



Member State of OIML
Japan



OIML Certificate No.
R60/2000-JP1-11.09
Revision 1

OIML CERTIFICATE OF CONFORMITY

Issuing authority

Name: National Metrology Institute of Japan / National Institute of
Advanced Industrial Science and Technology (NMIJ / AIST)
Address: AIST Tsukuba Central 3-9, Tsukuba Ibaraki 305-8563, Japan
Person responsible: Dr. Tamotsu Nomakuchi, President of AIST

Applicant

Name: JFE Advantech Co., Ltd.
Address: 3-48 Takahata-cho, Nishinomiya, Hyogo 663-8202, Japan

Manufacturer of the certified pattern

Name: JFE Advantech Co., Ltd.
Address: 3-48 Takahata-cho, Nishinomiya, Hyogo 663-8202, Japan

Identification of the certified pattern:

Compression load cell
Type: HR II -20, HR II -30, HR II -50, HR II -100, HR III -50, HR III -80, IR-20, IR-30
Fraction: $\pi=0.7$
Temperature range: $-10\text{ }^{\circ}\text{C} / 40\text{ }^{\circ}\text{C}$



Member State of OIML
Japan



OIML Certificate No.
R60/2000-JP1-11.09
Revision 1

Characteristics:

Model designation			HR II -xx where xx equal to the E_{max}	HR III -xx where xx equal to the E_{max}	IR -xx where xx equal to the E_{max}
Accuracy class	Class	-	C		
Maximum number of load cell verification intervals	n_{max}	-	3000, 4000, 5000		
Humidity symbol			CH		
Minimum dead load	E_{min}	kg	0		
Maximum capacity	E_{max}	t	20, 30, 50, 100	50, 80	20, 30
Safe load limit	E_{lim}	kg	$1.5 * E_{max}$		
Minimum verification interval	v_{min}	kg	$E_{max}/10000$		
Apportionment factor	p_{LC}		0.7		
Ratio of minimum LC Verification interval $Y = E_{max} / v_{min}$	Y	-	10000		
Ratio of minimum dead load output return $Z = E_{max} / (2 * DR)$	Z	-	5000 in the case of $n_{max} = 5000$		
Rated output		mV/V	2	in case, $E_{max} = 50$ 1.5	in case, $E_{max} = 80$ 1.6
Maximum excitation voltage		V DC	15		
Input impedance	R_{LC}	Ω	400		
Cable detail		-	11 m 4 wire	11 m 4 wire	in case, IR-20 9 m, 4 wire in case, IR-30 11 m, 4 wire

This certificate attests the conformity of the above-mentioned pattern (represented by the samples identified in the associated test report(s) with the requirements of the following Recommendation of the International Organization of Legal Metrology - OIML):

R60, edition 2000 (E)
For accuracy class C

This certificate relates only to the metrological and technical characteristics of the pattern of the instrument concerned, as covered by the relevant OIML International Recommendation.

This certificate does not bestow any form of legal international approval.

The conformity was established by tests described in the associated test report no. 11-11/R60:2000, that includes 19 pages.



Member State of OIML
Japan



OIML Certificate No.
R60/2000-JP1-11.09
Revision 1

The Issuing Authority
NMIJ/AIST



Dr. T. Nomakuchi
President of AIST
2012-04-16

The OIML member

Dr. Y. Miki
2012-04-16

Important note: Apart from the mention of certificate's reference number and the name of the OIML Member State in which the certificate is issued, partial quotation of the certificate and of the associated Test Report is not permitted, although either may be reproduced in full.



Evaluation Report

Load cells

Issuing Authority

Name : National Metrology Institute of Japan /National Institute
of Advanced Industrial Science and Technology (NMIJ/AIST)

Address : AIST Tsukuba Central 3, Tsukuba Ibaraki 305-8563, Japan

Applicant : JFE Advantech Co., Ltd.

Manufacturer : JFE Advantech Co., Ltd.

Applied Type : HR II -20, HR II -30, HR II -50, HR II -100, HR III -50, HR III -80, IR-20, IR-30

Evaluation Report Number : 24-002

This report ensures the conformity of the applied type with the requirements of the OIML R60 (edition 2000), on the basis of evaluation of the attached test report (N° 11-11/R60:2000).

Evaluator :

Wataru Kaminaga
Legal Metrology Division
NMIJ/AIST

Signature :

W. Kaminaga

Date: 2012. 4. 5

Supervisor :

Shigeki Yamaguchi
Head of Legal Metrology Division
NMIJ/AIST

Signature :

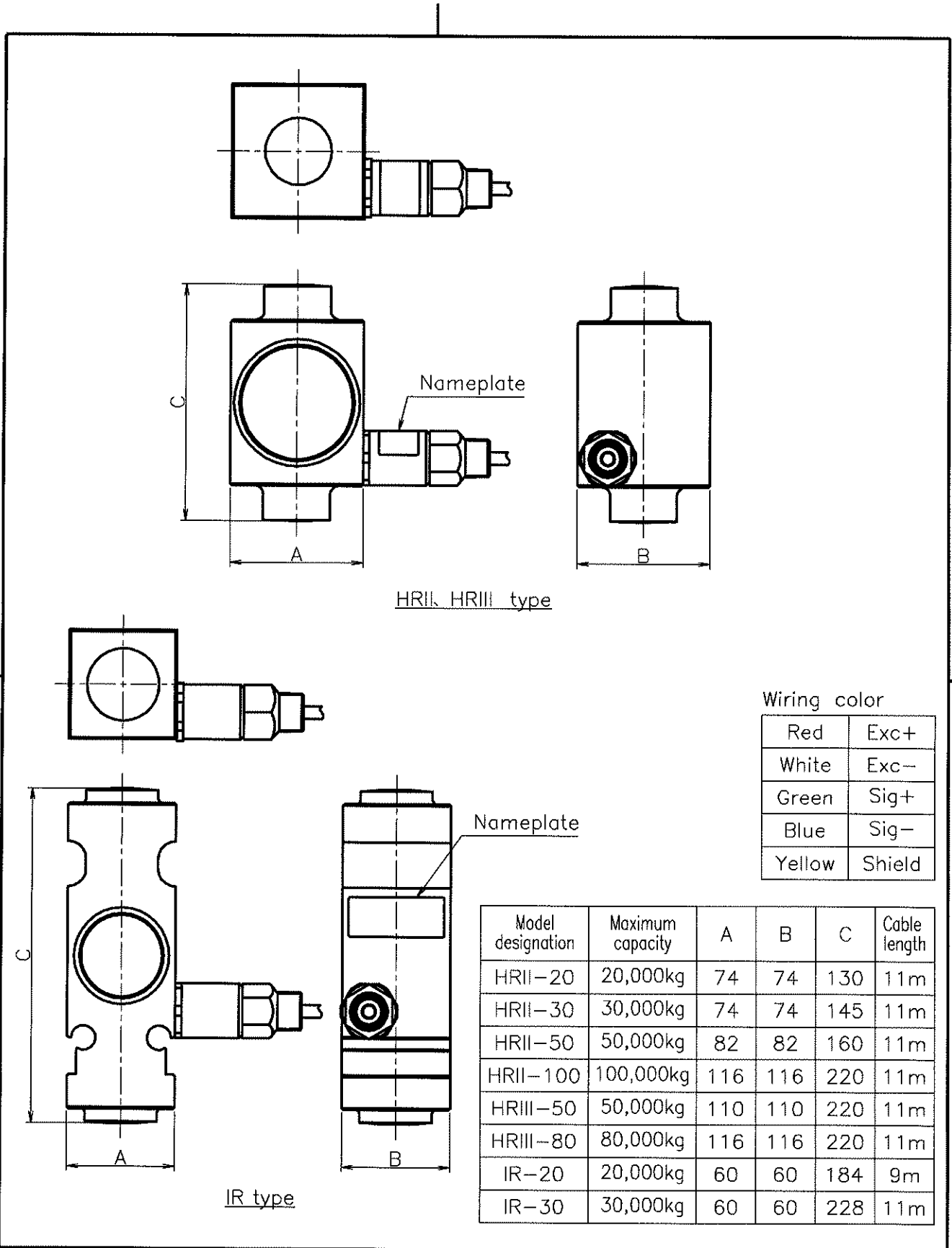
Shigeki Yamaguchi

Date: 2012. 4. 5

Description

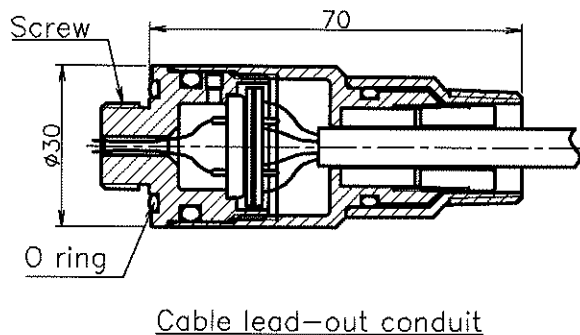
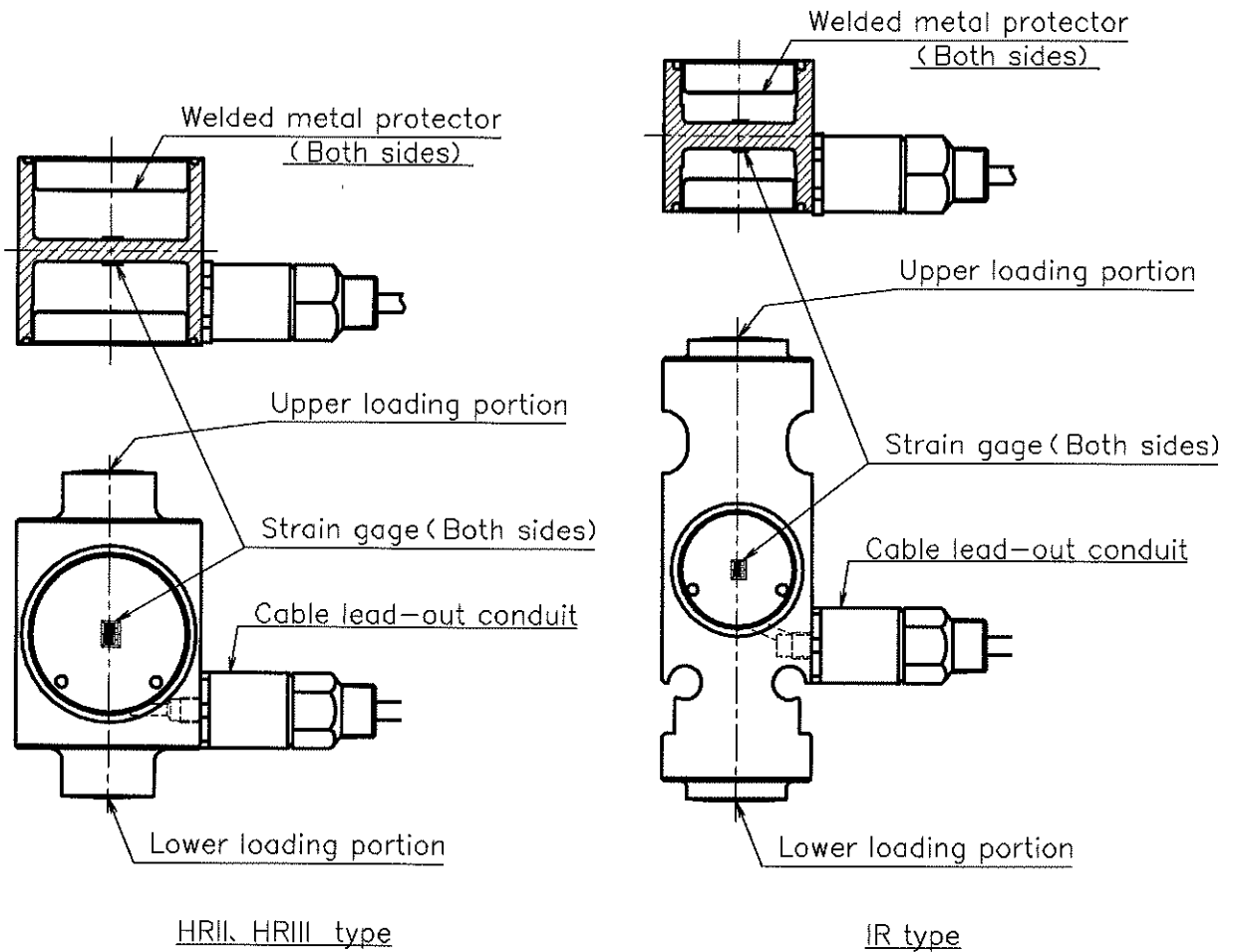
Technical data

Model designation			HR II -xx where xx equal to the E_{max}	HR III -xx where xx equal to the E_{max}	IR -xx where xx equal to the E_{max}
Accuracy class	Class	-	C		
Maximum number of load cell verification intervals	n_{max}	-	3000, 4000, 5000		
Humidity symbol			CH		
Minimum dead load	E_{min}	kg	0		
Maximum capacity	E_{max}	t	20, 30, 50, 100	50, 80	20, 30
Safe load limit	E_{lim}	kg	$1.5 * E_{max}$		
Minimum verification interval	v_{min}	kg	$E_{max}/10000$		
Apportionment factor	p_{LC}		0.7		
Ratio of minimum LC Verification interval $Y = E_{max} / v_{min}$	Y	-	10000		
Ratio of minimum dead load output return $Z = E_{max} / (2 * DR)$	Z	-	5000 in the case of $n_{max} = 5000$		
Rated output		mV/V	2	in case, $E_{max} = 50$ 1.5	in case, $E_{max} = 80$ 1.6
Maximum excitation voltage		V DC	15		
Input impedance	R_{LC}	Ω	400		
Cable detail		-	11 m 4 wire	11 m 4 wire	in case, IR-20 9 m, 4 wire in case, IR-30 11 m, 4 wire

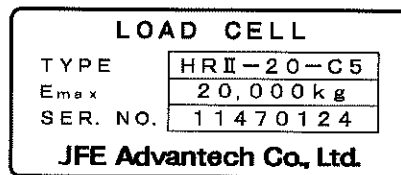
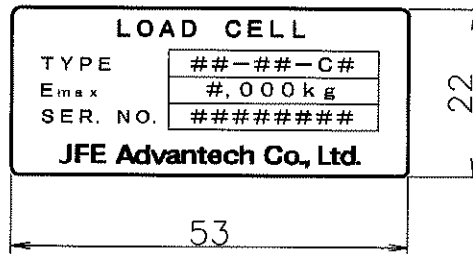


APPROVED	CHECKED	DESIGNED	DRAWN	TITLE
Y.Furuya	Y.Furuya	K.Tanaka		Outline Drawing
				HRII, HRIII, IR type load cell
DATE	Nov.1,2011	SCALE	1 : 3	DRAWING NO.
ORIGINAL NO.				MA4-4675
				JFE Advantech Co., Ltd.

ITEM	DWG.NO.	NAME OF PARTS	SIZE	MATERIAL	UNIT	MASS	REMARKS
		Body		SNCM439			
		Cable lead-out conduit		SUS303			



APPROVED	CHECKED	DESIGNED	DRAWN	TITLE			
Y.Furuya	Y.Furuya	K.Tanaka		Construction drawing			
				HRII, HRIII, IR type load cell			
DATE	Nov.1,2011	SCALE	1 : 3	JFE Advantech Co., Ltd.		DRAWING NO.	
ORIGINAL NO.			MA 4 - 4 6 7 6				



Sample

1. Material: PET
2. Character font: Gothic (Company name is logotype.)
3. Character color: Black
4. Line width: 0.3mm
5. Back face: Adhesives tape

APPROVED	CHECKED	DESIGNED	DRAWN	TITLE	Nameplate HRII, HRIII, IR type load cell
Y.Furuya	Y.Furuya	K.Tanaka			
DATE	Oct. 31, 2011	SCALE	1 : 1	JFE Advantech Co., Ltd.	DRAWING NO.
ORIGINAL NO.					MA 4 - 4 6 7 7



National Metrology Institute of Japan



Metrological regulation for load cells :
Test report

Project number : LC-OIML-11-011
Test report number : 11-11 / R60:2000
Issuing authority : National Metrology Institute of Japan /National Institute of
Advanced Industrial Science and Technology (NMIJ/AIST)
AIST Tsukuba Central 3 Tsukuba Ibaraki 305-8563, Japan

Applicant : JFE Advantech Co.,Ltd

Manufacturer : JFE Advantech Co.,Ltd

Date of application : 2011.11.7

End of evaluation : 2011.12.1

Date of issue : 2011.12.2

Signature : *Y. Koyano*

Yasuhiro Koyano
Chief of Legal Weighing Metrology Section
Mechanical Metrology Division

Testing authority

Name: National Metrology Institute of Japan
 Address: Central 3-1, 1-1-1 Umezono, Tsukuba, Ibaraki, 305-8563, Japan
 Contact information: Telephone: +81 29 861 4389 Fax: +81 29 861 4341

Applicant/Manufacturer information

Application no.: 23-011
 Application date: 2011.11.7
 Model designation: HR II, HR III, IR series

Manufacturer: JFE Advabtech Co., Ltd
 Address: 3-48 Takahata-cho Nishinomiya-shi Hyougo 663-8202 Japan

Applicant: JFE Advabtech Co., Ltd
 Address: 3-48 Takahata-cho Nishinomiya-shi Hyougo 663-8202 Japan

Representative: Kouji Tanaka
 (name, telephone) +81-798-66-1505

Instrument category: Load cell: Strain guage Documentation no.: _____

Information concerning the pattern

Accuracy class: A B C D

Maximum number of load cell verification intervals (n_{max}): 5000

Direction of loading: (for load cell characterization, see 4.6.3)

Tension Beam (shear) Compression
 Universal Beam (bending)

Safe load limit (Lim): 150% of E_{max} Apportionment factor, p_{LC} (see Note) 0.7

Limits of working temperature: (only if other than -10°C to $+40^{\circ}\text{C}$, see 5.5.1.1)

Upper: _____ $^{\circ}\text{C}$ Lower: _____ $^{\circ}\text{C}$

Power voltage: V_{min} 5 V V_{max} 15 V

or V: _____ V AC DC Recommended: AC DC

Humidity evaluation symbol: NH Yes No
 SH Yes No
 CH or no markings Yes No

Electronic load cell: Yes No

Note: This value of p_{LC} is assumed to be 0.7 unless otherwise declared by the manufacturer.

Information concerning the pattern (continued)

Application No: 23-011

Specify other conditions that must be observed to obtain the specified performance
(for example, electrical characteristics of the load cell):

Various designs within model range:

Maximum capacity E_{\max} (kg)	Minimum load cell verification v_{\min} (kg)	Maximum dead load E_{\min} (kg)	Maximum number of load cell n_{\max}	Minimum dead load output return DR (kg)
20000	2	0	5000	2
30000	3	0	5000	3
50000	5	0	5000	5
80000	8	0	5000	8
100000	10	0	5000	10

All values in this table are taken from documentation pages _____.

DR information required only when applicable.

Load cell(s) submitted:

Model designation	Serial number	E_{\max} (kg)
HR II -20	11470124	20000

Secondary equipment (specify load adapters, etc.):

Remarks:

General information concerning test conditions

Ref.:A3

Application no.: 23-011Load cell model: HR II -20 Serial no.: 11470124 E_{\max} : 20000 kg n_{\max} : 5000 v_{\min} : 2 kg DR (if applicable): 2 kgForce-generating system - description: Load cell performance testing device
(see Note)Minimum test load: 0 kgIndicating instrument - description: DMP40Environmental equipment - description: Walk-in type temperature & humidity chamber EBL-1Temperature: 19.9 ~ 20.1 °CRelative humidity: 42.9 ~ 43.4 %RHBarometric pressure: 100.91 ~ 101.77 kPaTest location: East 3B 01112Acceleration of gravity at test location: 9.79949 m/sec²Evaluator: Fukuda

Note : Include information concerning accuracy (for example, accredited laboratory).

Summary of the test

Application no.: 23-011

Load cell model: HR II -20

Serial no.: 11470124

 E_{max} : 20000 kg v_{min} : 2 kg

Force-generating system: Load cell performance testing device

Indicating instrument: DMP40

Evaluator: Fukuda

 n_{max} : 5000

DR: 2 kg

 ρ_{LC} : 0.7

No.	Test description	Passed	Failed	Report page	Remarks
D.2	Load cell errors (E_L)	×		10	
D.3	Repeatability errors (E_R)	×		11	
D.4	Temperature effects on MDLO (C_M)	×		12	
D.5	Creep (C_C)	×		13-16	
D.5	DR(C_{DR})	×		13-16	(see Note 2) DR: -1.39 kg
D.6	Barometric pressure effects (C_p)	×		17	
D.7	Humidity effects (CH or no mark) (C_{Hmin})	×		18	
D.7	Humidity effects (CH or no mark) (C_{Hmax})	×		18	
D.8	Humidity effects (SH)				
D.9	Marking requirements	See Page 19, Check that marked values are correct.			
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				

The following table checks the required calculations as per the General notes provisions of C.4:

Paragraph No.	Description	n_{max}		$n_{max}-500$		$n_{max}-1000$	
		Pass	Fail	Pass	Fail	Pass	Fail
C.4.2, C.4.3, C.4.5	Check all calculations using values of n at n_{max} and at lower than n_{max}	×		×		×	
C.4.4	Check that $v_{min} \leq \frac{D_{max}-D_{min}}{n_{max}}$	Pass		Fail			
		×					

Worst case figure for minimum dead load output return error (in mass units) = DR = -1.39 kg see Note 3

- Notes:
- 1 Enter "NA" for "the test is not applicable".
 - 2 Record error to accommodate OIML R76.
 - 3 This DR value is used in association with OIML R 76.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max}: 20000 kg
 η_{max}: 5000
 V_{min}: 2 kg
 PLC: 0.7 DR: 2 kg
 Force-generating system: Load cell performance testing device
 Indicating instrument: DMP40
 Evaluator: Fukuda

	At start	At end	
Date:	2011/11/7	2011/11/7	
Temperature:	19.9	19.9	°C
Relative humidity:	43.1	42.9	%
Barometric pressure:	100.91	100.94	kPa
Indicator temperature:	19.7	19.6	°C

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	-0.005538	7:56:20						
20000	2.003147	7:57:10						
0	-0.005580	7:58:00						
20000	2.003144	7:58:51						
0	-0.005579	7:59:41						
20000	2.003155	8:00:31						
0	-0.005573	8:01:21						
0	-0.005537	8:06:20	-0.005524	8:20:40	-0.005518	8:34:59	-0.005526 *	0.000019
2000	0.195354	8:07:00	0.195367	8:21:20	0.195371	8:35:39	0.195364	0.000017
4000	0.396200	8:07:40	0.396218	8:22:00	0.396218	8:36:19	0.396212	0.000018
6000	0.597040	8:08:20	0.597059	8:22:40	0.597057	8:36:59	0.597052	0.000019
8000	0.797889	8:09:00	0.797908	8:23:20	0.797903	8:37:39	0.797900	0.000019
10000	0.998733	8:09:40	0.998755	8:24:00	0.998748	8:38:19	0.998745	0.000022
12000	1.199592	8:10:20	1.199615	8:24:40	1.199606	8:38:59	1.199604	0.000023
14000	1.400449	8:11:00	1.400469	8:25:20	1.400461	8:39:39	1.400460	0.000020
16000	1.601314	8:11:40	1.601344	8:26:00	1.601333	8:40:19	1.601330	0.000030
18000	1.802189	8:12:20	1.802210	8:26:40	1.802199	8:40:59	1.802199	0.000021
20000	2.003059	8:13:00	2.003083	8:27:20	2.003076	8:41:39	2.003073	0.000024
18000	1.802176	8:13:40	1.802199	8:28:00	1.802193	8:42:19	1.802189	0.000023
16000	1.601316	8:14:20	1.601339	8:28:40	1.601335	8:42:59	1.601330	0.000023
14000	1.400469	8:15:01	1.400487	8:29:20	1.400478	8:43:39	1.400478	0.000018
12000	1.199629	8:15:41	1.199648	8:30:00	1.199642	8:44:19	1.199640	0.000019
10000	0.998774	8:16:21	0.998791	8:30:40	0.998785	8:44:59	0.998783	0.000017
8000	0.797915	8:17:01	0.797932	8:31:20	0.797928	8:45:39	0.797925	0.000017
6000	0.597045	8:17:40	0.597057	8:32:00	0.597055	8:46:19	0.597052	0.000012
4000	0.396166	8:18:20	0.396177	8:32:40	0.396175	8:46:59	0.396173	0.000011
2000	0.195303	8:19:00	0.195314	8:33:20	0.195326	8:47:39	0.195314	0.000023
0	-0.005533	8:19:40	-0.005525	8:34:00	-0.005520	8:48:19	-0.005526	0.000013

Notes: 1 * = Average initial minimum test load indication.
 2 Absolute (not relative) time shall be recorded.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max}: 20000 kg
 n_{max}: 5000
 V_{min}: 2 kg
 PL: 0.7 DR: 2 kg
 Force-generating system: Load cell performance testing device
 Indicating instrument: DMP40
 Evaluator: Fukuda

	At start	At end	
Date:	2011/11/8	2011/11/8	
Temperature:	40.1	40.1	°C
Relative humidity:	34.1	34.0	%
Barometric pressure:	101.18	101.20	kPa
Indicator temperature:	20.0	20.1	°C

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	-0.005517	8:24:51						
20000	2.003243	8:25:42						
0	-0.005481	8:26:32						
20000	2.003238	8:27:22						
0	-0.005469	8:28:12						
20000	2.003252	8:29:02						
0	-0.005457	8:29:53						
0	-0.005427	8:34:51	-0.005401	8:49:11	-0.005390	9:03:31	-0.005406	0.000037
2000	0.195452	8:35:31	0.195479	8:49:51	0.195489	9:04:11	0.195473	0.000037
4000	0.396294	8:36:11	0.396324	8:50:31	0.396334	9:04:51	0.396317	0.000040
6000	0.597133	8:36:51	0.597161	8:51:11	0.597171	9:05:31	0.597155	0.000038
8000	0.797985	8:37:31	0.798014	8:51:51	0.798021	9:06:11	0.798007	0.000036
10000	0.998834	8:38:11	0.998862	8:52:31	0.998872	9:06:51	0.998856	0.000038
12000	1.199701	8:38:51	1.199730	8:53:11	1.199740	9:07:31	1.199724	0.000039
14000	1.400562	8:39:31	1.400592	8:53:51	1.400603	9:08:11	1.400586	0.000041
16000	1.601440	8:40:11	1.601471	8:54:31	1.601480	9:08:51	1.601464	0.000040
18000	1.802319	8:40:51	1.802347	8:55:11	1.802360	9:09:31	1.802342	0.000041
20000	2.003201	8:41:31	2.003231	8:55:51	2.003247	9:10:11	2.003226	0.000046
18000	1.802316	8:42:11	1.802343	8:56:31	1.802354	9:10:51	1.802338	0.000038
16000	1.601451	8:42:51	1.601476	8:57:11	1.601487	9:11:31	1.601471	0.000036
14000	1.400593	8:43:31	1.400621	8:57:51	1.400631	9:12:11	1.400615	0.000038
12000	1.199752	8:44:11	1.199777	8:58:31	1.199785	9:12:51	1.199771	0.000033
10000	0.998893	8:44:51	0.998915	8:59:11	0.998924	9:13:31	0.998911	0.000031
8000	0.798034	8:45:31	0.798055	8:59:51	0.798063	9:14:11	0.798051	0.000029
6000	0.597157	8:46:11	0.597175	9:00:31	0.597183	9:14:51	0.597172	0.000026
4000	0.396277	8:46:51	0.396295	9:01:11	0.396303	9:15:31	0.396292	0.000026
2000	0.195417	8:47:31	0.195440	9:01:51	0.195447	9:16:11	0.195435	0.000030
0	-0.005409	8:48:11	-0.005397	9:02:31	-0.005387	9:16:51	-0.005398	0.000022

Notes: 1 * = Average initial minimum test load indication.
 2 Absolute (not relative) time shall be recorded.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max}: 20000 kg
 η_{max}: 5000
 V_{min}: 2 kg
 PLC: 0.7 DR: 2 kg

	At start	At end	
Date:	2011/11/9	2011/11/9	
Temperature:	-10.2	-10.2	°C
Relative humidity:	48.7	48.7	%
Barometric pressure:	101.63	101.62	kPa
Indicator temperature:	20.1	20.0	°C

Force-generating system: Load cell performance testing device
 Indicating instrument: DMP40
 Evaluator: Fukuda

Electronics power voltage
 (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	-0.005630	8:34:29						
20000	2.003161	8:35:20						
0	-0.005603	8:36:10						
20000	2.003142	8:37:00						
0	-0.005619	8:37:51						
20000	2.003146	8:38:41						
0	-0.005630	8:39:32						
0	-0.005553	8:44:30	-0.005588	8:58:49	-0.005586	9:13:09	-0.005576 *	0.000035
2000	0.195292	8:45:10	0.195269	8:59:29	0.195269	9:13:49	0.195277	0.000023
4000	0.396120	8:45:50	0.396097	9:00:09	0.396104	9:14:29	0.396107	0.000023
6000	0.596954	8:46:30	0.596935	9:00:49	0.596941	9:15:09	0.596943	0.000019
8000	0.797800	8:47:10	0.797786	9:01:29	0.797794	9:15:49	0.797793	0.000014
10000	0.998649	8:47:50	0.998636	9:02:09	0.998645	9:16:29	0.998643	0.000013
12000	1.199517	8:48:30	1.199505	9:02:49	1.199516	9:17:09	1.199513	0.000012
14000	1.400379	8:49:10	1.400369	9:03:29	1.400376	9:17:49	1.400375	0.000010
16000	1.601254	8:49:50	1.601245	9:04:09	1.601255	9:18:29	1.601251	0.000010
18000	1.802130	8:50:30	1.802116	9:04:49	1.802125	9:19:09	1.802124	0.000014
20000	2.003006	8:51:10	2.002996	9:05:29	2.003007	9:19:49	2.003003	0.000011
18000	1.802098	8:51:50	1.802087	9:06:09	1.802099	9:20:29	1.802095	0.000012
16000	1.601221	8:52:30	1.601205	9:06:49	1.601219	9:21:09	1.601215	0.000016
14000	1.400345	8:53:10	1.400333	9:07:29	1.400343	9:21:49	1.400340	0.000012
12000	1.199483	8:53:50	1.199474	9:08:09	1.199482	9:22:29	1.199480	0.000009
10000	0.998608	8:54:30	0.998601	9:08:49	0.998610	9:23:09	0.998606	0.000009
8000	0.797742	8:55:10	0.797734	9:09:29	0.797745	9:23:49	0.797740	0.000011
6000	0.596876	8:55:50	0.596869	9:10:09	0.596876	9:24:29	0.596874	0.000007
4000	0.396005	8:56:30	0.395999	9:10:49	0.396002	9:25:09	0.396002	0.000006
2000	0.195180	8:57:10	0.195173	9:11:29	0.195177	9:25:49	0.195177	0.000007
0	-0.005605	8:57:50	-0.005609	9:12:09	-0.005609	9:26:29	-0.005608	0.000004

Notes: 1 * = Average initial minimum test load indication.
 2 Absolute (not relative) time shall be recorded.

Form D.1 (3 runs) Load test data (E_L)

Ref.: A.4.1.1 to A.4.1.11. Complete one sheet for each test temperature, one for each humidity (SH) test in A.4.6, and when applicable, one for each electronics power voltage in A.4.7.3.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max}: 20000 kg
 n_{max}: 5000
 v_{min}: 2 kg
 PLC: 0.7 DR: 2 kg

	At start	At end	
Date:	2011/11/10	2011/11/10	
Temperature:	20.0	20.1	°C
Relative humidity:	43.4	43.4	%
Barometric pressure:	101.71	101.77	kPa
Indicator temperature:	20.0	20.1	°C

Force-generating system: Load cell performance testing device
 Indicating instrument: DMP40
 Evaluator: Fukuda

Electronics power voltage (when applicable): _____ V

Table D.1 (3 runs)

Test load (kg)	Run no. 1		Run no. 2		Run no. 3		Average indication (mV/V)	Repeatability error (mV/V)
	Indication (mV/V)	Time	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	-0.005515	8:34:25						
20000	2.003036	8:35:15						
0	-0.005481	8:36:06						
20000	2.003048	8:36:56						
0	-0.005471	8:37:47						
20000	2.003077	8:38:37						
0	-0.005461	8:39:28						
0	-0.005420	8:44:27	-0.005406	8:58:46	-0.005397	9:13:05	-0.005408 *	0.000023
2000	0.195443	8:45:06	0.195459	8:59:26	0.195465	9:13:45	0.195456	0.000022
4000	0.396262	8:45:46	0.396280	9:00:06	0.396287	9:14:25	0.396276	0.000025
6000	0.597074	8:46:26	0.597091	9:00:46	0.597099	9:15:05	0.597088	0.000025
8000	0.797897	8:47:06	0.797915	9:01:26	0.797922	9:15:45	0.797911	0.000025
10000	0.998717	8:47:46	0.998737	9:02:06	0.998743	9:16:25	0.998732	0.000026
12000	1.199556	8:48:26	1.199576	9:02:46	1.199582	9:17:05	1.199571	0.000026
14000	1.400394	8:49:06	1.400413	9:03:26	1.400416	9:17:45	1.400408	0.000022
16000	1.601247	8:49:46	1.601267	9:04:06	1.601265	9:18:25	1.601260	0.000020
18000	1.802099	8:50:26	1.802117	9:04:46	1.802124	9:19:05	1.802113	0.000025
20000	2.002959	8:51:06	2.002983	9:05:26	2.002983	9:19:45	2.002975	0.000024
18000	1.802089	8:51:46	1.802108	9:06:06	1.802113	9:20:25	1.802103	0.000024
16000	1.601243	8:52:26	1.601263	9:06:46	1.601267	9:21:05	1.601258	0.000024
14000	1.400412	8:53:06	1.400426	9:07:26	1.400433	9:21:45	1.400424	0.000021
12000	1.199591	8:53:46	1.199604	9:08:06	1.199608	9:22:25	1.199601	0.000017
10000	0.998757	8:54:26	0.998768	9:08:46	0.998774	9:23:05	0.998766	0.000017
8000	0.797925	8:55:06	0.797934	9:09:26	0.797940	9:23:45	0.797933	0.000015
6000	0.597075	8:55:46	0.597085	9:10:06	0.597089	9:24:25	0.597083	0.000014
4000	0.396223	8:56:26	0.396234	9:10:46	0.396237	9:25:05	0.396231	0.000014
2000	0.195396	8:57:06	0.195405	9:11:26	0.195406	9:25:45	0.195402	0.000010
0	-0.005415	8:57:46	-0.005406	9:12:06	-0.005401	9:26:25	-0.005407	0.000014

Notes: 1 * = Average initial minimum test load indication.
 2 Absolute (not relative) time shall be recorded.

Form D.2 Load cell errors (EL) calculation

Ref.: 5.1.1; A.4.1.12 to A.4.1.14; C.2.2.

Application no.:	<u>23-011</u>	At start	At end	
Load cell model:	<u>HR II -20</u>	Date:	<u>2011/11/7</u>	<u>2011/11/10</u>
Serial no.:	<u>11470124</u>	Test temperature:	<u>19.9</u>	<u>20.1</u> °C
E_{max} :	<u>20000 kg</u>	Relative humidity:	<u>43.1</u>	<u>43.4</u> %
η_{max} :	<u>5000</u>	Barometric pressure:	<u>100.91</u>	<u>101.77</u> kPa
V_{min} :	<u>2 kg</u>	Indicator temperature:	<u>19.7</u>	<u>20.1</u> °C
P_{LC} :	<u>0.7</u>	DR:	<u>2 kg</u>	
Force-generating system:	<u>Load cell performance testing device</u>	Conversion factor, f:	<u>0.000402</u>	
Indicating instrument:	<u>DMP40</u>	75% test load (g, kg or t):	<u>15000kg</u>	
Evaluator:	<u>Fukuda</u>	Reference indication at 75% test load:	<u>1.506449</u>	

Table D.2

Test load (kg)	Reference indication (mV/V)	19.9 °C (20°C)		40.1 °C(40°C)		-10.2 °C(-10°C)		20.0 °C(20°C)		mpe (V)
		Indication (mV/V)	Error(E_L) (V)	Indication (mV/V)	Error(E_L) (V)	Indication (mV/V)	Error(E_L) (V)	Indication (mV/V)	Error(E_L) (V)	
0	0.000000	0.000000	0.00	0.000000	0.00	0.000000	0.00	0.000000	0.00	0.35
2000	0.200856	0.200890	0.09	0.200879	0.06	0.200852	-0.01	0.200863	0.02	0.35
4000	0.401712	0.401738	0.06	0.401723	0.03	0.401683	-0.07	0.401684	-0.07	0.70
6000	0.602569	0.602578	0.02	0.602561	-0.02	0.602519	-0.12	0.602496	-0.18	0.70
8000	0.803425	0.803426	0.00	0.803413	-0.03	0.803369	-0.14	0.803319	-0.26	0.70
10000	1.004281	1.004272	-0.02	1.004262	-0.05	1.004219	-0.15	1.004140	-0.35	1.05
12000	1.205137	1.205131	-0.02	1.205130	-0.02	1.205088	-0.12	1.204979	-0.39	1.05
14000	1.405993	1.405986	-0.02	1.405992	0.00	1.405950	-0.11	1.405815	-0.44	1.05
16000	1.606849	1.606857	0.02	1.606870	0.05	1.606827	-0.06	1.606667	-0.45	1.05
18000	1.807706	1.807726	0.05	1.807748	0.11	1.807699	-0.02	1.807521	-0.46	1.05
20000	2.008562	2.008599	0.09	2.008632	0.18	2.008579	0.04	2.008383	-0.45	1.05
18000	1.807706	1.807716	0.03	1.807744	0.09	1.807670	-0.09	1.807511	-0.48	1.05
16000	1.606849	1.606856	0.02	1.606877	0.07	1.606791	-0.15	1.606665	-0.46	1.05
14000	1.405993	1.406004	0.03	1.406021	0.07	1.405916	-0.19	1.405831	-0.40	1.05
12000	1.205137	1.205166	0.07	1.205177	0.10	1.205055	-0.20	1.205009	-0.32	1.05
10000	1.004281	1.004310	0.07	1.004317	0.09	1.004182	-0.25	1.004174	-0.27	1.05
8000	0.803425	0.803451	0.07	0.803457	0.08	0.803316	-0.27	0.803341	-0.21	0.70
6000	0.602569	0.602579	0.03	0.602578	0.02	0.602449	-0.30	0.602491	-0.19	0.70
4000	0.401712	0.401699	-0.03	0.401698	-0.04	0.401578	-0.34	0.401639	-0.18	0.70
2000	0.200856	0.200841	-0.04	0.200841	-0.04	0.200752	-0.26	0.200810	-0.11	0.35
0	0.000000	0.000000	0.00	0.000008	0.02	-0.000032	-0.08	0.000000	0.00	0.35

Minimum test load, D_{min} : 0 kg

PASS: FAIL:

Notes:

- 1 Load/reference indications: if a 75% load point was not obtained, a straight line interpolation between the adjacent higher and lower load point indications is used (see 5.2.2 and calculation procedures in C.2.2).
- 2 Error, E_L : the difference between the test indication and the reference indication divided by the conversion factor, f.
- 3 Test load values are values above minimum test load, D_{min} .

Form D.3 Repeatability errors (E_R) calculation

Ref.: 5.4; A.4.1.13; C.2.3.

Application no.: 23-011

Load cell model: HR II -20

Serial no.: 11470124

E_{max}: 20000 kg

n_{max}: 5000

v_{min}: 2 kg

PLC: 0.7 DR: 2 kg

Force-generating system: Load cell performance testing device

Conversion factor, f: 0.000402

Indicating instrument: DMP40

Evaluator: Fukuda

Table D.3

Test load (kg)	19.9 °C (20°C)		40.1 °C(40°C)		-10.2 °C(-10°C)		20.0 °C(20°C)		mpe (V)
	Repeatability error (mV/V)	Repeatability error (V)	Repeatability error (mV/V)	Repeatability error (V)	Repeatability error (mV/V)	Repeatability error (V)	Repeatability error (mV/V)	Repeatability error (V)	
0	0.000019	0.05	0.000037	0.09	0.000035	0.09	0.000023	0.06	0.35
2000	0.000017	0.04	0.000037	0.09	0.000023	0.06	0.000022	0.05	0.35
4000	0.000018	0.04	0.000040	0.10	0.000023	0.06	0.000025	0.06	0.70
6000	0.000019	0.05	0.000038	0.09	0.000019	0.05	0.000025	0.06	0.70
8000	0.000019	0.05	0.000036	0.09	0.000014	0.03	0.000025	0.06	0.70
10000	0.000022	0.05	0.000038	0.09	0.000013	0.03	0.000026	0.06	1.05
12000	0.000023	0.06	0.000039	0.10	0.000012	0.03	0.000026	0.06	1.05
14000	0.000020	0.05	0.000041	0.10	0.000010	0.02	0.000022	0.05	1.05
16000	0.000030	0.07	0.000040	0.10	0.000010	0.02	0.000020	0.05	1.05
18000	0.000021	0.05	0.000041	0.10	0.000014	0.03	0.000025	0.06	1.05
20000	0.000024	0.06	0.000046	0.11	0.000011	0.03	0.000024	0.06	1.05
18000	0.000023	0.06	0.000038	0.09	0.000012	0.03	0.000024	0.06	1.05
16000	0.000023	0.06	0.000036	0.09	0.000016	0.04	0.000024	0.06	1.05
14000	0.000018	0.04	0.000038	0.09	0.000012	0.03	0.000021	0.05	1.05
12000	0.000019	0.05	0.000033	0.08	0.000009	0.02	0.000017	0.04	1.05
10000	0.000017	0.04	0.000031	0.08	0.000009	0.02	0.000017	0.04	1.05
8000	0.000017	0.04	0.000029	0.07	0.000011	0.03	0.000015	0.04	0.70
6000	0.000012	0.03	0.000026	0.06	0.000007	0.02	0.000014	0.03	0.70
4000	0.000011	0.03	0.000026	0.06	0.000006	0.01	0.000014	0.03	0.70
2000	0.000023	0.06	0.000030	0.07	0.000007	0.02	0.000010	0.02	0.35
0	0.000013	0.03	0.000022	0.05	0.000004	0.01	0.000014	0.03	0.35

PASS:

FAIL:

Note: Error, E_R: the maximum difference between the three test indications divided by the conversion factor, f (classes C and D) or the maximum difference between the five test indications divided by the conversion factor, f (classes A and B).

D.4 Temperature effects on MDLO (C_M) calculation

Ref.: 5.5.1.3; A.4.1.14; C.2.4.

Application no.: 23-011

Load cell model: HR II -20

Serial no.: 11470124

E_{max}: 20000 kg

n_{max}: 5000

V_{min}: 2 kg

P_{LC}: 0.7 DR: 2 kg

Force-generating system: Load cell performance testing device Conversion factor, f: 0.000402

Indicating instrument: DMP40

Evaluator: Fukuda

Table D.4

Temperature °C	Indication (mV/V)	Change (C _M) (V)	Change (v _{min} /5 °C)	mpc (v _{min} /5 °C)
19.9	-0.005526			
40.1	-0.005406	0.30	0.19	0.70
-10.2	-0.005576	-0.42	0.11	0.70
20.0	-0.005408	0.42	0.17	0.70

PASS: FAIL:

Notes:

- 1 MDLO: minimum dead load output.
- 2 Indication: the average initial minimum test load indication obtained from Table D.1.
- 3 The maximum permissible change(mpc) allowed is: (v_{min}/5°C) for classesB, C, and D; (v_{min}/2°C) for class A.
- 4 Change, C_M(v): the difference between the observed indications, and the indications at the prior temperature, divided by the conversion factor, f.

Form D.5 Creep (Cc) and DR (CDR)

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max} : 20000 kg
 η_{max} : 5000
 V_{min} : 2 kg
 P_{LC} : 0.7 DR: 2 kg

	At start	At end	
Date:	2011/11/7	2011/11/7	
Temperature:	19.9	19.9	°C
Relative humidity:	42.8	42.9	%
Barometric pressure:	100.93	100.91	kPa
Indicator temperature:	19.7	19.7	°C

Force generating system: Load cell performance testing device Conversion factor, f: 0.000402
 Indicating instrument: DMP40
 Evaluator: Fukuda

Table D.5

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)		
0							
0							
0							
0							
(*) →	0	-0.005535	100.93	9:48:09			←initial "no load" indicatio
Fill in time →	Record time of initial loading →			9:48:09			
(**) →	20000	2.003155	100.93	9:48:59	0.00	0.735	←initial "load" indication
Constant maximum test load, Dmax	20000	2.003086	100.93	9:49:59	-0.17	0.735	
	20000	2.003089	100.93	9:50:59	-0.16	0.735	
	20000	2.003097	100.93	9:51:59	-0.14	0.735	
	20000	2.003102	100.93	9:52:59	-0.13	0.735	
	20000	2.003109	100.93	9:53:59	-0.11	0.735	
	20000	2.003106	100.93	9:54:59	-0.12	0.735	
	20000	2.003116	100.93	9:55:59	-0.10	0.735	
	20000	2.003119	100.94	9:56:59	-0.09	0.735	
	20000	2.003123	100.94	9:57:59	-0.08	0.735	
	20000	2.003124	100.93	9:58:59	-0.08	0.735	
	20000	2.003135	100.93	10:03:59	-0.05	0.735	
	20000	2.003142	100.93	10:08:59	-0.03	0.735	
	20000	2.003148	100.92	10:13:59	-0.02	0.735	
	20000	2.003153	100.91	10:18:59	0.00	0.735	
Fill in time →	Record time of initial unloading →			10:18:59			
(***) →	0	-0.005512	100.91	10:19:50	0.06	0.500	←initial indication
These rows are for reference purposes only	0	-0.005501	100.91	10:20:11	0.08	0.500	
	0	-0.005484	100.91	10:20:31	0.13	0.500	
	0	-0.005473	100.91	10:20:51	0.15	0.500	
	0	-0.005467	100.91	10:21:11	0.17	0.500	
	0	-0.005465	100.91	10:21:31	0.17	0.500	
30-20 minute creep difference in units:					0.03	0.1575	

DR (v):	0.06	30 minute creep:	PASS:	×	FAIL:	
actual time (s):	51	30-20 minute creep difference:	PASS:	×	FAIL:	
specified time (s):	50	DR ≤ 0.5v:	PASS:	×	FAIL:	
mpe for DR (v):	0.49	DR within manufacturer specified DR requirements:	PASS:	×	FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (**) divided by the conversion factor, f.
 - 2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
 - 3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
 - 4 Absolute (not relative) time shall be recorded.

Form D.5 Creep (Cc) and DR (CDR)

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max}: 20000 kg
 n_{max}: 5000
 V_{min}: 2 kg
 P_{LC}: 0.7 DR: 2 kg

	At start	At end	
Date:	2011/11/8	2011/11/8	
Temperature:	40.1	40.1	°C
Relative humidity:	33.8	33.8	%
Barometric pressure:	101.19	101.18	kPa
Indicator temperature:	20.0	20.1	°C

Force generating system: Load cell performance testing device Conversion factor, f: 0.000402
 Indicating instrument: DMP40
 Evaluator: Fukuda

Table D.5

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)	
0						
0						
0						
0						
(*) → 0	-0.005422	101.19	10:16:40			← initial "no load" indicatio
Fill in time →	Record time of initial loading →		10:16:40			
(**) → 20000	2.003274	101.19	10:17:31	0.00	0.735	← initial "load" indication
Constant maximum test load, Dmax	20000	2.003215	10:18:31	-0.15	0.735	
	20000	2.003215	10:19:31	-0.15	0.735	
	20000	2.003223	10:20:31	-0.13	0.735	
	20000	2.003231	10:21:31	-0.11	0.735	
	20000	2.003238	10:22:31	-0.09	0.735	
	20000	2.003246	10:23:31	-0.07	0.735	
	20000	2.003248	10:24:31	-0.06	0.735	
	20000	2.003252	10:25:31	-0.05	0.735	
	20000	2.003256	10:26:31	-0.04	0.735	
	20000	2.003258	10:27:31	-0.04	0.735	
	20000	2.003274	10:32:31	0.00	0.735	
	20000	2.003282	10:37:31	0.02	0.735	
	20000	2.003291	10:42:31	0.04	0.735	
	20000	2.003300	10:47:31	0.06	0.735	
Fill in time →	Record time of initial unloading →		10:47:31			
(***) → 0	-0.005361	101.17	10:48:22	0.15	0.500	← initial indication
These rows are for reference purposes only	0	-0.005356	10:48:42	0.16	0.500	
	0	-0.005339	10:49:02	0.21	0.500	
	0	-0.005327	10:49:22	0.24	0.500	
	0	-0.005322	10:49:42	0.25	0.500	
	0	-0.005320	10:50:02	0.25	0.500	
	30-20 minute creep difference in units:					0.04

DR (v):	0.15	30 minute creep:	PASS:	×	FAIL:	
actual time (s):	51	30-20 minute creep difference:	PASS:	×	FAIL:	
specified time (s):	50	DR ≤ 0.5v:	PASS:	×	FAIL:	
mpc for DR (v):	0.49	DR within manufacturer specified DR requirements:	PASS:	×	FAIL:	

Notes: 1 Change (v) for creep: the observed indication minus the initial "load" indication (**) divided by the conversion factor, f.
 2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
 3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
 4 Absolute (not relative) time shall be recorded.

Form D.5 Creep (Cc) and DR (CDR)

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 23-011
 Load cell model: HR II -20
 Serial no.: 11470124
 E_{max}: 20000 kg
 η_{max}: 5000
 V_{min}: 2 kg
 p_{LC}: 0.7 DR: 2 kg

	At start	At end	
Date:	2011/11/9	2011/11/9	
Temperature:	-10.2	-10.2	°C
Relative humidity:	48.7	48.7	%
Barometric pressure:	101.63	101.62	kPa
Indicator temperature:	20.1	20.0	°C

Force generating system: Load cell performance testing device Conversion factor, f: 0.000402
 Indicating instrument: DMP40
 Evaluator: Fukuda

Table D.5

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)		
0							
0							
0							
0							
(*) → 0	-0.005537	101.58	10:26:18			←initial "no load" indicatio	
Fill in time →	Record time of initial loading →		10:26:18				
(**) → 20000	2.003153	101.58	10:27:08	0.00	0.735	←initial "load" indication	
Constant maximum test load, Dmax	2.003064	101.58	10:28:08	-0.22	0.735		
	2.003038	101.58	10:29:08	-0.29	0.735		
	2.003030	101.57	10:30:08	-0.31	0.735		
	2.003022	101.57	10:31:08	-0.33	0.735		
	2.003018	101.57	10:32:08	-0.34	0.735		
	2.003018	101.57	10:33:08	-0.34	0.735		
	2.003019	101.57	10:34:08	-0.33	0.735		
	2.003013	101.57	10:35:08	-0.35	0.735		
	2.003012	101.57	10:36:08	-0.35	0.735		
	2.003013	101.57	10:37:08	-0.35	0.735		
	2.003006	101.57	10:42:08	-0.37	0.735		
	2.003005	101.57	10:47:08	-0.37	0.735		
	2.003004	101.57	10:52:08	-0.37	0.735		
	2.003004	101.55	10:57:08	-0.37	0.735		
Fill in time →	Record time of initial unloading →		10:57:08				
(***) → 0	-0.005677	101.55	10:58:00	-0.35	0.500	←initial indication	
These rows are for reference purposes only	0	-0.005648	101.55	10:58:20	-0.28	0.500	
	0	-0.005621	101.55	10:58:40	-0.21	0.500	
	0	-0.005602	101.55	10:59:00	-0.16	0.500	
	0	-0.005589	101.55	10:59:20	-0.13	0.500	
	0	-0.005581	101.55	10:59:40	-0.11	0.500	
	30-20 minute creep difference in units:				0.00	0.1575	

DR (v):	-0.35	30 minute creep:	PASS:	x	FAIL:	
actual time (s):	51	30-20 minute creep difference:	PASS:	x	FAIL:	
specified time (s):	50	DR ≤ 0.5v:	PASS:	x	FAIL:	
mpc for DR (v):	0.49	DR within manufacturer specified DR requirements:	PASS:	x	FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (**) divided by the conversion factor, f.
 - 2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
 - 3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
 - 4 Absolute (not relative) time shall be recorded.

Form D.5 Creep (Cc) and DR (CDR)

Ref.: 5.3.1, 5.3.2; A.4.2, A.4.3 Complete one sheet for each test temperature.

Application no.: 23-011
 Load cell model: HR II-20
 Serial no.: 11470124
 E_{max}: 20000 kg
 n_{max}: 5000
 v_{min}: 2 kg
 P_{LC}: 0.7 DR: 2 kg

	At start	At end	
Date:	2011/11/10	2011/11/10	
Temperature:	20.1	20.0	°C
Relative humidity:	43.4	43.4	%
Barometric pressure:	101.74	101.70	kPa
Indicator temperature:	20.1	20.1	°C

Force generating system: Load cell performance testing device Conversion factor, f: 0.000402
 Indicating instrument: DMP40
 Evaluator: Fukuda

Table D.5

Test load (kg)	Indication (mV/V)	Barometric pressure (kPa)	Time	Change (v)	mpe (v)	
0						
0						
0						
0						
(*) → 0	-0.005411	101.74	10:26:15			← initial "no load" indication
Fill in time →	Record time of initial loading →		10:26:15			
(**) → 20000	2.003067	101.74	10:27:06	0.00	0.735	← initial "load" indication
Constant maximum test load, D _{max}	20000	2.003011	10:28:06	-0.14	0.735	
	20000	2.003000	10:29:06	-0.17	0.735	
	20000	2.003005	10:30:06	-0.15	0.735	
	20000	2.003011	10:31:06	-0.14	0.735	
	20000	2.003016	10:32:06	-0.13	0.735	
	20000	2.003022	10:33:06	-0.11	0.735	
	20000	2.003023	10:34:06	-0.11	0.735	
	20000	2.003023	10:35:06	-0.11	0.735	
	20000	2.003028	10:36:06	-0.10	0.735	
	20000	2.003031	10:37:06	-0.09	0.735	
	20000	2.003041	10:42:06	-0.06	0.735	
	20000	2.003047	10:47:06	-0.05	0.735	
	20000	2.003054	10:52:06	-0.03	0.735	
	20000	2.003058	10:57:06	-0.02	0.735	
Fill in time →	Record time of initial unloading →		10:57:06			
(***) → 0	-0.005403	101.71	10:57:58	0.02	0.500	← initial indication
These rows are for reference purposes only	0	-0.005391	10:58:18	0.05	0.500	
	0	-0.005372	10:58:38	0.10	0.500	
	0	-0.005359	10:58:58	0.13	0.500	
	0	-0.005353	10:59:18	0.14	0.500	
	0	-0.005350	10:59:38	0.15	0.500	
30-20 minute creep difference in units:				0.03	0.1575	

DR (v):	0.02	30 minute creep:	PASS:	x	FAIL:	
actual time (s):	51	30-20 minute creep difference:	PASS:	x	FAIL:	
specified time (s):	50	DR ≤ 0.5v:	PASS:	x	FAIL:	
mpc for DR (v):	0.49	DR within manufacturer specified DR requirements:	PASS:	x	FAIL:	

- Notes:
- 1 Change (v) for creep: the observed indication minus the initial "load" indication (**) divided by the conversion factor, f.
 - 2 Determine the difference between the reading obtained at 20 minutes and the reading obtained at 30 minutes (see 5.3.1).
 - 3 Change (v) for DR: the initial indication (***) minus the initial "no load" indication (*) divided by the conversion factor, f.
 - 4 Absolute (not relative) time shall be recorded.

Form D.6 Barometric pressure effects (Cp)

Ref.: 5.5.2; A.4.4.

Application no.: 23-011

Load cell model: HR II -20

Serial no.: 11470124

 E_{\max} : 20000 kg n_{\max} : 5000 V_{\min} : 2 kg P_{LC} : 0.7

DR: 2 kg

Force-generating system: —

Conversion factor, f: 0.000402

Indicating instrument: DMP40

Evaluator: Fukuda

	At start	At end	
Date:	2011/11/25	2011/11/25	
Test temperature:	18.3	18.2	°C
Relative humidity:	46.2	47.1	%
Barometric pressure:	101.52	101.52	kPa
Indicator temperature:	20.3	20.3	°C

Table D.6

Pressure (kPa)	Indication (mV/V)	Time	Change (V)	Change (v_{\min}/kPa)	mpc (v_{\min}/kPa)
101.52	-0.011584		0.00	0.00	0
102.52	-0.011668		-0.21	-0.53	1
101.53	-0.011584		0.21	-0.53	1
100.52	-0.011502		0.20	-0.51	1
101.52	-0.011588		-0.21	-0.54	1

PASS: FAIL:

Remarks:

- Notes: 1 Change (v): the difference between the observed indication and the initial indication divided by the conversion factor, f.
 2 Although A.4.4 specifies a change of only 1 kPa for this test, additional measurements may be taken.
 3 Absolute (not relative) time shall be recorded.

Form D.7 Humidity effects (CH or no mark)

Ref.: 5.5.3.1;A.4.5.

Application no.:	23-011				
Load cell model:	HR II -20				
Serial no.:	11470124			Date:	2011/11/10 2011/11/25
E_{max} :	20000 kg			Temperature:	20.0 20.1 °C
n_{max} :	5000			Relative humidity:	42.6 43.2 %
v_{min} :	2 kg			Barometric pressure:	101.65 101.54 kPa
ρ_{LC} :	0.7	DR:	2 kg	Indicator temperature:	20.1 20.2 °C
Force generating system:	Load cell performance testing device			Conversion factor, f:	0.000402
Indicating instrument:	DMP40			Conditions during damp heat cyclic test:	
Evaluator:	Fukuda			Chamber temp.(high):	40.1 °C Relative humidity: 95.2 %
				Chamber temp.(low):	25.3 °C Relative humidity: 95.3 %

Table D.7

Test load (kg)	Before humidity test		After humidity test		Change (v)	mpe (v)
	Indication (mV/V)	Time	Indication (mV/V)	Time		
0	-0.005387	11:28:21	-0.005521	9:13:25		
20000	2.003068	11:29:11	2.003116	9:14:15		
0	-0.005432	11:30:02	-0.005569	9:15:06		
20000	2.003069	11:30:52	2.003030	9:15:56		
0	-0.005429	11:31:43	-0.005570	9:16:47		
20000	2.003091	11:32:33	2.003045	9:17:37		
0	-0.005423	11:33:23	-0.005568	9:18:28		
0	-0.005382	11:38:27	-0.005523	9:23:32		
20000	2.003117	11:39:17	2.003066	9:24:22		
0	-0.005426	11:40:08	-0.005570	9:25:13		
20000	2.003107	11:40:59	2.003048	9:26:03		
0	-0.005424	11:41:49	-0.005570	9:26:54		
20000	2.003117	11:42:39	2.003052	9:27:44		
0	-0.005420	11:43:30	-0.005564	9:28:34		
0						
0						
Average(⊖)	-0.005413		-0.005557		-0.36	200 ← $\leq 4\%n_{max}$
Average(⊕)	2.003114		2.003055			
Averages difference(*)	2.008527		2.008612		0.21	1.0

(⊖) Indications at minimum test load Change (⊖), CHmin: PASS: FAIL:

(⊕) Indications at maximum test load (see Note) Change (*), CHmax: PASS: FAIL:

(*) Average, see 5.5.3.1 and C.2.7

- Notes:
- 1 This test is not necessary if the load cell is marked NH or SH.
 - 2 Change(v): the difference between the after indication and the before indication divided by the conversion factor, f.
 - 3 Use five test runs for classes A and B; use three test runs for classes C and D.
 - 4 Absolute (not relative) time shall be recorded.

Form D.9 Marking requirements

Ref.: 4.6, 4.7.

Application no.: 23-011
 Load cell model: HR II-20
 Serial no.: 11470124
 E_{max}: 20000 kg
 n_{max}: 5000
 v_{min}: 2 kg
 P_{LC}: 0.7 DR: 2 kg
 Force-generating system: —
 Indicating instrument: DMP40
 Evaluator: Fukuda

Table D.9.1

R 60 reference	Mandatory information	On load cell	In document
4.6.1	Accuracy class designation	-	+
4.6.2	Maximum number of load cell verification intervals, n _{max}	-	+
4.6.3	Loading designation (if necessary)	-	+
4.6.4	Working temperature designation	-	+
4.6.5.1	Humidity symbol "NH"	/	/
4.6.5.3	Humidity symbol "SH"	/	/
4.6.6.1, 4.7.1	Name or trademark of manufacturer (see Note 1)	+	+
4.6.6.1, 4.7.1	Manufacturer's own designation or load cell model (see Note 1)	+	+
4.6.6.1, 4.7.1	Serial number (see Note 1)	+	+
4.6.6.1	Year of manufacture	-	+
4.6.6.1	Minimum dead load, E _{min}	-	+
4.6.6.1, 4.7.1	Maximum capacity, E _{max} (see Note 1)	+	+
4.6.6.1	Safe load limit, E _{lim}	-	+
4.6.6.1	Minimum load cell verification interval (v _{min})	-	+
4.6.6.1	Other pertinent conditions	-	-
4.6.6.1	Apportionment factor, P _{LC} (if not equal to 0.7)	-	+
4.6.7	Standard classification	-	-
4.6.8	Multiple classifications	-	-

Table D.9.2

R 60 reference	Non-mandatory additional information	On load cell	In document
4.6.5.2	Humidity symbol "CH"	-	+
4.6.6.2	Relative v _{min} , Y	-	+
4.6.6.2	Relative DR, Z	-	+

Include references to the following:

Documents supplied with load cells: _____

Diagrams showing markings on load cells: _____

- Notes:
- 1 Required both on load cell and in document.
 - 2 Indicate that the marking is present with a "+".
 - 3 Indicate that the marking is not present with a "-".
 - 4 Indicate that the marking is not applicable with a "/".