Analog signal converters CC-E I/I
Current / current isolators
Data sheet

CC-E I/I-1

CC-E I/I-2

Features

- Loop-powered I/I isolator without external power supply for analog current signals of 0-20 mA and 4-20 mA
- Electrical isolation between input and output
- Very low internal voltage drop ≤ 2,5 V
- Available with one or two independent channels
- Width only 18 mm (1 and 2 channels)

Approvals

c UL us LISTED (pending)

Ordering data

Type	Number of channels	Order code
CC-E I/I-1	1 channel	1SVR 010 200 R1600
CC-E I/I-2	2 channel	1SVR 010 201 R0300

Application

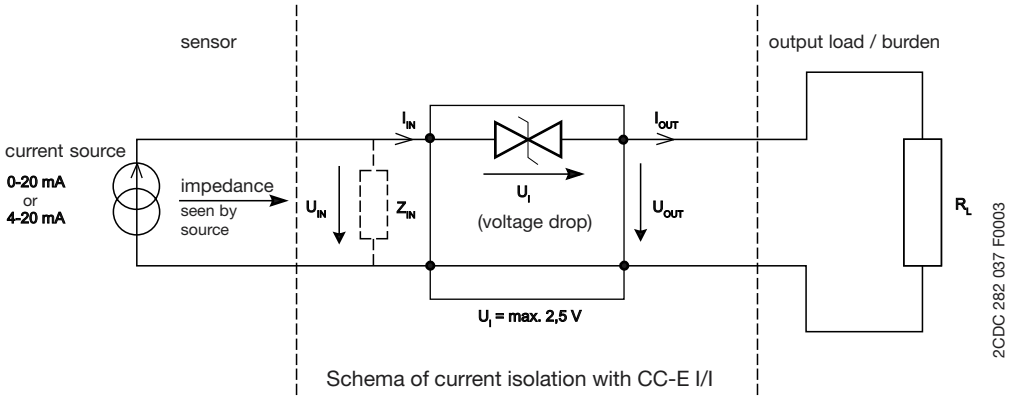
The CC-E I/I is an isolator for the electrical isolation of current signals without auxiliary supply. It allows the isolation between sensors, transmitters, actuators etc. and the signal receivers. Wiring instructions see page 2.

Operating mode

One of the most important characteristics of the CC-E I/I is the internal voltage drop of < 2,5 V and the burden to be driven by the input current source.

Calculation of the max. output load R_L of the isolator CC-E I/I depends on the max. load to be connected to the input current source:

Most current sources are designed to drive a load between 20 Ω and 500 Ω. In our example, a value of 500 Ω is used, which can be driven by the current source connected to the input of the isolator.



Schema of current isolation with CC-E I/I

The burden to be driven by the input current source is the input impedance (Z_{IN}) of the isolator CC-E I/I. Z_{IN} will vary with the output load as follows:

$Z_{IN} = R_L + U_{IN} / I$

$Z_{IN} = 500\ \Omega$ (max. load, which the input current source can drive)

$R_L = Z_{IN} - U_{IN} / I$

$R_L = 500\ \Omega - U_{IN} / I$

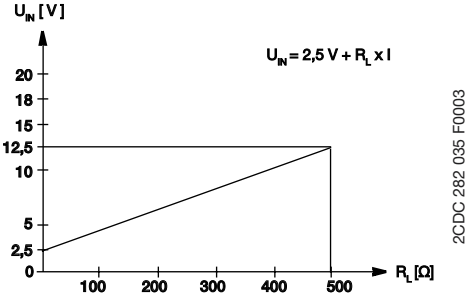
this means that

I = 20 mA and U_I = 2,5 V is followed by:

$R_L = 500\ \Omega - 2,5\ V / 20\ mA$

$R_L =$ **375 Ω**

In this example, the CC-E I/I can drive a maximum output load R_L of 375 Ω. If the input burden to be driven is larger, the input current source must be increased. At a maximum output load of R_L = 500 Ω of the isolator CC-E I/I, the input current source is loaded with 625 Ω.



Input voltage depending on the output load
R_L at I = 20 mA

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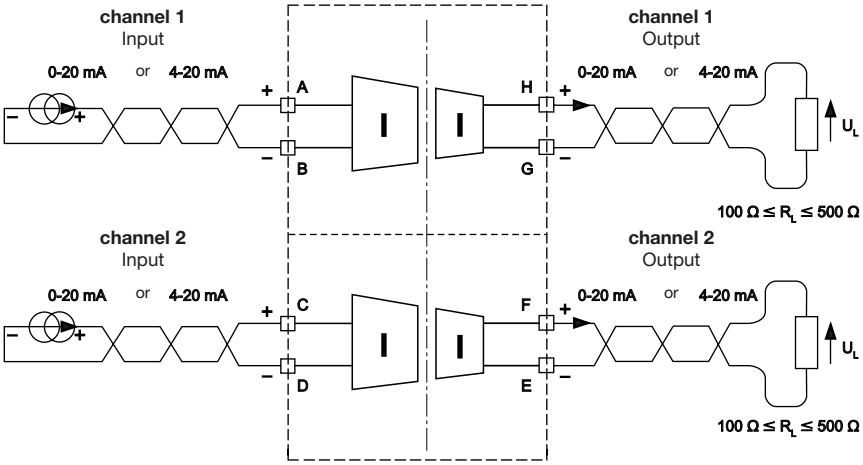
Wiring instructions



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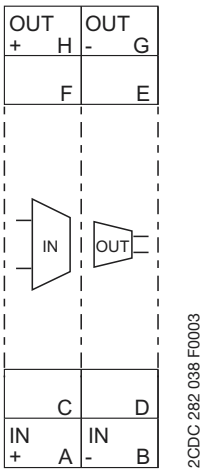
Position of connection terminals



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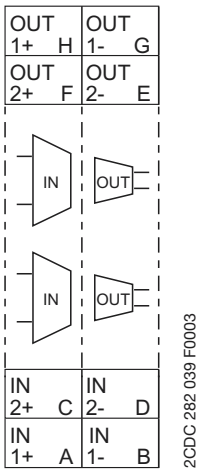
A, B Input
G, H Output

Version: 1 channel
(1SVR 010 200 R1600)



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A, B Input (channel 1)
G, H Output (channel 1)
C, D Input (channel 2)
E, F Output (channel 2)

version: 2 channels
(1SVR 010 201 R0300)

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Technical data

Input circuit		**channel 1: A (+), B (-), channel 2: C (+), D (-)**
Input current I_{IN}		0-20 mA, 4-20 mA
Input current minimum		< 100 µA
Input current maximum		50 mA[1] (U_{IN} < 18 V)
Input voltage U_{IN}		U_{IN} < 2.5 V + (I_{IN} x R_L)
Input voltage drop U_I		< 2.5 V (20 mA, R_L = 0Ω)
Input voltage maximum		18 V[1] (I_{IN} < 50 mA)
Output circuit		**channel 1: H (+), G (-), channel 2: F (+), E (-)**
Output current I_{OUT}		0-20 mA, 4-20 mA
Output load R_L		0-500 Ω
Output voltage U_{OUT}		U_{OUT} = I_{OUT} x R_L
Residual ripple		< 20 mV_{pp} (500 Ω, 20 mA)
Response time (0-100 %)		< 15 ms (0-500 Ω, 20 mA), < 5 ms (500 Ω, 20 mA, 25 °C)
Accuracy output to input current		≤ 0.1 % of full scale (20 mA)
Temperature coefficient		< ± 50 ppm / °K
Load influence (0-500 Ω)		≤ ± 0.05 % / 100 Ω, ≤ - 0.1 % / 100 Ω (25 °C)
General data		
Width of the enclosure		18 mm
Wire size		max. 2.5 mm² (14 AWG)
Weight	1 channel	approx. 37 g / 1.295 oz
	2 channel	approx. 44 g / 1.54 oz
Mounting position		any
Degree of protection	enclosure / terminals	IP 20 /IP 20
Temperature range	operation	-25 °C ... +60 °C
	storage	-40 °C ... +85 °C
Mounting		DIN rail (EN 50022)
Standards		
Product standard		EN 50178 (partly)
Low Voltage Directive		73/23/EEC
EMC Directive		89/336/EEC
Electromagnetic compatibility		
Interference immunity	acc. to EN 61000-6-2	
electrostatic discharge (ESD)	acc. to EN 61000-4-2	level 3 (6/8 kV)
electromagnetic field	acc. to EN 61000-4-3	level 3 (10 V/m)
fast transients (Burst)	acc. to EN 61000-4-4	level 3 (2 kV / 5 kHz)
powerfull impulses (Surge)	acc. to EN 61000-4-5	installation class 3 (0.5/1 kV)
HF line emission	acc. to EN 61000-4-6	10 V, 150 kHz - 80 MHz
magnetic field	acc. to EN 61000-4-8	30 A/m
Interference emission	acc. to EN 61000-6-4	
Radiated noise	acc. to EN 55011	class B
Operational reliability	acc. to EN 68-2-6	4 g
Mechanical resistance	acc. to EN 68-2-6	10 g
Environmental testing	acc. to IEC 68-2-30 Db	24 h Zyklus, 55 °C, 93 % rel., 96 h
Approvals		**cUL (pending)**
Isolation data		
Insulation voltage input / output		500 V_{eff} / 50 Hz
Insulation voltage between channels	(device with 2 channels)	5 kV_{eff} / 50 Hz
Pollution category		II
Overvoltage category		II

[1] The input parameters have to be limited to the indicated maximum values.

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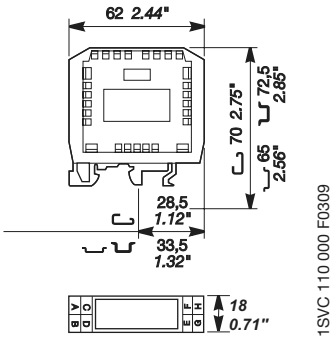
Dimensions

in mm



1SVC 110 000 F0309

Publication No. 2CDC 115 003 D0201
Printed in the Federal Republik of Germany

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