

Test Report



DANAK
Reg. no. 19

Type test of load cell type TSSP-200KGW

Performed for Cardinal Scale Manufacturing Co.

DANAK-199753
Project no.: E830085
Page 1 of 10
1 annex

23 December 2004

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Title	Type test of load cell type TSSP-200KGW
Test object	One load cell type TSSP-200KGW, 230 kg
Report no.	DANAK-199753
Project no.	E830085
Test period	December 2004
Client	Cardinal Scale Manufacturing Co. 203 E Daugherty 64870 Webb City, Michigan USA
Contact persons	Stephen Langford
Manufacturer	Cardinal Scale Manufacturing Co.
Pattern designation	TSSP-200KGW
Specifications	International Recommendation OIML R 60, edition 2000
Results	OIML R 60, edition 2000 was fulfilled
Date	23 December 2004
Responsible	 Jens Hovgård Project Manager, M.Sc.E.E. DELTA EC-Notified body no. 0199

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Annex 1 OIML R 60 Test Report Load cell type TSSP-200KGW (29 pages)

1. Résumé

This report describes findings and results achieved during type testing of a single point strain gauge load cell type TSSP-200KGW manufactured by Cardinal Scale Manufacturing Co.

The examination and testing were performed according to International Recommendation OIML R 60, edition 2000.

One load cell has been tested with the following result in brief:

Rated capacity	230 kg
Maximum capacity tested	200 kg
Class	C
$n_{\max}$	3000
$V_{\min}$	0.002 [%E _{max}]
Y	45454
Dead load output return, DR	0.0127 [%E _{max}]
Z	3947
Temperature rating	+40/-10 [°C]
Humidity rating	"CH"

The report proves the conformity of the load cell type TSSP-200KGW, 230 kg with the requirements of the International Recommendation OIML R 60, edition 2000.

2. Submitted test item

General information concerning the submitted test item appears from *annex 1*.

3. General information

This report describes findings and results achieved during type examination and testing of a load cell type TSSP-200KGW, 230 kg as described briefly in *chapter 1* and in detail in *annex 1*.

The manufacturer delivered the load cell mounted to a fixture as shown in the *annex 1*.

4. Examinations and tests

According to OIML R 60, edition 2000.

5. Test results

The examination, tests and results appear from the R 60 report, which is the *annex* to this report.

6. Conclusion

The test item referred to in this report fulfilled the test requirements as described in *annex 1*.

7. OIML R 60 test report

The OIML R 60 test report contains detailed results of the type examination and testing carried out.

The test report appears from *annex 1*.

Annex 1
OIML R 60 Test Report
Load cell type TSSP-200KGW
(29 pages)

OIML R 60 TEST REPORT

Made from the DELTA Test Program DTPR60

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL RECOMMENDATION

OIML R 60 Edition 2000

LOAD CELLS

Part 2 : Type evaluation report R 60-2

TEST ITEM

**Cardinal Scale Manufacturing
Type TSSP-200KGW**

Report no.:	DANAK-199753
Project no.:	E830085
Date:	2004-12-20
Test laboratory:	DELTA
Evaluator/responsible:	Jens Hovgård, DELTA Electronics Testing, Denmark

Registered user:

DELTA Electronics Testing, Denmark

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Registered user: DELTA Electronics Testing, Denmark

GENERAL INFORMATION

Reference: OIML R60 edition 2000
 Evaluator / responsible: Jens Hovgård

Testing authority

Name: DELTA
 address: Venlighedsvej 4, DK-2970 Hørsholm, Denmark

Testing laboratory

Name: DELTA
 address: Venlighedsvej 4, DK-2970 Hørsholm, Denmark
 Test location: Weight Laboratory

Applicant / Manufacturer Information

Application no.: E830085
 application date:
 Model designation: TSSP-200KGW
 Manufacturer: Cardinal Scale Manufacturing
 address: 203 E. Daugherty, 64870 Webb City, Michigan, USA
 Applicant: Cardinal Scale Manufacturing
 address: 203 E. Daugherty, 64870 Webb City, Michigan, USA
 Representative: Stephen Langford
 Instrument category: Strain gauge load cell
 Documentation no.:

Information concerning the pattern

Accuracy class: C (C3)

Max number of intervals, n_{max} : 3000

Apportionment factor, p_{LC} : 0.7

Direction of loading: Single Point

Load cell fabricated from: Stainless steel

Safe load limit (Lim): 200 [%E_{max}]

Electrical characteristics:

Rated output: 2 [mV/V]
 Input/output resistance: 350/350 [ohm]

Load cell output: Analog

Load cell excitation: dc/ac

Specified voltage: 5 [V_{min}] 20 [V_{max}] 12 [V] Recommended

Test voltage: 10 [V] 225 Hz

Load cell cable: 3 m shielded

Connections, if applicable: Excitation: (+): red (-): black Sense (+): Sense (-):
 Signal: (+): green (-): white Shield:

Limits of working temperature, if other than +40 °C / -10 °C: Max: °C Min: °C

Humidity symbol: CH (high Humidity) 'no marking'

Gauge cavity sealing: Not hermetic sealed

Relevant humidity test has previously been performed on model:

In case the humidity test is omitted, refer the report/certificate no.: TC5670 from NMI

Various designs within model range: (Manufacturer's specifications)

Model designation	Various capacities	E _{max}	V _{min}		E _{min}	n _{max}	DR	
Type number		[kg]	[kg]	[%E _{max}]	[kg]		[kg]	[%E _{max}]
TSSP-200KG		200	0.0333	0.0166667	0	3000	0.0333	0.0167

Load cell(s) submitted: (Manufacturer's specifications)

Model designation	Serial number	E _{max}	V _{min}		E _{min}	n _{max}	DR	
Type number		[kg]	[kg]	[%E _{max}]	[kg]		[kg]	[%E _{max}]
TSSP-200KGW	TG045001	230	0.0288	0.01250	0	3000	0.03833	0.01667

Humidity test is not included

Setup of n_{max} for all tests:

Setup of v for accuracy classification:

$$v = 0.0667 \quad "v = (D_{max} - D_{min}) / n_{max}"$$

3000

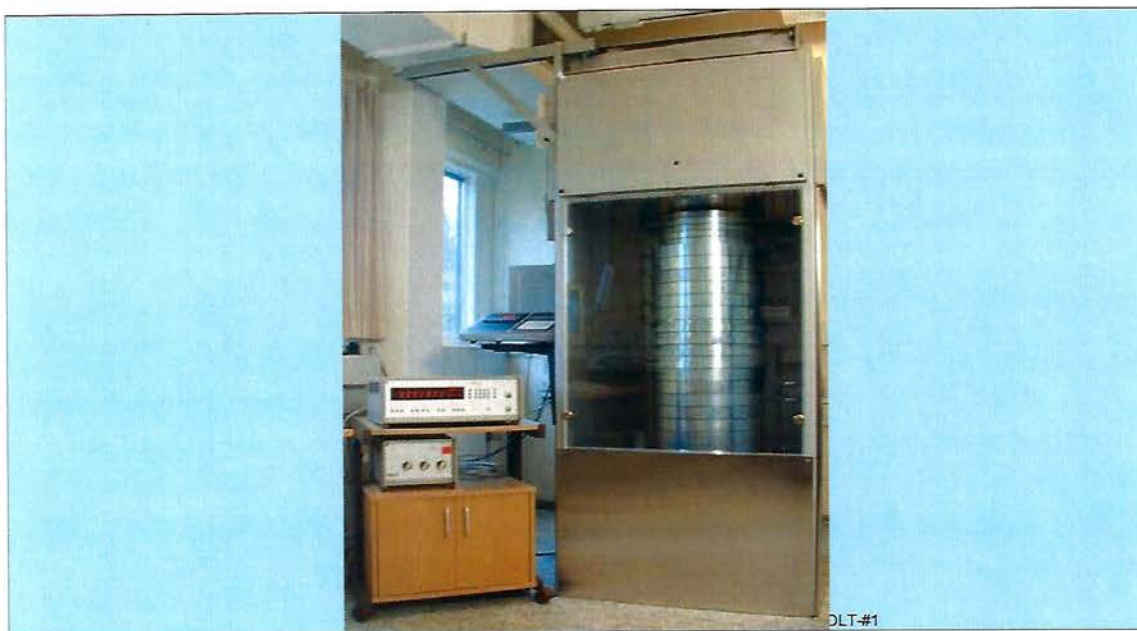
$$Z = 3000$$

Registered user

DELTA Electronics Testing Denmark

TEST EQUIPMENT

	Ref.: OIML R60 edition 2000
	Evaluator: Jens Hovgård
	Application: E830085
Test item	Load cell type: TSSP-200KGW
	E _{max} : 230 [kg]
	n _{max} : 3000
	P _{LC} : 0.7
	v: 0.0667 [kg]
Test loads	Stack of weights. See the photo below.
Accuracy or accuracy class:	Accuracy better than 10 times MPE. The calibration certificates are kept by DELTA.
Calibrated:	2000-2003
Traceability:	DKD
Force generating system	
See foto on page no.:	See below.
Minimum load during test:	For "Load cell errors" tests: 0 [kg]
	For "Creep" tests: 0 [kg]
Acc. of gravity at the test location:	[m/s ²]
Readout instrument	Must be specified!
Resolution during test:	0.000001 [mV/V]
Manufacture:	HBM
Type:	DMP 39
Serial no.:	
Calibrated:	DKD
Traceability:	
Environmental equipment	
Temperature:	DLT-#1
Humidity:	-
Barometric pressure:	Barometric pressure chamber with a water column as the pressure gauge.
Test location:	Weighing Laboratory, DELTA

Photograph of test setup

Registered user

DELTA Electronics Testing, Denmark

Marking requirements

Ref.: OIML R60 edition 2000: Clause 4.7

Evaluator: Jens Hovgård

Load cell model: TSSP-200KGW

Serial no.: TG045001

 $E_{\max}$: 230 [kg] $\eta_{\max}$ (specified): 3000

Accuracy class: (C3)

 p_{LC} : 0.7 $v_{\min}$: 0.0125 [% $E_{\max}$]DR: 0.016667 [% $E_{\max}$]

Humidity symbol: CH (high Humidity) 'no marking'

R60 subclause	Information to be marked / informed	Required on cell & document	Marked on cell	Included on document	P / F (fixed)	P / F (optional)
4.6.1	Accuracy class designation (A, B, C or D)			x	P	
4.6.2	Maximum number of load cell intervals		x	x	P	
4.6.3	Load direction indicated, if necessary			x		
4.6.4	Special limits of working temperature, [°C]					/
4.6.5.1	Symbol "NH" (no humidity)					/
4.6.5.3	Symbol "SH" (low humidity)					/
4.6.6.1a)	Manufacturer's name or trademark	4.7.1 *)	x	x	P	
4.6.6.1b)	Manufacturer's designation or load cell model	4.7.1 *)	x	x	P	
4.6.6.1c)	Serial number	4.7.1 *)	x	x	P	
4.6.6.1c)	Year of manufacture			x	P	
4.6.6.1d)	Minimum dead load, $E_{\min}$			x	P	
4.6.6.1d)	Maximum capacity, $E_{\max}$	4.7.1 *)	x	x	P	
4.6.6.1d)	Safe load limit, $E_{\lim}$			x	P	
4.6.6.1e)	Minimum load cell verification interval, $v_{\min}$		x	x	P	
4.6.6.1f)	Other pertinent conditions					
4.6.6.1g)	The value of factor p_{LC} , if not equal to 0.7					/
4.6.7	Standard classification symbols			x	P	
4.6.8	Multiple classifications, if necessary					
Conclusion:					P	P

R60 subclause	Non-mandatory additional information		On cell	On document
4.6.5.2	Symbol "CH" (cyclic humidity)			x
4.6.6.2a)	"Y" (refer to OIML R76) ($Y = E_{\max} / v_{\min}$)			x
4.6.6.2b)	DR or "Z" (refer to OIML R76) ($Z = E_{\max} / 2DR$)			x

*) Required on the cell and the accompanying document supplied with the load cell as well.

+ or x The marking is present

/ Not relevant

Documents provided by the manufacturer:

Accompanying document (required). Refer doc.:

Data sheet (optional):

Markings on load cells (optional):

Photographs (optional):

Drawings (optional):

See Datasheet

-

Yes

Yes

Yes

Information provided

Overall conclusion:

PASSED

Remarks:

Registered user: DELTA Electronics Testing Denmark

Summary of the test

Test ref.: OIML R60 edition 2000
 Evaluator: Jens Hovgård
 Type: TSSP-200KGW
 Serial No.: TG045001

Manufacturer's spec. ¹: As follows:

Accuracy class ¹: (C3)

$E_{\min}$ ¹: 0 [kg]

$E_{\max}$ ¹: 230 [kg]

$n_{\max}$ ¹: 3000

$v_{\min}$ ¹: 0.0125 [%E_{max}] = 0.02875 [kg]

DR ¹: 0.016667 [%E_{max}]

p_{LC} ¹: 0.7 (R60: 5.1.1)

Report no.: DANAK-199753

Report date: 2004-12-20

Project no.: E830085

Test period: 2004 02-dec 06-dec

Temperature range tested: 40 -10 [°C]

Electronics voltage: 10 [V, 225 Hz]

v during test: 0.0667 [kg]

Resolution during test: 0.000001 [mV/V]

Conclusion and results

No.	Test description	Conclusion	Report page	Main results and remarks
D.2	Load cell errors (E_L)	Passed	See Contents	$n_{\max} = 3000$ (valid for the test results) Specification fulfilled
D.3	Repeatability errors (E_R)	Passed		
D.4	Temperature effects on MDLO (C_M) (Minimum Dead Load Output)	Passed		$v_{\min} = 0.002$ [%E _{max}] $Y = 52631$ Specification fulfilled
D.5	Creep (C_C)	Passed		
	DR (C_{DR}) (Dead load Return)	Passed		DR = 0.0291 [kg] = 0.0127 [%E _{max}] Z = 3947 Specification fulfilled
D.6	Barometric pressure effects (C_P)	Passed		
D.7	Humidity effects (CH or no mark) ($C_{H\min}$)	/		Refer the information on page >Inform<
	Humidity effects (CH or no mark) ($C_{H\max}$)	/		
D.8	Humidity effects (SH) (low humidity)	/		
D.9	Marking requirements	Passed		
D.10	Load cells equipped with electronics:	/		
D.11	Warm-up time			
D.12	Power voltage variations			
D.13	Short time power reductions			
D.14	Bursts (electrical fast transients)			
D.15	Electrostatic discharge			
D.16	Electromagnetic susceptibility			
D.17	Span stability			

Conclusion altogether: Passed

Checks (R60: C4)

No.	Test description	$n_{\max}$	$n_{\max}-500$	$n_{\max}-1000$	Conclusion
D.2	Load cell errors	3000	2500	2000	Passed Passed Passed
Check that: $v_{\min} \leq (D_{\max} - D_{\min}) / n_{\max} (= v)$ 0.00437 [kg] $\leq$ 0.067 [kg]					Passed

Conclusion for all checks: Passed

Overall conclusion: PASSED

Remarks:

Registered user: DELTA Electronics Testing, Denmark

TEST DATA SETUP

Test ref.: OIML R60 edition 2000

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

E_{Max}: 230 [kg]n_{max}: 3000

v: 0.0667 [kg]

p_{LC}: 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Number of decimals: 6

Calibration point: 75 [% of (Dmax-Dmin)]

Max test load: 200 [kg] (Dmax)

Min test load: 0 [kg] (Dmin)

Start: 02-12-2004

Temperature range: 39.95 -9.6 [°C]

Humidity: [% RH]

Barometric pressure: [kPa]

Indicator temperature *): [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

*) Readout instrument: DMP 39

Indication unit: [mV/V]

Load unit: [kg]

*) Measure address:

RS 232 setup

Com port	1
Baud rate	9600
Data bits	7
Stop bits	1
Parity	Even
EOS	13
Buffer size	100

No.	Test load		Speci fied step time	Apply/remove loads		Load (%) of Max	Number of v	Steps of v	MPE	
	D [kg]	D _{min} /D _{max}	[s]	Load [kg]	Weights [kg]	[%]		[v]	Steps * p _{LC} [v] [kg]	
1	0	= Dmin		0	0	0	0	0.5	0.35	0.0233
2	0	= Dmin		0	0	0	0	0.5	0.35	0.0233
3	0	= Dmin		0	0	0	0	0.5	0.35	0.0233
4	20		20	20			9	300	0.5	0.0233
5	40		20	20			17	600	1	0.0467
6	60		20	20			26	900	1	0.0467
7	80		20	20			35	1200	1	0.0467
8	100		20	20			43	1500	1	0.0467
9	150		20	50			65	2250	1.5	0.0700
10	200	= Dmax	20	50			87	3000	1.5	0.0700
11	150		20	-50			65	2250	1.5	0.0700
12	100		20	-50			43	1500	1	0.0467
13	80		20	-20			35	1200	1	0.0467
14	60		20	-20			26	900	1	0.0467
15	40		20	-20			17	600	1	0.0467
16	20		20	-20			9	300	0.5	0.0233
17	0	= Dmin	20	-20			0	0	0.5	0.0233
18										
19										
20										
21										
22										
23										

7 Steps besides the zero point.

Remarks:

R60, table 6: Combined loading and stabilization times to be achieved prior to reading.

Change in load [kg]		Time [s]
Greater than	Up to and including	
0	10	10
10	100	20
100	1000	30
1000	10000	40
10000	100000	50
100000		60

Dead load tester

Com port 2

Temperature controller

Com port 3

Baud rate 2400

Temperature logging

Com port 4

Baud rate 2400

Registered user: DELTA Electronics Testing, Denmark

Estimation of measurement uncertainty

Measuring chain for determination of errors of measurements

Standard bridge calibrator BN100 with traceability to DKD in Germany.
 High precision measuring instrument DMP39 with traceability to BN100.
 Reference weights with traceability to DKD in Germany.
 Mass normals of dead load tester with traceability to reference weights.

Uncertainty of measurements

BN100: Max contribution 0.001 [%]
 DMP39 & BN100 (repeatability error): 0.0002 [%] *)
 *) confidence factor =

Temp. measurements at influence tests: ± 0.2 [°C]
 Refer to separate test pages for temperature variation during test.

Mass used for dead load.

Mass [kg]	Accuracy		Expanded uncertainty	
	[v]	[%]	[v]	[%]
20	-0.0015	-0.0005	0.0051	0.0017
40	-0.0045	-0.0007	0.0063	0.0010
60	-0.0069	-0.0008	0.0065	0.0007
80	-0.0069	-0.0006	0.0068	0.0006
100	-0.0062	-0.0004	0.0072	0.0005
150	-0.0038	-0.0002	0.0102	0.0005
200	-0.0024	-0.0001	0.0156	0.0005

Conclusion:

Everything considered the accuracy and stability of the measurements are sufficient good to comply with R60 (edition 2000).

Test: Load cell errors & Repeatability errors**Initial test**

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 $E_{\max}$: 230 [kg] $n_{\max}$: 3000 v : 0.0667 [kg] p_{LC} : 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date: 2004 02-dec 02-dec

Test temperature: 20 20 [°C]

Humidity: 50 50 [% RH]

Bar. pressure: / / [kPa]

Indicator temp. *): 19.7 19.7 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % ($D_{\max}-D_{\min}$): 150 [kg]

Ri at Cal.P: 1.454659 [mV/V]

Factor, f: 0.000647 [mV/V] / v

*) Readout instrument: DMP 39

*) Measure address:

Temp.var.

Max.
20
Min.
20

Measurements

R60: A.4.1

No.	Test load	Run no. 1		Run no. 2		Run no. 3		Average	Zero corrected Average	Repeatability
	D [kg]	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	1, 2, 3 [mV/V]	1, 2, 3 [mV/V]	Error [mV/V]
1	0	0.016981	9:46:33	0.016979	9:52:22	0.016980	9:58:12	0.016980		
2	0	0.016985	9:46:39	0.016985	9:52:28	0.016984	9:58:18	0.016985		
3	0	0.016989	9:46:45	0.016991	9:52:34	0.016987	9:58:25	0.016989	0.000000	0.000000
4	20	0.210838	9:47:07	0.210829	9:52:56	0.210825	9:58:46	0.210831	0.193842	0.00001
5	40	0.404801	9:47:28	0.404814	9:53:18	0.404804	9:59:07	0.404806	0.387817	0.00001
6	60	0.598789	9:47:50	0.598797	9:53:39	0.598789	9:59:29	0.598792	0.581803	0.00001
7	80	0.792690	9:48:11	0.792694	9:54:00	0.792680	9:59:51	0.792688	0.775699	0.00001
8	100	0.986616	9:48:33	0.986637	9:54:22	0.986608	10:00:12	0.986621	0.969632	0.00003
9	150	1.471661	9:48:54	1.471647	9:54:43	1.471635	10:00:34	1.471648	1.454659	0.00003
10	200	1.956763	9:49:15	1.956742	9:55:05	1.956732	10:00:56	1.956746	1.939757	0.00003
11	150	1.471765	9:49:37	1.471755	9:55:26	1.471747	10:01:17	1.471756	1.454767	0.00002
12	100	0.986762	9:49:58	0.986763	9:55:47	0.986751	10:01:39	0.986759	0.969770	0.00001
13	80	0.792793	9:50:20	0.792803	9:56:09	0.792782	10:02:01	0.792793	0.775804	0.00002
14	60	0.598875	9:50:41	0.598885	9:56:31	0.598856	10:02:22	0.598872	0.581883	0.00003
15	40	0.404834	9:51:03	0.404857	9:56:52	0.404835	10:02:44	0.404842	0.387853	0.00002
16	20	0.210848	9:51:24	0.210848	9:57:14	0.210842	10:03:06	0.210846	0.193857	0.00001
17	0	0.016966	9:51:45	0.016969	9:57:35	0.016961	10:03:27	0.016965	-0.000024	0.00001

Factor f = $\frac{[(\text{Average}_{D1} \text{ at the Calibration Point}) - \text{Average}_{D1} \text{ at D1}] \cdot (\text{Calibration Point (20)} \cdot n)}{[(D - D1) \cdot (D_{\max} - D1)] \cdot n_{\max} \cdot f}$ Ri = $\frac{[(D - D1) \cdot (D_{\max} - D1)] \cdot n_{\max} \cdot f}{\text{Average}_{D1} \cdot (\text{Calibration Point (20)} \cdot n)}$ E_L = $\frac{(\text{Average}_{D1} - Ri) \cdot f}{f}$ **Result**

No.	Test load	Reference indication	Error	Load cell Error	mpe (Table 2)	Passed / Failed
	D [kg]	Ri [mV/V]	[mV/V]	(E _L) [V]	[V]	P / F
3	0	0.000000	0.000000	0.00	0.35	P
4	20	0.193955	-0.000113	-0.17	0.35	P
5	40	0.387909	-0.000092	-0.14	0.70	P
6	60	0.581864	-0.000061	-0.09	0.70	P
7	80	0.775818	-0.000119	-0.18	0.70	P
8	100	0.969773	-0.000141	-0.22	0.70	P
9	150	1.454659	0.000000	0.00	1.05	P
10	200	1.939545	0.000212	0.33	1.05	P
11	150	1.454659	0.000108	0.17	1.05	P
12	100	0.969773	-0.000003	0.00	0.70	P
13	80	0.775818	-0.000014	-0.02	0.70	P
14	60	0.581864	0.000020	0.03	0.70	P
15	40	0.387909	-0.000056	-0.09	0.70	P
16	20	0.193955	-0.000098	-0.15	0.35	P
17	0	0.000000	-0.000024	-0.04	0.35	P

P / F:

Conclusion

PASSED / FAILED:

Remarks:

R60: 5.4 & A.4.1.14

Repeatability		
Repeatability Error	mpe (5.4)	Passed / Failed
(E _R) [V]	[V]	P / F
0.01	0.35	P
0.02	0.35	P
0.02	0.70	P
0.01	0.70	P
0.02	0.70	P
0.05	0.70	P
0.04	1.05	P
0.05	1.05	P
0.03	1.05	P
0.02	0.70	P
0.03	0.70	P
0.04	0.70	P
0.03	0.70	P
0.01	0.35	P
0.01	0.35	P

PASSED

Test: Load cell errors & Repeatability errors**Initial test**

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 $E_{\max}$: 230 [kg] $n_{\max}$: 3000 v : 0.0667 [kg] p_{LC} : 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date:

At	Start	End
2004	02-dec	02-dec
Test temperature:	20	20
Humidity:	50	50
Bar. pressure:	/	/
Indicator temp. *):	19.7	19.7

Temp.var.

Max.
20
Min.
20

Test temperature:

Humidity:

Bar. pressure:

Indicator temp. *):

Electronics voltage:

[°C]

[% RH]

[kPa]

[°C]

[V, 225 Hz]

Deadload during test:

Cal.P: 75 % ($D_{\max}-D_{\min}$):

Ri at Cal.P:

Factor, f:

0 [kg]

150 [kg]

1.454659 [mV/V]

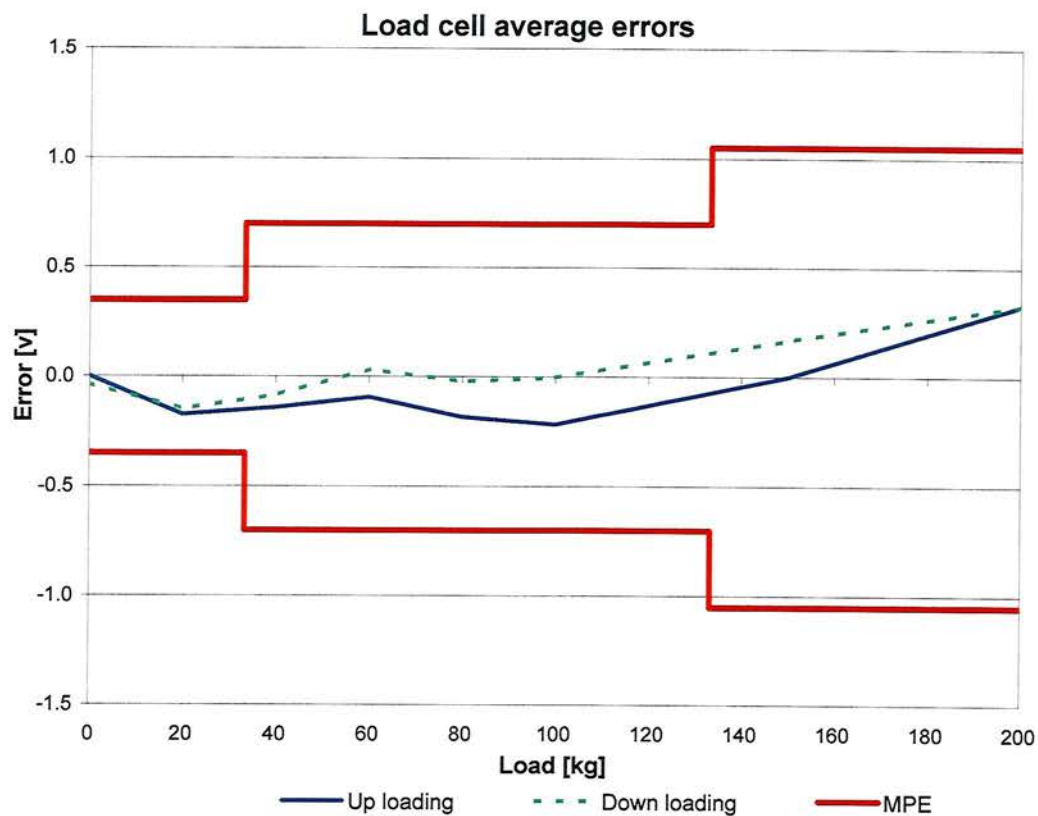
0.000647 [mV/V] / v

*) Readout instrument: DMP 39

*) Measure address:

Measurements

R60: A.4.1



Registered user: DELTA Electronics Testing, Denmark

Test: Load cell errors & Repeatability errors**High temperature**

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{Max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg] p_{LC} : 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date: 2004 02-dec 02-dec

Test temperature: 39.9 40 [°C]

Humidity: / / [% RH]

Bar. pressure: / / [kPa]

Indicator temp. *): 20 20 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % ($D_{max}-D_{min}$): 150 [kg] (Initref)

Ri at Cal.P: 1.454659 [mV/V] (Initref)

Factor, f: 0.000647 [mV/V] / v (Initref)

*) Readout instrument: DMP 39

*) Measure address:

Measurements

R60: A.4.1

No.	Test load	Run no. 1		Run no. 2		Run no. 3		Average	Zero corrected Average	Repeatability
	D [kg]	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	1, 2, 3 [mV/V]	1, 2, 3 [mV/V]	Error [mV/V]
1	0	0.017103	23:59:37	0.017090	00:05:19	0.017089	00:11:01	0.017094		
2	0	0.017110	23:59:43	0.017102	00:05:25	0.017097	00:11:07	0.017103		
3	0	0.017116	23:59:49	0.017104	00:05:31	0.017099	00:11:13	0.017106	0.000000	0.000017
4	20	0.210994	00:00:10	0.210978	00:05:52	0.210978	00:11:34	0.210983	0.193877	0.000016
5	40	0.404996	00:00:31	0.404990	00:06:13	0.404978	00:11:55	0.404988	0.387882	0.000018
6	60	0.599009	00:00:52	0.599007	00:06:34	0.599004	00:12:16	0.599007	0.581900	0.000004
7	80	0.792922	00:01:13	0.792912	00:06:55	0.792915	00:12:37	0.792916	0.775810	0.000010
8	100	0.986863	00:01:34	0.986859	00:07:16	0.986864	00:12:58	0.986862	0.969756	0.000005
9	150	1.471954	00:01:55	1.471945	00:07:37	1.471939	00:13:19	1.471946	1.454840	0.000015
10	200	1.957077	00:02:16	1.957061	00:07:58	1.957046	00:13:40	1.957061	1.939955	0.000031
11	150	1.472013	00:02:37	1.472008	00:08:19	1.472002	00:14:01	1.472008	1.454902	0.000011
12	100	0.986961	00:02:58	0.986949	00:08:40	0.986949	00:14:22	0.986953	0.969847	0.000012
13	80	0.792982	00:03:19	0.792973	00:09:01	0.792976	00:14:43	0.792977	0.775871	0.000008
14	60	0.599035	00:03:40	0.599031	00:09:22	0.599034	00:15:04	0.599033	0.581927	0.000005
15	40	0.404991	00:04:01	0.404993	00:09:43	0.404987	00:15:25	0.404991	0.387884	0.000006
16	20	0.210972	00:04:22	0.210967	00:10:04	0.210966	00:15:46	0.210968	0.193862	0.000006
17	0	0.017076	00:04:43	0.017073	00:10:25	0.017066	00:16:07	0.017072	-0.000035	0.000010

Factor, f = ((Average_{end} at the Calibration Point) - Average_{end} at D1) / ((Calibration Point)/100) * n)

Ri = ((D - D1) - (Dmax - D1)) * smax * f

RL = (Average_{end} - Ri) / f**Result**

R60: 5.1, 5.2 & A.4.1.13

R60: 5.4 & A.4.1.14

Load cell errors					
No.	Test load	Reference indication	Error	Load cell Error	mpe (Table 2)
	D [kg]	R _i [mV/V]	[mV/V]	(E _L) [V]	[V]
3	0	0.000000	0.000000	0.00	0.35
4	20	0.193955	-0.000077	-0.12	0.35
5	40	0.387909	-0.000027	-0.04	0.70
6	60	0.581864	0.000037	0.06	0.70
7	80	0.775818	-0.000008	-0.01	0.70
8	100	0.969773	-0.000017	-0.03	0.70
9	150	1.454659	0.000181	0.28	1.05
10	200	1.939545	0.000410	0.63	1.05
11	150	1.454659	0.000243	0.38	1.05
12	100	0.969773	0.000074	0.11	0.70
13	80	0.775818	0.000053	0.08	0.70
14	60	0.581864	0.000063	0.10	0.70
15	40	0.387909	-0.000025	-0.04	0.70
16	20	0.193955	-0.000092	-0.14	0.35
17	0	0.000000	-0.000035	-0.05	0.35

P / F:

Conclusion

PASSED / FAILED:

Repeatability		
Repeatability Error	mpe (5.4)	Passed / Failed
(E _R) [V]	[V]	P / F
0.03	0.35	P
0.02	0.35	P
0.03	0.70	P
0.01	0.70	P
0.01	0.70	P
0.01	0.70	P
0.02	1.05	P
0.05	1.05	P
0.02	1.05	P
0.02	0.70	P
0.01	0.70	P
0.01	0.70	P
0.01	0.35	P
0.02	0.35	P

PASSED

Remarks:

Test: Load cell errors & Repeatability errors**High temperature**

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{Max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg] p_{LC} : 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date:

At	Start	End
2004	02-dec	02-dec
Test temperature:	39.9	40
Humidity:	/	/
Bar. pressure:	/	/
Indicator temp. *):	20	20

Temp.var.

Max.
40.4
Min.
39.9

Test temperature: 39.9 [°C]

Humidity: / [% RH]

Bar. pressure: / [kPa]

Indicator temp. *): 20 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % ($D_{max}-D_{min}$): 150 [kg] (Initref)

Ri at Cal.P: 1.454659 [mV/V] (Initref)

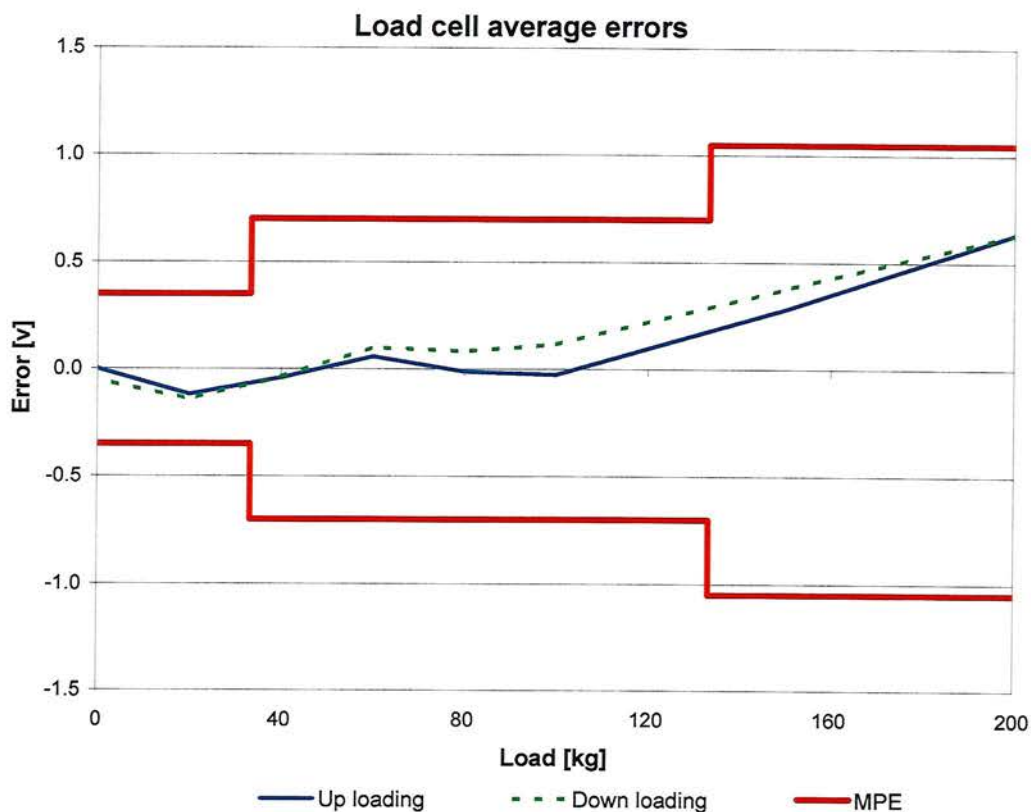
Factor, f: 0.000647 [mV/V] / v (Initref)

*) Readout instrument: DMP 39

*) Measure address:

Measurements

R60: A.4.1



Registered user: DELTA Electronics Testing, Denmark

Test: Load cell errors & Repeatability errors

Low temperature

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

E_{Max}: 230 [kg]n_{max}: 3000

v: 0.0667 [kg]

p_{LC}: 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date: 2004 03-dec 03-dec

Temp.var: Max. -9.6 Min. -10

Test temperature: -9.6 [°C]

Humidity: / [% RH]

Bar. pressure: / [kPa]

Indicator temp. *): 20 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % (D_{max}-D_{min}): 150 [kg] (Initref)

Ri at Cal.P: 1.454659 [mV/V] (Initref)

Factor, f: 0.000647 [mV/V] / v (Initref)

*) Readout instrument: DMP 39

*) Measure address:

Measurements

R60: A.4.1

No.	Test load	Run no. 1		Run no. 2		Run no. 3		Average	Zero corrected Average	Repeatability
	D [kg]	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	1, 2, 3 [mV/V]	1, 2, 3 [mV/V]	Error [mV/V]
1	0	0.017186	16:33:44	0.017180	16:39:26	0.017179	16:45:09	0.017182		
2	0	0.017185	16:33:50	0.017181	16:39:32	0.017177	16:45:15	0.017181		
3	0	0.017189	16:33:56	0.017183	16:39:39	0.017183	16:45:22	0.017185	0.000000	0.000006 D ₁
4	20	0.210950	16:34:17	0.210941	16:40:00	0.210943	16:45:43	0.210945	0.193760	0.000009
5	40	0.404861	16:34:38	0.404854	16:40:21	0.404863	16:46:04	0.404859	0.387674	0.000009
6	60	0.598788	16:34:59	0.598782	16:40:42	0.598785	16:46:25	0.598785	0.581600	0.000006
7	80	0.792614	16:35:20	0.792606	16:41:03	0.792601	16:46:46	0.792607	0.775422	0.000013
8	100	0.986512	16:35:41	0.986504	16:41:24	0.986504	16:47:07	0.986507	0.969322	0.000008
9	150	1.471407	16:36:02	1.471396	16:41:45	1.471396	16:47:28	1.471400	1.454215	0.000012
10	200	1.956369	16:36:23	1.956372	16:42:06	1.956354	16:47:49	1.956365	1.939180	0.000018 D _{max}
11	150	1.471550	16:36:44	1.471549	16:42:27	1.471536	16:48:10	1.471545	1.454360	0.000014
12	100	0.986701	16:37:05	0.986697	16:42:48	0.986690	16:48:31	0.986696	0.969511	0.000011
13	80	0.792800	16:37:26	0.792798	16:43:09	0.792789	16:48:52	0.792796	0.775611	0.000012
14	60	0.598920	16:37:47	0.598924	16:43:30	0.598909	16:49:13	0.598918	0.581733	0.000015
15	40	0.404948	16:38:08	0.404943	16:43:51	0.404946	16:49:34	0.404945	0.387760	0.000005
16	20	0.211000	16:38:29	0.210996	16:44:12	0.210990	16:49:55	0.210995	0.193810	0.000010
17	0	0.017179	16:38:50	0.017177	16:44:33	0.017175	16:50:16	0.017177	-0.000008	0.000004

Factor, f = ((Average indic at the Calibration Point) - Average indic at D1) / ((Calibration Point/100) * n)

Ri = ((D - D1) / (D_{max} - D1)) * n_{max} * f

EL = (Average indic - Ri) / f

Result

R60: 5.1, 5.2 & A.4.1.13

R60: 5.4 & A.4.1.14

Load cell errors					
No.	Test load	Reference indication	Error	Load cell Error	mpe (Table 2)
	D [kg]	R _i [mV/V]	[mV/V]	(E _L) [v]	[v]
3	0	0.000000	0.000000	0.00	0.35
4	20	0.193955	-0.000195	-0.30	0.35
5	40	0.387909	-0.000235	-0.36	0.70
6	60	0.581864	-0.000264	-0.41	0.70
7	80	0.775818	-0.000396	-0.61	0.70
8	100	0.969773	-0.000451	-0.70	0.70
9	150	1.454659	-0.000444	-0.69	1.05
10	200	1.939545	-0.000365	-0.56	1.05
11	150	1.454659	-0.000299	-0.46	1.05
12	100	0.969773	-0.000261	-0.40	0.70
13	80	0.775818	-0.000207	-0.32	0.70
14	60	0.581864	-0.000131	-0.20	0.70
15	40	0.387909	-0.000149	-0.23	0.70
16	20	0.193955	-0.000144	-0.22	0.35
17	0	0.000000	-0.000008	-0.01	0.35

P / F:

Conclusion

PASSED / FAILED:

Repeatability		
Repeatability Error	mpe (5.4)	Passed / Failed
(E _R) [v]	[v]	P / F
0.01	0.35	P
0.01	0.35	P
0.01	0.70	P
0.01	0.70	P
0.02	0.70	P
0.01	0.70	P
0.02	1.05	P
0.03	1.05	P
0.02	1.05	P
0.02	0.70	P
0.02	0.70	P
0.02	0.70	P
0.01	0.70	P
0.02	0.35	P
0.01	0.35	P

PASSED

Remarks:

Test: Load cell errors & Repeatability errors

Low temperature

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001

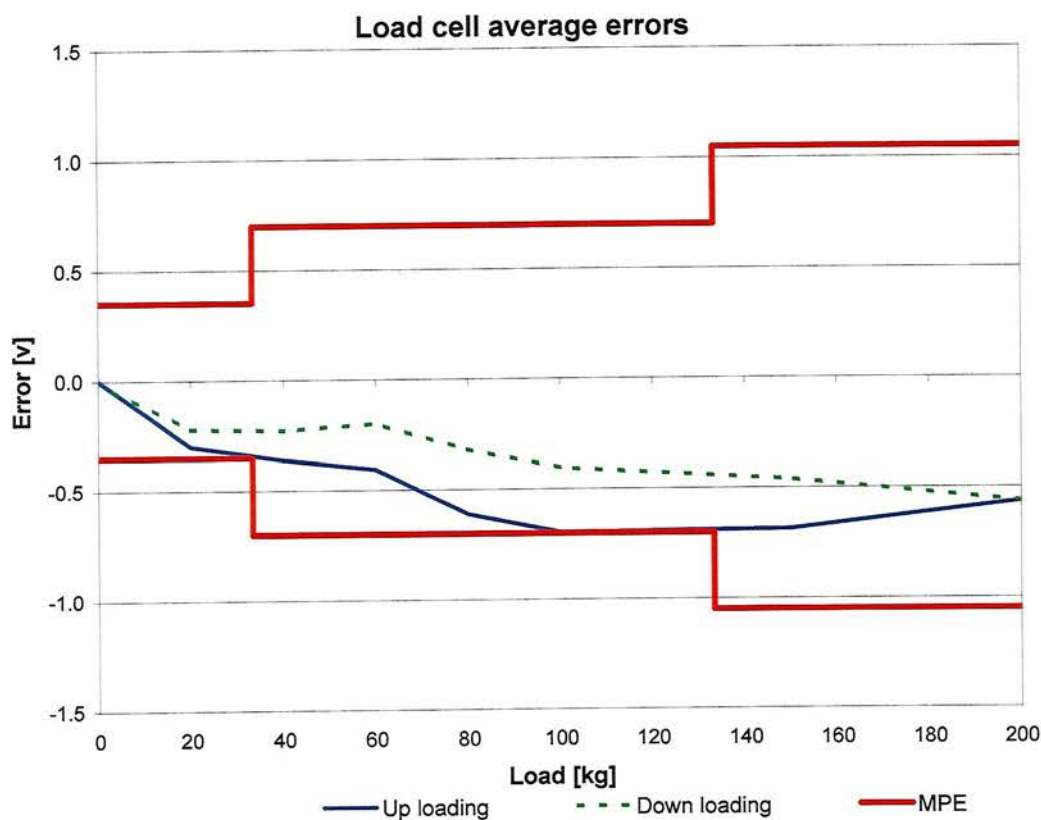
E_{Max} : 230 [kg]
 n_{max} : 3000
 v : 0.0667 [kg]
 p_{LC} : 0.7 (R60: 5.1.1)
 Resolution during test: 0.000001 [mV/V]

	At	Start	End	Temp.var.
Date:	2004	03-dec	03-dec	Max.
Test temperature:		-9.6	-9.6	-9.6
Humidity:		/	/	Min.
Bar. pressure:		/	/	-10
Indicator temp. *):		20	20	
Electronics voltage:		10 [V, 225 Hz]		
Deadload during test:		0 [kg]		
Cal.P: 75 % ($D_{max}-D_{min}$):		150 [kg] (Initref)		
Ri at Cal.P:		1.454659 [mV/V] (Initref)		
Factor, f:		0.000647 [mV/V] / v (Initref)		

*) Readout instrument: DMP 39
 *) Measure address:

Measurements

R60: A.4.1



Registered user: DELTA Electronics Testing, Denmark

Test: Load cell errors & Repeatability errors**Final temperature test**

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{Max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg] p_{LC} : 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date: 2004 04-dec 04-dec

Test temperature: 19.5 19.5 [°C]

Humidity: 50 50 [% RH]

Bar. pressure: / / [kPa]

Indicator temp. *): 20 20 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % ($D_{max}-D_{min}$): 150 [kg] (Initref)

Ri at Cal.P: 1.454659 [mV/V] (Initref)

Factor, f: 0.000647 [mV/V] / v (Initref)

*) Readout instrument: DMP 39

Temp.var.

Max.

20.2

Min.

19.5

Measurements

R60: A.4.1

*) Measure address:

No.	Test load	Run no. 1		Run no. 2		Run no. 3		Average	Zero corrected Average	Repeatability
	D [kg]	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	1, 2, 3 [mV/V]	1, 2, 3 [mV/V]	Error [mV/V]
1	0	0.017216	02:41:22	0.017204	02:47:04	0.017205	02:52:47	0.017208		
2	0	0.017221	02:41:28	0.017207	02:47:10	0.017212	02:52:53	0.017213		
3	0	0.017221	02:41:34	0.017210	02:47:17	0.017215	02:52:59	0.017215	0.000000	0.000011 D_1
4	20	0.211087	02:41:55	0.211070	02:47:38	0.211073	02:53:20	0.211077	0.193862	0.000016
5	40	0.405049	02:42:16	0.405049	02:47:59	0.405052	02:53:41	0.405050	0.387835	0.000003
6	60	0.599051	02:42:37	0.599039	02:48:20	0.599051	02:54:02	0.599047	0.581832	0.000012
7	80	0.792953	02:42:58	0.792938	02:48:41	0.792946	02:54:23	0.792946	0.775731	0.000015
8	100	0.986889	02:43:19	0.986873	02:49:02	0.986882	02:54:44	0.986881	0.969666	0.000015
9	150	1.471937	02:43:40	1.471958	02:49:23	1.471948	02:55:05	1.471948	1.454733	0.000020
10	200	1.957086	02:44:01	1.957058	02:49:44	1.957060	02:55:26	1.957068	1.939853	0.000028 D_{max}
11	150	1.472058	02:44:22	1.472066	02:50:05	1.472047	02:55:47	1.472057	1.454842	0.000019
12	100	0.987041	02:44:43	0.987039	02:50:26	0.987030	02:56:08	0.987037	0.969822	0.000011
13	80	0.793071	02:45:04	0.793072	02:50:47	0.793061	02:56:29	0.793068	0.775853	0.000011
14	60	0.599132	02:45:25	0.599129	02:51:08	0.599124	02:56:50	0.599129	0.581914	0.000008
15	40	0.405091	02:45:46	0.405094	02:51:29	0.405086	02:57:11	0.405090	0.387875	0.000008
16	20	0.211080	02:46:07	0.211086	02:51:50	0.211079	02:57:32	0.211082	0.193867	0.000007
17	0	0.017195	02:46:28	0.017198	02:52:11	0.017189	02:57:53	0.017194	-0.000021	0.000009

Factor $f = \frac{[(Average_{indc} \text{ at the Calibration Point}) - Average_{indc} \text{ at } D_1] \cdot (Calibration \text{ Point } 100) \cdot n}{(D - D_1) \cdot [D_{max} - D_1] \cdot n_{max} \cdot f}$

$R_1 = \frac{[(D - D_1) \cdot (D_{max} - D_1)] \cdot n_{max} \cdot f}{Average_{indc} \cdot R_0 \cdot f}$

Result

R60: 5.1, 5.2 & A.4.1.13

R60: 5.4 & A.4.1.14

Load cell errors					
No.	Test load	Reference indication	Error	Load cell Error	mpe (Table 2)
	D [kg]	R_1 [mV/V]	[mV/V]	(E_L) [V]	[V]
3	0	0.000000	0.000000	0.00	0.35
4	20	0.193955	-0.000093	-0.14	0.35
5	40	0.387909	-0.000074	-0.11	0.70
6	60	0.581864	-0.000031	-0.05	0.70
7	80	0.775818	-0.000087	-0.13	0.70
8	100	0.969773	-0.000106	-0.16	0.70
9	150	1.454659	0.000074	0.11	1.05
10	200	1.939545	0.000308	0.48	1.05
11	150	1.454659	0.000183	0.28	1.05
12	100	0.969773	0.000049	0.08	0.70
13	80	0.775818	0.000035	0.05	0.70
14	60	0.581864	0.000050	0.08	0.70
15	40	0.387909	-0.000034	-0.05	0.70
16	20	0.193955	-0.000088	-0.14	0.35
17	0	0.000000	-0.000021	-0.03	0.35

P / F:

P

Conclusion

PASSED / FAILED:

PASSED

Remarks:

PASSED

PASSED

Test: Load cell errors & Repeatability errors

Final temperature test

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{Max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg] p_{LC} : 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/V]

Date:

At	Start	End
2004	04-dec	04-dec

Temp.var.

Test temperature: 19.5 19.5 [°C]

Humidity: 50 50 [% RH]

Bar. pressure: / / [kPa]

Indicator temp. *): 20 20 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % ($D_{max}-D_{min}$): 150 [kg] (Initref)

Ri at Cal.P: 1.454659 [mV/V] (Initref)

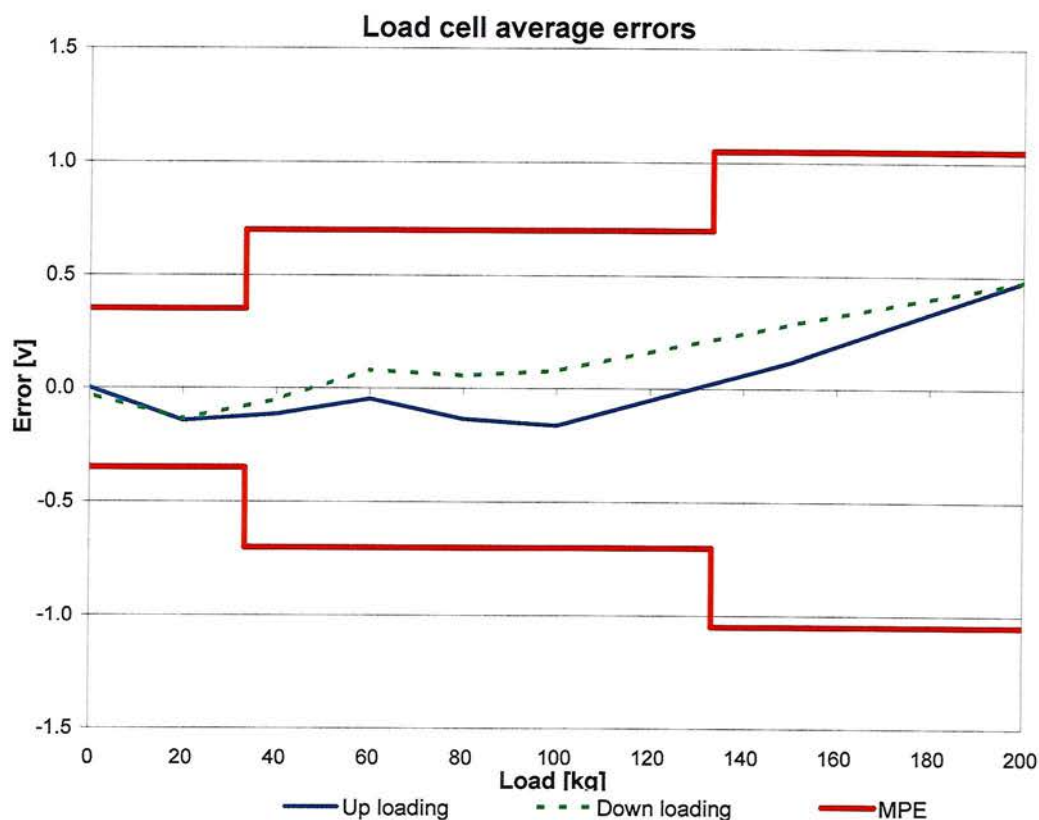
Factor, f: 0.000647 [mV/V] / v (Initref)

*) Readout instrument: DMP 39

*) Measure address:

Measurements

R60: A.4.1



Registered user: DELTA Electronics Testing, Denmark

Test: Load cell errors

Test ref.: R60: A.4.1.4 to A.4.1.13 & Annex C
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001
 E_{Max} : 230 [kg]
 n_{max} : 3000
 v : 0.0667 [kg]
 p_{LC} : 0.7 (R60: 5.1.1)
 Resolution during test: 0.000001 [mV/V]

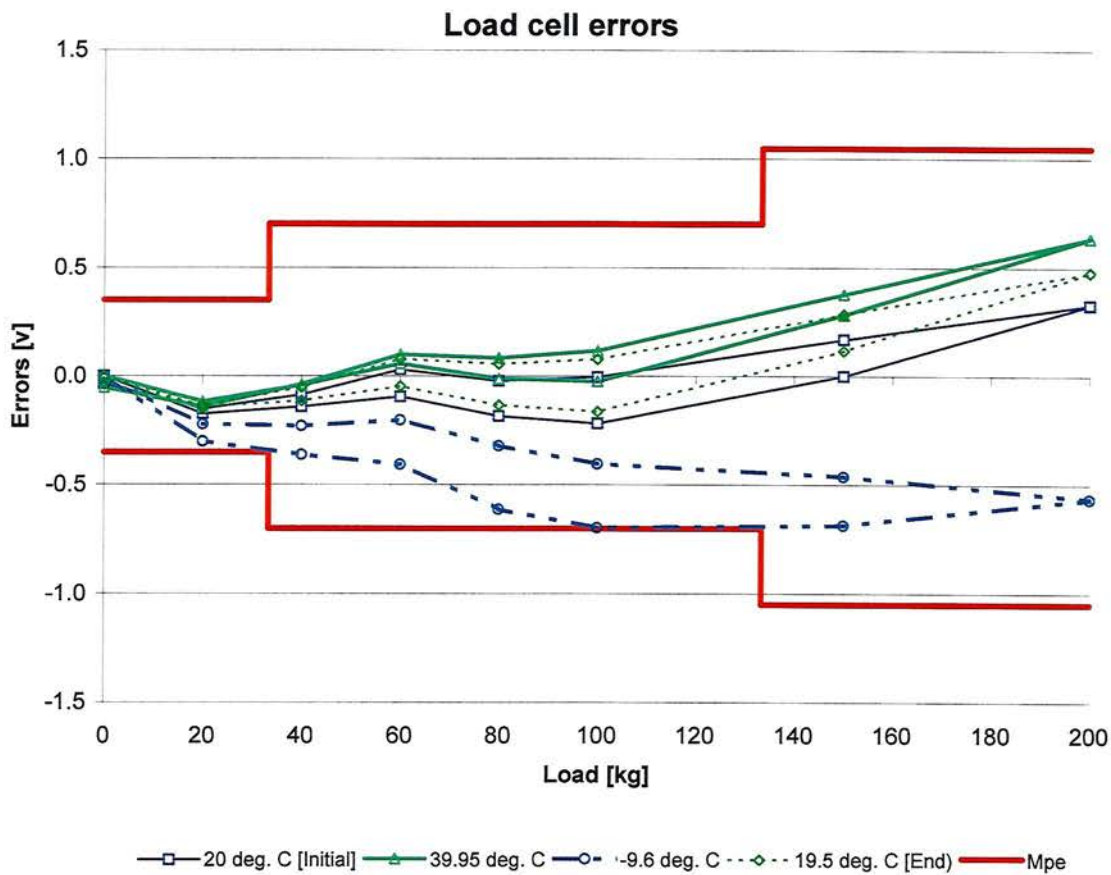
All temperature tests in graphics

	At	Start	End	
Date:	2004	02-dec	04-dec	
Temperature range:		39.95	-9.6	[°C]
Humidity:		/	/	[% RH]
Bar. pressure:		/	/	[kPa]
Indicator temp. *):		/	/	[°C]
Electronics voltage:			10	[V, 225 Hz]
Deadload during test:			0	[kg]
Cal.P: 75 % ($D_{max}-D_{min}$):			150	[kg] (Initref)
Ri at Cal.P:			1.454659	[mV/V] (Initref)
Factor, f:			0.000647	[mV/V] / (Initref)

*) Readout instrument: DMP 39
 *) Measure address:

Measurements

R60: A.4.1

**Conclusion**

PASSED / FAILED:

PASSED

Remarks:

Registered user: DELTA Electronics Testing, Denmark

Test: Temperature effects on MDLO (C_M)

Test ref: R60: A.4.1.16 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

E_{Max} : 230 [kg]

 $n_{\max}: 3000$

v:	0.0667	[kg]	0.0290 [%Emax]
----	--------	------	----------------

p_{LC}: 0.7 (R60: 5.1.1)

Resolution during test: 0.000001 [mV/M]

$$v_{\min} (\%E_{\max})^1: 0.0125 = 0 \text{ [kg]} \quad 0.43 \text{ [v]}$$
$$Y_1 \text{ (R76 multi-interv.)} : E_{\max} / v_{\min} = 8000$$
¹⁾ Manufacturer's specification

	At	Start	End	
Date:	2004	02-dec	04-dec	
Test temperature:	/	/	/	[°C]
Humidity:	/	/	/	[% RH]
Bar. pressure:	/	/	/	[kPa]
Indicator temp. *):	/	/	/	[°C]
Electronics voltage:				10 [V, 225 Hz]
Deadload during test:				0 [kg]
Cal.P: 75 % (D _{max} -D _{min}):				150 [kg]
Ri at Cal.P:				1.454659 [mV/M]
Factor, f:				0.000647 [mV/M] / v

*) Readout instrument: DMP 39

*) Measure address:

Results

R60: 5.5.1.3

No.	Temp. (Mean) [°C]	Temp. Change [K]	Indication [mV/V]	Indication Change [mV/V]	Indication Change (C _M) [V]	Indication I _{chv} Change v / 5°C [V]	Indication I _{chv} _{min} Change v / 5°C [V _{min}]	Require- ment mpc [V _{min}]	Passed Failed
1	20	20.0	0.016989	0.000117	0.1814	0.0455	0.6941	0.7	P
2	39.95		0.017106						
2	39.95	49.6	0.017106	0.000079	0.1218	0.0123	0.1876	0.7	P
3	-9.6		0.017185						
3	-9.6	29.1	0.017185	0.000030	0.0464	0.008	0.122	0.7	P
4	19.5		0.017215						

Maximum Indication change / 5 °C:

[illegible][illegible]

	0.0455 [V]
Result:	0.0019 [% E_{max}]
Result:	52631

P

Specification fulfilled

Specification fulfilled

Passed
vmin = 0.0019 [%Emax]
Y = 52631

Conclusion

PASSED / FAILED:

PASSED

Remarks:

Test: Reference test for Creep test

Test ref.: R60: A.4.1, A.4.1.13 & A.4.1.14 & Annex C
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001

E_{max} : 230 [kg]
 n_{max} : 3000
 v : 0.0667 [kg]
 P_{LC} for Creep: 0.7 R60: 5.3.1
 Resolution during test: 0.000001 [mV/V]
 $V_{min} (\%E_{max})$: 0.0125 = 0.02875 [kg]
 $DR (\%E_{max})$: 0.016667

¹⁾ Manufacturer's specification

Date: At Start End Temp. var.
 2004 02-dec 02-dec
 Test temperature: 20 20 [°C]
 Humidity: 50 50 [% RH]
 Bar. pressure: / / [kPa]
 Indicator temp. *): 20 20 [°C]
 Electronics voltage: 10 [V, 225 Hz]
 Deadload during test: 0 [kg]
 Cal.P: 75 % ($D_{max}-D_{min}$): 150 [kg]
 RI at Cal.P: 1.454817 [mV/V]
 Factor, f: 0.000647 [mV/V] / v
 *) Readout instrument: DMP 39
 *) Measure address:

Measurements

R60: A.4.1

No.	Test load	Apply test load	Run no. 1		Run no. 2		Run no. 3		Average	Zero corrected Average	Repeatability
	D [kg]	[kg]	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	Indication [mV/V]	Time hh:mm:ss	1, 2, 3 [mV/V]	1, 2, 3 [mV/V]	Error [mV/V]
1	0	0	0.016981	9:46:33	0.016979	9:52:22	0.016980	9:58:12			
2	0	0	0.016985	9:46:39	0.016985	9:52:28	0.016984	9:58:18			
3	0	0	0.016989	9:46:45	0.016991	9:52:34	0.016987	9:58:25	0.016989	0.000000	0.000004
6	200	200	1.956763	9:49:15	1.956742	9:55:05	1.956732	10:00:56	1.956746	1.939757	0.000031

Note! Extra time to be added for moving from no-load to full-load and vice versa if "table 6" cannot be achieved:

[s]

Result

R60: 5.1, 5.2 & A.4.1.13

R60: 5.4 & A.4.1.14

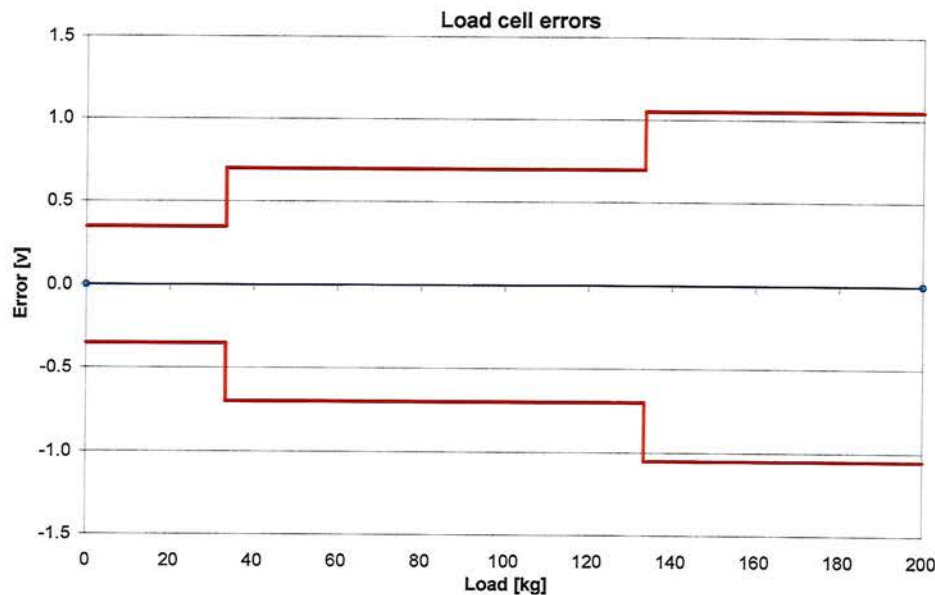
Load cell errors						
No.	Test load	Apply test load	Referen- ce indication	Error	Load cell Error	mpe (Table 2)
	D [kg]	[kg]	R_i [mV/V]	[mV/V]	(E_i) [V]	[V]
3	0	0	0.000000	0.000000	0.00	0.35
6	200	200	1.939757	0.000000	0.00	1.05
P / F:						P

Repeatability		
Repeatability Error	mpe (5.4)	Passed / Failed
(E_R)		P / F
[V]	[V]	
0.01	0.35	P
0.05	1.05	P
		P

Conclusion

PASSED

Remarks:



Issued by Jens Hovgård, DELTA Electronics Testing, Denmark

Test: Creep & Minimum dead load output return

(Initial test)

Test ref.: R60: A.4.2 + 5.3.1 & A.4.3 + 5.3.2 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg] P_{LC} for Creep: 0.7 R60: 5.3.1

Resolution during test: 0.000001 [mV/V]

 v_{min}^1 : 0.0125 [%E_{max}] = 0.02875 [kg] DR^1 : 0.016667 [%E_{max}] = 0.03833 [kg] Z^1 (R76 multi-interv): $E_{max} / (2 \cdot DR^1) = 3000$ ¹⁾ Manufacturer's specification

Date: 2004 At Start End

Test temperature: 20 20 [°C]

Humidity: / / [% RH]

Bar. pressure: / / [kPa]

Indicator temp. *): 19.7 19.7 [°C]

Electronics voltage: 10 [V, 225 Hz]

Deadload during test: 0 [kg]

Cal.P: 75 % (D_{max}-D_{min}): 150 [kg] (Refcreep)

Ri at Cal.P: 1.454817 [mV/V] (Refcreep)

Factor, f = 0.000647 [mV/V] (Refcreep)

*) Readout instrument: DMP 39

*) Measure address:

Temp.var.

Max.

Min.

20

20

20

Measurements

No.	Test load D [kg]	Indication [mV/V]	Real time hh:mm:ss	Step time mm:ss	Corrected Indication [mV/V]	Corrected Error [mV/V]	Corrected Error [V]	Error change Creep errors [mV/V]	Error change Creep errors [V]
0	0	0.016981	11:03:40	0:00					
0	0	0.017020	11:03:51	0:11					
1	0	0.017019	11:04:02	0:11	0.000000	0.000000	0.00		
2	200	1.956758	11:04:33	0:31	1.939739	-0.000018	-0.03	0.000000	0.00
3	200	1.956740	11:04:44	0:11	1.939721	-0.000036	-0.06	-0.000018	-0.03
4	200	1.956694	11:05:35	0:51	1.939675	-0.000082	-0.13	-0.000064	-0.10
5	200	1.956689	11:06:34	0:59	1.939650	-0.000107	-0.17	-0.000089	-0.14
6	200	1.956653	11:07:34	1:00	1.939634	-0.000123	-0.19	-0.000105	-0.16
7	200	1.956639	11:08:34	1:00	1.939620	-0.000136	-0.21	-0.000118	-0.18
8	200	1.956631	11:09:34	1:00	1.939612	-0.000144	-0.22	-0.000127	-0.20
9	200	1.956623	11:10:34	1:00	1.939604	-0.000153	-0.24	-0.000135	-0.21
10	200	1.956619	11:11:34	1:00	1.939600	-0.000157	-0.24	-0.000139	-0.21
11	200	1.956612	11:12:34	1:00	1.939593	-0.000163	-0.25	-0.000145	-0.22
12	200	1.956612	11:13:34	1:00	1.939593	-0.000164	-0.25	-0.000146	-0.23
13	200	1.956608	11:14:34	1:00	1.939589	-0.000168	-0.26	-0.000150	-0.23
14	200	1.956603	11:15:34	1:00	1.939584	-0.000172	-0.27	-0.000155	-0.24
15	200	1.956600	11:16:34	1:00	1.939581	-0.000176	-0.27	-0.000158	-0.24
16	200	1.956599	11:17:34	1:00	1.939580	-0.000177	-0.27	-0.000159	-0.25
17	200	1.956595	11:18:34	1:00	1.939576	-0.000180	-0.28	-0.000163	-0.25
18	200	1.956593	11:19:34	1:00	1.939574	-0.000183	-0.28	-0.000165	-0.26
19	200	1.956591	11:20:34	1:00	1.939572	-0.000185	-0.29	-0.000167	-0.26
20	200	1.956586	11:21:34	1:00	1.939567	-0.000189	-0.29	-0.000172	-0.27
21	200	1.956592	11:22:34	1:00	1.939573	-0.000184	-0.28	-0.000166	-0.26
22	200	1.956594	11:23:34	1:00	1.939575	-0.000182	-0.28	-0.000164	-0.25
23	200	1.956588	11:24:34	1:00	1.939569	-0.000187	-0.29	-0.000170	-0.26
24	200	1.956585	11:25:34	1:00	1.939566	-0.000191	-0.30	-0.000173	-0.27
25	200	1.956583	11:26:34	1:00	1.939564	-0.000193	-0.30	-0.000175	-0.27
26	200	1.956578	11:27:34	1:00	1.939559	-0.000197	-0.31	-0.000180	-0.28
27	200	1.956581	11:28:34	1:00	1.939562	-0.000195	-0.30	-0.000177	-0.27
28	200	1.956579	11:29:34	1:00	1.939560	-0.000197	-0.30	-0.000179	-0.28
29	200	1.956577	11:30:34	1:00	1.939558	-0.000198	-0.31	-0.000180	-0.28
30	200	1.956574	11:31:34	1:00	1.939555	-0.000202	-0.31	-0.000184	-0.28
31	200	1.956572	11:32:34	1:00	1.939553	-0.000204	-0.32	-0.000186	-0.29
32	200	1.956569	11:33:34	1:00	1.939550	-0.000206	-0.32	-0.000188	-0.29
33	200	1.956568	11:34:34	1:00	1.939549	-0.000208	-0.32	-0.000190	-0.29
34	0	0.016841	11:35:08	0:34	-0.000178	-0.000178	-0.28	-0.000178	-0.28
		0.016861	11:35:19						
		0.016874	11:35:30						
		0.016884	11:35:41						
		0.016893	11:35:52						
		0.016902	11:36:03						
		0.016906	11:36:14						

Take off sense

time: 11:34:37

Duration: 31

Summary of the test30 minutes creep (C₃₀):20-30 min. creep difference (C₃₀₋₂₀):Dead load output return (C_{DR}):DR: $E_{max} \cdot C_{DR} / n_{max} = 0.0212$ [kg]DR [% E_{max}]: $C_{DR} \cdot 100 / n_{max} = 0.0092$ [% E_{max}]Z: $E_{max} / (2 \cdot DR) = 5437$

Result	Requirement	Passed / Failed
0.29 [V]	0.7 * mpe: 0.74 [V]	P
0.03 [V]	0.15 * mpe: 0.1575 [V]	P
0.28 [V]	T _{DR} * 0.5v: 0.5 [V]	P
	T _{DR} * 0.5v: 0.0383 [kg]	P

DR¹: 0.0167 [% E_{max}] Specification fulfilledZ¹: 3000 Specification fulfilledNote for C_{DR}: T_{DR} is calculated according to R60 table 6. See R60, Annex C (C.2.5.6)T_{DR} = 1 T_{DR} = 1 - (actual time / "specified time in table 6" - 1) (Note: TDR >= 0.9 is considered as 1)**Conclusion**

PASSED / FAILED:

PASSED

Remarks:

Test: Creep & Minimum dead load output return

(Initial test)

Test ref.: R60: A.4.2 + 5.3.1 & A.4.3 + 5.3.2 & Annex C
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001

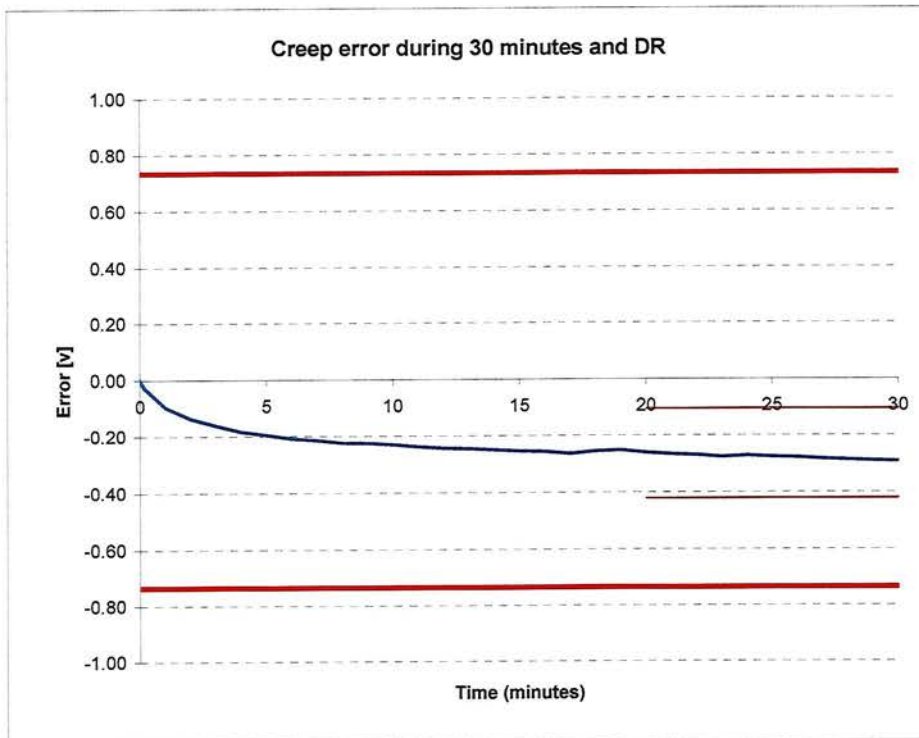
E_{max} : 230 [kg]
 n_{max} : 3000
 v : 0.0667 [kg]
 P_{LC} for Creep: 0.7 R60: 5.3.1
 Resolution during test: 0.000001 [mV/V]
 v_{min}^1 : 0.0125 [%Emax] = 0.02875 [kg]
 DR^1 : 0.016667 [%Emax] = 0.03833 [kg]

Z^1 (R78 multi-interv): $Emax / (2 * DR^1) = 3000$

¹⁾ Manufacturer's specification

	At	Start	End	Temp.var.
Date:	2004	02-dec	02-dec	Max.
Test temperature:	20	20		20
Humidity:	/	/		Min.
Bar. pressure:	/	/		20
Indicator temp. *):	19.7	19.7		
Electronics voltage:			10 [V, 225 Hz]	
Deadload during test:			0 [kg]	
Cal.P: 75 % ($D_{max}-D_{min}$):			150 [kg] (Refcreep)	
Ri at Cal.P:			1.454817 [mV/V] (Refcreep)	
Factor, f =			0.000647 [mV/V] (Refcreep)	
*) Readout instrument: DMP 39				

*) Measure address:

Measurements

Registered user: DELTA Electronics Testing, Denmark

Test: Creep & Minimum dead load output return (High temperature)

Test ref.: R60: A.4.2 + 5.3.1 & A.4.3 + 5.3.2 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg]

P.L.C for Creep: 0.7 R60: 5.3.1

Resolution during test: 0.000001 [mV/V]

 v_{min}^1 : 0.0125 [%Emax] = 0.02875 [kg]DR¹: 0.016667 [%Emax] = 0.03833 [kg] Z^1 (R76 multi-interv): $E_{max} / (2 \cdot DR^1) = 3000$ ¹) Manufacturer's specification

Date:	At	Start	End	Temp. var.
2004	03-dec	03-dec		Max.
Test temperature:	40.2	40.2	[°C]	40.3
Humidity:	/	/	[% RH]	Min.
Bar. pressure:	/	/	[kPa]	40.1
Indicator temp. *):	20	20	[°C]	
Electronics voltage:			10 [V, 225 Hz]	
Deadload during test:			0 [kg]	
Cal.P: 75 % ($D_{max}-D_{min}$):			150 [kg]	(Refcreep)
Ri at Cal.P:			1.454817 [mV/V]	(Refcreep)
Factor, f =			0.000647 [mV/V]	(Refcreep)
*) Readout instrument:			DMP 39	

*) Measure address:

Measurements

No.	Test load D [kg]	Indication [mV/V]	Real time hh:mm:ss	Step time mm:ss	Corrected Indication [mV/V]	Corrected Error [mV/V]	Corrected Error [V]	Error change Creep errors [mV/V]	Error change Creep errors [V]
0	0	0.017097	01:16:19	0:00					
0	0	0.017171	01:16:29	0:10					
1	0	0.017173	01:16:40	0:11	0.000000	0.000000	0.00		
2	200	1.957115	01:17:11	0:31	1.939943	0.000186	0.29	0.000000	0.00
3	200	1.957083	01:17:22	0:11	1.939910	0.000154	0.24	-0.000032	-0.05
4	200	1.957032	01:18:13	0:51	1.939860	0.000103	0.16	-0.000083	-0.13
5	200	1.956999	01:19:12	0:59	1.939827	0.000070	0.11	-0.000116	-0.18
6	200	1.956980	01:20:12	1:00	1.939808	0.000051	0.08	-0.000135	-0.21
7	200	1.956964	01:21:12	1:00	1.939792	0.000035	0.05	-0.000151	-0.23
8	200	1.956949	01:22:12	1:00	1.939777	0.000020	0.03	-0.000166	-0.26
9	200	1.956938	01:23:12	1:00	1.939766	0.000009	0.01	-0.000177	-0.27
10	200	1.956933	01:24:12	1:00	1.939760	0.000003	0.01	-0.000183	-0.28
11	200	1.956924	01:25:12	1:00	1.939752	-0.000005	-0.01	-0.000191	-0.30
12	200	1.956924	01:26:12	1:00	1.939751	-0.000005	-0.01	-0.000191	-0.30
13	200	1.956915	01:27:12	1:00	1.939742	-0.000014	-0.02	-0.000200	-0.31
14	200	1.956909	01:28:12	1:00	1.939737	-0.000020	-0.03	-0.000206	-0.32
15	200	1.956902	01:29:12	1:00	1.939729	-0.000027	-0.04	-0.000213	-0.33
16	200	1.956898	01:30:12	1:00	1.939726	-0.000031	-0.05	-0.000217	-0.34
17	200	1.956894	01:31:12	1:00	1.939722	-0.000035	-0.05	-0.000221	-0.34
18	200	1.956896	01:32:12	1:00	1.939724	-0.000033	-0.05	-0.000219	-0.34
19	200	1.956885	01:33:12	1:00	1.939713	-0.000044	-0.07	-0.000230	-0.36
20	200	1.956880	01:34:12	1:00	1.939708	-0.000049	-0.08	-0.000235	-0.36
21	200	1.956878	01:35:12	1:00	1.939705	-0.000052	-0.08	-0.000238	-0.37
22	200	1.956876	01:36:12	1:00	1.939704	-0.000053	-0.08	-0.000239	-0.37
23	200	1.956877	01:37:12	1:00	1.939704	-0.000052	-0.08	-0.000238	-0.37
24	200	1.956874	01:38:12	1:00	1.939702	-0.000055	-0.08	-0.000241	-0.37
25	200	1.956870	01:39:12	1:00	1.939697	-0.000060	-0.09	-0.000246	-0.38
26	200	1.956864	01:40:12	1:00	1.939691	-0.000066	-0.10	-0.000252	-0.39
27	200	1.956864	01:41:12	1:00	1.939692	-0.000065	-0.10	-0.000251	-0.39
28	200	1.956864	01:42:12	1:00	1.939692	-0.000065	-0.10	-0.000251	-0.39
29	200	1.956866	01:43:12	1:00	1.939694	-0.000063	-0.10	-0.000249	-0.39
30	200	1.956865	01:44:12	1:00	1.939693	-0.000064	-0.10	-0.000250	-0.39
31	200	1.956858	01:45:12	1:00	1.939686	-0.000071	-0.11	-0.000257	-0.40
32	200	1.956852	01:46:12	1:00	1.939679	-0.000078	-0.12	-0.000264	-0.41
33	200	1.956853	01:47:12	1:00	1.939680	-0.000076	-0.12	-0.000262	-0.41
34	0	0.016922	01:47:46	0:34	-0.000251	-0.000251	-0.39	-0.000251	-0.39
		0.016946	01:47:57						
		0.016963	01:48:08						
		0.016978	01:48:19						
		0.016987	01:48:30						
		0.016997	01:48:41						
		0.017005	01:48:52						

Take off sense time: 1:47:16
Duration: 30**Summary of the test**30 minutes creep (C₀):20-30 min. creep difference (C_{0.30-20}):Dead load output return (C_{DR}):

Result	Requirement	Passed / Failed
0.41 [V]	0.7 * mpe: 0.74 [V]	P
0.04 [V]	0.15 * mpe: 0.1575 [V]	P
0.38 [V]	T _{DR} * 0.5v: 0.5 [V]	P
DR: $E_{max} \cdot C_{DR} / n_{max} = 0.0291$ [kg]	T _{DR} * 0.5v: 0.0383 [kg]	P
DR [% E _{max}]: $C_{DR} \cdot 100 / n_{max} = 0.0127$ [% E _{max}]	DR ¹ : 0.0167 [% E _{max}]	Specification fulfilled
Z: $E_{max} / (2 \cdot DR) = 3947$	Z ¹ : 3000	Specification fulfilled

Note for C_{DR}: T_{DR} is calculated according to R60 table 6. See R60, Annex C (C.2.5.6)T_{DR} = 1 T_{DR} = 1 - (actual time / "specified time in table 6" - 1) (Note: TDR >= 0.9 is considered as 1)**Conclusion**

PASSED / FAILED:

PASSED

Remarks:

Test: Creep & Minimum dead load output return (High temperature)

Test ref.: R60: A.4.2 + 5.3.1 & A.4.3 + 5.3.2 & Annex C
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001

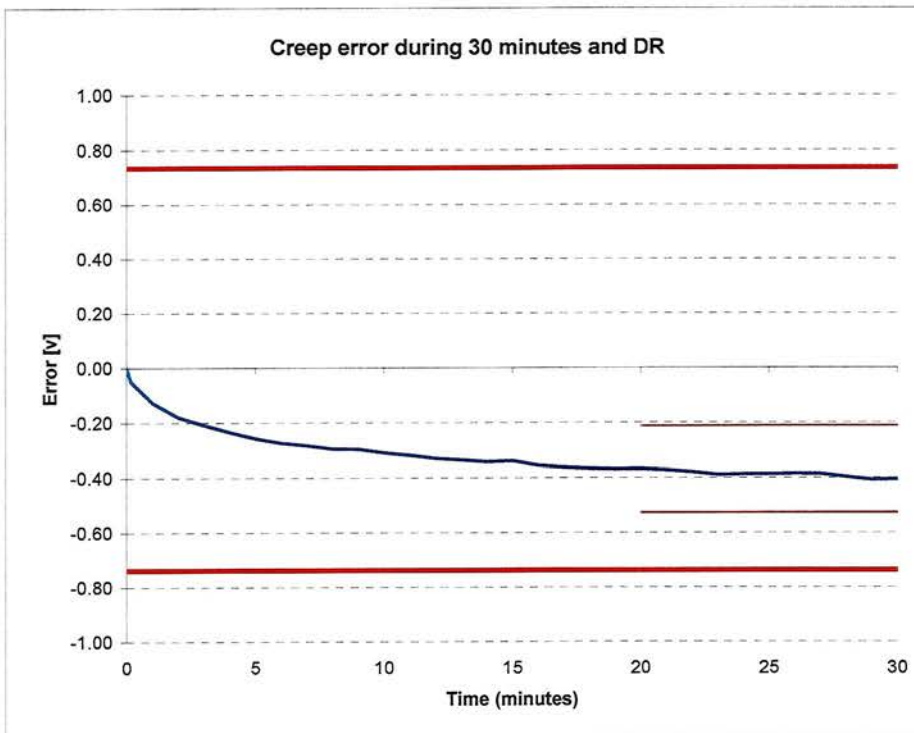
E_{Max} : 230 [kg]
 ρ_{max} : 3000
 v : 0.0667 [kg]
 P_{LC} for Creep: 0.7 R60: 5.3.1
 Resolution during test: 0.000001 [mV/V]
 v_{min}^1 : 0.0125 [%Emax] = 0.02875 [kg]
 DR^1 : 0.016667 [%Emax] = 0.03833 [kg]

Z^1 (R76 multi-interv): Emax / (2 * DR^1) = 3000

¹⁾ Manufacturer's specification

Date: 2004 03-dec 03-dec
 Test temperature: 40.2 40.2 [°C]
 Humidity: / / [% RH]
 Bar. pressure: / / [kPa]
 Indicator temp. *): 20 20 [°C]
 Electronics voltage: 10 [V, 225 Hz]
 Deadload during test: 0 [kg]
 Cal.P: 75 % ($D_{max}-D_{min}$): 150 [kg] (Refcreep)
 Ri at Cal.P: 1.454817 [mV/V] (Refcreep)
 Factor, f = 0.000647 [mV/V] (Refcreep)
 *) Readout instrument: DMP 39

*) Measure address:

Measurements

Registered with: DELTA Electronics Testing, Denmark

Test: Creep & Minimum dead load output return

(Low temperature)

Test ref.: R60: A.4.2 + 5.3.1 & A.4.3 + 5.3.2 & Annex C
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001

Date: 2004 03-dec 03-dec
 Test temperature: -9.6 -9.6 [°C]
 Humidity: / / [% RH]
 Bar. pressure: / / [kPa]
 Indicator temp. *): 20 20 [°C]
 Electronics voltage: 10 [V, 225 Hz]
 Deadload during test: 0 [kg]
 Cal.P: 75 % (D_{max}-D_{min}): 150 [kg] (Refcreep)
 Ri at Cal.P: 1.454817 [mV/V] (Refcreep)
 Factor, f = 0.000647 [mV/V] (Refcreep)
 *) Readout instrument: DMP 39

E_{Max}: 230 [kg]
 n_{max}: 3000
 v: 0.0667 [kg]
 PLC for Creep: 0.7 R60: 5.3.1
 Resolution during test: 0.000001 [mV/V]
 V_{min}¹⁾: 0.0125 [%E_{max}] = 0.02875 [kg]
 DR¹⁾: 0.016667 [%E_{max}] = 0.03833 [kg]

Z¹⁾ (R76 multi-interv): E_{max} / (2 * DR¹⁾) = 3000

*) Measure address:

¹⁾ Manufacturer's specification

Measurements

No.	Test load D [kg]	Indication [mV/V]	Real time hh:mm:ss	Step time mm:ss	Corrected Indication [mV/V]	Corrected Error		Error change Creep errors	
						[mV/V]	[V]	[mV/V]	[V]
	0	0.017175	17:50:28	0:00					
	0	0.017187	17:50:39	0:11					
1	0	0.017190	17:50:50	0:11	0.000000	0.000000	0.00		
2	200	1.956392	17:51:21	0:31	1.939202	-0.000554	-0.86	0.000000	0.00
3	200	1.956389	17:51:32	0:11	1.939199	-0.000557	-0.86	-0.000003	0.00
4	200	1.956373	17:52:23	0:51	1.939183	-0.000574	-0.89	-0.000019	-0.03
5	200	1.956362	17:53:22	0:59	1.939172	-0.000584	-0.90	-0.000030	-0.05
6	200	1.956348	17:54:22	1:00	1.939158	-0.000599	-0.93	-0.000045	-0.07
7	200	1.956345	17:55:22	1:00	1.939155	-0.000602	-0.93	-0.000047	-0.07
8	200	1.956333	17:56:22	1:00	1.939143	-0.000614	-0.95	-0.000060	-0.09
9	200	1.956329	17:57:22	1:00	1.939139	-0.000618	-0.96	-0.000063	-0.10
10	200	1.956320	17:58:22	1:00	1.939130	-0.000626	-0.97	-0.000072	-0.11
11	200	1.956318	17:59:22	1:00	1.939128	-0.000628	-0.97	-0.000074	-0.11
12	200	1.956313	18:00:22	1:00	1.939123	-0.000633	-0.98	-0.000079	-0.12
13	200	1.956311	18:01:22	1:00	1.939121	-0.000635	-0.98	-0.000081	-0.12
14	200	1.956311	18:02:22	1:00	1.939121	-0.000635	-0.98	-0.000081	-0.12
15	200	1.956304	18:03:22	1:00	1.939114	-0.000643	-0.99	-0.000088	-0.14
16	200	1.956300	18:04:22	1:00	1.939110	-0.000646	-1.00	-0.000092	-0.14
17	200	1.956307	18:05:22	1:00	1.939117	-0.000639	-0.99	-0.000085	-0.13
18	200	1.956300	18:06:22	1:00	1.939110	-0.000646	-1.00	-0.000092	-0.14
19	200	1.956304	18:07:22	1:00	1.939114	-0.000643	-0.99	-0.000088	-0.14
20	200	1.956298	18:08:21	0:59	1.939108	-0.000649	-1.00	-0.000094	-0.15
21	200	1.956294	18:09:22	1:01	1.939104	-0.000653	-1.01	-0.000098	-0.15
22	200	1.956296	18:10:22	1:00	1.939106	-0.000650	-1.01	-0.000096	-0.15
23	200	1.956292	18:11:22	1:00	1.939102	-0.000655	-1.01	-0.000100	-0.15
24	200	1.956290	18:12:22	1:00	1.939100	-0.000657	-1.02	-0.000102	-0.16
25	200	1.956286	18:13:22	1:00	1.939096	-0.000661	-1.02	-0.000107	-0.16
26	200	1.956285	18:14:21	0:59	1.939095	-0.000661	-1.02	-0.000107	-0.17
27	200	1.956286	18:15:22	1:01	1.939096	-0.000660	-1.02	-0.000106	-0.16
28	200	1.956286	18:16:22	1:00	1.939096	-0.000661	-1.02	-0.000106	-0.16
29	200	1.956287	18:17:21	0:59	1.939097	-0.000659	-1.02	-0.000105	-0.16
30	200	1.956282	18:18:22	1:01	1.939092	-0.000665	-1.03	-0.000111	-0.17
31	200	1.956286	18:19:22	1:00	1.939096	-0.000661	-1.02	-0.000106	-0.16
32	200	1.956286	18:20:21	0:59	1.939096	-0.000661	-1.02	-0.000107	-0.16
33	200	1.956285	18:21:22	1:01	1.939095	-0.000662	-1.02	-0.000107	-0.17
34	0	0.017086	18:21:55	0:33	-0.000104	-0.000104	-0.16	-0.000104	-0.16
		0.017092	18:22:07						
		0.017094	18:22:18						
		0.017097	18:22:28						
		0.017102	18:22:40						
		0.017105	18:22:51						
		0.017107	18:23:01						

Take off sense
 time: 18:21:25
 Duration: 30

Summary of the test

30 minutes creep (C_c):

20-30 min. creep difference (C_{c30-20}):

Dead load output return (C_{DR}):

DR: E_{max} * C_{DR} / n_{max} = 0.0123 [kg]
 DR [% E_{max}]: C_{DR} * 100 / n_{max} = 0.0054 [% E_{max}]
 Z: E_{max} / (2 * DR) = 9344

Note for C_{DR}: T_{DR} is calculated according to R60 table 6. See R60, Annex C (C.2.5.6)
 T_{DR} = 1 T_{DR} = 1 - (actual time / "specified time in table 6" - 1) (Note: TDR >= 0.9 is considered as 1)

Conclusion

PASSED / FAILED:

PASSED

Remarks:

Test: Creep & Minimum dead load output return

(Low temperature)

Test ref.: R60: A.4.2 + 5.3.1 & A.4.3 + 5.3.2 & Annex C

Observer: Jens Hovgård

Accuracy class: (C3)

Type: TSSP-200KGW

Serial No.: TG045001

 E_{Max} : 230 [kg] n_{max} : 3000 v : 0.0667 [kg]

PLC for Creep: 0.7 R60: 5.3.1

Resolution during test: 0.000001 [mV/V]

 v_{min}^1 : 0.0125 [%Emax] = 0.02875 [kg] DR^1 : 0.01667 [%Emax] = 0.03833 [kg] Z^1 (R78 multi-interv): $E_{max} / (2 \cdot DR^1) = 3000$ ¹⁾ Manufacturer's specification

Date:

2004

At

Start

End

Temp.var.

Max.

Test temperature:

-9.6

-9.6

[°C]

Min.

Humidity:

/

/

[% RH]

Bar. pressure:

/

/

[kPa]

Indicator temp. *):

20

20

[°C]

Electronics voltage:

10 [V, 225 Hz]

Deadload during test:

0 [kg]

Cal.P: 75 % ($D_{max}-D_{min}$):

150 [kg]

(Refcreep)

Ri at Cal.P:

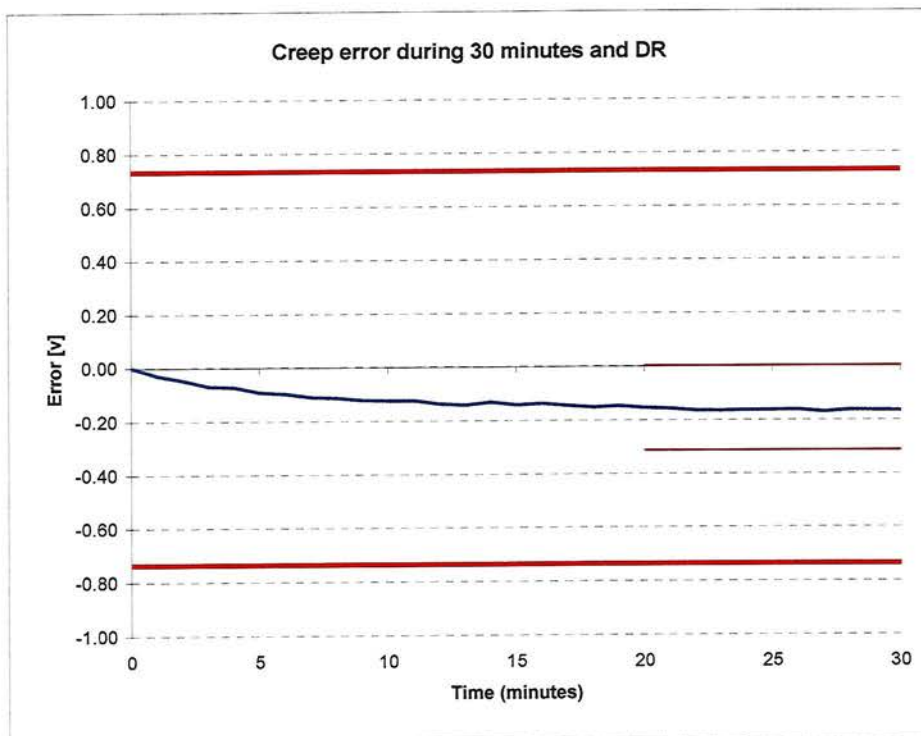
1.454817 [mV/V] (Refcreep)

Factor, f =

0.000647 [mV/V] (Refcreep)

*) Readout instrument: DMP 39

*) Measure address:

Measurements

Registered user: DELTA Electronics Testing, Denmark

Test: Effects of barometric pressure

Test ref.: R60: 5.5.2 & A.4.4
 Observer: Jens Hovgård
 Accuracy class: (C3)
 Type: TSSP-200KGW
 Serial No.: TG045001
 E_{Max}: 230 [kg]
 n_{max}: 3000
 v: 0.0667 [kg]
 p_{LC}: 0.7 (R60: 5.1.1)
 Resolution during test: 0.000001 [mV/V]
 v_{min}: 0.02875 [kg]

Date: At Start End
 2004 06-dec 06-dec
 Test temperature: 20 20 [°C]
 Humidity: 50 50 [% RH]
 Bar. pressure: 101.3 [kPa]
 Indicator temp. *): 20 20 [°C]
 Electronics voltage: 10 [V, 225 Hz]
 Deadload during test: 0 [kg]
 Cal.P: 75 % (D_{max}-D_{min}): 150 [kg] (Refcreep)
 Ri at Cal.P: 1.454817 [mV/V] (Refcreep)
 Factor, f = 0.000647 [mV/V] / v (Refcreep)
 *) Readout instrument: DMP 39
 *) Measure address:

Measurements

The selected method has been used:

Keyboard entered data: Not used

No.	Test load [kg]	Pressure Calculated		Sensor output Absolute [mV/V]	Load cell output (Indication) [mV/V]	Time hh:mm:ss	Change of load cell Cp [v]	Change [v / kPa]	Change [vmin / kPa]	mpc [vmin / kPa]	P / F
		Absolute [kPa]	Over atm. [kPa]								
1	0										
2	0										
3	0										
4	0										
5	0										

Keyboard entered data: Water column

No.	Test load	Pressure difference	Pressure		Load cell output (Indication)	Time	Change of load cell Cp	Change	Change	mpc	P / F
			either or								
			Above atm.								
[kg]	[kPa]	[kPa]	[mm]	[mV/V]	hh:mm:ss	[v]	[v / kPa]	[vmin / kPa]	[vmin / kPa]		
1	0	0.0	0		-0.007482	16:50:00					
2	0	14.5		145	-0.007398	16:51:00	0.13	0.01	0.02	1.00	P
3	0	0.0		0	-0.007472	16:52:00	0.02			1.00	
4	0	14.5		145	-0.007390	16:53:00	0.14	0.01	0.02	1.00	P
5	0	0.0		0	-0.007468	16:54:00	0.02			1.00	
											P

Result

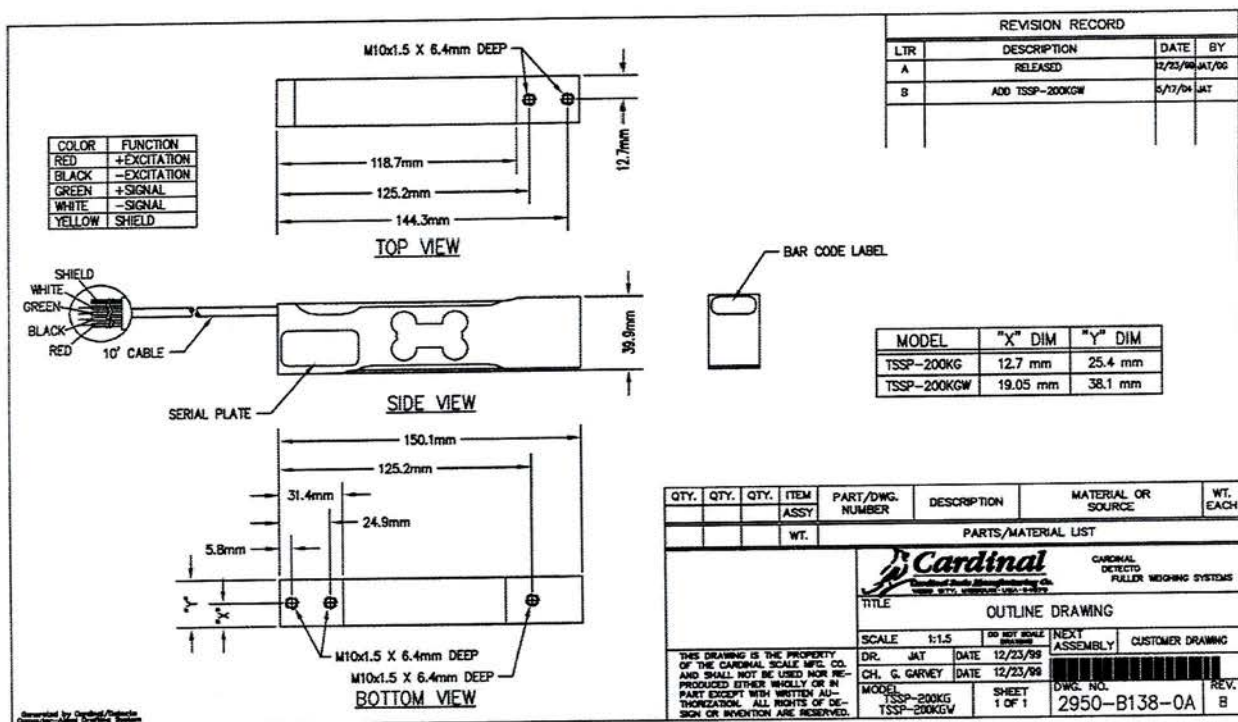
PASSED / FAILED:

PASSED

Remarks:

Registered user: DELTA Electronics Testing, Denmark

Drawings



Remarks:

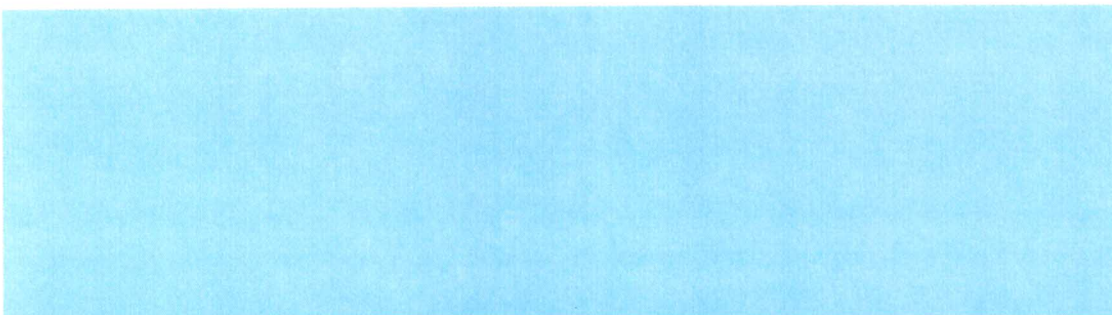
Registered user: DELTA Electronics Testing, Denmark

Data sheet and rating plate

Data sheet

Load cell: Type or model		TSSP-200kgW
Manufacturer:		Cardinal Scale Manufacturing Co.
Trade mark, if applicable		
Classification		C3
Maximum number of LC verification intervals, $n_{\max}$		3000
Maximum capacity, $E_{\max}$	[kg]	230
Minimum dead load, relative ($E_{\min}/E_{\max}$)		0
Excitation voltage (Vdc or Vac or both)	[V]	5-20 ac/dc
Sensitivity	[mV/V]	2
Safe load limit, relative ($E_{\text{LIM}}/E_{\max}$)	[%]	150
Ultimate load limit, relative	[%]	300
Safe side overload, relative	[%]	100
Minimum LC verification interval ($v_{\min}$)	[% $E_{\max}$]	0.0125
Ratio to minimum LC verification interval (Y)		8000
Dead load output return (DR)	[% $E_{\max}$]	0.0167
Ratio to minimum dead load output return (Z)		3000
Input/output resistance	[ohm]	350/350
Temperature operating limits	[°C]	-10 to 40
Symbol for type of load cell (R60 section 4.6.3)		no symbol
Humidity classification (NH, SH or CH or no symbol)		no symbol
Environmental protection		
Cable length, shielding etc.		3 m, shielded, PVC insulated
number of wires, square		4 x 0.5 mm ²
color codes		See Inform
Materials		Stainless steel
Year of manufacture		2004
In case of a digital load cell:		
Power supply		
Rated output (for example number of counts for $E_{\max}$)		
Interface		

Rating plate on the load cell



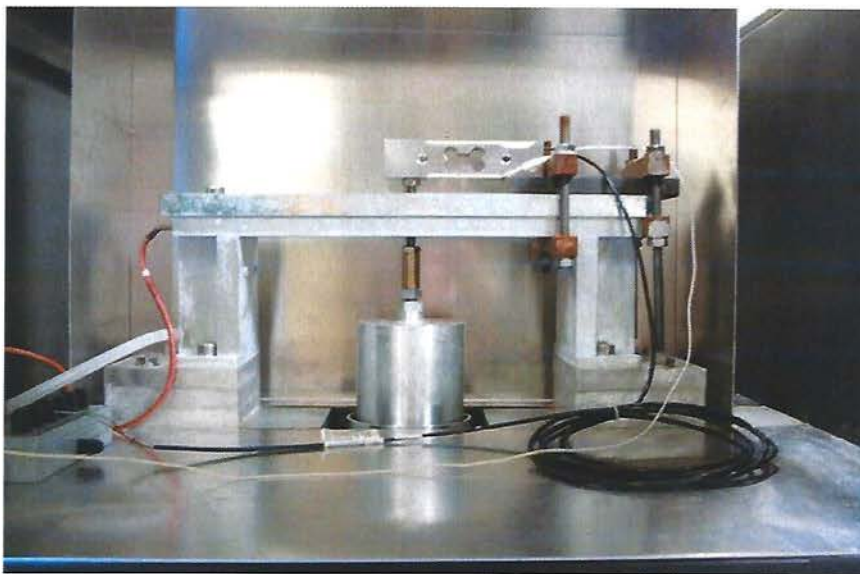
Remarks:

Registered user
DELTA Electronics Testing, Denmark

Photographs



Tested load cell



Load cell mounted in climatic chamber of Dead Load tester.

Remarks:

Registered user: DELTA Electronics Testing, Denmark