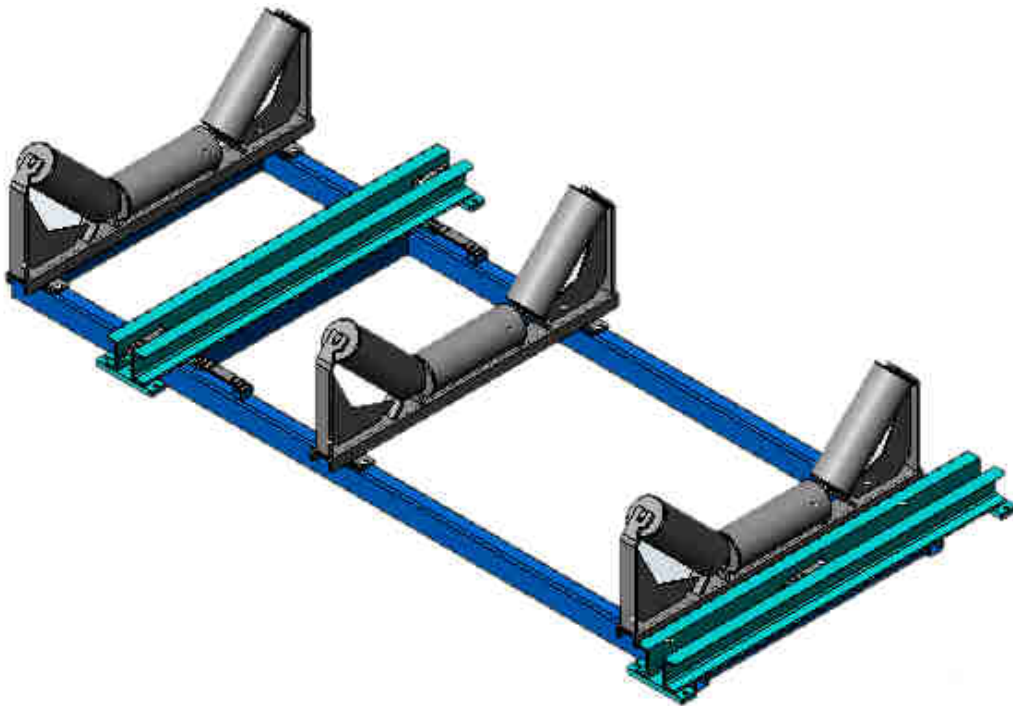


Figure 4 Weighing frame

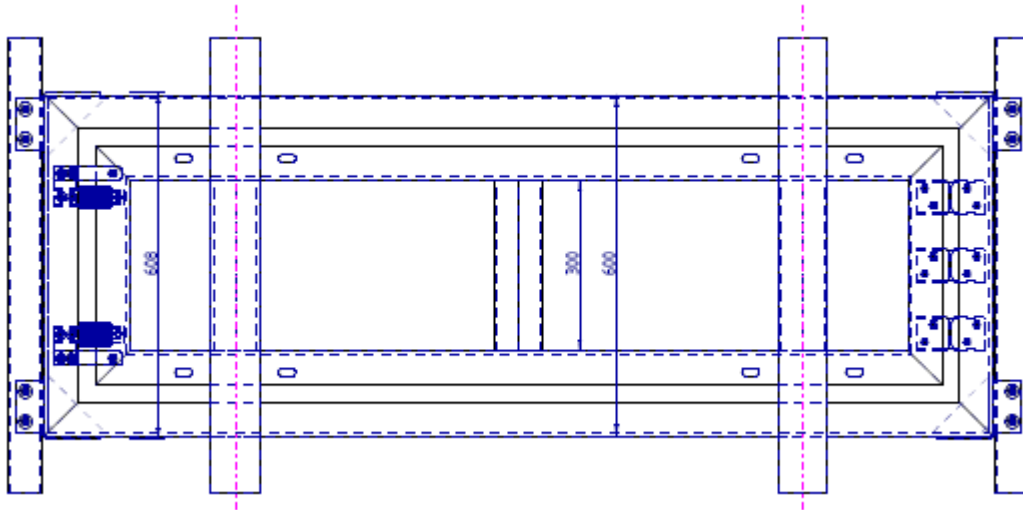


Figure 5 Weighing frame hinged in one end

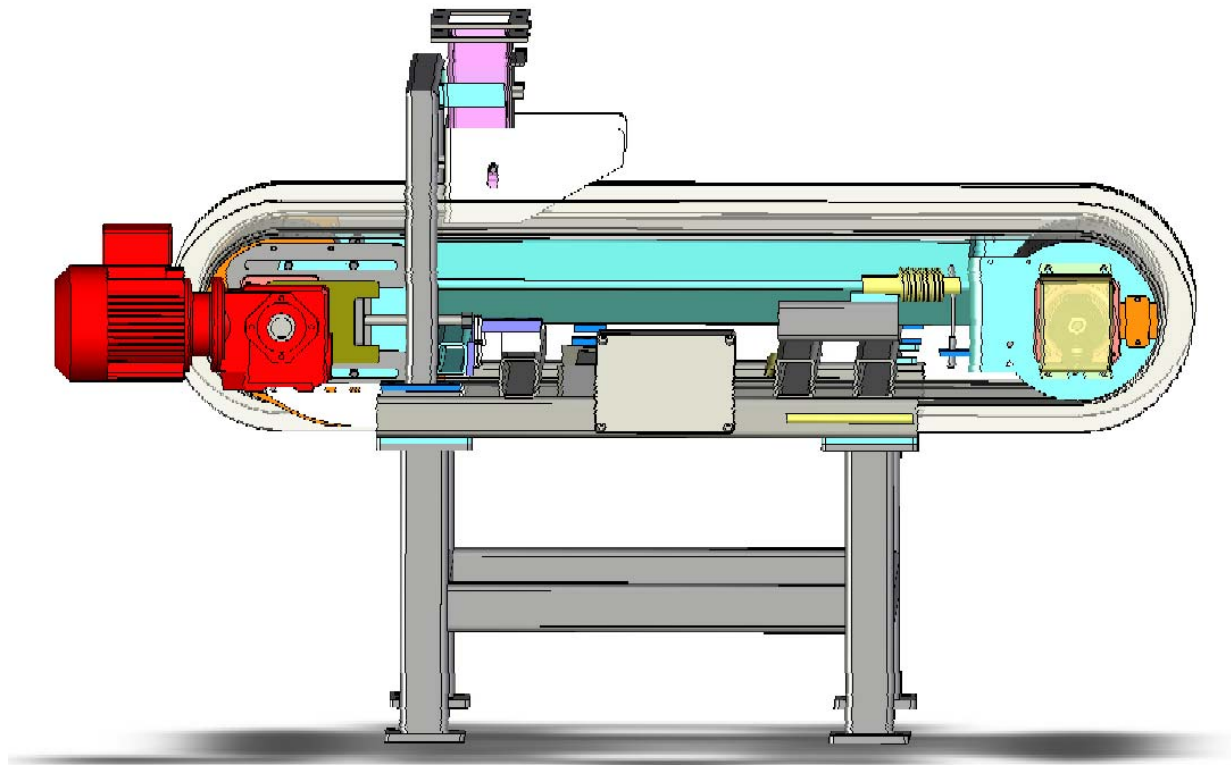


Figure 6 Belt conveyer hinged below inlet

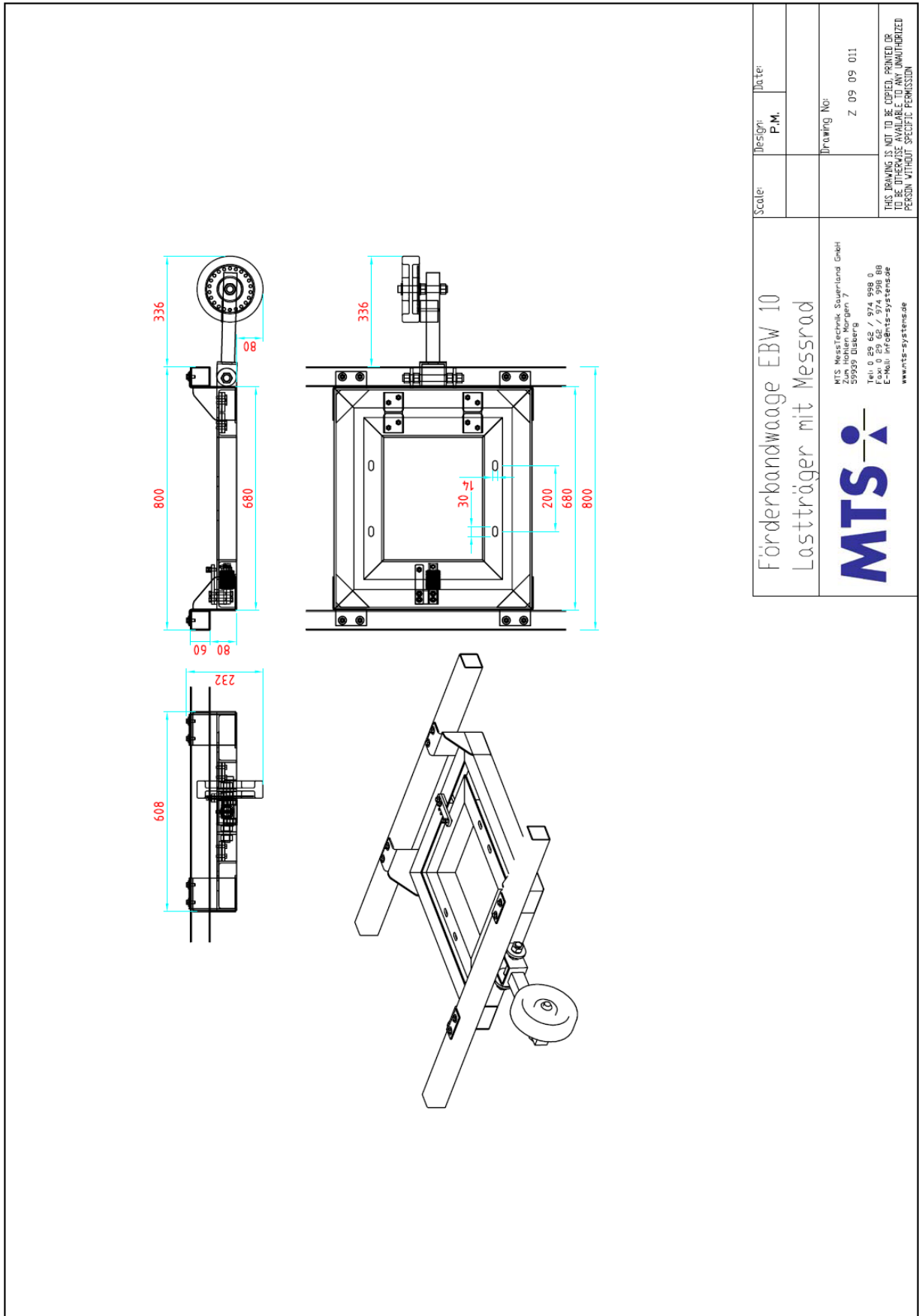


Figure 7 EBW 10 weighing frame

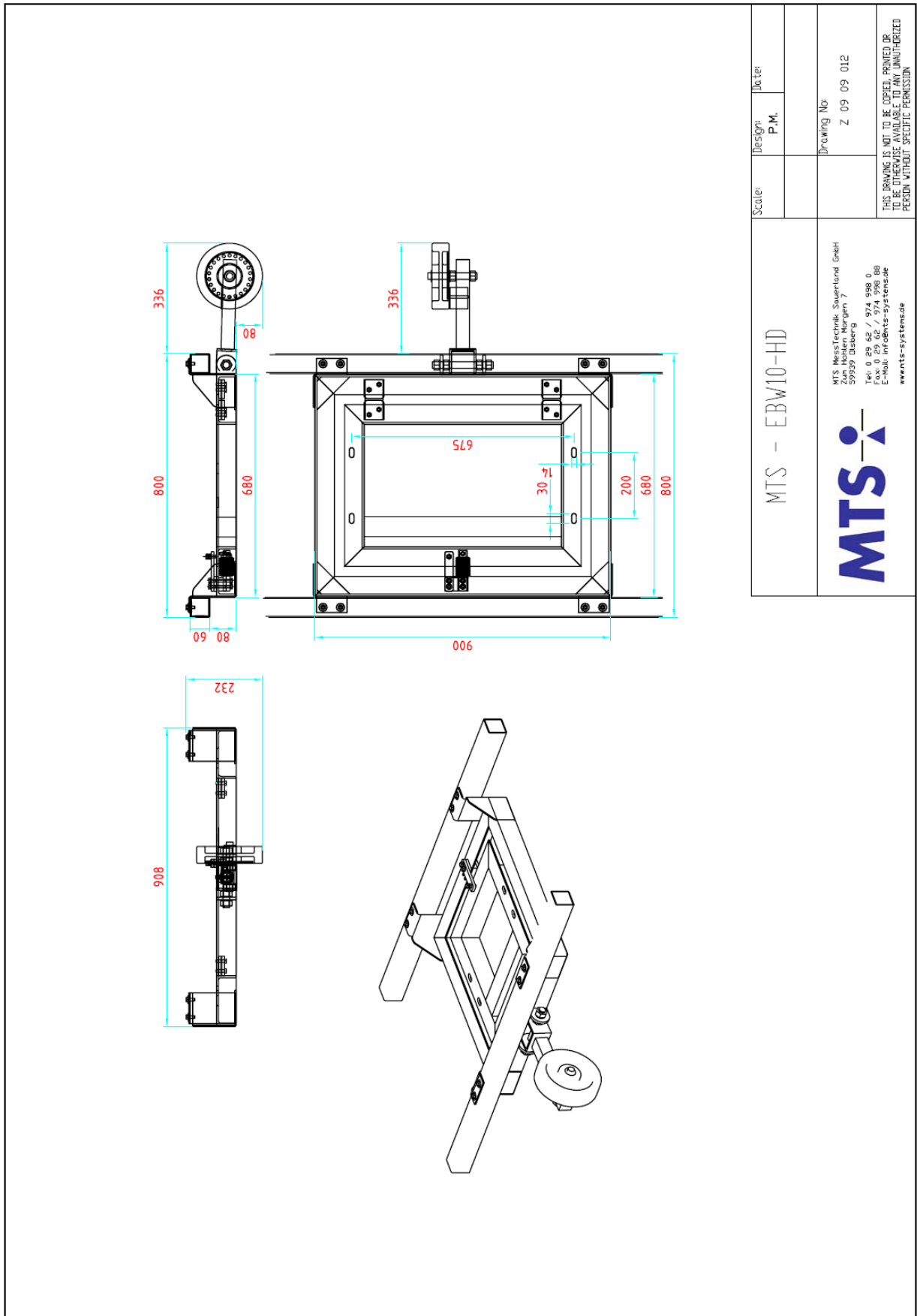


Figure 8 EBW 10-HD Weighing frame

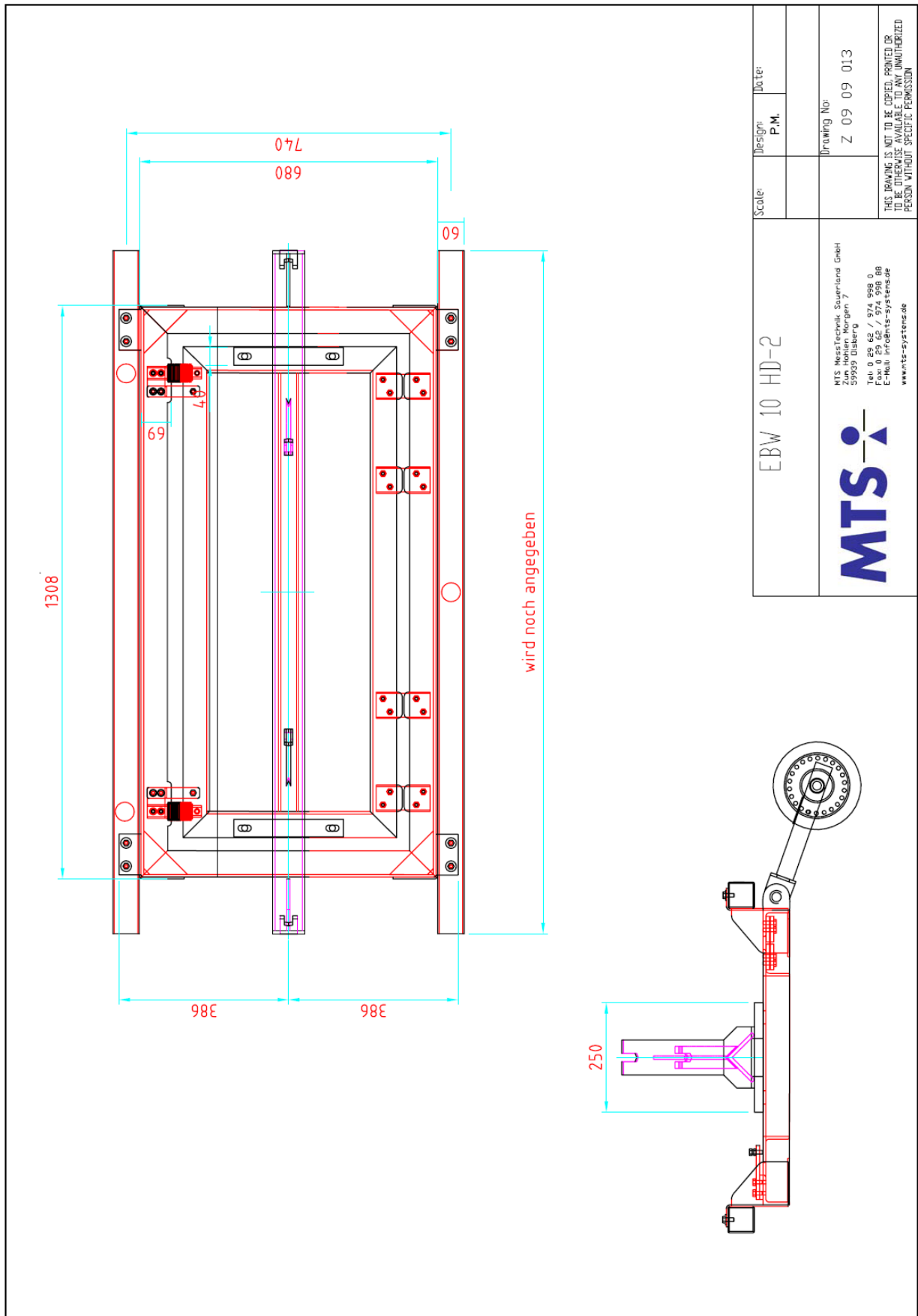


Figure 9 EBW 10-HD-2 Weighing frame

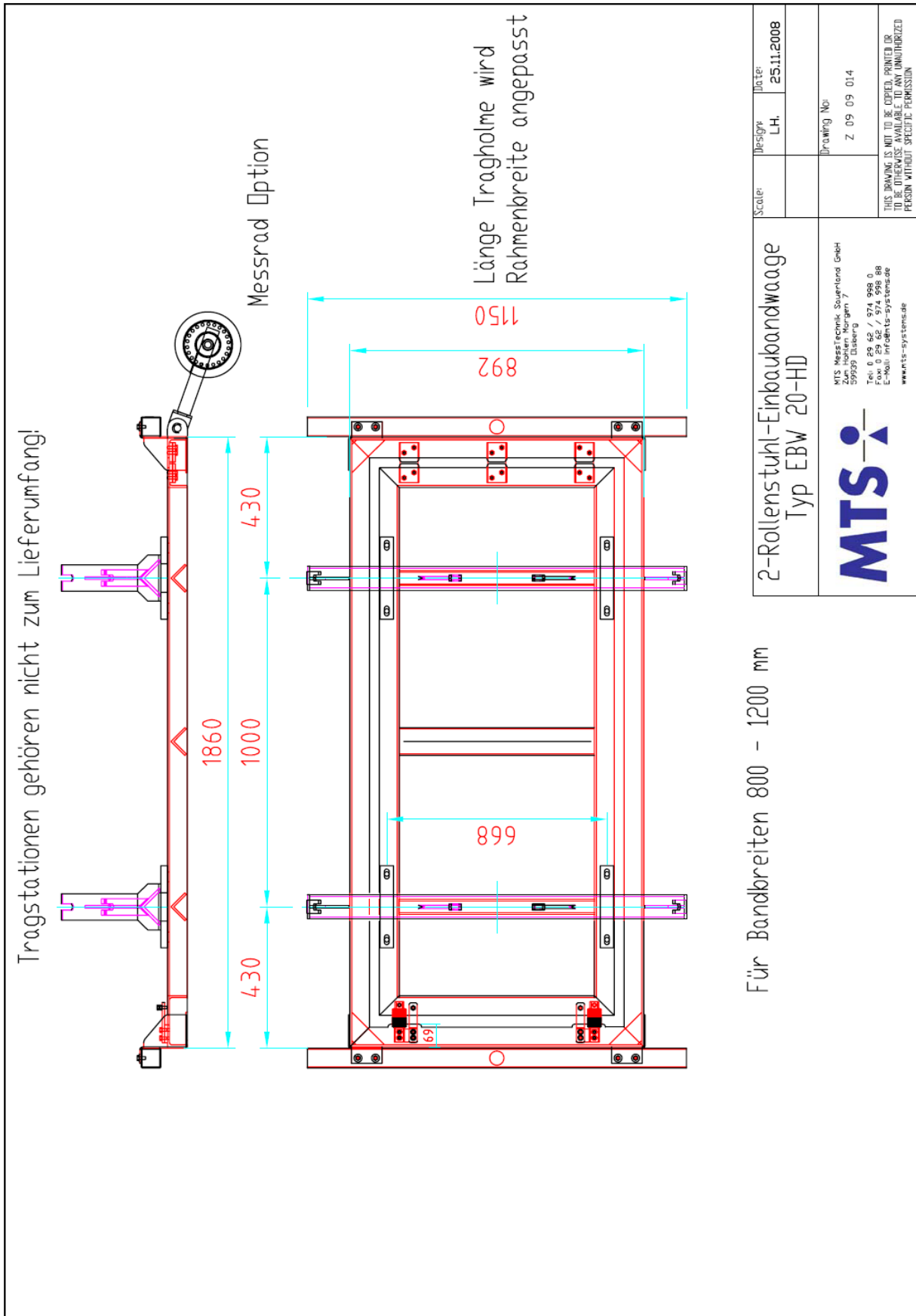


Figure 10 EBW 20-HD Weighing frame

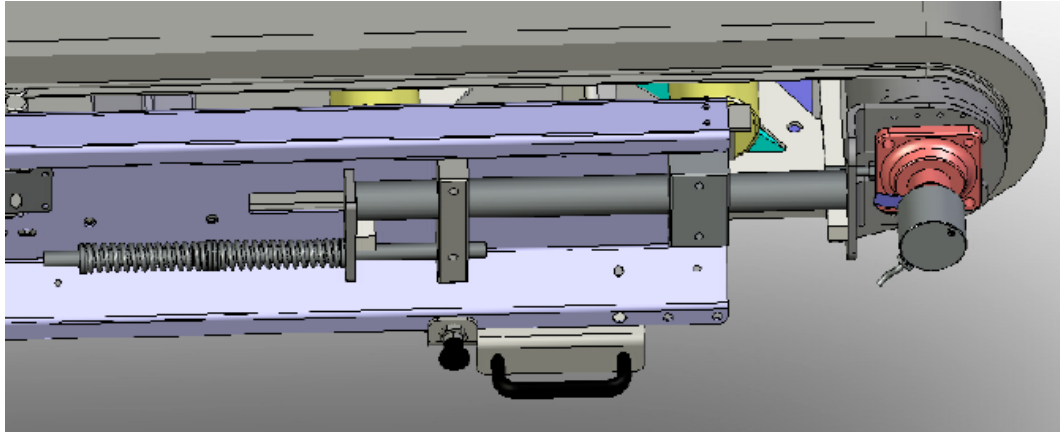


Figure 11 Spring arrangement for tightening of the belt

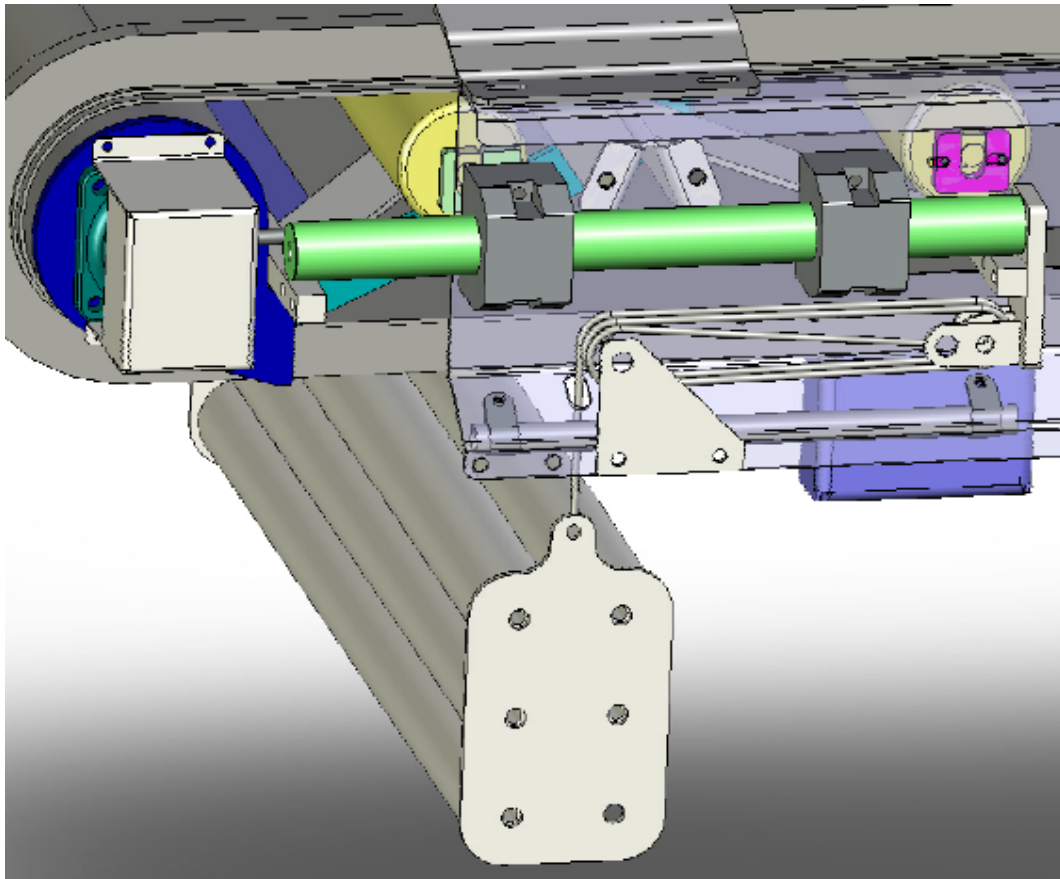


Figure 12 Arrangement for gravimetric tightening of the belt


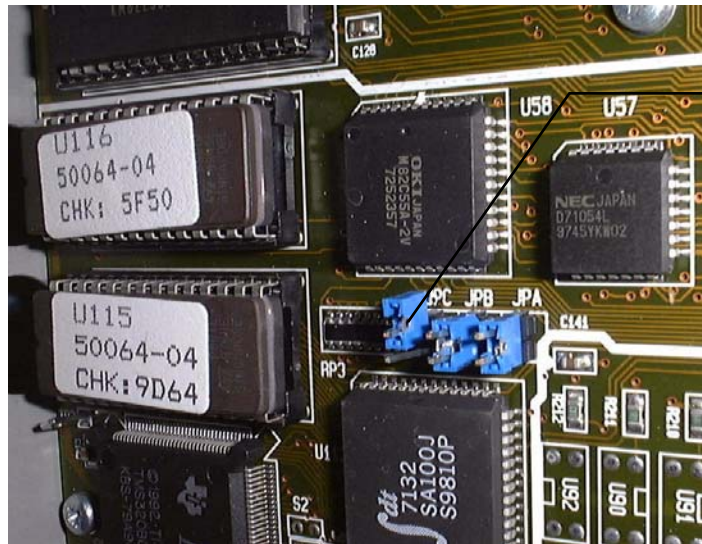
Electronic instrument		MID type approval nr.: DK0199.187
Type	<i>WC9604D/80</i>	Electromagnetic class: <i>E2</i>
Serial nr.	<i>81-003</i>	Temperature range: -25°C - +40°C, non condensing
Manufacture:.	Jesma Vejeteknik A/S	Accuracy class: <i>1</i>
<i>SERIAL NUMBER WILL BE DISPLAYED BY PRESSING THE BUTTONS "CL" AND ", "</i>		Max. flow rate Qmax: [t/h] <i>50</i>
		Min. flow rate Qmin: [t/h] <i>10</i>
Weighing unit		
Manufacture:.	MTS MessTechnik Sauerland GmbH	Belt speed: v [m/sec.] <i>0,20</i>
Type	<i>EBW 20-HD</i>	Totalization scale interval: d [kg] <i>10</i>
Serial nr.	<i>06 07 7472</i>	Scale interval during test: (d/100) [kg] <i>0,1</i>
Load cell(s)		
2 pc Vishay 355 load cells	<i>50 kg</i>	Max. Capacity (Max.): [kg] <i>84</i>
		Min. Totalized load: \sum_{Min} [kg] <i>4000</i>
Displacement transducer		
SCANCON 2RHI: [Pulses/rev.	<i>500</i>	Belt revolutions for zero-setting: <i>3</i>
		Belt width: [mm] <i>1200</i>
Supply voltage	<i>230V AC / 50Hz</i>	Weigh length: L [mm] <i>1200</i>
Product to be weighed	<i>Biomass / Wood chips</i>	Belt length endless: [mm] <i>22000</i>
Zero setting must take place for every tree hours of operation		 08

Figure 13 Inscription plate

MTS MessTechnik Sauerland GmbH	
Type:	EBW 20-HD
Serial nr.	06 07 7472

Figure 14 Mark to be placed on the load receptor



Programming lock (Jumper C).
When the jumper makes contact, the program is locked.

Figure 15 Calibration jumper

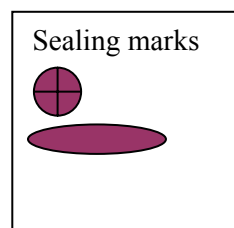
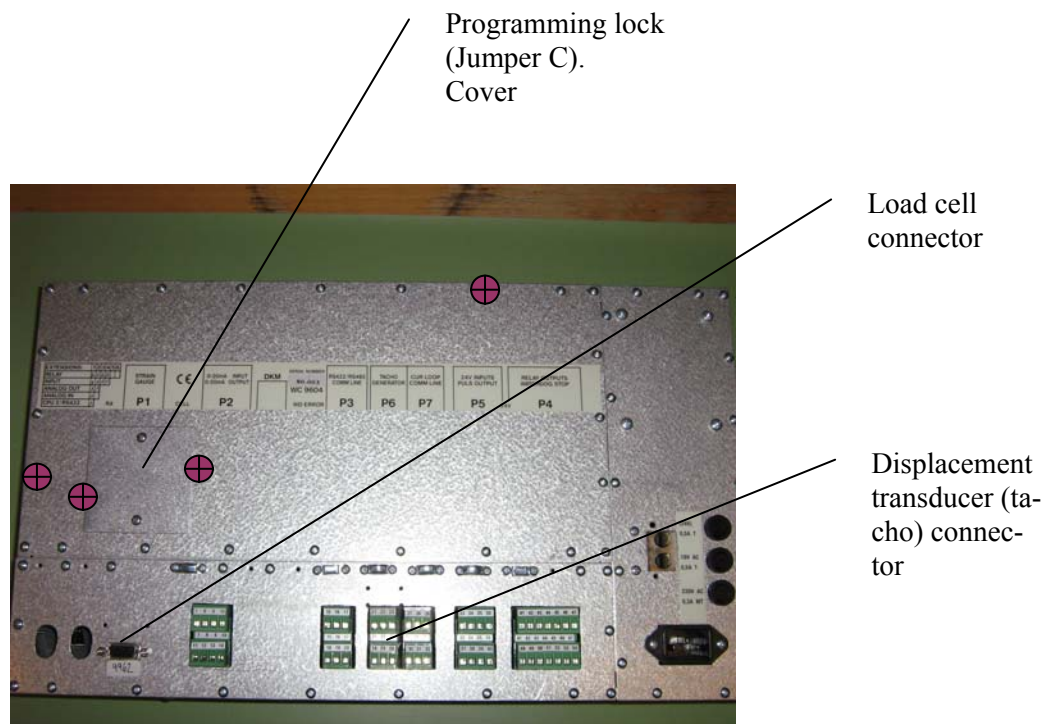


Figure 16 Sealing of Electronic Controller

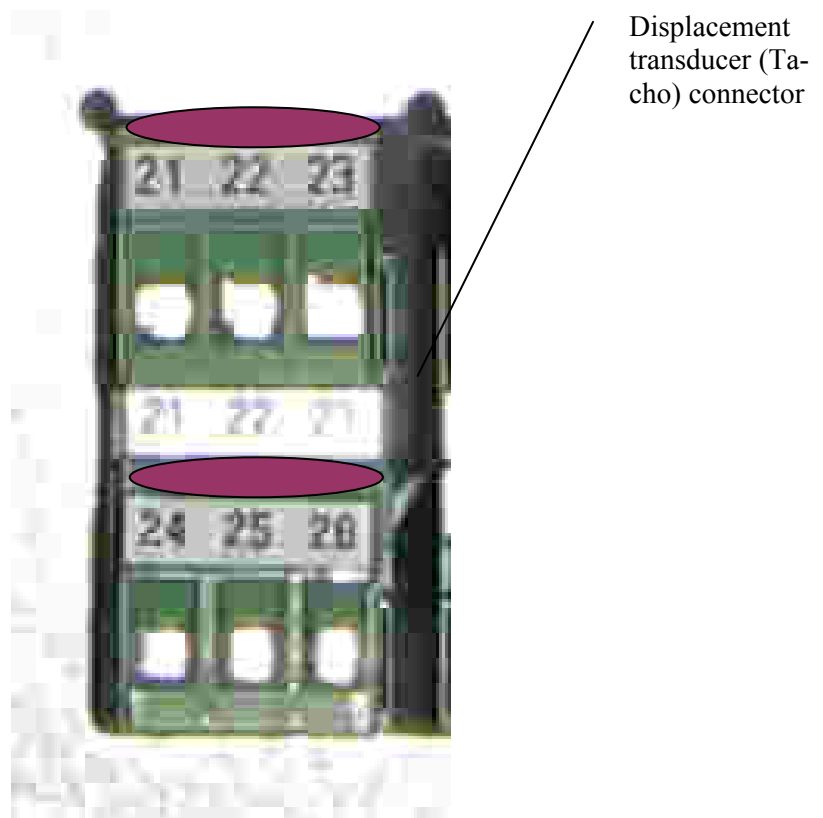
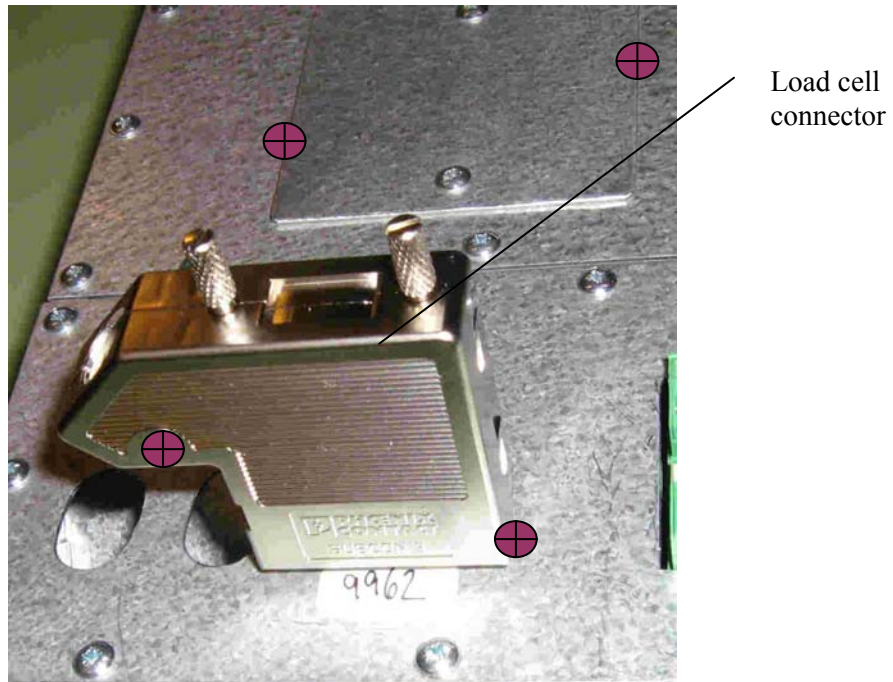


Figure 17 Sealing of load cell and displacement transducer (tacho) connector

10. Composition of modules – illustrated

COMPOSITION OF MODULES

Ref.: WELMEC 2 (Issue 4), July 2004, paragraph 11.

Belt weigher.

EC Type-Examination Certificate No.: (In conformity with OIML R50, 1997:) **DK0199.187**

ELECTRONIC DEVICE (Module 1)	Type: Jesma	9604-80
Accuracy class according to OIML R50:		0,5
Number of totalization scale intervals for Σ min:	n_i	800
Fraction of maximum permissible error (mpe)	p_1	0,7
Excitation voltage:	E_{ex} [VDC]	10
Minimum span range (for Q_{max}):	SP_{max} [mV]	2
Minimum span range for Q_{min} :	SP_{min} [mV]	0,4
Minimum input-voltage per totalization scale interval:	$E_{in} = SP_{min} / n_i$ [μ V]	0,5
Load cell interface:		6-wire (remote sense)
Minimum load cell impedance:	R_{LCmin} [Ω]	43
Maximum load cell impedance:	R_{LCmax} [Ω]	1100
Maximum permissible length of the cable:	$(L/A)_{max}$ [m / mm ²]	210
Data communication interface:		Protective interface
Temperature range:	T_{min} / T_{max} [°C]	-25 / 40
Test report or Test Certificate as appropriate:		
LOAD RECEPTOR (Module 2)	Type: MTS	EBW 20-HD
Weigh length:	W_L [mm]	1200
Belt length	B_L [m]	22
Maximum belt speed	BV_{max} [m/s]	0,2
Minimum belt speed	BV_{min} [m/s]	0,2
Fraction of mpe:	p_2	0,14
Number of load cells:	N	2
Dead load:	DL [kg]	100
Reduction ratio of the load transmitting device:	$R = F_M / F_L$	0,5
Correction factor:	Q	1
LOAD CELLS (Module 3)	Type: Vishay	355 C3
Accuracy class according to OIML R60:		C
Maximum accuracy class certified		C3
Maximum number of load cell intervals:	n_{LC}	3000
Fraction of mpe:	p_3	0,7
Sensitivity:	S [mV / V]	2
Impedance:	R_{LC} [Ω]	350
Minimum load cell verification interval:	v_{min} [% of E_{max}]	0,0067
Rated capacity:	E_{max} [kg]	50
Minimum measuring range for Q_{min} :	$v_{min} * n$ [% of E_{max}]	2,68
Temperature range:	T_{min} / T_{max} [°C]	-10 / 40
Test report or Test Certificate as appropriate:	PTB	1.13 - 93.311
COMPLETE BELT WEIGHER	Manufacturer: MTS Messtechnik Sauerland GmbH	
	Type: EBW 20-HD	
	Serial no.: 06 07 7472	
Accuracy class according to OIML R50:		1
Fractions: $p_i = p_1^2 + p_2^2 + p_3^2 = (R76 \text{ clause } 3.5.4.1)$		
Mass unit:	t / kg / g	kg
Maximum capacity:	Max [kg]	84
Minimum capacity:	Min [kg]	16,8
Scale interval:	d [kg]	10
Maximum flowrate:	Q_{max} [kg / h]	50400
Minimum flowrate:	Q_{min} [kg / h]	10080
Number of totalization scale intervals for Σ min:	n	400
Minimum Totalization load:	Σ_{min} [kg]	4000
Minimum totalization interval:	$Min * R / N / n = e$ [kg]	0,011
Utilisation of the load cells:	$\alpha = (Max * R) / [(E_{max} * N)]$	0,42
Output-voltage of the load cells:	$E_{out} = S * E_{ex} * \alpha$ [mV]	8,40
Max resistance of each wire in the cable to the junction box for load cell:	[Ω]	1
Specific cable-length to the junction box for load cells, if any	L_a [m]	80
Sectional area of each wire in the cable:	A_a [mm ²]	0,75
Temperature range allowed:	T_{min} / T_{max} [°C]	-10 / 40
Peripheral Equipment subject to legal control:

Requirements for compatibility	Satisfied, provided that all calculations below are ≥ 0
$p_i \leq 1$	$1 - p_i = 0$
$n \leq n_i$	$n_i - n = 400$
$(v_{min} / R) * \sqrt{N} \leq e$	$e - (v_{min} / R) * \sqrt{N} = 0,0010$
$SP_{max} \leq E_{out}$	$E_{out} - SP_{max} = 6,40$
$R_{LCmin} \leq R_{LC} / N$	$R_{LC} / N - R_{LCmin} = 132$
$R_{LC} / N \leq R_{LCmax}$	$R_{LCmax} - R_{LC} / N = 925$
$L_a / A_a \leq (L/A)_{max}$	$(L/A)_{max} - L_a / A_a = 103$
$Q * (Max+DL) * R / N \leq E_{max}$	$E_{max} - Q * (Max+DL) * R / N = 4,00$

Signature and date:

COMPATIBILITY: SATISFIED