

## Supplementary Components

Isolating power supplies and Output isolators

### SITRANS I100

#### Overview



Analog input 0/4 to 20 mA

The isolating power supplies are used for the intrinsically safe operation of 2- and 3-wire transmitters and for connecting to intrinsically safe mA sources.

The 2- and 3-wire transmitters are supplied with auxiliary power from the transmitter supply unit.

For 2-wire transmitters the isolators transfer the HART communication signal bidirectionally.

#### Benefits

- Active output 0/4 to 20 mA
- Suitable for 2-, 3-wire transmitters, 2-wire HART transmitters and mA sources
- Intrinsically safe input [Ex ia] IIC
- Galvanic isolation between input, output and auxiliary power
- Open-circuit and short-circuit monitoring and messaging for input and output (can be switched off)
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 2 (IEC 61508)

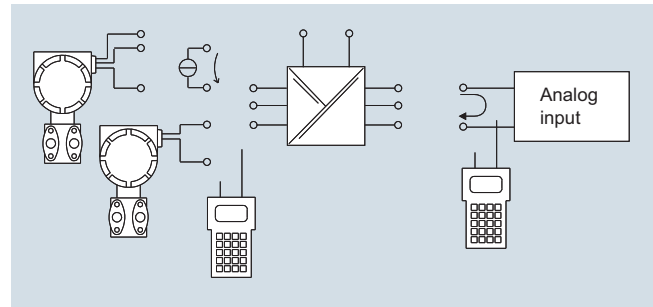
	Zones					
	0	1	2	20	21	22
Ex i interfaces	X	X	X	X	X	X
Installation in			X			X

#### Design

The HART isolating power supply is comprised of a compact plastic enclosure (IP30) and is equipped with push-in screw terminals.

On the front are a green LED for indicating the power supply status and a red LED for signaling errors.

The auxiliary power supply can be connected individually using push-in screw terminals or jointly for up to 40 units using pac-Bus.



SITRANS I100 isolating power supply, function block diagram

#### Technical specifications

##### SITRANS I100 Isolating Power Supplies with HART

###### Ex i input

Input signal	0/4 ... 20 mA with HART
Functional range	0 ... 24 mA
Max. input current for mA sources	50 mA
Transmitter supply voltage	≥ 16 V at 20 mA (for 2-, 3-wire)
Supply voltage residual ripple	≤ 25 mV <sub>eff</sub>
No-load voltage	≤ 26 V
Short-circuit current	≤ 35 mA
Input resistance (AC impedance HART)	≈ 500 Ω
Input resistance for mA sources	30 Ω
Communication signal (on 2-wire transmitters)	Bidirectional HART transmission, 0.5 ... 30 kHz

###### Output

Output signal	0/4 ... 20 mA with HART
Load resistance R <sub>L</sub>	0 ... 600 W (terminal 1+/2-) 0 ... 379 W (terminal 3+/2-) (with internal 221 Ω resistance for HART)
Residual ripple	≤ 40 μA <sub>eff</sub>
No-load voltage	≤ 15.5 V
Communication signal	Bidirectional HART transmission, 0.5 kHz ... 30 kHz
Response time (10 % ... 90 %)	≤ 25 ms
Transfer behavior Input/Output	1:1 (0 ... 20 mA --> 0 ... 20 mA, 4 ... 20 mA --> 4 ... 20 mA)

###### Measuring accuracy

Accuracy, typical data expressed as % of calibrated span at U <sub>N</sub> , 23 °C	
Linearity error	≤ 0.1 %
Offset error	≤ 0.1 %
Temperature influence	≤ 0.1 %/10 K
Power supply effect within voltage range	≤ 0.01 %
Load resistance effect	≤ 0.02 %

## Supplementary Components

### Isolating power supplies and Output isolators

SITRANS I100

<b>Rated conditions</b>		<b>Error detection Ex i input</b>	
Degree of protection of enclosure	IP30	• Open circuit	< 2 mA
Degree of protection of terminals	IP20	• Short-circuit	> 22 mA
Ambient conditions		• Output behavior	= Input signal
• Ambient temperature	-20 ... +60 °C/+70 °C (-4 ... +140 °F/+158 °F) (see "Operating instructions")	• Output current at $I_{in} = 0$	$I_{out} = 0$ mA
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)	Error detection output	
• Relative humidity (no condensation)	≤ 95 %	• Open circuit	< 2 mA
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in the industrial environment	Error messaging Ex i input/output	
<b>Mechanical specifications</b>		• Settings (LF switch)	Activated/deactivated
Screw terminals		• Error indication	LED red "LF"
• One-wire connexion		Error messaging and power supply failure	• Contact (30 V/100 mA), closed to ground in case of error
- Rigid	0.2 ... 2.5 mm <sup>2</sup> (0.00031 ... 0.0039 in <sup>2</sup> )	• pac-Bus, floating contact (30 V/100 mA)	
- Flexible	0.2 ... 2.5 mm <sup>2</sup> (0.00031 ... 0.0039 in <sup>2</sup> )	<b>Certificates and approvals</b>	
- Flexible with end ferrules (without/with plastic ferrule)	0.25 ... 2.5 mm <sup>2</sup> (0.00039 ... 0.0039 in <sup>2</sup> )	Explosion protection ATEX	
• Two-wire connection		• EC type-examination certificate	DMT 03 ATEX E 010 X
- Rigid	0.2 ... 1 mm <sup>2</sup> (0.00031 ... 0.00155 in <sup>2</sup> )	• Degree of protection	II 3 (1) G Ex nA nC [ia] IIC T4 II (1) D [Ex iaD]
- Flexible	0.2 ... 1.5 mm <sup>2</sup> (0.00031 ... 0.0023 in <sup>2</sup> )	Installation	In Zone 2, Div. 2 and in the safe area
- Flexible with end ferrules	0.25 ... 1 mm <sup>2</sup> (0.00039 ... 0.00155 in <sup>2</sup> )	Other approvals	USA (FM) Kanada (CSA) Shipping (DNV)
Weight	Approx. 160 g (0.35 lb)	Safety specifications (CENELEC)	
Type of installation	On DIN rail according to EN 50022 (NS35/15; NS35/7.5)	• Max. voltage $U_o$	27 V
Mounting position	Vertical or horizontal	• Max. current $I_o$	88 mA
Enclosure material	PA 6.6	• Max. power $P_o$	576 mW
Fire protecting class (UL-94)	V0	• Max. connectable capacitance $C_o$ for IIC/IIB	90 nF/705 nF
<b>Auxiliary power</b>		• Max. connectable inductance $L_o$ for IIC/IIB	2.3 mH/14 mH
Rated voltage $U_N$	24 V DC	• Internal capacitance $C_i$ and inductance $L_i$	Negligible
Voltage range	18 ... 31.2 V	• Insulation voltage $U_m$	253 V
Residual ripple within voltage range	≤ 3.6 V <sub>SS</sub>	• When connecting mA sources:	
Rated current ( $U_N$ , 20 mA)	70 mA	- Max. output voltage $U_o$	4.1 V
Power consumption ( $U_N$ , 20 mA)	1.7 W	- Max. connectable voltage $U_i$	30 V
Power loss (at $U_N$ , $R_L = 250 \Omega$ )	1.3 W	- Max. connectable current $I_i$	100 mA
Operation indicator	Green "PWR" LED	- Internal capacitance $C_i$ and inductance $L_i$	Negligible
Reverse polarity protection	Yes	• For more information and value combinations	See "Certification"
Undervoltage monitoring	Yes (no faulty module/output states)		
Galvanic isolation			
• Test voltage according to EN 60079-11			
- Ex i input to output	1.5 kV AC		
- Ex i input to auxiliary power	1.5 kV AC		
- Ex i input to Error contact	1.5 kV AC		
• Test voltage according to EN 50178			
- Output to auxiliary power	350 V AC		
- Error contact to auxiliary power and output	350 V AC		

## Supplementary Components

Isolating power supplies and Output isolators

### SITRANS I100

#### Selection and Ordering data

Article No.

**SITRANS I100 Isolating Power Supply with HART** ▶ **7NG4124-0AA00**

For rail mounting, for supplying 2-/3-wire transmitters and for mA sources, output 0/4 ... 20 mA, with intrinsically safe input

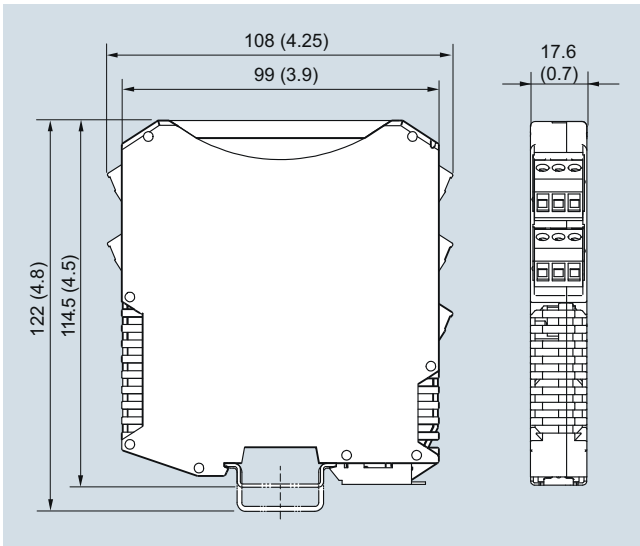
#### Accessories

**pac-Bus basic set** ▶ **7NG4998-1AA**  
With 5 single elements and 1 terminal set (beginning and end)

**pac-Bus extension set** ▶ **7NG4998-1AB**  
With 5 single elements

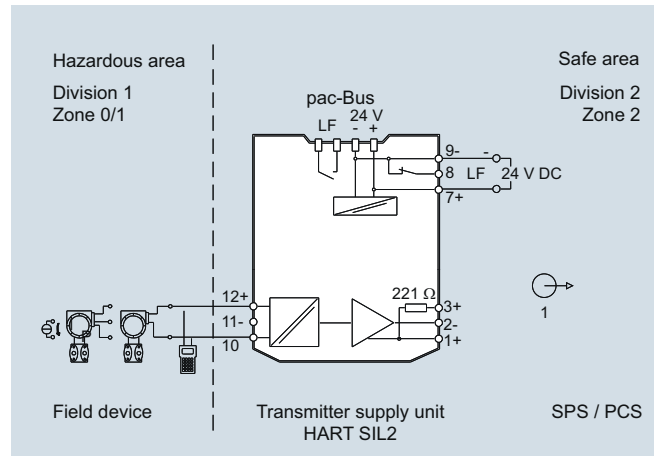
▶ Available ex stock.

#### Dimensional drawings

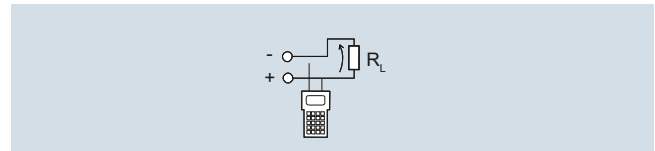


SITRANS I100 isolating power supply with HART, dimensions in mm (inch)

#### Schematics



SITRANS I100 isolating power supply with HART, connection diagram



SITRANS I100 isolating power supply with HART, output configuration

**Overview**



Analog output 0/4 to 20 mA for HART

The output isolators are used for the intrinsically safe operation of valve positioners, i/p converters or indicators.

Operation of intrinsically safe HART valve positioners (e.g. SIPART PS2 and SITRANS VP300) is also possible. The units transfer a superimposed HART communication signal bidirectionally.

**Benefits**

- For HART output signals 0/4 to 20 mA
- Intrinsically safe output [Ex ia] IIC
- Galvanic isolation between input, output and auxiliary power
- Open-circuit and short-circuit monitoring and messaging (can be switched off)
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 2 (IEC 61508)

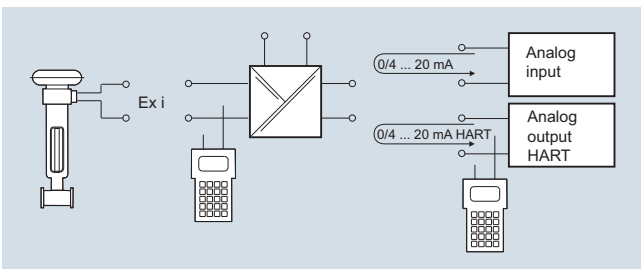
	Zones					
	0	1	2	20	21	22
Ex i interface	X	X	X	X	X	X
Installation in			X			X

**Design**

The HART output isolator is comprised of a compact plastic housing (IP30) and is equipped with push-in screw terminals.

On the front are a green LED for indicating the power supply status and a red LED for signaling errors.

The auxiliary power supply can be connected individually using push-in screw terminals or jointly for up to 40 units using pac-Bus.



SITRANS I200 output isolator, function block diagram

**Technical specifications**

<b>SITRANS I200 output isolator with HART</b>	
<b>Input</b>	
Input signal	0/4 ... 20 mA with HART
Functional range	0 ... 24 mA
Max. input current	50 mA
Input resistance (changeable switch LI)	225 Ω/550 Ω
Communication signal	Bidirectional HART transmission, 0.5 ... 30 kHz
<b>Ex i output</b>	
Output signal	0/4 ... 20 mA with HART
Connectable load resistance	0 ... 800 Ω
Min. load resistance for short-circuit monitoring	150 Ω
Residual ripple	≤ 50 mV
No-load voltage	≤ 25.6 V
Response time (10 % ... 90 %)	≤ 25 ms
Transfer behavior Input/Output	1:1 (0 ... 20 mA --> 0 ... 20 mA, 4 ... 20 mA --> 4 ... 20 mA)
<b>Measuring accuracy</b>	
Accuracy, typical data expressed as % of calibrated span at U <sub>N</sub> , 23 °C	
Linearity error	≤ 0.1 %
Offset error	≤ 0.1 %
Temperature influence	≤ 0.1 %/10 K
Power supply effect within voltage range	≤ 0.01 %
Load resistance effect	≤ 0.02 %
<b>Rated conditions</b>	
Degree of protection of enclosure	IP30
Degree of protection of terminals	IP20
Ambient conditions	
• Ambient temperature	-20 ... +70 °C (-4 ... +158 °F) (see "Operating instructions")
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Relative humidity (no condensation)	≤ 95 %
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in the industrial environment

## Supplementary Components

### Isolating power supplies and Output isolators

#### SITRANS I200

##### Mechanical specification

Screw terminals

- One-wire connection

- Rigid	0.2 ... 2.5 mm <sup>2</sup> (0.00031 ... 0.0039 in <sup>2</sup> )
- Flexible	0.2 ... 2.5 mm <sup>2</sup> (0.00031 ... 0.0039 in <sup>2</sup> )

- Flexible with end ferrules (without/with plastic ferrule)	0.25 ... 2.5 mm <sup>2</sup> (0.00039 ... 0.0039 in <sup>2</sup> )
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- Two-wire connection

- Rigid	0.2 ... 1 mm <sup>2</sup> (0.00031 ... 0.00155 in <sup>2</sup> )
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- Flexible	0.2 ... 1.5 mm <sup>2</sup> (0.00031 ... 0.0023 in <sup>2</sup> )
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- Flexible with end ferrules	0.25 ... 1 mm <sup>2</sup> (0.00039 ... 0.00155 in <sup>2</sup> )
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Weight

Approx. 160 g (0.35 lb)

Type of installation

On DIN rail according to EN 50022 (NS35/15; NS35/7.5)

Mounting position

Vertical or horizontal

Enclosure material

PA 6.6

Fire protecting class (UL-94)

V0

##### Auxiliary power

Rated voltage  $U_N$

24 V DC

Voltage range

18 ... 31.2 V

Residual ripple within voltage range

≤ 3.6 V<sub>SS</sub>

Rated current ( $U_N$ , 20 mA)

80 mA

Power consumption ( $U_N$ , 20 mA)

1.3 W

Power loss (at  $U_N$ ,  $R_L = 500 \Omega$ )

1.1 W

Operation indicator

Green "PWR" LED

Reverse polarity protection

Yes

Undervoltage monitoring

Yes (no faulty module/output states)

Galvanic isolation

- Test voltage according to EN 60079-11

- Ex i output to input 1.5 kV AC

- Ex i output to auxiliary power 1.5 kV AC

- Error contact to Ex i output 1.5 kV AC

- Test voltage according to EN 50178

- Input to auxiliary power 350 V AC

- Error contact to auxiliary power and input 350 V AC

Error detection Ex i output

- Open circuit

> 10 k $\Omega$

- Short-circuit

< 15  $\Omega$

- Input behavior

> 6 k $\Omega$

- Open-circuit detection only for input current

≥ 3.6 mA

- Settings (LF switch)

Activated/deactivated

- Error indication

LED red "LF"

- Error messaging and power supply failure

- Contact (30 V/100 mA), closed to ground in case of error

- pac-Bus, floating contact (30 V/100 mA)

##### Certificates and approvals

Explosion protection ATEX

- EC type-examination certificate

DMT 03 ATEX E 012 X

- Degree of protection

II 3 (1) G Ex nA nC [ia] IIC T4  
II (1) D [Ex iaD]

Installation

In Zone 2, Div. 2 and in the safe area

Other approvals

USA (FM)  
Canada (CSA)  
Shipping (DNV)

Safety specifications (CENELEC)

- Max. voltage  $U_o$

25.6 V

- Max. current  $I_o$

96 mA

- Max. power  $P_o$

605 mW

- Max. connectable capacitance  $C_o$  for IIC/IIB

103 nF/800 nF

- Max. connectable inductance  $L_o$  for IIC/IIB

1.9 mH/11 mH

- Internal capacitance  $C_i$  and inductance  $L_i$

Negligible

- Insulation voltage  $U_m$

253 V

- For more information and value combinations see "Certification".

##### Selection and Ordering data

Article No.

##### SITRANS I200 output isolator with HART

▶ 7NG4131-0AA00

For rail mounting, input 0/4 ... 20 mA, output 0/4 ... 20 mA, intrinsically safe

##### Accessories

##### pac-Bus basic set

▶ 7NG4998-1AA

With 5 single elements and 1 terminal set (beginning and end)

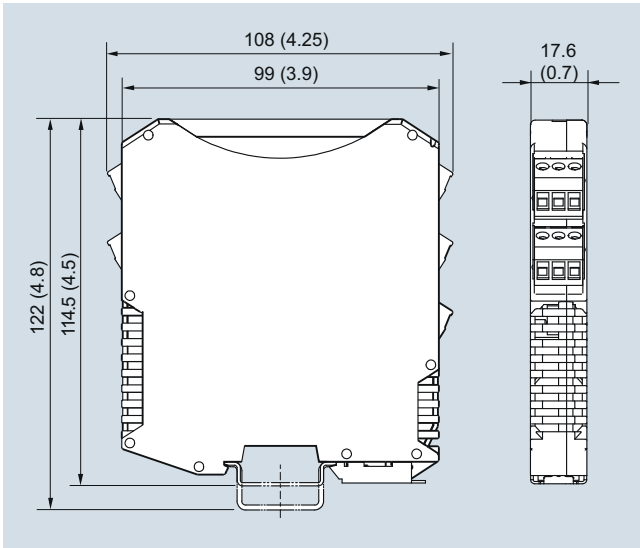
##### pac-Bus extension set

▶ 7NG4998-1AB

With 5 single elements

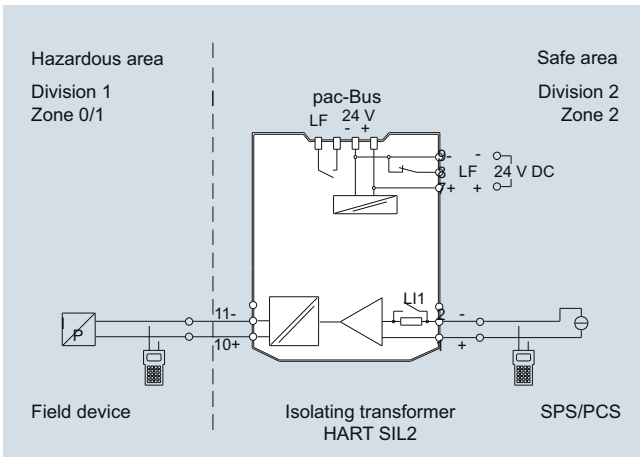
▶ Available ex stock.

**Dimensional drawings**



SITRANS I200 output isolator with HART, dimensions in mm (inch)

**Schematics**



SITRANS I200 output isolator with HART, connection diagram