



Ordinary Location

VEGAPULS Air 23, 41, 42

FM21NCA0004

FM21NUS0005



Document ID: 66385



VEGA



CERTIFICATE OF CONFORMITY

1. ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS
2. Certificate No: FM21NCA0004
3. Equipment: (Type Reference and Name) VEGAPULS Air 23
VEGAPULS Air 41
VEGAPULS Air 42
4. Name of Listing Company: Vega Grieshaber KG
5. Address of Listing Company: Am Hohenstein 113
Schiltach D-77761
Germany
6. The examination and test results are recorded in confidential report number:
PR459098 dated 6th August 2021
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:
CAN/CSA-C22.2 No. 61010-1:2012, CAN/CSA C22.2 No. 94.1:2015, CAN/CSA C22.2 No. 60529:2016

Certificate issued by:

J.E. Marquedant
J.E. Marquedant

VP, Manager - Electrical Systems

6 August 2021
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

F 333 (Apr 21)



Page 1 of 4

SCHEDULE

to Canadian Certificate Of Conformity No: FM21NCA0004

8. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

9. Equipment Ratings:

VEGAPULS Air 23

Suitable for use in ordinary (non-hazardous) locations, indoor and outdoor, with Degree of Protection IP66/69 and Type 6P.

VEGAPULS Air 41

Suitable for use in ordinary (non-hazardous) locations, indoor and outdoor, with Degree of Protection IP66/68 (IPX8 @ 0.2 bar, 24 hr) and Type 6P.

VEGAPULS Air 42

Suitable for use in ordinary (non-hazardous) locations, indoor and outdoor, with Degree of Protection IP66/68 (IPX8 @ 0.2 bar, 24 hr) and Type 6P.

10. **Description of Equipment:**

General

The VEGAPULS Air 23, 41, 42 are battery powered autarkic radar sensor with measured value transmission via radio technology continuous level measurement in plastic vessels.

The VEGAPULS Air 23, 41, 42 emit a continuous radar signal in GHz range through their antennas. The emitted signal is reflected by the medium and received as an echo by the antenna. The frequency difference between the emitted and received signal is proportional to the distance and depends on the filling height. The determined distance is converted into a respective output signal and output wirelessly as measured value.

The devices are powered by integrated primary cells (SAFT LS17500). The lithium cell used for this is a compact storage of high cell voltage and capacity for a long service life. There is no possibility to connect the VEGAPULS Air 23, 41, 42 to an external power supply. The cells are not intended to be replaced by the user

The measuring cycle described above is time-controlled via the integrated clock. Outside the measurement cycle, the device is in sleep mode. This concept of time-controlled sending of measured values and the sleep mode in between enables operation of the devices in the range of several years, depending on the measuring interval.

The VEGAPULS Air 23, 41, 42 transmit their measured values and other data wirelessly to asset management systems, e.g. the VEGA Inventory System. For this purpose, they offer the following transmission paths:

- Mobile radio NB-IoT (LTE-CAT-NB1)
- Mobile radio LTE-M (LTE-CAT-M1)
- LoRaWAN network Mobile radio via LTE-M (Long Term Evolution for Machines) as well as via NB-IoT (Narrow Band Internet of Things) is an extension of the mobile radio standard LTE to IoT

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
 T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

F 333 (Apr 21)

Page 2 of 4

SCHEDULE



to Canadian Certificate Of Conformity No: FM21NCA0004

Applications

Ambient conditions

Ambient temperature device -20 to +60 °C

Process conditions

For the process conditions, please also note the specifications on the type label. The lowest value (amount) always applies.

Process temperature -20°C to +60 °C

Process pressure

VEGAPULS Air 41, Air 42 -1 to 2 bar (-100 to 200 kPa/-14.5 to 29.01 psig)

Electrical Data

Integrated primary cells

Cell type	LS 17500, Lithium metal (Li/SOCL2), not rechargeable
Number of single cells	
VEGAPULS Air 23	2
VEGAPULS Air 41, Air 42	5
Cell voltage, each	3.6 V
Cell capacitance, each	3.6 Ah
Energy content, each	12.96 Wh
Lithium content, each	approx. 0.9 g
Weight, per typ.	23 g
Self-discharge	< 1 % after 1 year at 20 °C

Enclosure materials

Part	Material
Housing Top and Housing Bottom	PVDF Kynar 720(f1)
O-Ring Silicone Red	VMQ 50.54-01 (50 Shore A)

11. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals Canadian Certification Requirements.

12. Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
 T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmaprovals.com www.fmaprovals.com

F 333 (Apr 21)

Page 3 of 4

SCHEDULE



to Canadian Certificate Of Conformity No: FM21NCA0004

13. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
6 th August 2021	Original Issue.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

F 333 (Apr 21)

Page 4 of 4



CERTIFICATE OF CONFORMITY

1. ELECTRICAL EQUIPMENT PER US REQUIREMENTS

2. Certificate No: FM21NUS0005

3. Equipment:
(Type Reference and Name) VEGAPULS Air 23
VEGAPULS Air 41
VEGAPULS Air 42

4. Name of Listing Company: Vega Grieshaber KG

5. Address of Listing Company: Am Hohenstein 113
Schiltach D-77761
Germany

6. The examination and test results are recorded in confidential report number:

PR459098 dated 6th August 2021

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3810:2018, ANSI/UL 61010-1:2012, ANSI/UL 50:2015, ANSI/IEC 60529:R2011

8. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:

J.E. Marquedant
J.E. Marquedant
VP, Manager - Electrical Systems

6 August 2021
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmaprovals.com www.fmaprovals.com

SCHEDULE

to US Certificate Of Conformity No: FM21NUS0005

9. Equipment Ratings:

VEGAPULS Air 23

Suitable for use in ordinary (non-hazardous) locations, indoor and outdoor, with Degree of Protection IP66/69 and Type 6P.

VEGAPULS Air 41

Suitable for use in ordinary (non-hazardous) locations, indoor and outdoor, with Degree of Protection IP66/68 (IPX8 @ 0.2 bar, 24 hr) and Type 6P.

VEGAPULS Air 42

Suitable for use in ordinary (non-hazardous) locations, indoor and outdoor, with Degree of Protection IP66/68 (IPX8 @ 0.2 bar, 24 hr) and Type 6P.

10. Description of Equipment:

General

The VEGAPULS Air 23, 41, 42 are battery powered autarkic radar sensor with measured value transmission via radio technology continuous level measurement in plastic vessels.

The VEGAPULS Air 23, 41, 42 emit a continuous radar signal in GHz range through their antennas. The emitted signal is reflected by the medium and received as an echo by the antenna. The frequency difference between the emitted and received signal is proportional to the distance and depends on the filling height. The determined distance is converted into a respective output signal and output wirelessly as measured value.

The devices are powered by integrated primary cells (SAFT LS17500). The lithium cell used for this is a compact storage of high cell voltage and capacity for a long service life. There is no possibility to connect the VEGAPULS Air 23, 41, 42 to an external power supply. The cells are not intended to be replaced by the user.

The measuring cycle described above is time-controlled via the integrated clock. Outside the measurement cycle, the device is in sleep mode. This concept of time-controlled sending of measured values and the sleep mode in between enables operation of the devices in the range of several years, depending on the measuring interval.

The VEGAPULS Air 23, 41, 42 transmit their measured values and other data wirelessly to asset management systems, e.g. the VEGA Inventory System. For this purpose, they offer the following transmission paths:

- Mobile radio NB-IoT (LTE-CAT-NB1)
- Mobile radio LTE-M (LTE-CAT-M1)
- LoRaWAN network Mobile radio via LTE-M (Long Term Evolution for Machines) as well as via NB-IoT (Narrow Band Internet of Things) is an extension of the mobile radio standard LTE to IoT Applications

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

F 332 (Jun 16)

Page 2 of 4



SCHEDULE

to US Certificate Of Conformity No: FM21NUS0005

Ambient conditions

Ambient temperature device -20 to +60 °C

Process conditions

For the process conditions, please also note the specifications on the type label. The lowest value (amount) always applies.

Process temperature -20°C to +60 °C

Process pressure

VEGAPULS Air 41, Air 42 -1 to 2 bar (-100 to 200 kPa/-14.5 to 29.01 psig)

Electrical Data

Integrated primary cells

Cell type	LS 17500, Lithium metal (Li/SOCL2), not rechargeable
Number of single cells	
VEGAPULS Air 23	2
VEGAPULS Air 41, Air 42	5
Cell voltage, each	3.6 V
Cell capacitance, each	3.6 Ah
Energy content, each	12.96 Wh
Lithium content, each	approx. 0.9 g
Weight, per typ.	23 g
Self-discharge	< 1 % after 1 year at 20 °C

Enclosure materials

Part	Material
Housing Top and Housing Bottom	PVDF Kynar 720(f1)
O-Ring Silicone Red	VMQ 50.54-01 (50 Shore A)

11. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

12. Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
 T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

SCHEDULE



to US Certificate Of Conformity No: FM21NUS0005

13. **Certificate History**

Details of the supplements to this certificate are described below:

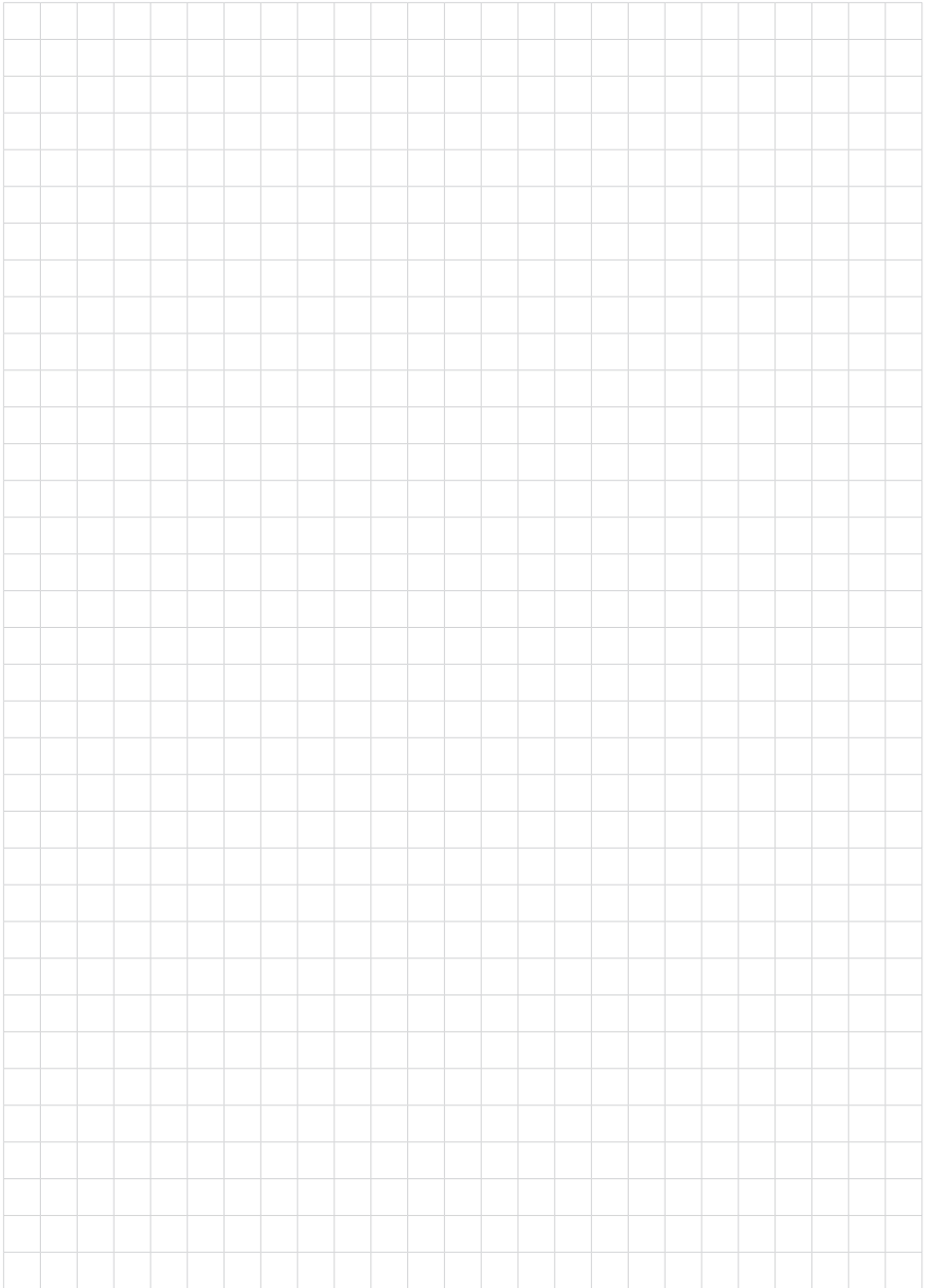
Date	Description
6 th August 2021	Original Issue.

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

FM Approvals LLC, 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
 T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

F 332 (Jun 16)

Page 4 of 4



Printing date:

VEGA

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

Subject to change without prior notice

© VEGA Grieshaber KG, Schiltach/Germany 2021

66385-EN-210909

VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany

Phone +49 7836 50-0
E-mail: info.de@vega.com
www.vega.com