

EVALUATION CERTIFICATE

No. 0200-WL-11238

Object name	DAD14x.y		
Object type	Non-automatic weighing indicator / weight transmitter		
Issued by	FORCE Certification EU - Notified Body No. 0200		
In accordance with	EN 45501:2015, OIML R76:2006 and WELMEC Guide 8.8:2017 on metrological aspects of non-automatic weighing instruments.		
Fractional factor (p_i)	0.5 (refer to 3.10.2.1 of EN 45501:2015).		
Issued to	Hauch & Bach ApS Femstykket 6 DK-3540 Lynge Denmark		
Manufacturer	Hauch & Bach ApS		
In respect of	Non-automatic weighing indicators.		
Characteristics	Suitable as a non-automatic weighing instruments with the following characteristics: Weighing range: Single-interval or multi-interval or multi-range. Accuracy class: III or IIII Verification scale interval: $e_i =$ Max_i/n_i Maximum number of verification scale intervals: $n_i =$ 10,000 per interval/range Minimum input voltage per VSI: 0.2 μV The essential characteristics are described in the annex.		
Description and documentation	The non-automatic weighing indicators are described and documented in the annex to this certificate.		
Remarks	Summary of tests involved: See the annex to this certificate.		

This evaluation certificate cannot be quoted in an EU type examination certificate without permission from the holder of the certificate mentioned above.

Note: This certificate is a revised edition which replaces DK0199-17.01.

The annex comprises 6 pages.

Issued on **2023-01-12**

FORCE Certification references:

Task no.: 121-26905.90.10 and ID no.: 0200-WL-11238-1

Signatory: Jens Hovgård Jensen

Descriptive annex

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1. Name and type of instrument and modules

The weighing transmitter / indicator is designated DAD14x.y. It is an electronic non-automatic weighing transmitter / indicator to be connected to a separate load receptor and capable of either transmitting the instant weight to an external display unit / digital indicator or to work as a non-automatic weighing indicator itself.

The x.y in the name of the instrument indicates the following,

x = 1	Ethernet interface
2	Profibus interface
3	2 Ethernet interfaces
y = 1	Analogue output
2	No analogue output

The indicators consist of analogue to digital conversion circuitry, microprocessor, control circuitry, power supply conditioner, keyboard, non-volatile memory for storage of calibration and setup data, and a weight display, all contained within a single enclosure.

2. Description of the construction and function

2.1 Construction

2.1.1 Indicator / weight transmitter

The electronic weight transmitter / indicator consists of two electronic boards: A main board bearing the microcontroller and all other components and a display board.

The display has LED indication for: ‘-‘ (negative weight), center zero, NET and status of the two logic Inputs and the three logic Outputs. The weight display has 6 seven-segment digits with a height of 5 mm. The weight unit (t, kg or g) is displayed at a separate label fixed to the inside of the transparent lid covering the entire display and keyboard. When working as a weight transmitter the display is to be regarded as a service display.

The enclosure is made of ABS plastics intended for mounting on to a DIN rail and with pluggable screw terminals along the top and bottom for connection of power, load cell, various interface ports, voltage- and current outputs and logic I/Os.

Behind the transparent lid at the front of the enclosure are 4 keys for operating the functions of the weight transmitter / indicator.

All instrument calibration and metrological setup data are stored in the non-volatile memory.

The weight transmitter / indicator is power supplied with $10 - 30 \text{ VDC} \leq 4 \text{ W}$.

2.1.2 Load receptors, load cells and load receptor supports

Set out in Section 3.3.

2.1.3 Interfaces and peripheral equipment

Set out in Section 4.

2.2 Functions

The instrument is a microcontroller based electronic weight indicator that requires the external connection of strain gauge load cell(s).

The primary functions provided are,

- Self-test function
- Initial zero-setting – $\leq \pm 10$ % of Max
- Semi-automatic zero-setting – ± 2 % of Max
- Zero-tracking – ± 2 % of Max
- Semi-automatic tare device
- Event counter (TAC)

Software version

The software version is displayed during the start-up of the indicator. After that the TAC number is shown. The version format is x.yy, where x is the basic software family, while yy version numbers for changes and corrections not influencing the legal function of the software.

The approved hardware and software versions are:

Model	Hardware revision	Software version
DAD141.y	141.101.v.1.1x	1.06
	141.101.v.2.xx	2.01
DAD142.y	142.205.v.1.xx	1.06
	142.205.v.2.xx	2.01
DAD143.y	Rev.1	1.04

3. Technical data

3.1 Weight transmitter / Indicator

The weight transmitters / indicators have the following characteristics:

Type:	DAD14x.y
Accuracy class:	III or IIII
Weighing range:	Single-interval or multi-interval for indicator, Single-interval, multi-range or multi-interval for weight transmitter
Maximum number of verification scale intervals (n):	10000 per range/interval for Class III 1000 per range/interval for Class IIII
Minimum input voltage per VSI:	0.2 μ V
Maximum capacity of interval or range (Max):	$n \times e$
Verification scale interval, e_i =	Max/n
Initial zero-setting range:	± 10 % of Max
Maximum tare effect:	100 % of Max
Fractional factor (pi):	0.5
Excitation voltage:	5 VDC
Circuit for remote sense:	Active, (see below)
Minimum input impedance:	58 ohm
Maximum input impedance:	1200 ohm
Connecting cable to load cell(s):	See Section 3.1.1
Supply voltage:	10 - 30 VDC, ≤ 4 W.
Operating temperature range:	Min/Max = -15 °C/+55 °C
Peripheral interface(s):	See Section 4

3.1.1 Connecting cable between the indicator and the load cell or the junction box for load cells

3.1.1.1 4-wire system

Line:	4 wires, shielded
Maximum length:	The certified length of the load cell cable, which shall be connected directly to the indicator. (No junction box is allowed).

3.1.1.2 6-wire system

Line:	6 wires, shielded
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Option 1:

Maximum length:	2028 m/mm ² (for n = 10,000)
Maximum resistance per wire:	34.3 ohm

In case the (n) for the weighing instrument is less than (n) mentioned above, the following apply:

Option 2:

Coefficient of temperature of the span error of the indicator:	$E_s = 0.0019$ [%/25K]
Coefficient of resistance for the wires in the J-box cable:	$S_x = 0.0008$ [%/ohm]
$L/A_{max} = 295.86 / S_x * (emp/n - E_s)$ [m/mm ²] in which $emp = p_i * mpe * 100/e$	

From this, the maximum cable length for the weighing instrument may be calculated with regard to (n) for the actual configuration of the instrument.

4. Interfaces and peripheral equipment

4.1 Interfaces

4.1.1 Load cell input

The connector pins for load cell connection are located on the bottom of the enclosure.

4.1.2 Other interfaces

The DAD14x.y weight transmitter / weighing indicator may in addition to the standard RS485/RS232 and Logic inputs/outputs be equipped with one of following protective interfaces,

- Ethernet
- Profibus
- Modbus RTU
- CAN-open
- Device Net
- Analogue outputs

The interfaces are characterised “Protective interfaces” according to paragraph 8.4 in the Directive and do not have to be secured.

5. Location of seals and inscriptions

Seals shall bear the verification mark of a notified body or alternative mark of the manufacturer according to ANNEX II, module F or D of Directive 2014/31/EU.

Access to the set-up and calibration facility requires that a calibration jumper is removed from the main board. The jumper can be accessed from the outside, top part of the housing.

The weight transmitter / indicator also has a Traceable Access Counter, which increment each time the calibration or legal part of the set-up has been changed.

The sealing of the calibration jumper, which also prevents the housing from being dismantled - is accomplished with a brittle plastic sticker. The sticker is placed across the opening behind which the calibration jumper is located.

6. Location of CE mark of conformity and inscriptions

The following details are found at the identification section, which is printed or written directly at the enclosure or at a label placed at the enclosure of the weight transmitter / indicator:

- CE mark and space for supplementary metrological marking
- Manufacturer's mark and postal address of manufacturer
- Max, Min, e =
- n_{max} , temperature range, model no., serial no. and accuracy class.
- Evaluation certificate no., EU type examination certificate no.

7. Tests

The DAD141.y has been tested according to OIML R76-1:2006, EN 45501:1992, WELMEC 2.1:2001 annex5 and OIML D11:2004 section 12 and 13 with severity level 3.

The DAD143.y has been tested according to OIML R76-1:2006, EN 45501:2015 and OIML D11:2004 section 12 and 13 with severity level 3.

By that they all fulfill EN 45501:2015 and electromagnetic class E2 for MID (2014/32/EU).

Examination / tests

Temperature tests: 20/55/-15/5/20 (tested at minimum input-voltage sensitivity)	
Temperature effect on no-load indication	
Temperature effect on span	
Repeatability	
Tare	
Warm-up time	
Voltage variations	
Electrical bursts	(power supply lines 2 kV, I/O and data lines 1 kV)
Surge	(power supply lines 2 kV)
Electrostatic discharges	
Immunity to radiated electromagnetic fields	(10 V/m)
Immunity to conducted electromagnetic fields	(10 V)
Damp heat, steady state	
Span stability	
Examination of construction	
Maximum load cell cable length and impedance of cable to load cell	
Load cell interface measurements with interruptions of the sense circuit	

The test item fulfilled the maximum permissible errors at all tests.

8. Documentation

Contents of the technical documentation held by the notified body:

8.1 Product specification

- Manual
- Schematics
- PCB layout

8.2 Test & Examination report

Test report no. DANAK-1914015, 71 pages.

Type examination report 121-26905.10, 66 pages.