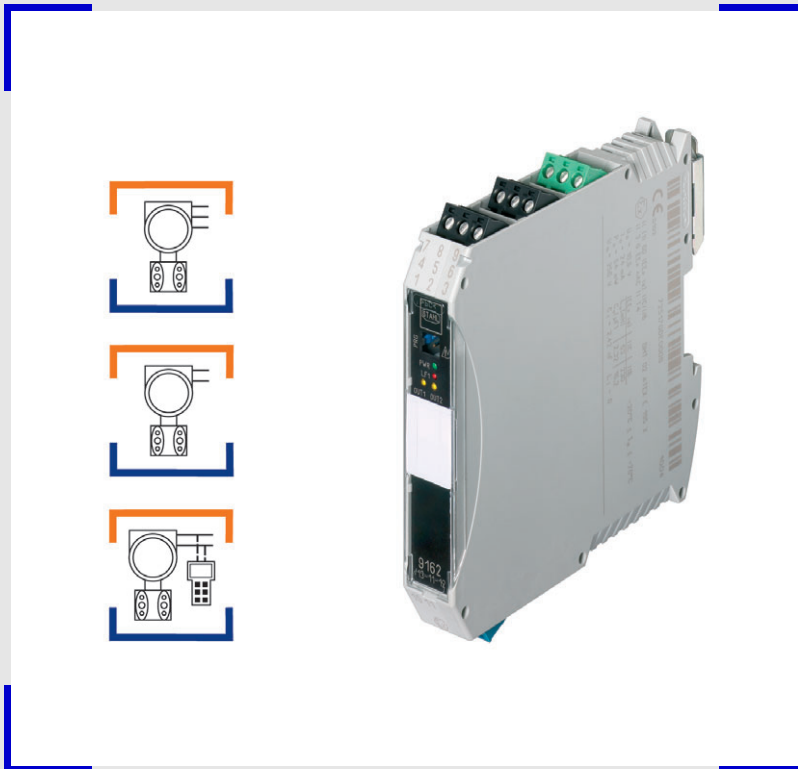


Transmitter Supply Unit with Limit Contact
Field Circuit Ex i
 Series 9162



www.stahl.de



11025E00

- > Compact limit value switch with 2 configurable limiting values and 0/4 ... 20 mA or 4 ... 20 mA output
- > Suitable for 2-, 3-wire transmitters, 2-wire HART transmitters and mA sources
- > Intrinsically safe input [Ex ia] IIC
- > Open circuit / short-circuit monitoring and messaging
- > Variant for use up to SIL 2 (IEC 61508)

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The transmitter supply unit with a limiting value is used for intrinsically safe operation of 2- and 3-wires transmitters or for connection to intrinsically safe mA sources. Furthermore, the device gives the opportunity to compare the analogue signal with two adjustable limiting values.

Exceeding the limiting values or falling below them is reported by the contacts.

The transmitter supply unit can be easily parameterised by means of the ISpac Wizard software.



	ATEX / IECEx						NEC 505						NEC 506						NEC 500					
	0	1	2	20	21	22	Class I						Class II						Class III					
Zone	0	1	2	20	21	22	Zone	0	1	2	20	21	22	Division	1	2	1	2	1	2				
Ex i interface	x	x	x	x	x	x	Ex i interface	x	x	x														
Installation in			x			x	Installation in			x			x											

WebCode 9162A

Transmitter Supply Unit with Limit Contact
Field Circuit Ex i
 Series 9162



Selection Table

Version	Channels	Input	Output	Limit contact	SIL	Order number
Transmitter supply unit with limit contact Series 9162	1	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART	2 NO / NC	--	9162/13-11-12s
	1	4 ... 20 mA with HART	4 ... 20 mA with HART	2 NO / NC	2	9162/13-11-14s
Note The order numbers listed in the table are for devices equipped with screw-type terminals. For devices equipped with spring-type terminals, replace the ending "s" for screw-type terminals with "k" for spring-type terminals.						

Explosion Protection

Global (IECEX)

Gas and dust

IECEX FMG 10.0020X
 Ex nAc nCc [ia] IIC T4 Ta = - 20 ... + 70 °C
 [Ex iaD]

Ex nA nC [ia Ga] IIC T4 Gc
 [Ex ia Da] IIIC

Europe (ATEX)

Gas and dust

FM 06 ATEX 0008 X
 Ⓢ II 3 (1) G Ex nAc nCc [ia] IIC T4
 Ⓢ II (1) D [Ex ia] IIIC

Ⓢ II 3 (1) G Ex nA nC [ia Ga] IIC T4 Gc
 Ⓢ II (1) D [Ex ia Da] IIIC

Certifications and certificates

Version

9162/13-11-12

9162/13-11-14, SIL 2

Certificates

IECEX, ATEX, India (PESO), Canada (cFM),
 Kazakhstan (GOST K), Korea (KTL),
 Russia (GOST R), Serbia (SRPS), USA (FM),
 Belarus (operating authorisation)

IECEX, ATEX

Ship approval

DNV

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Safety data

Max. voltage U_o	27 V
Max. current I_o	87.9 mA
Max. power P_o	574 mW
Max. connectable capacitance C_o	
IIC	90 nF
Max. connectable inductance L_o	
IIC	2.3 mH
Internal capacitance C_i	negligible
Internal inductance L_i	negligible
Insulation voltage U_m	250 V
When connecting a current source	
Max. output voltage U_o	4.1 V
Max. output current I_o	0.41 mA
Max. output power P_o	0.43 mW
Max. connectable capacity C_o	
IIC	100 μ F
Max. connectable inductance L_o	
IIC	1 mH
Max. connectable voltage U_i	30 V
Max. connectable current I_i	50 mA
Internal capacitance C_i	negligible
Internal inductance L_i	negligible

Further parameters

Installation	in Zone 2 and in the safe area
Further information	see respective certificate and operating instructions

Explosion Protection

Functional safety (IEC 61508)

Version	9162/13-11-14, SIL 2		
Test report	Exida STAHL 08/04-21-R020		
Max. SIL	2		
Output	4 ... 20 mA	Limit contact	Limit contacts in series
Safe failure fraction SFF	91.2 %	90.2 %	93.4 %
MTBF	134 years	123 years	123 years
PFD _{AVG} at T _[Proof]	2.9 x 10 ⁻⁴	3.2 x 10 ⁻⁴	2.15 x 10 ⁻⁴
	5.46 x 10 ⁻⁴	6.06 x 10 ⁻⁴	4.06 x 10 ⁻⁴
	1.31 x 10 ⁻³	1.46 x 10 ⁻³	9.78 x 10 ⁻⁴
Further information	For further information, see Safety manual and test reports.		

Technical Data

Electrical data

Auxiliary power		
Nominal voltage U _N	24 V DC	
Voltage range	18 ... 31.2 V	
Residual ripple	≤ 3.6 V _{SS}	
Nominal current at U _N , 20 mA	83 mA	
Power consumption at U _N , 20 mA	2 W	
Power dissipation at U _N , R _L = 250 Ω	1.5 W	
Polarity reversal protection	yes	
Operation indication	LED green "PWR"	
Undervoltage monitoring	yes (no defective devices / output states)	
Galvanic separation		
Test voltages		
acc. to standard	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 message contact	1.5 kV AC	
Ex i input to limit contact	1.5 V AC	
acc. to standard	EN 50178	
Output to auxiliary power	350 V AC	
Output to limit contact	350 V AC	
Error message contact to auxiliary power and outputs	350 V AC	
Ex i input		
Version	9162/13-11-12	9162/13-11-14, SIL 2
Input signal	0/4 ... 20 mA with HART	4 ... 20 mA with HART
Functional range	0 ... 24 mA	2 ... 22 mA
Max. input current for mA sources	50 mA	
Supply voltage for transmitter	≥ 16 V at 20 mA (for 2-, 3-wires)	
Residual ripple of supply voltage	≤ 25 mV _{eff}	
Open-circuit voltage	≤ 26 V	
Short-circuit current	≤ 35 mA	
Input resistance (AC impedance HART)	≈ 500 Ω	
Input resistance for mA sources	30 Ω	
Communication signal	bidirectional HART transmission, 0.5 ... 30 kHz (in 2-wire transmitters)	

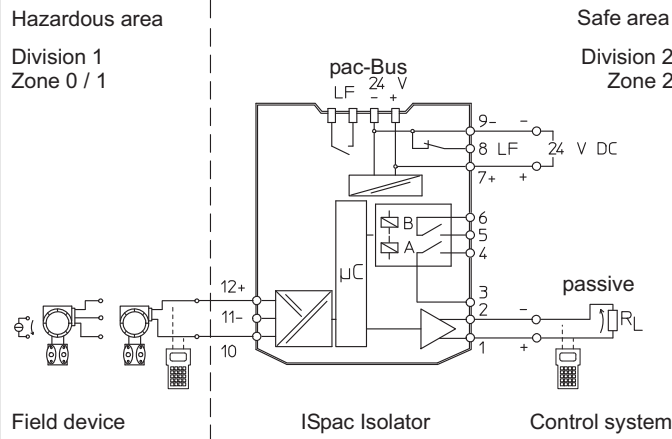
Technical Data

Output		
Version	9162/13-11-12	9162/13-11-14, SIL 2
Output signal	0/4 ... 20 mA with HART	4 ... 20 mA with HART
Load resistance R_L	0 ... 600 Ω (terminal 1+ / 2-)	0 ... 600 Ω (terminal 1+ / 2-)
Functional range	0 ... 24 mA	2 ... 22 mA
Residual ripple	$\leq 40 \mu A_{eff}$	
Open-circuit voltage	$\leq 15.5 V$	
Communication signal	bidirectional HART transmission, 0.5 ... 30 kHz	
Signal delay	< 30 ms	
Signal rise, signal drop	< 45 ms	
Limiting values		
Configuration	using ISpac Wizard	
Message	2 NO / NC	
Switching voltage	$\leq \pm 30 V$	
Switching current (resistive load)	$\leq 100 mA$	
Switch on resistance	$\leq 2.5 \Omega$ (typical < 1 Ω)	
Reclosing lockout	Reset using the DIP switch or "Power-Off" (configurable)	
Switching delay	< 80 ms	
Switch-back delay	< 100 ms	
Error detection Ex i input		
Version	9162/13-11-12	9162/13-11-14, SIL 2
Wire breakage	< 2 mA	< 2 mA
Short circuit	> 22 mA	> 22 mA
Behaviour of the output	= input signal (configurable 0 ... 23 mA or "hold last value")	configurable 0 ... 23 mA
Message of line fault and auxiliary power failure	- contact (30 V / 100 mA) closed to earth in case of error - pac-Bus, potential-free contact (30 V / 100 mA)	
Error limits		
	Accuracy, typical data expressed in % of the measuring range at U_N , 23 °C	
Linearity error	≤ 0.1	
Offset error	≤ 0.1	
Temperature influence	$\leq 0.1 \% / 10 K$	
Power supply effect within voltage range	≤ 0.01	
Load resistance influence	≤ 0.02	
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 (use in industrial environment)	
Ambient conditions		
Ambient temperature		
Single device	-20 ... +70 °C	
Group assembly	-20 ... +60 °C	
	The installation conditions affect the ambient temperature. Observe the "Cabinet installation guide".	
Storage temperature	-40 ... +80 °C	
Relative humidity (no condensation)	$\leq 95 \%$	
Use at the height of	< 2000	

Technical Data

Electrical connection

Connection diagram



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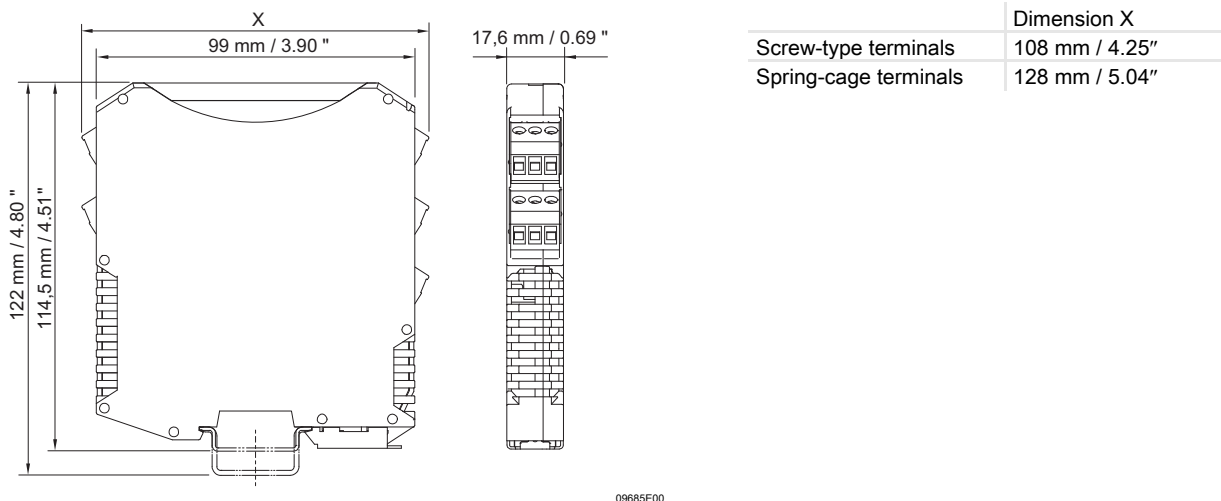
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Technical Data

Mechanical data

Connection	Screw-type terminals	Spring-type terminals
Single-wire connection		
- rigid	0.2 ... 2.5 mm ²	0.2 ... 2.5 mm ²
- flexible	0.2 ... 2.5 mm ²	0.2 ... 2.5 mm ²
- flexible with core end sleeves (without / with plastic sleeve)	0.25 ... 2.5 mm ²	0.25 ... 2.5 mm ²
Two-wire connection		
- rigid	0.2 ... 1 mm ²	--
- flexible	0.2 ... 1.5 mm ²	--
- flexible with core end sleeves	0.25 ... 1 mm ²	0.5 ... 1 mm ²
Weight	approx. 160 g	
Mounting type	on top hat rail (NS35/15, NS35/7.5) or in pac-Carrier	
Mounting orientation	horizontal or vertical	
Enclosure	IP30	
Terminals	IP20	
Enclosure material	PA 6.6	
Fire resistance (UL-94)	V0	

Dimensional Drawings (All Dimensions in mm / inch) - Subject to Alterations



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Accessories and Spare Parts

Designation	Description	Order number
Transparent cover	yellow, transparent. Clear marking of the device for SIL applications. (Packaging unit: 10 pieces)	Deckel
Parameterising set - ISpac - Wizard	The software serves for commissioning, configuring and diagnosing the ISpac isolators Series 9146, 9162 and 9182. For further information, see operating instructions. Form of delivery: CD-ROM; parameterising software incl. parameterising cable / adaptor System requirements: <ul style="list-style-type: none"> • IBM compatible PC with MS Windows 98, NT, 2000, XP, Vista, Windows 7 • CD-ROM drive • RS 232 C interface • RS 232 / USB adaptor 	9199/20-02

Customer specific parameterisation

R. STAHL offers the service to configure ISpac isolators according to your requirements.
 There are two options:

1. The form can be downloaded on the product page ISpac, section "Data sheet". Please edit the form directly on your PC.
2. Download the software at ISpac Wizard free: "<http://www.r-stahl.com/downloads/software/ex-i-isolators.html>".
 Create them using the software configuration. Forward the file to your R. STAHL sales office.

Order-No.:	-Pos.:	Pieces:	
Type	Channel	Output	Limit value
9162/13-11-14.	1	0/4 mA ...20 mA	2 NC

with: Screw terminal s Spring cage terminal k

Please read the operating instructions before you fill in the following form.

	Default	Customer Specific
Signal Tag	Signal 1	
Output		
Signal	0 mA ... 24mA	
Fault behaviour	Output Fault value (2.4 mA)	<input type="checkbox"/> Output Fault value:
Limit value for Relay A		
Signalling	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Value	2.4 mA	mA (0.29 mA ... 24 mA)
Behaviour contact	inactive	<input type="checkbox"/> inactive <input type="checkbox"/> opens, if value > limit value <input type="checkbox"/> opens, if value < limit value
Hysteresis	0.24 mA	mA (0.24 mA ... 2.4 mA)
Reset lockout	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Limit value for Relay B		
Signalling	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Value	2.4 mA	mA (0.29 mA ... 24 mA)
Behaviour contact	inactive	<input type="checkbox"/> inactive <input type="checkbox"/> opens, if value > limit value <input type="checkbox"/> opens, if value < limit value
Hysteresis	0.24 mA	mA (0.24 mA ... 2.4 mA)
Reset lockout	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive

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 The illustrations cannot be considered binding.