Anhang 4 zu Ergebnisbericht Nr. T16-1157 über die Labortests der SW zum kontinuierlichen Totalisieren der Bauart "F-EBW"

März 2020

INTERNATIONAL RECOMMENDATION

OIML R 50-3

Edition 2014 (E)

Continuous totalizing automatic weighing instruments (belt weighers).

Part 3: Test report format

Instruments de pesage totalisateurs continus à fonctionnement automatique (peseuses sur bande).

Partie 3: Format du rapport d'essais

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

Identification of the instrument

Application no.:	BEV-13.414/0016-NB/2017	Type designation:	F-EBW
Identification no.:	E9510170215	Manufacturer:	Kukla Waagenfabrik
Software version:	W 02.08.00 bzw. P 02.08.00		
Report date:			

Documentation from the manufacturer

(Record as necessary to identify the equipment under test)

System or module name	Drawing number or software reference	Issue level	Serial no.
Waage	Kukla DWC-7B bzw. Bernegger & Rainer "X20CP0482"		E9510170215
Wägezelle	HBM, Z6FC3, 10 kg		31689686

Simulator documentation

System or module name	Drawing number or software reference	Issue level	Serial no.
Thermo-Hygrometer	Lufft "OPUS 10"		MM003615
Gewichtsstücke	2 mal 5 kg		MM003551
Impulsgeber inkl. Pegelwandlung von 10 auf 24 V	Keysight "33500 B"		MM004006

General information concerning the type

Application no.:	BEV-13.414/0016-NB/2017	Manufacturer:	Kukla Waagenfabrik
Type designation:	F-EBW	Applicant:	Kukla Waagenfabrik
Instrument category:	SW zum kont. Totalisieren		

Testing on: [ ] Complete instrument [X] Module*

Accuracy class:	[ ] 0.2		[X] 0.5		[ ] 1		[ ] 2		
Q_{min} =	10	t/h	Q_{max} =	40	t/h	Σ_{min} =	1000	kg	
Speed, v =	1,0	m/s	v_{min} =	0,1	m/s	v_{max} =	1,1	m/s	
Max =	10	kg	d =	1		W_L =		m	

U_{nom}** = 24 V U_{min} = 18,8 V U_{max} = 28,8 V f = Hz Battery, U = V

Zero-setting device: [ ] Non-automatic [X] Semi-automatic [ ] Automatic

Temperature range: - 10 °C bis + 40 °C

Printer: [ ] Built-in [ ] Connected [X] Non present but connectable [ ] No connection

Instrument submitted:		Load sensor:	
Identification no.:	siehe Seite 3	Manufacturer:	siehe Seite 3
Software version:		Type:	
Connected equipment:		Capacity:	
		Number:	
		Classification symbol:	
Interfaces (number, nature):		OIML R 60 Certificate of conformity. Please tick. If "Yes" supply certificate number.	Yes: X / No:
Evaluation period:		Certificate number:	TC 2207
Date of report:			
Observer:			

* The test equipment (simulator or part of a complete instrument) connected to the module shall be defined in the test form(s) used

** The voltage U_{nom} shall be as defined in IEC 61000-4-11 section 5

Information concerning the test equipment used for type evaluation

Application no.:	BEV-13.414/0016-NB/2017	Type designation:	F-EBW
Report date:	2020-07-22	Manufacturer:	Kukla Waagenfabrik

List all test equipment used in this report (including descriptions of the equipment used for testing)

Equipment name	Manufacturer	Type no.	Serial no.	Used for (test references)
1) für Prüfungen nach 1.6.2:				
Burst/Surge Generator	EM Test	UCS 500 M4	0897-45	
Koppelzange	EM Test	HFK		
2) für Prüfungen nach 1.6.4:				
ESD-Generator	Schlöder	SSD 30000	901383	
inkl. Pistole			901383	
3) für Prüfungen nach 1.6.5:				
Signalgenerator	Rhode & Schwarz	SMH	832311/015	
Antennen:	Rhode & Schwarz	HL 562		
	Rhode & Schwarz	HK 116		
Verstärker:	ENI	3100 LA	263	
	Bonn Elektronik	BLWA 2010-50	20721	
	MILMEGA	AS 0822	EC 0262	
Richtkoppler	Amplifier Research	DC 6180	16549	
Leistungsmesser:	Rhode & Schwarz	URV5-Z2	825.938/015	
	Rhode & Schwarz	URV5-Z2	891.649/04	
	Rhode & Schwarz	NRV-Z1	860.462/005	
	Rhode & Schwarz	URY	882852047	

Summary of type evaluation tests

Application no.: BEV-13.414/0016-NB/2017 Type designation: F-EBW

Report date: 2020-07-22 Manufacturer: Kukla Waagenfabrik

R 50-3	Tests	Report page	Passed	Failed	Remarks
1	Simulation tests				
1.1	Warm-up time				
1.2	Variation of simulation speed				
1.3	Eccentric loading				
1.4	Zero-setting device				
1.4.1	Zero-setting (range)				
1.4.2	Zero-setting (semi-automatic and automatic)				
1.5	Influence quantities				
1.5.1	Static temperatures				
1.5.2	Temperature effect at zero flowrate				
1.5.3	Damp heat				
1.5.3.1	Damp heat, steady state (non-condensing)				
1.5.3.2	Damp heat, cyclic (condensing)				
1.5.4	Mains voltage variation				
1.5.4.1	AC mains voltage variation				
1.5.4.2	DC mains voltage variation				
1.5.5	Battery voltage variation, not mains connected (DC)				
1.6	Disturbances		X		
1.6.1	AC mains voltage dips, short interruptions and reductions				nicht anwendbar
1.6.2	Bursts (fast transient tests) on:		X		
1.6.2.1	- AC and DC mains power lines		X		
1.6.2.2	- signal, data and control lines		X		
1.6.3	Surges on:				nicht anwendbar
1.6.3.1	- AC and DC mains power lines				nicht anwendbar
1.6.3.2	- signal, data and control lines				nicht anwendbar
1.6.4	Electrostatic discharge		X		
1.6.4.1	Direct application		X		

1.6.4.2	Indirect application (contact discharges only)		X		
1.6.5	Immunity to electromagnetic fields:		X		
1.6.5.1	- radiated electromagnetic fields		X		
1.6.5.2	- conducted electromagnetic fields				nicht anwendbar
1.7	Metrological characteristics				
1.7.1	Repeatability				
1.7.2	Discrimination of the totalization indicating device				
1.7.3	Discrimination of the totalization indicating device used for zero totalization				
1.7.4	Short- and long-term stability of zero				
1.8	In-situ tests				
1.8.1	Maximum permissible errors on checking of zero				
1.8.2	Discrimination of the indicator used for zero-setting				
2	In-situ product tests				
2.1	Accuracy of control instrument				
2.2	Repeatability				
	MPE for type evaluation				
	MPE for initial verification and in-service inspection				

1.6 Disturbances (R 50-1, 5.5.2 & R 50-2, 7.3)

1.6.1 AC mains voltage dips, short interruptions and reductions (R 50-1, 5.5.2 & R 50-2, 7.3.1)

Application no.: .....

Type designation: .....

Observer: .....

Resolution during test: (smaller than *d*) .....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:	2020-03-04	2020-03-04	yyyy-mm-dd
Time:	08:30	08:40	hh:mm:ss
Barometric pressure:			hPa

Marked nominal voltage, U_{nom} = ... V or voltage range, U_{min} / U_{max} [7] = ... / V

Pre-test information

	Flowrate (/h)	Equivalent pulses for Σ_{min}	Static load, L, for Σ_{min} ( )
Q_{max}			

Disturbance					Result		
Amplitude (% of U_{nom} [8])	Duration (cycles)	Number of disturbances	Repetition interval	Pulses	Indicated totalization, I	Significant fault	
						No	Yes (remarks)
	without disturbance						
0	0.5	10					
0	1	10					
40	10	10					
70	25/30 [9]	10					
80	250/300 [9]	10					
0	250/300 [9]	10					

[X] Passed [ ] Failed

Remarks: Diese Prüfung ist nicht unmittelbar anwendbar, da das Gerät mit Gleichspannung versorgt wird.

Include information that affect the test condition, as indicated in the last paragraph of R 50-2, 7.1

Die Prüfung erfolgte dennoch gemäß den Vorgaben der OIML R50-1 (1997), A.8.1
Die Versorgungsspannung wurde für 10 ms auf 0 V, und
für 20 ms auf 12 V reduziert
(Beide Spannungseinbrüche erfolgten je 10 mal im Abstand von 10 s.)
--> Resultat: Die Waage fällt vollständig aus; die Messung wurde angehalten!

[7] If a voltage-range is marked, use the average value as nominal U_{nom}
[8] The reference voltage shall be as defined in IEC 61000-4-11.
[9] These values are for 50 Hz/60 Hz, respectively.

1.6.2 Bursts (fast transient tests) on mains power lines and on signal, data and control lines (R 50-1, 5.5.2 & R 50-2, 7.3.2)

1.6.2.1 Bursts on AC and DC mains power lines

Application no.: BEV-13.414/0016-NB/2017

Type designation: F-EBW

Observer: Pohl

Resolution during test: (smaller than *d*) 1 kg

	At start	At end	
Temp.:	22,8	22,8	°C
Rel. h.:	37,0	37,5	%
Date:	2020-03-03	2020-03-03	yyyy-mm-dd
Time:	17:45	18:10	hh:mm:ss
Barometric pressure:	--	--	hPa

Pre-test information

	Flowrate (t /h)	Equivalent pulses for Σ_{min}	Static load, L, for Σ_{min} (kg)	Σ_{min}
Q_{max}	40	7200	10	800 kg

Kind or type of voltage supply:

DC [X] Other form [ ] Voltage 24 V

Power supply lines: test voltage 2.0 kV, duration of the test: 1 min at each polarity

Q_{ist} (kg/h)	Connection L	Connection N	Connection PE	Polarity	Pulses	Indicated totalization, I (kg)	Significant fault: No	Significant fault: Yes (remarks)	SOLL (kg)
	↓ ground	↓ ground	↓ ground						
39996	without disturbance				12000	1332			1333
39988	X			pos	12000	1333	X		1333
39988				neg	12000	1333	X		1333
	without disturbance								
39988		X		pos	12000	1333	X		1333
39988				neg	12000	1332	X		1333
	without disturbance								
39988	X	X		pos	12000	1333	X		1333
39988				neg	12000	1333	X		1333

Where L = line, N = neutral, PE = protective earth

[X] Passed [ ] Failed

Remarks:

1.6.2 Bursts (fast transient tests) on mains power lines and on signal, data and control lines (R 50-1, 5.5.2 & R 50-2, 7.3.2)

1.6.2.2 Bursts on signal, data and control lines

Application no.: BEV-13.414/0016-NB/2017

Type designation: F-EBW

Observer: Pohl

Resolution during test: 1 kg
(smaller than *d*)

	At start	At end	
Temp.:	22,8	22,8	°C
Rel. h.:	37,5	37,5	%
Date:	2020-03-03	2020-03-03	yyyy-mm-dd
Time:	18:10	18:25	hh:mm:ss
Barometric pressure:	--	--	hPa

Pre-test information

	Flowrate (t /h)	Equivalent pulses for Σ_{min}	Static load, L, for Σ_{min} (kg)	Σ_{min}
Q_{max}	40	7200	10	800 kg

I/O signals, data and control lines: test voltage 1.0 kV, duration of the test: 1 min at each polarity

Q_{ist} (kg/h)	Cable/interface	Polarity	Pulses	Indicated totalization, I (kg)	Significant fault		SOLL (kg)
					No	Yes (remarks)	
	without disturbance						
39988	Wägezelle	pos	12000	1333	X		1333
39988		neg	12000	1333	X		1333
	without disturbance						
39988	Tacho	pos	12000	1333	X		1333
39988		neg	12000	1333	X		1333
	without disturbance						
		pos					
		neg					
	without disturbance						
		pos					
		neg					
	without disturbance						
		pos					
		neg					
	without disturbance						
		pos					
		neg					

Explain or make a sketch indicating where the clamp is located on the cable; if necessary, use an additional page.

[X] Passed [ ] Failed

Remarks:

Include information that affect the test condition, as indicated in the last paragraph of R 50-2, 7.1

1.6.4 Electrostatic discharge (R 50-1, 5.5.2 & R 50-2, 7.3.4)

1.6.4.1 Direct application

Application no.: BEV-13.414/0016-NB/2017

Type designation: F-EBW

Observer: Pohl

Resolution during test: (smaller than *d*) 1 kg

	At start	At end	
Temp.:	19,5	20,0	°C
Rel. h.:	38,5	38,0	%
Date:	2020-03-04	2020-03-04	yyyy-mm-dd
Time:	9:00	10:00	hh:mm:ss
Barometric pressure:	--	--	hPa

Pre-test information

	Flowrate (t /h)	Equivalent pulses for Σ_{min}	Static load, L, for Σ_{min} (kg)	Σ_{min}
Q_{max}	40	7200	10	800

[X] Contact discharge [ ] Paint penetration

[ ] Air discharge Polarity*: [X] positive [X] negative

Discharges			Pulses	Indicated totalization, I (kg)	Significant fault		SOLL (kg)
Test voltage (kV)	Number of discharges ≥ 10	Repetition interval (s)			No	Yes (remarks)	
without disturbance							
2	--						
4	--						
6	60	5	20000	2222	X		2222
8 (air discharges)	60	5	20000	2222	X		2222

[X] Passed [ ] Failed

Note: If the EUT fails, the test point at which this occurs shall be recorded.

Remarks: insgesamt 30 mal mit positiver und 30 mal mit negativer Polarität entladen (bei Kontakt und mittels Luftübertragung)

Include information that affect the test condition, as indicated in the last paragraph of R 50-2, 7.1

* IEC 61000-4-2 specifies that the test shall be conducted with the most sensitive polarity.

1.6.5 Immunity to electromagnetic fields (R 50-1, 5.5.2 & R 50-2, 7.3.5)

1.6.5.1 Immunity to radiated electromagnetic fields (R 50-1, 5.5.2 & R 50-2, 7.3.5.1)

Application no.: BEV-13.414/0016-NB/2017

Type designation: F-EBW

Observer: Pohl

Resolution during test: 1 kg (smaller than *d*)

	At start	At end	
Temp.:	23,0	23,7	°C
Rel. h.:	35,0	34,0	%
Date:	2020-03-03	2020-03-03	yyyy-mm-dd
Time:	12:44	16:06	hh:mm:ss
Barometric pressure:	--	--	hPa

Pre-test information

Test severity:

	Flowrate (t /h)	Equivalent pulses for Σ_{min}	Static load, L, for Σ_{min} (kg)	Σ_{min}
Q_{max}	40	7200	10	800 kg

Frequency range: 80[10] to 2000 MHz
Field strength: 10 V/m
Modulation: 80 % AM, 1 kHz, sine wave

Rate of sweep: 1 % (Verweildauer: 1s)

Tachfrequenz = 100 Hz
(d_{Test} = 0,1 kg)

Q_{ist} (kg/h)	Disturbance: Test facility	Frequency Range (MHz)	Polarization	Facing EUT	Result: Pulses	Indicated totalization, I	Significant fault: No	Significant fault: Yes (remarks) (Remarks)	SOLL (kg)
	without disturbance								
		-	0°	Front	62000				
39996		80 - 1000	Vertical 90°	~~Right~~	62000	6888	X		6888
		-		Left	62000				
40004		80 - 1000		~~Rear~~	62000	6889	X		6890
		-	0°	Front	62000				
39996		80 - 1000	Horizontal 90°	~~Right~~	62000	6888	X		6888
		-		Left	62000				
40004		80 - 1000		~~Rear~~	62000	6889	X		6890
		-	0°	Front	20000				
40000		1000 - 2000	Vertical 90°	~~Right~~	20000	2223	X		2222
		-		Left	20000				
40004		1000 - 2000		~~Rear~~	20000	2222	X		2222
		-	0°	Front	20000				
40000		1000 - 2000	Horizontal 90°	~~Right~~	20000	2222	X		2222
		-		Left	20000				
40000		1000 - 2000		~~Rear~~	20043	2227	X		2227

Note: If EUT fails, the frequency and level at which this occurs shall be recorded.

[X] Passed [ ] Failed

Remarks: Die Anzahl der Impulse wurde anhand der Prüfdauer gewählt;
zwischen 1800 und 2000 MHz zeigten sich Schwankungen im Wägezellensignal - nicht relevant.

[10] For instruments having no mains or other I/O ports available so that the conducted test according to R 50-2, 7.3.5.2 cannot be applied, the lower limit of the radiation test is 26 MHz

1.6.5 Immunity to electromagnetic fields (R 50-1, 5.5.2 & R 50-2, 7.3.5)
1.6.5.1 Immunity to radiated electromagnetic fields (R 50-1, 5.5.2 & R 50-2, 7.3.5.1)

Application no.: BEV-13.414/0016-NB/2017

Type designation: F-EBW

Observer: Pohl

Resolution during test: 1 kg (smaller than *d*)

	At start	At end	
Temp.:	23,8	24,0	°C
Rel. h.:	34,0	34,0	%
Date:	2020-03-03	2020-03-03	yyyy-mm-dd
Time:	16:20	17:00	hh:mm:ss
Barometric pressure:	--	--	hPa

Pre-test information

Test severity:

	Flowrate (t /h)	Equivalent pulses for Σ_{min}	Static load, L, for Σ_{min} (kg)	Σ_{min}
Q_{max}	40	7200	10	800 kg

Frequency range: 80[10] to 2000 MHz
Field strength: 10 V/m
Modulation: 80 % AM, 1 kHz, sine wave

Rate of sweep: 1 % (Verweildauer: 1s)

Tachfrequenz = 100 Hz
(d_{Test} = 0,1 kg)

Q_{ist} (kg/h)	Disturbance: Test facility	Frequency Range (MHz)	Polarization	Facing EUT	Result: Pulses	Indicated totalization, I	Significant fault: No	Significant fault: Yes (remarks) (Remarks)	SOLL (kg)
	without disturbance								
		-	0°	Front					
40000		26 - 80	Vertical	~~Right~~	32150	3573	X		3572
		-	90°	Left					
40008		26 - 80		~~Rear~~	32150	3572	X		3573
		-	0°	Front					
40000		26 - 80	Horizontal	~~Right~~	32145	3571	X		3572
		-	90°	Left					
40008		26 - 80		~~Rear~~	32150	3572	X		3573
			Vertical	Front					
				Right					
				Left					
				Rear					
			Horizontal	Front					
				Right					
				Left					
				Rear					

Note: If EUT fails, the frequency and level at which this occurs shall be recorded.

[X] Passed [ ] Failed

Remarks: Die Anzahl der Impulse wurde anhand der Prüfdauer gewählt.

[10] For instruments having no mains or other I/O ports available so that the conducted test according to R 50-2, 7.3.5.2 cannot be applied, the lower limit of the radiation test is 26 MHz