DANAK
PROD Reg. nr 7026

FORCE Certification

EVALUATION CERTIFICATE

No. 0200-WL-10005

Object name	**SGM8x0**
Object type	**A weighing controller/indicator for automatic catchweigher/checkweigher instruments**
Issued by	**FORCE Certification** EU - Notified Body No. 0200
In accordance with	OIML R51:2006, OIML D11:2004 section 12 and 13 applying severity level 3 WELMEC Guide 2.8:2012 WELMEC Guide 7.2:2019 WELMEC Guide 8.8:2017.
Issued to	**PENKO Engineering B.V.** Schutterweg 35, 6718 XC Ede, The Netherlands
Manufacturer	**PENKO Engineering B.V.**
In respect of	A weighing controller/indicator for automatic catchweigher/checkweigher instruments.
Description and documentation	The weighing indicator is described and documented in the annex to this certificate.
Remarks	Summary of tests involved: See the annex to this certificate.

Note: This certificate is a revised edition which replaces DK0199-R51-14.07 revision 3.

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

The annex comprises 10 pages.

Issued on **2021-01-21**

Jens Hovgård Jensen
2021-01-21

Digitally signed by Jens Hovgård Jensen
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Certification Manager

FORCE Certification references:
Task no.: 121-21273.90.30 and ID no.: 0200-WL-10005

Signatory: Jens Hovgård Jensen

Descriptive annex

Contents

1. Name and type of instrument

The weighing indicator/transmitter is designated SGM8x0. It is an electronic non-automatic weighing indicator/transmitter to be connected to a separate load receptor and capable of transmitting the instant weight to an external display unit or to a digital indicator.
The indicator/transmitter can be configured to single-interval, multi-range or multi-interval.

The name of the indicator may be followed by alphanumeric characters for technical, legal or commercial characterisation of the instrument.

The indicator/transmitter consists of a CPU-board with PSU, analog circuits for load cell interface and communication and I/O interfaces, plus a display-board with keys, LED display and LED indicators all contained in a single enclosure.
The CPU-board contains non-volatile memory for storage of calibration and setup data and for alibi memory (DSD).

2. Description of the construction and function

2.1 Construction

2.1.1 SGM8x0 weighing indicator

The SGM8x0 indicator/transmitter is supplied in an ABS enclosure for DIN rail mounting.

The SGM8x0 indicator/transmitter is specified in Section 3.1.

2.1.2 Load cells

Requirements to connected load cell(s) are set out in Section 3.2.

2.1.3 Load receptor

Requirements to connected load receptor are set out in Section 3.3.

2.1.4 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 – within 20 % of Max
- Semi-automatic zero-setting – within 4 % of Max
- Automatic zero-setting – within 4 % of Max
- Zero-tracking – within 4 % of Max
- Semi-automatic tare – up to 100 % of Max
- Preset tare – up to 100 % of Max
- Printing device
- Extended resolution
- Real Time Clock
- Data storage device - Alibi memory

SW counter
A new software version can be downloaded into the SGM8x0 weight indicator/transmitter without breaking the physical sealing. Therefore SGM8x0 has a non-resettable SW-counter, which increments each time a new software version is downloaded.

TAC counter
The SGM8x0 weight indicator/transmitter has a non-resettable TAC counter, which increments each time the legal relevant part of the setup is changed.

CAL counter
The SGM8x0 weight indicator/transmitter has a non-resettable CAL counter, which increments each time a calibration is performed.

Event Log
The SGM8x0 weight indicator/transmitter has an event log in which all system events are logged with a time stamp. The event log can be viewed by connecting the indicator/transmitter through its USB interface to a PC running the 'PI Mach II' application.

Software version
The SGM8x0 weight indicator/transmitter has software separation. All the legal relevant software is contained in a dll-file, which integrity is checked at start up. Version, time stamp and checksum of the dll-file can be viewed together with the above counters by connection the indicator/transmitter through its USB interface to a PC running the 'PI Mach II' application.
The tested legal relevant software versions are:

Ver. 1.0.0.96	Date: 6-2-2014	Checksum: AEA7B382
Ver. 1.0.0.114	Date: 6-7-2020	Checksum: 122D1730

The non-legally relevant application software version is displayed in SGM8x0's display at start-up together with the SW counter, TAC counter and CAL counter.
The application version of the tested SGM820 was 1.4.0.9.0.2.
SW counter: **-1234-**
TAC counter: **tA.1234**
CAL counter: **CA.1234**
where '1234' represent the actual counter value.

Additional Software version:

Legally relevant software version is also displayed at start-up in 4 steps with a pause of 3 seconds between each display step:

crc
AEA7-
b382
=1.0.0.96
Reconstructions of the 4 display actions means:
crc AEA7B382 version is 1.0.0.96

3. Technical data

3.1 Weight indicator

The SGM8x0 has the following characteristics:

Type:	SGM8x0
Accuracy class:	XIII, XIIII, Y(a) or Y(b)
Weighing range:	Single-interval, multi-range or multi-interval
Number of verification scale intervals (n_i):	≤ 10000
Maximum capacity of interval or range (Max_i):	$n_i \times e_i$
Verification scale interval, e_i = :	≥ 0.4 µV
Minimum capacity (Min_i):	20 × e_i for Y(a), 10 × e_i for Y(b)
Maximum time between automatic zero-setting:	50 minutes for $e_1 \geq 0.4$ µV, 125 minutes for $e_1 \geq 1.0$ µV
Minimum warm-up time[1)]:	29 minutes for $e_1 \geq 0.4$ µV, 12 minutes for $e_1 \geq 1.0$ µV
Maximum tare effect:	100 % of Max
Fractional factor (pi):	0.5
Electromagnetic class:	E2
Excitation voltage:	5 VDC
Minimum input voltage:	0 mV
Maximum input voltage:	11 mV for range 2 mV/V 16.5 mV for range 3 mV/V
Circuit for remote sense:	Active, (see below)
Minimum input impedance:	43.75 ohm
Maximum input impedance:	1200 ohm
Connecting cable to load cell(s):	See Section 3.1.1
Supply voltage:	24 VDC, not to be supplied from DC Mains
Operating temperature range:	-10 ° C to +40 ° C
Peripheral interface:	Set out in Section 4

[1)] Unless automatic zero-setting is performed as part of every weighing cycle.

3.1.1 Connecting cable between the weight indicator and a junction box for load cell(s), if any

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 weighing indicator.

3.1.1.2 6-wire system

Line:	6 wires, shielded
Maximum length:	2147 m/mm^2 (for n = 10 000)

3.2 Load cells

The SGM8x0 weighing indicator may only be used with load cell(s) that fulfil the following general acceptance of load cells.

3.2.1 General acceptance of load cells

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

1) There is a respective Part / Evaluation / Test Certificate (EN 45501) or an OIML Certificate of Conformity (R60:2000 or R60:2017) issued for the load cell by a Notified Body responsible for type examination under Directive 2014/31/EU.

2) The certificate contains the load cell types and the necessary load cell data required for the manufacturer's declaration of compatibility of modules (WELMEC 2:2015), and any particular installation requirements). A load cell marked NH is allowed only if humidity testing to EN 45501 has been conducted on this load cell.

3) The compatibility of load cells and indicator is established by the manufacturer by means of the compatibility of modules form, contained in the above WELMEC 2 document, or the like, at the time of EC verification or declaration of EC conformity of type.

4) The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

3.3 Load receptors

The SGM8x0 weighing indicator may only be used with a load receptor that has a load transmission device in accordance with the standard solutions shown in WELMEC Guide 2.4:2001.

3.4 Composition of modules

Composition of modules to automatic catchweighers/checkweighers using SGM8x0 shall satisfy OIML R76-1:2006 annex F.

4. Interfaces and peripheral equipment

4.1 Interfaces

The weight indicator is equipped with one or more of the following protective interfaces:

- USB
- RS485
- Digital I/O
- Analog output (optional)
- Ethernet (optional)
- Profibus (optional)
- Profinet (optional)
- CAN bus (optional)
- Isolated RS232/RS422 (optional)

The interfaces are characterised “Protective interfaces” and do not have to be secured.

5. Approval conditions

5.1 Compatibility of modules

In case of composition of modules, OIML R76-1:2006 annex F shall be satisfied.

6. Special conditions for verification

6.1 Composition of modules

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

The composition of modules shall agree with Section 5.1.

7. Securing and sealing of SGM8x0 indicator/transmitter

7.1 Securing and sealing

Seals shall bear the verification mark of a notified body or alternative mark of the manufacturer according to ANNEX II, module D or F of the Directive 2014/32/EU.

7.1.1 SGM8x0 indicator/transmitter

Access to the configuration and calibration facilities is secured by a TAC counter and a CAL counters. The legally relevant software is secured by a SW counter. The value of the three counters shall be marked on the instrument at time of verification.

The electronic of the SGM8x0 weighing indicator/transmitter shall be protected against exchange by sealing of the enclosure against opening with brittle stickers.

7.1.2 Weight indicator/transmitter - load cell connector - load receptor

Sealing of the connection between the SGM8x0 weighing indicator/transmitter and the load receptor and load cell(s) is accomplished by sealing the connector(s) with brittle plastic sticker(s) or with wire and seal.

In the rare cases where this is not possible the connection can be secured in one of the following ways:

- Inserting the serial number of the load receptor as part of the principal inscriptions contained on the SGM8x0 weighing indicator/transmitter identification label.
- The load receptor bears the serial number of the SGM8x0 weighing indicator/transmitter on its data plate.

7.1.3 Junction box for load cells

A junction box for load cells shall be sealed against opening with wire and seal or brittle plastic sticker(s).

8. Tests performed

Tests carried out by FORCE for this evaluation certificate on PENKO Engineering's SGM8x0 weight indicator.

Test
Temperature effect on sensitivity with minimum weighing range and input impedance of 35 / 350 Ohm (20, 40, -10, 5 and 20 °C)
Temperature effect on no-load indication with minimum weighing range and input impedance of 35 Ohm (20, 40, -10, 5 and 20 °C)
Damp heat, steady state
Repeatability
Warm-up time
Span stability
Cable length between the wight indicator and a junction box for load cells
EMC immunity tests are performed with a load cell of 350 Ohm
Voltage variations
Electrical bursts (OIML D11:2004, severity level 3)
Electrostatic discharge
Radiated electromagnetic fields
Conducted electromagnetic fields

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

Surge is not tested as SGM8x0 is not to be supplied from DC Mains.

The test results have been re-examined

9. Documentation

Test report
DANAK-1914067, dated 24 April 2014, 38 pages
DANAK-1914066, dated 24 April 2014, 72 pages
DANAK-1914082, dated 02 May, 89 pages

Technical file
Contents of the technical documentation held by the notified body in technical file T207534.

10. Pictures

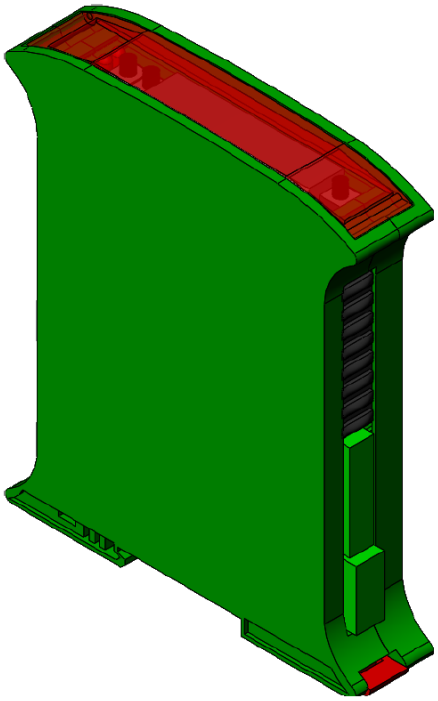

Figure 1 SGM8x0 enclosure

Figure 2 SGM8x0 front with cover closed

Figure 3 SGM8x0 front with cover opened

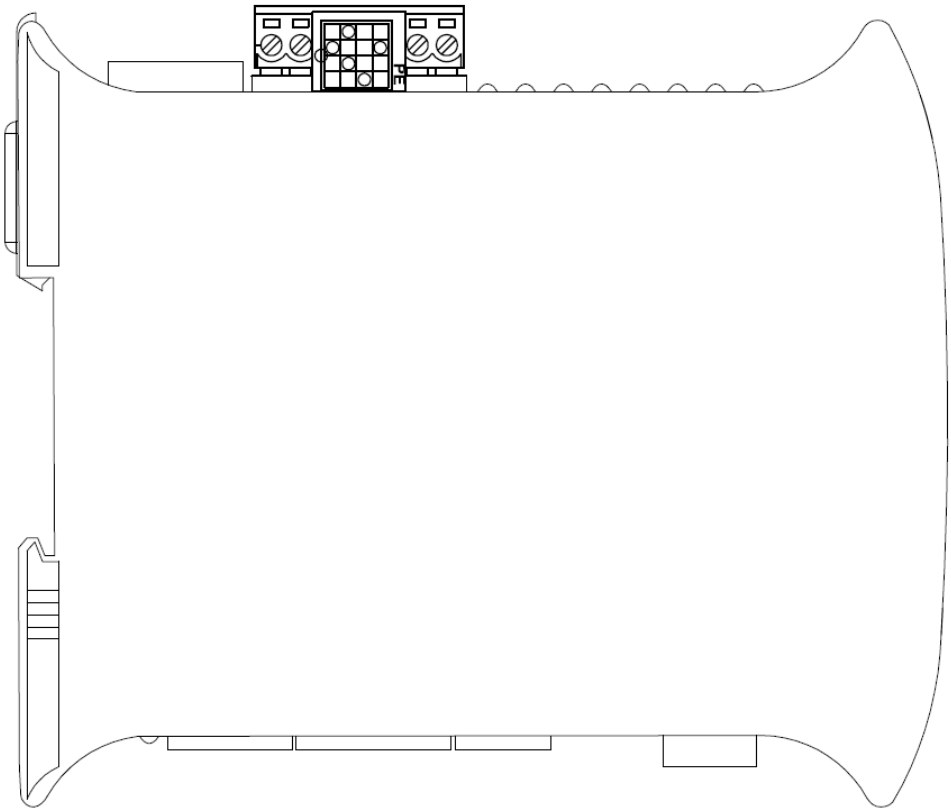

Figure 4 Sealing of SGM8x0 enclosure