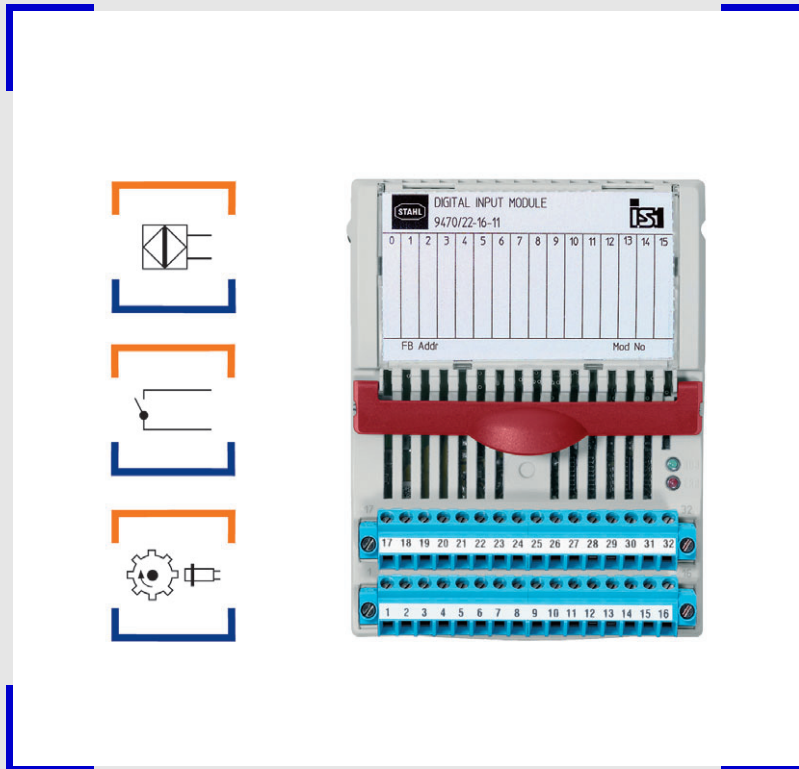


# Digital Input Module NAMUR Ex i / I.S. Inputs, 16 Channels for Zone 1 / Div. 1 Series 9470/22



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02006E00

- > 16 channels for contacts and NAMUR proximity switches (EN 60947-5-6)
- > Intrinsically safe inputs Ex ia IIC
- > Galvanic separation between inputs and system
- > Open-circuit and short-circuit monitoring for each field circuit
- > Two channels can be used as frequency inputs or counters up to 20 kHz
- > Module can be replaced in operation (hot swap)
- > New version: Type 9470/32



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The Digital Input Module is used for the connection and supply of up to 16 volt-free contacts or proximity switches acc. to EN 60947-5-6 (NAMUR). All inputs are intrinsically safe, short-circuit proof and individually monitored for open-circuit and short-circuit. Channels 14 and 15 can also be used for frequency measurement or as pulse counters up to 20 kHz. The interface of the Digital Input Module with the internal data bus of the BusRail is designed with redundancy.



	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 interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x				
Installation in		x	x		x <sup>*)</sup>	x <sup>*)</sup>	Installation in		x	x		x <sup>*)</sup>	x <sup>*)</sup>	Installation in	x	x	x <sup>*)</sup>	x <sup>*)</sup>	x <sup>*)</sup>	x <sup>*)</sup>				

<sup>\*)</sup> Restrictions see table explosion protection

WebCode 9470A

# Digital Input Module NAMUR Ex i / I.S. Inputs, 16 Channels for Zone 1 / Div. 1

## Series 9470/22



### Selection Table

Version	Description	Order number	Weight kg / lbs
Digital Input Module NAMUR	16 channels for contacts and NAMUR proximity switches (EN 60947-5-6)	<b>9470/22-16-11</b>	0.316 / 0.697
Note	Please order 2 terminals separately - see Accessories		

### Explosion Protection

<b>Global (IECEx)</b>			
Gas	PTB 06.0001X Ex ib [ia] IIC/IIB T4		
<b>Europe (ATEX)</b>			
Gas and dust	PTB 99 ATEX 2184 ⊕ II 2 (1) G Ex ib [ia] IIC T4 ⊕ II (1) D [Ex ia] IIIC		
<b>Certificates</b>			
Certificates	IECEx, ATEX, Brazil (Inmetro), Canada (CSA), Kazakhstan (GOST K), Russia (GOST R), Serbia (SRPS), USA (FM), Belarus (operating authorisation)		
Ship approval	ABS, BV, ClassNK, DNV, GL, LR		
<b>Safety data</b>			
Maximum values		per channel	4 channels connected in parallel
	max. voltage $U_o / V_{oc}$	11.6 V	11.6 V
	max. current $I_o / I_{sc}$	22 mA	55 mA
	max. power $P_o$	51 mW	127 mW
Cable parameters (ATEX) (for inductive or capacitive circuits)		per channel	4 channels connected in parallel
	max. capacitance $C_o / C_a$ for IIC	600 nF	560 nF
	max. inductance $L_o / L_a$ for IIC	1 mH	1 mH
Further information	see respective certificate and operating instructions		
<b>Further parameters</b>			
Installation in	Zones 1 & 2, Div. 1 & 2, Zones 21 & 22		
Further information	see respective certificate and operating instructions		

### Technical Data

<b>Electrical data</b>			
Ex i / I.S. digital inputs			
Number of channels	16		
Signal	EN 60947-5-6 (NAMUR)		
Minimum current for ON	2.1 mA		
Maximum current for OFF	1.2 mA		
Switching threshold	1.65 mA		
Supply voltage	7.8 V		
Internal resistance	1 kΩ		
Minimum pulse width of the input signal		without OC/SC detection	with OC/SC detection
	Channels 0-15 as digital inputs	approx. 1 ms	approx. 2 ms
	Channels 14 or 15 as frequency input or counter	approx. 2 ms	approx. 4 ms

# Digital Input Module NAMUR Ex i / I.S. Inputs, 16 Channels for Zone 1 / Div. 1

## Series 9470/22



### Technical Data

#### Electrical data

Ex i / I.S. digital inputs				
Maximum signal delay			without OC/SC detection	with OC/SC detection
	from digital inputs to internal bus	channels 0-15 as digital inputs channels 14 or 15 as frequency input or counter	approx. 1 ms approx. 2 ms	approx. 2 ms approx. 4 ms
	from frequency inputs to internal bus	measuring range 1 Hz ... 1 kHz (measurement frequency f = 1 ... 35 Hz)	2 ms + 1/f	4 ms + 1/f
		measuring range 1 Hz ... 1 kHz (measurement frequency f = 35 Hz ... 1 kHz)	34 ms + 1/f	36 ms + 1/f
		measuring range 1 Hz ... 20 kHz gate time		
		50 ms 200 ms 1 s	approx. 50 ms approx. 200 ms approx. 1 s	approx. 50 ms approx. 200 ms approx. 1 s
	from counter inputs to internal bus		approx. 2 ms	approx. 4 ms
Galvanic separation				
	between power supply and system components	1500 V AC		
	between two input / output modules	500 V AC		
	between inputs and system components	500 V AC		
		The inputs of an I/O module have a common negative conductor.		
Channels 14 and 15 as frequency input or counter				
	Maximum switching frequency	20 kHz (the line length must be reduced for frequencies > 1 kHz, e.g. at 5 kHz to approx. 75 m / 246 ft)		
	Minimum pulse width	25 µs		
Frequency input				
		Measuring range		
		1 Hz ... 1 kHz	1 Hz ... 20 kHz	
	Resolution	0.05 Hz	1 Hz	
	Accuracy	0.02 %	0.02 %	
		adjustable parameters for each channel		
Counter input				
	Control signal for counter	Start, Stop, Reset		
	Counter range	0 ...65535		
Settings				
	Open-circuit and short-circuit monitoring	ON, OFF (for each channel)		
	Value to fieldbus during open circuit, short circuit	ON, OFF, hold last value (all channels)		
	Invert input value	ON, OFF (all channels)		
	Adjustable pulse width	0 s, 0.6 s, 1.2 s, 2.4 s (for channel groups)		
	Gate time for frequency measuring range 1 Hz ... 20 kHz	50 ms, 200 ms, 1 s		
	Active edge for counter (channels 14 and 15)	positive (voltage ↑) negative (voltage ↓)		

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# Digital Input Module NAMUR Ex i / I.S. Inputs, 16 Channels for Zone 1 / Div. 1

## Series 9470/22



### Technical Data

#### Electrical data

##### Diagnostics

Retrievable parameters  
Characteristic values for open circuit and short-circuit detection

Manufacturer, type, version, serial number

Open-circuit detection  
Short-circuit detection

< 0.05 mA  
< 100 Ω

Note: If open-circuit / short-circuit detection is required, then contacts require resistors with 1.2 kΩ wiring in series and 15 kΩ in parallel.

##### Module faults

- Internal primary bus faults
- Internal redundant bus faults
- No response
- Module does not correspond to configuration
- Hardware fault

##### Operator interface

Operation  
Fault

LED green "RUN"  
LED red "ERR"

##### Auxiliary power

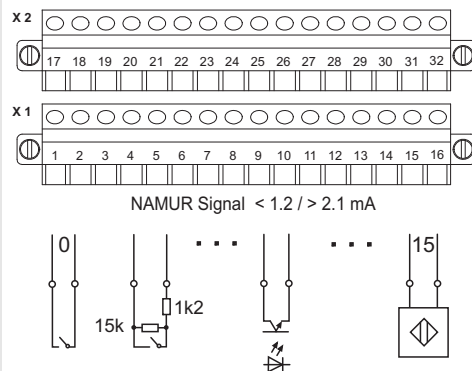
Maximum power consumption  
Maximum power dissipation

5 W  
5 W

##### Electrical connection

Ex i field signals  
Connection diagram

Plug-in terminals 16-pole with catch, 2.5 mm<sup>2</sup> / up to 14 AWG, screw or spring type



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#### Ambient conditions

Ambient temperature  
Storage temperature  
Maximum relative humidity  
Sinusoidal vibration (IEC EN 60068-2-6)  
Semi-sinusoidal shock (IEC EN 60068-2-27)  
Electromagnetic compatibility

-20 ... +65 °C / -4 ... +149 °F  
-40 ... +70 °C / -40 ... +158 °F  
95 % (no condensation)  
1 g in frequency range between 10 ... 500 Hz  
2 g in frequency range 45 ... 100 Hz  
15 g (3 shocks per axis and direction)

Tested according to the following standards and regulations:  
EN 61326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21

#### Mechanical data

Module enclosure  
Fire resistance (UL 94)  
Degree of protection (IEC 60529)  
Modules  
Connections

Polyamide 6GF  
V2  
IP30  
IP20

#### Mounting / installation

Installation conditions  
Mounting type  
Mounting orientation

on 35 mm DIN rail NS 35/15  
horizontal and vertical



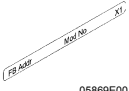



# Digital Input Module NAMUR Ex i / I.S. Inputs, 16 Channels for Zone 1 / Div. 1 Series 9470/22



## Technical Data

Engineering notes	<ul style="list-style-type: none"> <li>Mixing of Zone 1 / Division 1 modules (9470/.2) and Zone 2 / Division 2 modules (9470/.5) on same BusRail is allowed.</li> <li>For separation between intrinsically safe and non-intrinsically safe circuits (<math>\geq 50</math> mm / 2 in), a partition (162740) is required.</li> </ul>
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## Accessories and Spare Parts

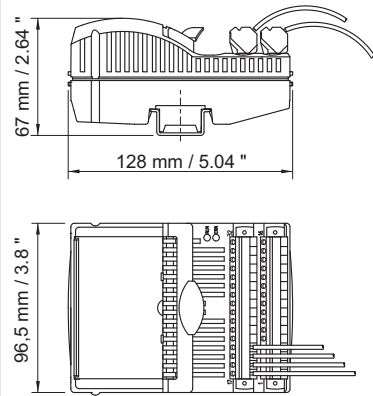
Designation	Figure	Description	Art. no.
Plug-in terminal		2.5 mm <sup>2</sup> / 14 AWG with catch, 16-pole, screw connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	162702
		2.5 mm <sup>2</sup> / 14 AWG with catch, 16-pole, screw connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Labelling: 17 ... 32	162718
		2.5 mm <sup>2</sup> / 14 AWG with catch, 16-pole, spring connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits including test jacks Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	162695
		2.5 mm <sup>2</sup> / 14 AWG with catch, 16-pole, spring connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits including test jacks Labelling: 17 ... 32	162716
Labelling strips		"FB Addr ... Mod No ..." for pluggable terminal, sheet with 26 strips	162788
Warning sign		"Clean modules only with a damp cloth."	162796
DIN A4 sheet		For label plate on I/O modules; 6 labels on each sheet; print-out using IS Wizard; packaging unit = 20 sheets	162832
Partition		For assembly between intrinsically safe and non-intrinsically safe connectors of the I/O modules, in order to adhere to the required 50 mm / 2 in distance	162740

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# Digital Input Module NAMUR Ex i / I.S. Inputs, 16 Channels for Zone 1 / Div. 1 Series 9470/22



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



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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.