

# Isolators

Transmitter supply unit With limit contact

Ex i field circuit

9162/13-11-14k Art. No. 238252



- Universal use for transmitters and mA sources (4-wire transmitters) with two configurable limit values and one 4 to 20 mA output
- Bidirectional HART transmission

MY R. STAHL 9162A



9162 series transmitter supply units with limit values can be used for the intrinsically safe operation of two- and three-wire transmitters or for connecting to intrinsically safe mA sources. Two limit values can be easily set using the "ISpac Wizard" software. If the value exceeds or falls below these limit values, these units will trip an electronic contact. A wire-breakage and short-circuit monitoring function provides increased availability.

## Technical Data

### Explosion Protection

Application range (zones)	2
Ex interface zone	0 1 20 21 22
IECEX gas certificate	IECEX BVS 15.0013 X
IECEX gas explosion protection	Ex nA nC [ja Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 15.0013 X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	BVS 15 ATEX E018 X
ATEX gas explosion protection	⊕ II 3 (1) G Ex nA nC [ja Ga] IIC T4 Gc
ATEX dust certificate	BVS 15 ATEX E018 X
ATEX dust explosion protection	⊕ II (1) D [Ex ia Da] IIIC
FMus certificate	FM16US0122X
cFM certificate	FM16CA0067X
Marking cFMus	Class I, Div. 2, Groups A,B,C,D; Class I, Zone 2, nA nC Group IIC AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G; Class I, Zone 0, [Ex ia] IIC T4 at Ta = 70°C See Doc. 9162 6 031 001 1
Certificates	ATEX (BVS), Canada (FM), China (NEPSI), IECEX (BVS), SIL (exida), USA (FM)
Ship approval	CCS, EU RO MR (DNV)
Declaration of Conformity	ATEX (EUK), China (CCC)

### Safety Data

Max. voltage U <sub>0</sub>	27 V
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#### Safety Data

Max. current $I_o$	87.9 mA			
Max. current $I_o$ (3-conductor)	88.3 mA			
Max. power $P_o$ (3-conductor)	574 mW			
Max. power $P_o$	574 mW			
Max. permissible external capacity $C_o$ for IIC	0.09 $\mu$ F			
Max. permissible external capacity $C_o$ for IIB	0.705 $\mu$ F			
Max. permissible external inductance $L_o$ for IIC	2.3 mH			
Max. permissible external inductance $L_o$ for IIB	14 mH			
Max. voltage $U_i$	30 V			
Max. current $I_i$	100 mA			
Max. voltage $U_o$ isolation amplifier	4.1 V			
Internal capacitance	Negligible			
Internal capacitance isolation amplifier	Negligible			
Internal inductance	Negligible			
Internal inductance $L_i$ isolation amplifier	Negligible			
Safety-related max. voltage	253 V			
Intrinsically safe limiting values inductance $L_o$ /capacitance $C_o$	Jointly connectable inductance $L_o$ /capacitance $C_o$			
IIC	$L_o$ [mH]	1 mH	0.500 mH	0.200 mH
	$C_o$ [ $\mu$ F]	0.056 $\mu$ F	0.072 $\mu$ F	0.090 $\mu$ F
IIB	$L_o$ [mH]	10 mH	1 mH	0.200 mH
	$C_o$ [ $\mu$ F]	0.290 $\mu$ F		
IIIC	$L_o$ [mH]	10.000 mH	1.000 mH	0.200 mH
	$C_o$ [ $\mu$ F]	0.290 $\mu$ F	0.380 $\mu$ F	0.600 $\mu$ F

#### Functional Safety

HFT	0
SFF	90%
Lambda SD	0 FIT
Lambda SU	0 FIT
Lambda DD	436 FIT
Lambda DU	46 FIT
$PFD_{avg}$ at $T_{proof}$ 1 year	2,23E-04
$PFD_{avg}$ at $T_{proof}$ 2 years	4,19E-04
$PFD_{avg}$ at $T_{proof}$ 5 years	1,10E-03

#### Electrical Data

Number of channels	1
Measuring transformer feed operation	Yes
Isolation amplifier operation	Yes
LFD relay	Yes
Communication signal	HART, 0.5 to 10 kHz
Limiting values configuration	Using ISpac Wizard (V3.04 and more recent)

#### Auxiliary Power

Auxiliary power	24 V DC
Auxiliary power nominal voltage	24 V DC
Auxiliary power voltage range	18 to 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{SS}$
Nominal current	85 mA
Auxiliary power max. power dissipation	1.5 W
Power consumption	2 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

#### Galvanic Isolation

Test voltage as per standard	IEC 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 fault message contact	1.5 kV AC
Test voltage as per standard	EN 50178
Output to auxiliary power	350 V AC
Output to output	350 V AC
Galvanic separation FMC to HE and output	350 V AC

#### Input

Input function	Isolation amplifier Transmitter power unit
Input	4 to 20 mA with HART
Input signal	4 to 20 mA with HART
Function range input	2 – 22 mA
Max. input current, mA sources	50 mA
Input for open-circuit voltage $U_a$	$\leq 26 V$
Short-circuit current	$\leq 35 mA$
Supply voltage for transmitter	$\geq 16 V$ at 20 mA
Note about supply voltage	(T < -10 °C: US - 0.2 V / 10K)
HART input resistance (AC)	> 250 $\Omega$
Line fault and loss of power signalisation	- Contact (30 V/100 mA), closed against earth in case of error - pac-Bus, potential-free contact (30 V/100 mA)
Input resistance	30 $\Omega$

#### Output

Output	4 to 20 mA with HART
Output signal	4 to 20 mA with HART
Function range output	2 – 22 mA
Switching delay	< 80 ms
Load resistance $R_L$	0 to 600 $\Omega$ (terminal 1+/2-)
Max. load resistance $R_L$	600 $\Omega$
Output residual ripple	$\leq 40 \mu A_{eff}$
Load resistance influence	$\leq 0,02 \%$
Analog signal delay	< 30 ms

<b>Output</b>	
Settling time 10-90%	< 45 ms
Temperature influence error limits	≤ 0.1%/10 K
Limit contact (per channel)	2 NO
Switching voltage limiting values	≤ ± 30 V
Switching current limiting values	≤ 170 mA
Switch-on resistance	≤ 2.5 ohm (typical < 1 ohm)
Switching state indication	Yellow "OUT" LED
Switch-back delay	< 100 ms
Fault message contact switching capacity	30 V / 100 mA
LF switch user adjustment	Activated/deactivated
Indication of line fault	Red "LF" LED
Wire breakage error detection	< 3.6 mA
Short circuit error detection	> 21 mA
Deviation	≤ 0,2 %
Auxiliary power influence error limits	≤ 0,01 %
Behaviour of the output	= input signal
Linearity error	≤ 0,1 %
Offset error	≤ 0,1 %
<b>Ambient Conditions</b>	
Ambient temperature	-40 °C ... +70 °C (Single device) -40 °C ... +60 °C (Group assembly)
Ambient temperature	-40 °F ... +158 °F (Single device) -40 °F ... +140 °F (Group assembly)
Note	"The installation conditions affect the ambient temperature. Observe the "Cabinet installation guide""
Storage temperature	-40 °C ... +80 °C
Storage temperature	-40 °F ... +176 °F
Maximum relative humidity	95%
Use at the height of	< 2000 m
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 For use in industrial areas
<b>Mechanical Data</b>	
Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
AWG clamping range	24 – 12
Connection cross-section AWG	24 ... 12
Grid dimension	17.6 mm
Width	17.6 mm
Width, inches	0.69 in
Height	114.5 mm
Height, inches	4.51 in
Length	128 mm
Length, inches	5.04 in
Mounting depth, inches	4.51 in

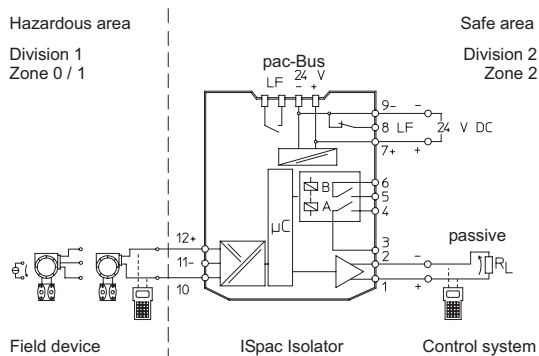
#### Mechanical Data

Weight	225 g
Weight	0.5 lb

#### Mounting / Installation

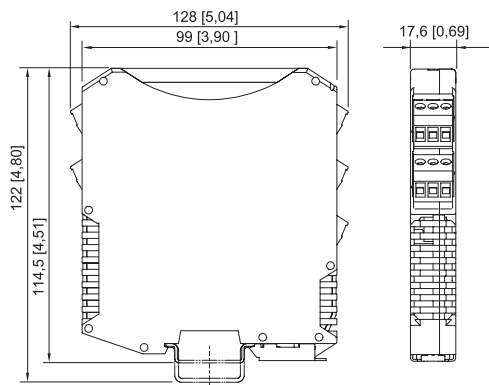
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Vertical Horizontal
Connection type	Spring clamp terminal
Min. rigid conductor cross section	0.2 mm <sup>2</sup>
Max. rigid conductor cross section	2.5 mm <sup>2</sup>
Min. flex conductor cross section	0.2 mm <sup>2</sup>
Max. flex conductor cross section	2.5 mm <sup>2</sup>
Connection cross-section AWG	24 – 14

#### Technical Drawings – Subject to Alterations



Connection diagram 9162/13-11-14

#### Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



ISpac Series 9146, 9147, 9160, 9162, 9163, 9165, 9167, 9170, 9172, 9175, 9176, 9180, 9182, 9193, ISbus Series 9412 with spring clamp terminal

#### Accessories

##### 9162 Parameterisation

	Parameterisation ex works optionally available for all variants.	Art. No. 270538
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## ISpac Wizard parameterising set

Art. No.



The software is used to commission, configure and diagnose Series 9146, 9162 and 9182 ISpac isolators.  
For further information, see the operating instructions.  
Delivery form: USB stick; parameterising software incl. parameterising cable/adaptor  
System requirements:  
IBM-compatible PC with MS XP, Vista, Windows 7, 10  
RS 232 C interface  
RS 232/USB adaptor

202595

## Resistive coupling element

Art. No.



The 0/4 to 20 mA signal of channel 1 is converted to a 0/2 to 10 V signal. The resistive coupling element replaces the existing connection terminal. (Set with 5 pieces)

273968

## Spare Parts

### Screw terminal

Art. No.



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: green

112817



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: black

112816



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: blue

112818

### Screw terminal with test tap

Art. No.



3-pole plug with test tap, screw connector  
thread: M3  
stripping length: 7 mm  
colour: black

113005



3-pole plug with test tap, screw connector  
thread: M3  
stripping length: 7 mm  
colour: blue

113004

### Spring clamp terminal

Art. No.



3-pole plug with test tap, spring clamp connection  
stripping length: 10 mm  
colour: green

112825



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	3-pole plug with test tap, spring clamp connection stripping length: 10 mm colour: black	112824
	3-pole plug with test tap, spring clamp connection stripping length: 10 mm colour: blue	112826

We reserve the right to make alterations to the technical data, dimensions, weights, designs and products available without notice. The illustrations cannot be considered binding.