

ADDENDUM TO OPERATING INSTRUCTIONS

FLWSIC500
Gas flow meter

FLWSIC500 – Class I, Division 2

Document Information

Described Product

Product name: FLOWSIC500

Document ID

Title: Addendum to Operating Instructions
FLOWSIC500 "Class I, Division 2"
Part No.: 8022943
Document ID: 9285023
Version: 1-0
Release: 2018-05

Manufacturer

SICK Engineering GmbH
Bergener Ring 27 · D-01458 Ottendorf-Okrilla · Germany
Phone: +49 35205 52410
Fax: +49 35205 52450
E-mail: info.pa@sick.de

Original Documents

The English version 8022943 of this document is an original document from SICK Engineering GmbH.
SICK Engineering GmbH assumes no liability for the correctness of an unauthorized translation.
Please contact SICK Engineering GmbH or your local representative in case of doubt.

Legal Information

Subject to change without notice.

© SICK Engineering GmbH. All rights reserved.

Warning Symbols



Hazard (general)

Warning Levels / Signal Words

DANGER

Risk or hazardous situation which *will* result in severe personal injury or death.

WARNING

Risk or hazardous situation which *could* result in severe personal injury or death.

CAUTION

Hazard or unsafe practice which *could* result in less severe or minor injuries.

NOTICE

Hazards which *could* result in property damage

Information Symbols



Important technical information for this product



Supplementary information



Link to information in another place

1	Important Information	5
1.1	About this document	6
1.2	For your safety	6
2	Class I Division 2	7
2.1	Product identification	8
2.2	Operation in potentially explosive atmospheres	9
2.3	Product description	10
2.4	Electrical Installation	11
2.4.1	Operating parameters and terminal assignment	11
2.5	Annex	14

FLOWSIC500

1 Important Information

About this document
For your safety

1.1 **About this document**

This document is an addendum to the currently valid Operating Instructions FLOWSIC500 and may only be used in conjunction with them.

This document applies to FLOWSIC500 with Ex classification Class I, Division 2, Groups A, B, C, and/or D, T4 (see type plate → p. 9, Fig. 3).

Special instructions for FLOWSIC500 in this document overwrite related general information in the FLOWSIC500 Operating Instructions

1.2 **For your safety**

**NOTICE:**

- ▶ Read the Operating Instructions carefully before using the FLOWSIC500.
- ▶ Observe all safety and warning notes!

FLWSIC500

2 Class I Division 2

Product identification
Operation in potentially explosive atmospheres
Product description
Electrical Installation

2.1 Product identification

Make sure this document is valid for your FLOWSIC500:

- Check the type code, position 20 "Ex certification" on the type plate (→ Fig. 2) of your FLOWSIC500.

The FLOWSIC500 with Ex certification "4" Class I, Division 2, Groups A, B, C, and/or D, T4 is described in this document.

Fig. 1 Type code

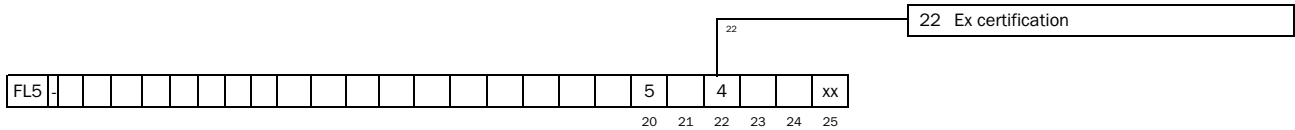
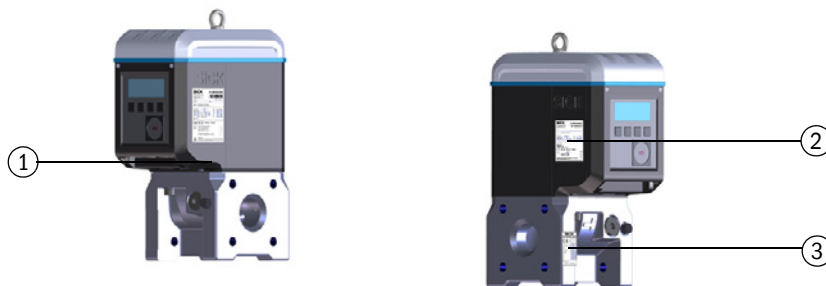


Fig. 2 Location of type plates

Marking according to CSA








- 1 Type plate, metrological parameters (metrology)
- 2 Type plate, electrical parameters (electronics)
- 3 Type plate, Pressure Equipment Directive

Fig. 3 Type plate electrical parameters (examples)

Battery-powered version

Externally powered version

SICK FLOWSIC500	
FL5-abccdefghijklmnopqr5C4v	
Part No. 1000000	Serial No. 10000000
 SP C US	Cl. I, Div. 2, Groups A, B, C and D, T4 Class I, Zone 2, IIC T4 Gc CSA 13.2566240
Powered by Battery pack inside ext. Power supply not allowed	
 WARNING-EXPLOSION HAZARD: Substitution of components may impair suitability for Class I, Division 2. Do not connect while circuit is live unless area is known to be nonhazardous. AVERTISSEMENT-RISQUE D'EXPLOSION: La substitution de composants peut nuire a la Class I, Division 2. Ne pas se connecter lorsque le circuit est sous tension a moins que la zone ne soit reconnue non dangereuse.	
	
Sensor	Sensor
(1) PWR+ (2) Data+ (3) GND (4) Data-	(1) PWR+ (2) Data+ (3) GND (4) Data-
Diameter: 3.445"	Material: Aluminium
Max. weight: 40.3lb (incl. adapter)	4099990

SICK FLOWSIC500	
FL5-abccdefghijklmnopqr5B4v	
Part No. 1000000	Serial No. 10000000
 SP C US	Cl. I, Div. 2, Groups A, B, C and D, T4 Class I, Zone 2, IIC T4 Gc CSA 13.2566240
Power Supply: Class 2/SELV 5.5...28.8 Vdc; max. 100 mA	
 WARNING-EXPLOSION HAZARD: Substitution of components may impair suitability for Class I, Division 2. Do not connect while circuit is live unless area is known to be nonhazardous. AVERTISSEMENT-RISQUE D'EXPLOSION: La substitution de composants peut nuire a la Class I, Division 2. Ne pas se connecter lorsque le circuit est sous tension a moins que la zone ne soit reconnue non dangereuse.	
	
Sensor	Sensor
(1) PWR+ (2) Data+ (3) GND (4) Data-	(1) PWR+ (2) Data+ (3) GND (4) Data-
Diameter: 3.445"	Material: Aluminium
Max. weight: 40.3lb (incl. adapter)	4099990

2.2

Operation in potentially explosive atmospheres



The FLOWSIC500 is suitable for use in potentially explosive atmospheres:
Class I, Division 2, Groups A, B, C, and/or D, T4.

2.3

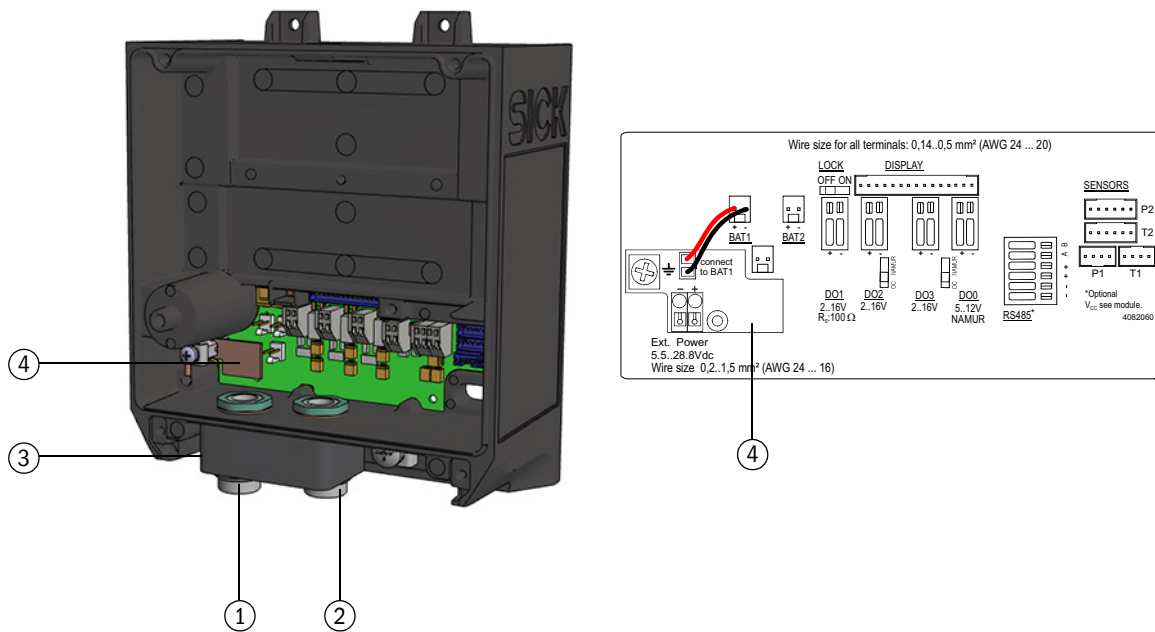
Product description

Instead of the two M12 connectors, the Class I, Division 2 version of the FLOWSIC500 is equipped with with 1/2" NPT thread adapter in order to provide wiring methods according to the CEC Part 1.

An additional circuit board is installed in the terminal compartment for the externally powered meter configuration.

Additional M8 connectors for connection of external pressure and temperature sensors are optionally available (see Operating Instructions FLOWSIC500, §3.5).

Fig. 4 FLOWSIC500 Class I, Division 2



- 1 Gable entry 1 - 1/2" NPT
- 2 Cable entry 2 - 1/2" NPT
- 3 Thread adapter
- 4 Additional circuit board for externally powered meter configuration of FLOWSIC500 Class I, Division 2

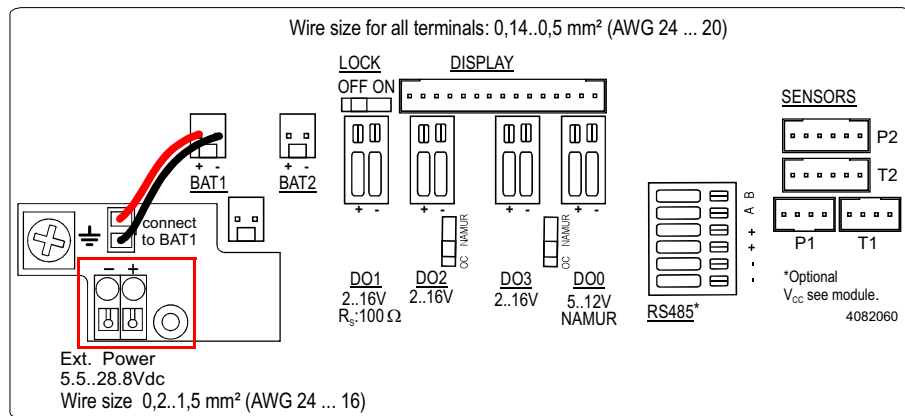
2.4 Electrical Installation

WARNING:
 Do not change internal switch settings, or connect or disconnect unless power has been removed, or the area is known to be non-hazardous.

AVERTISSEMENT:
 Ne modifiez pas les paramètres du commutateur interne, ou connectez ou déconnectez-le, sauf si l'alimentation a été coupée ou si la zone est réputée non dangereuse.

- ▶ In case of a battery powered meter configuration, connect the batteries as described in the Operating Instructions FLOWSIC500, §3.4.9 "Battery operation". Connection with an additional external power supply is not allowed.
- ▶ An additional circuit board is installed in case of an externally powered meter configuration. Connect the external power supply to the circuit board according to → Fig. 5 (connection: Ext. Power).
- ▶ Install in accordance with the CEC, part 1 or NEC500/NEC505. Keep unused cable entries closed with the supplied blind plugs.

Fig. 5 Connection for external power supply



2.4.1 Operating parameters and terminal assignment

2.4.1.1 Cable entry 1

Terminal assignment for battery- powered meter configuration

WARNING:
 No external power supply may be connected in case of a battery powered meter configuration.

Table 1 Terminal assignment for cable entry 1, externally powered meter configuration

Terminal assignment	Function/signal	Operating parameters
DO_1-	Diagnosis warning, Pulse output in test mode (→ Table 1) and for configuration K,	Passive, not electrically isolated
DO_1+	f _{max} = 2 kHz at 120% Q _{max}	Max. 16 V Max. 100 mA R _{on} < 110 Ω R _{off} > 1 MΩ

Terminal assignment for externally powered meter configuration

Table 2

Terminal assignment for cable entry 1, externally powered meter configuration

Terminal assignment	Function/signal	Operating parameters
PWR-	Voltage supply	Rated input voltage 5.5 ... 28.8 V dc, 100 mA, Class 2 / SELV
PWR+		
DO_1-	Diagnosis warning, Pulse output in test mode (→ Table 1) and for configuration K, $f_{\max} = 2 \text{ kHz}$ at 120% Q_{\max}	Passive, not electrically isolated Max. 16 V Max. 100 mA $R_{\text{on}} < 110 \Omega$ $R_{\text{off}} > 1 \text{ M}\Omega$
DO_1+		

2.4.1.2

Cable entry 2: Signal output

Table 3

Terminal assignment for cable entry 2

Terminal assignment	Function/signal	Operating parameters
Terminal assignment configuration 1: LF pulses and malfunction (electrically isolated), type code I/O: F		
DO_2+	LF pulses f_{\max} configurable to 100 Hz at 120% Q_{\max}	Passive, electrically isolated, configurable as: OC (Open Collector)*: Max. 16 V Rated current 20 mA
DO_2-		
DO_3-	Malfunction	or NAMUR: Rated input voltage 8.2 V $I_{\text{on}} = 3.4 \text{ mA}$ $I_{\text{off}} = 0.7 \text{ mA}$
DO_3+		
Terminal assignment configuration 2: HF pulses and malfunction (electrically isolated), type code I/O: G		
DO_0+	HF pulses f_{\max} configurable to 2 kHz at 120% Q_{\max}	NAMUR, electrically isolated, optically isolated Rated input voltage 8.2 V $I_{\text{on}} = 3.4 \text{ mA}$ $I_{\text{off}} = 0.7 \text{ mA}$
DO_0-		
DO_3-	Malfunction	Passive, electrically isolated, configurable as OC (Open Collector)* or NAMUR, see Configuration 1 for operating parameters
DO_3+		
Pin assignment configuration 3: Encoder and LF pulses (electrically isolated), type code I/O: H		
DO_0+	Encoder log	NAMUR, electrically isolated, optically isolated Rated input voltage 8.2 V $I_{\text{on}} = 3.4 \text{ mA}$ $I_{\text{off}} = 0.7 \text{ mA}$
DO_0-		
DO_3-	LF pulses	Passive, electrically isolated, configurable as OC (Open Collector)* or NAMUR, see Configuration 1 for operating parameters
DO_3+		

* Standard configuration

Table 3 Terminal assignment for cable entry 2

Terminal assignment	Function/signal	Operating parameters
Terminal assignment configuration 4: RS485 module (external feed), standard version: Type code I/O: J, low voltage version: Type code I/O: I		
PWR+	RS485 module (externally powered)	Electrically isolated
Data A		Standard version: Rated input voltage 4 ... 16 V dc
PWR-		Low voltage version: Rated input voltage 2.7 ... 5 V dc
Data B		
Terminal assignment configuration 5: Encoder and HF pulses (not electrically isolated), type code I/O: K		
The HF pulses are output via DO_1, → Table 2.		
DO_0+	Encoder log	NAMUR, electrically isolated, optically isolated Rated input voltage 8.2 V $I_{on} = 3.4 \text{ mA}$ $I_{off} = 0.7 \text{ mA}$
DO_0-		
DO_3-	Malfunction	Passive, electrically isolated, configurable as OC (Open Collector)* or NAMUR, see Configuration 1 for operating parameters
DO_3+		
* Standard configuration		
Terminal assignment configuration 6: LF pulses and malfunction (electrically isolated), type code I/O: L		
DO_2+	LF pulses	Passive, electrically isolated, configurable as: OC (Open Collector)*: Max. 16 V Rated current 20 mA
DO_2-	f_{max} configurable to 100 Hz at 120% Q_{max}	
DO_3-	LF pulses	or NAMUR: Rated input voltage 8.2 V $I_{on} = 3.4 \text{ mA}$ $I_{off} = 0.7 \text{ mA}$
DO_3+	f_{max} configurable to 100 Hz at 120% Q_{max}	

2.5

Annex

Fig. 6

Type code

1	Device type	FL5 FLOWSIC500
2	Nominal size adapter	X Replacement meter only
	1	DN 50 / 2"
	2	DN 80 / 3"
	3	DN100 / 4"
	D	DN150 / 6", adapter 4"
3	Flange-flange dimension adapter	X Replacement meter only
	A	50 mm
	B	171 mm
	E	241 mm
	G	300 mm
	L	450 mm
4	Pressure rating / flange standard	O1 PN16 / EN1092-1
	O2	Class 150 / ASME B16.5
5	Mating surface	X Replacement meter only
	A	Flat face, smooth finish
	B	Raised face, smooth finish
	C	Form A / DIN EN 1092-1
	D	Form B1 / DIN EN 1092-1
6	Connection p-sensor	X Replacement meter only
	1	Plug NPT 1/4"
	2	Plug G1/4"
	3	Compression fitting 1/4"
	4	Compression fitting D6
7	Connection T-sensor	X Replacement meter only
	A	without
	E	2x G 1/2" plug
8	Material adapter/gas meter	1 Aluminum / aluminum
9	Material certification adapter/gas meter	A 3.1 / 3.1
10	Surface adapter/gas meter	1 Shot-peened / SICK standard
11	Reserve	X -
12	Nominal size gas meter	1 DN 50 / 2"
	2	DN 80 / 3"
	3	DN100 / 4"
	C	DN150 / 6"
13	Flow direction	A Left - right
	B	Right - left
14	Transducer	1 Type 1: 300 kHz
15	Maximum flow rate	A Qmax 65 m ³ /h
	B	Qmax 100 m ³ /h
	C	Qmax 160 m ³ /h
	D	Qmax 250 m ³ /h
	E	Qmax 400 m ³ /h
	F	Qmax 650 m ³ /h
	G	Qmax 1000 m ³ /h
16	Measuring span	1 1:50
	2	1:100
	3	1:160
	4	1:200
	9	1:250

17	Sensoric for volume correction	A -
	B	T-Sensor external
	C	T-Sensor internal
	D	p/T-Sensoren external
	E	p/T-Sensoren internal
18	Gas temperature/ambient temperature	1 -25°C ... +60°C / -25°C ... +60°C
	3	-40°C ... +70°C / -40°C ... +70°C
19	Pressure range p-Sensor	A -
	B	absolute 0,8 ... 5,2 bar
	C	absolute 2,0 ... 10,0 bar
	D	absolute 4,0 ... 20,0 bar
	F	relative 0 ... 4,0 bar / 0 ... 58,0 PSI
	G	relative 0 ... 10,0 bar / 0 ... 145,0 PSI
	H	relative 0 ... 25,0 bar / 0 ... 362,6 PSI
20	Cable connection	5 Cable entries, NPT
21	Power supply	B External with backup battery
	C	Autarkic with battery pack (5 years)
22	EX certification	4 CSA Class 1 Div 2, Groups A, B, C, and/or D, T4
23	I/O (Interface configurations)	A Impulse LF + Status (not galvanically isolated)
	B	Impulse HF (galvanically isolated)
	C	Encoder
	D	RS485 (externally powered)
	E	Encoder + Impulse (not galvanically isolated)
	F	Impulse LF + Status (galvanically isolated)
	G	Impulse HF + Status (galvanically isolated)
	H	Encoder + Impulse LF (galvanically isolated)
	I	RS485 Modul - battery powered (external)
	J	RS485 Modul - line powered (external)
	K	Encoder + Impulse HF (not galvanically isolated)
	L	2 x LF-Impulses (galvanically isolated)
24	Conformity	2 PED
	3	MID, PED
25	Customized solution	XX -

Australia

Phone +61 3 9457 0600
1800 334 802 – tollfree
E-Mail sales@sick.com.au

Austria

Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Belgium/Luxembourg

Phone +32 (0)2 466 55 66
E-Mail info@sick.be

Brazil

Phone +55 11 3215-4900
E-Mail marketing@sick.com.br

Canada

Phone +1 905 771 14 44
E-Mail information@sick.com

Czech Republic

Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

Chile

Phone +56 2 2274 7430
E-Mail info@schadler.com

China

Phone +86 4000 121 000
E-Mail info.china@sick.net.cn

Denmark

Phone +45 45 82 64 00
E-Mail sick@sick.dk

Finland

Phone +358-9-2515 800
E-Mail sick@sick.fi

France

Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Germany

Phone +49 211 5301-301
E-Mail info@sick.de

Great Britain

Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

Hong Kong

Phone +852 2153 6300
E-Mail ghk@sick.com.hk

Hungary

Phone +36 1 371 2680
E-Mail office@sick.hu

India

Phone +91-22-4033 8333
E-Mail info@sick-india.com

Israel

Phone +972-4-6881000
E-Mail info@sick-sensors.com

Italy

Phone +39 02 27 43 41
E-Mail info@sick.it

Japan

Phone +81 (0)3 5309 2112
E-Mail support@sick.jp

Malaysia

Phone +603 808070425
E-Mail enquiry.my@sick.com

Netherlands

Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

New Zealand

Phone +64 9 415 0459
0800 222 278 – tollfree
E-Mail sales@sick.co.nz

Norway

Phone +47 67 81 50 00
E-Mail sick@sick.no

Poland

Phone +48 22 837 40 50
E-Mail info@sick.pl

Romania

Phone +40 356 171 120
E-Mail office@sick.ro

Russia

Phone +7-495-775-05-30
E-Mail info@sick.ru

Singapore

Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovakia

Phone +421 482 901201
E-Mail mail@sick-sk.sk

Slovenia

Phone +386 (0)1-47 69 990
E-Mail office@sick.si

South Africa

Phone +27 11 472 3733
E-Mail info@sickautomation.co.za

South Korea

Phone +82 2 786 6321
E-Mail info@sickkorea.net

Spain

Phone +34 93 480 31 00
E-Mail info@sick.es

Sweden

Phone +46 10 110 10 00
E-Mail info@sick.se

Switzerland

Phone +41 41 619 29 39
E-Mail contact@sick.ch

Taiwan

Phone +886 2 2375-6288
E-Mail sales@sick.com.tw

Thailand

Phone +66 2645 0009
E-Mail tawiwat@sicksgp.com.sg

Turkey

Phone +90 (216) 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates

Phone +971 (0) 4 88 65 878
E-Mail info@sick.ae

USA/Mexico

Phone +1(952) 941-6780
1 (800) 325-7425 – tollfree
E-Mail info@sick.com

Vietnam

Phone +84 8 62920204
E-Mail Ngo.Duy.Linh@sicksgp.com.sg

More representatives and agencies
at www.sick.com