

Frequency Transmitter Field Circuit Non-Ex i Series 9146



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- > Most compact device in its class:
 - limit value switch, frequency/current conversion, impulse divider function within 17.6 mm width
- > Line fault detection indicated by LED and potential free relay contact allows easy monitoring and speeds-up troubleshooting
- > Broad input frequency range 0.001 ... 20 kHz

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The frequency transmitter allows to monitors the speed of rotating devices like fans, centrifuges, tube extruder, etc. The detected input frequency is processed in different ways:

- > relay output with configurable set points
- > conversions into an proportional 0/4 mA ... 20 mA analog signal
- > impuls output with optional frequency divider function

The optional start-up delay allows to start a system without creating accidental alarms. The frequency transmitter can be easily configured by the ISpac Wizard.

	ATEX / GOST					
Zone	0	1	2	20	21	22
Installation in			x ^{*)}			x ^{*)}

^{*)} Restrictions see table explosion protection

WebCode 9146B

Frequency Transmitter Field Circuit Non-Ex i

Series 9146



Selection Table

Version	Channels	Output	Limit value contact	Impulse output	Connection type	Order number
Frequency Transmitter Field Circuit Non-Ex i Series 9146	1	0/4 ... 20 mA	2 NO / NC	one NO selectable	Screw terminals	9146/10-11-62s
					Spring clamp terminals	9146/10-11-62k

Explosion Protection

Europe (ATEX)

Gas and dust BVS 09 ATEX E 094 X
 Ⓢ II 3 G Ex nAc nCc II T4

Certificates and approvals

Certificates ATEX, Kazakhstan (GOST-K), Serbia (SRPS), Belarus (GOST-B)

Further parameters

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

Technical Data

Electrical data

Auxiliary power

Nominal voltage U_N 24 V DC
 Voltage range 18 ... 31.2 V
 Residual ripple within voltage range $\leq 3.6 V_{SS}$
 Nominal current at U_N
 1 channel 55 mA
 Power consumption at U_N
 1 channel 1.32 W
 Reverse polarity protection yes

Input

Input signal acc. to EN 60947-5-6 (NAMUR)
 Current for ON / OFF
 Current for ON ≥ 2.1 mA
 Current for OFF ≤ 1.2 mA
 No-load voltage 8.5 V
 Short-circuit current 8.5 mA
 Input frequency 0.001 ... 20000 Hz
 Impulse width / break 25 μ s
 Resolution < 0.1 % of measurement range

Output

Output signal (configurable) 0/4 ... 20 mA
 Function range 0 ... 20.5 mA
 Connectable load resistance 0 ... 600 Ω
 Operating mode counter, frequency by period, gate time

Limiting values

Message 2 NO (electronic)
 Switching voltage $\leq \pm 30$ V
 Switching current (resistive load) ≤ 50 mA
 On-resistance $\leq 12.5 \Omega$ (typique $< 9.5 \Omega$)
 Lockout function Reset using the DIP-switch or „Power-Off“ (configurable)
 Start override off / 1 ... 999 sec.
 Parameterisation via Software ISpac Wizard

Pulse output

Frequency range 0 ... 5 kHz
 Dividing ratio Input / Output 1:1 ... 1:20000
 Switching voltage $\leq \pm 30$ V
 Switching current ≤ 50 mA
 Parameterisation via Software ISpac Wizard
 Activated impulse output allocates contact "B" (see connection diagram)

Fault limits

Accuracy, typical data expressed in % of basic measuring range at U_N , 23 °C
 Middle measurement error ≤ 0.1 %
 Temperature effect ≤ 0.05

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Technical Data

Electrical data

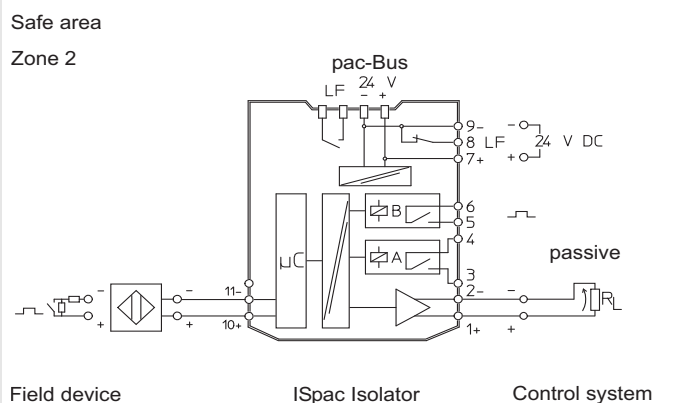
Fault detection input	
Open-circuit	$I_{in} < 0.05 \dots 0.35 \text{ mA}$ according to EN 60947-5-6
Short-circuit	$R_{in} < 100 \dots 360 \Omega$ according to EN 60947-5-6
Behaviour of output	configurable, default: short circuit: 3.8 mA open circuit: 20.5 mA
Settings (switch LF)	activated / deactivated
Error detection	LED red "LF" each channel
Signalization of line fault and power supply failure	- Contact (30 V / 100 mA), close to ground in case of error - pac-Bus, floating contact (30 V / 100 mA)
Galvanic isolation	
Test voltages	
Input to output	1.5 kV AC
Input to power supply	1.5 kV AC
Input to configuration interface	1.5 kV AC
Input to error contact	1.5 kV AC
mutually between inputs	--
Acc. to standard	EN 50178
Output to auxiliary power	350 V AC
Output to configuration interface	350 V AC
Outputs interconnected	350 V AC
Error contact to power supply and outputs	350 V AC
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in industrial environment; NAMUR NE 21
Ambient conditions	
Ambient temperature	
Single device	-20 ... +70 °C
Group assembly	-20 ... +60 °C
	The installation conditions affect the ambient temperature. Observe operating instructions
Storage temperature	-40 ... +80 °C
Relative humidity (no condensation)	≤ 95 %

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Technical Data

Electrical connection

Connection diagram



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Technical Data

Mechanical data

Connection		Screw terminals	Spring cage terminals
	Connection single-wire		
	- 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
	Connection two core		
	- 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		
Installation type	on DIN rail (NS35/15, NS35/7.5) or in pac-Carrier		
Installation position	vertical or horizontal		
Enclosure	IP30		
Terminals	IP20		
Enclosure material	PA 6.6		
Fire resistance (UL-94)	V0		

Accessories and Spare Parts

Designation	Description	Order number
Parameterising set ISpac - Wizard	The software is used to commission, configurate and diagnose on the ISpac Isolators Series 9146, 9162 and 9182. For further information see operating instructions. Supplied: as CD-ROM; Parameterising software incl. Parameterising cable / adapter. 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 adapter 	9199/20-02
Resistance coupling element	Connection of additional contacts in the Ex area as well, in order to enable short circuit and open circuit detection.	105944

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

	Dimension X
Screw terminals	108 mm / 4.25"
Spring cage terminals	128 mm / 5.04"

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Customer Specific Set-up Sheet

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 .prj file to your R. STAHL sales office.

Order-No.: **-Pos.:** **Pieces:**

Type	Channels	Output	Limit value
<input type="checkbox"/> 9146/10-11-62.	1	0/4 mA...20 mA	2 NC / NO

With: Screw terminal s Spring cage terminal k

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

	Default	Channel 1
Signal-Tag	ID-Nr.	
Input		
Operating mode	Frequency via period	<input type="checkbox"/> Counter <input type="checkbox"/> Frequency via period <input type="checkbox"/> Frequency via event (50 ms) <input type="checkbox"/> Frequency via event (200 ms) <input type="checkbox"/> Frequency via event (1000 ms)
Impulse type	Positive slope	<input type="checkbox"/> Positive slope <input type="checkbox"/> Negative slope
Frequency range	0 Hz ... 1000 Hz	From to (max. 20 000 Hz)
Output		
Signal	4 mA ... 20 mA	<input type="checkbox"/> 0 mA ... 20 mA <input type="checkbox"/> 4 mA .. 20 mA
Fault behavior	Output Fault value (2.4 mA)	<input type="checkbox"/> Hold last value (start with fault value) <input type="checkbox"/> Fault control off <input type="checkbox"/> Output Fault value:
Limiting value for Relay A (only 9146/10-11-62.)		
Signalling	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Value	25 %	% (0 % ... 100 %)
Behavior contact	inactive	<input type="checkbox"/> inactive <input type="checkbox"/> closes, if value > limit value <input type="checkbox"/> closes, if value < limit value <input type="checkbox"/> opens, if value > limit value <input type="checkbox"/> opens, if value < limit value
Hysteresis	7,5 %	% (0.1 % ... 10%)
Start up delay	0 s	s (0 s ... 999s) valid for the channels
Relay Lockout	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Limiting value for Relay B (only 9146/10-11-62.)		
Signalling	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Value		% (0 % ... 100 %)
Behavior contact	inactive	<input type="checkbox"/> inactive <input type="checkbox"/> closes, if value > limit value <input type="checkbox"/> closes, if value < limit value <input type="checkbox"/> opens, if value > limit value <input type="checkbox"/> opens, if value < limit value
Hysteresis	7,5 %	% (0.1 % ... 10 %)
Start up delay	0 s	s (0 s ... 999 s) valid for the channel
Relay Lockout	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Impulse output	inactive	<input type="checkbox"/> active <input type="checkbox"/> inactive
Divider	4	(1 ... 20 000)

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