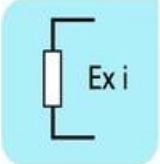



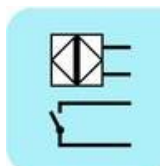
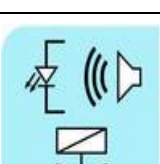
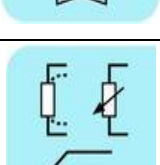
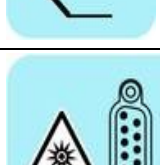


Selection guides

Signal types	Type	Signification	Drawing	Page
Ex i Power Supply	9143	Ex i Power Supply		2
Frequency Input	9146	Frequency Transmitter		3
Analog Input	9160	Transmitter Supply Unit + HART		4
	9162	Transmitter Supply Unit with Limit Value Contact + HART		
	9163	Isolating Repeater + HART		
Analog Output	9165	Isolating Repeater + HART		5
	9167	Isolating Repeater Loop Power + HART		
Digital Input	9170	Switching Repeater		6
	9172	Ex i Relay Module		
Digital Output	9175 9176	Binary Output		7
	9172	Ex i Relay Module		
Temperature Input	9180	Resistance Isolator		8
	9182	Temperature Transmitter		
Profibus DP, Modbus	9185	Feldbus Isolating Repeater		9
	9186	Feldbustrennübertrager (LWL)		

Ex i Power Supply

Type	Ex i																				
	9143/10-065-150-10	9143/10-065-200-10	9143/10-099-220-10	9143/10-104-220-10	9143/10-114-200-10	9143/10-124-150-10	9143/10-156-065-10	9143/10-156-160-10	9143/10-187-050-10	9143/10-244-035-10	9143/10-244-06-10	9143/10-065-200-20	9143/10-104-220-20	9143/10-114-200-20	9143/10-124-150-20	9143/10-156-065-20	9143/10-156-160-20	9143/10-187-050-20	9143/10-244-035-20	9143/10-244-060-20	
Function																					
For the intrinsically safe operation of field devices e.g. transmitters...	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Installation																					
In Zone 2 & 22	x	x	x	x	x	x	x	x	x	x	x										
Ex i Interfaces [Zone 1 und 21]	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Number of channels	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nominal voltage (U_N) [V]																					
4,0...5,6	x	x										x									
8,8...9,1			x																		
8,7...9,5				x									x								
9,4...10,4					x									x							
9,5...11,8						x									x						
12,5...14,7							x	x								x	x				
14,6...17,6									x									x			
18,9...23,0										x	x									x	x
Max. Nominal current I_n																					
15 mA											x									x	
35 mA									x										x		
40 mA											x										x
45 mA							x									x					
130 mA	x				x										x						
140 mA								x										x			
160 mA		x										x									
180 mA				x										x							
200 mA			x	x									x								
Power supply																					
24 V AC / DC	x	x	x	x	x	x	x	x	x	x	x										
85 V...230 V AC												x	x	x	x	x	x	x	x	x	x
Intrinsically safe output																					
[Ex ib] IIC / IIB	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Galvanic isolation																					
Between output and power supply	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Frequency Transmitter

Type	Ex i		Non-Ex i
	9146/10-11-12	9146/20-11-11	9146/10-11-12
Function			
To monitors the speed of rotating devices like fans, centrifuges, tube extruder,...	x	x	x
Installation			
In Zone 2 & 22	x	x	x
Ex i Interfaces [Zone 0 und 20]	x	x	
Number of Channels	1	2	1
Ex i Input signal			
Gem. EN 60947-5-6 (NAMUR)	x	x	x
Input frequency 0,001 Hz...20 kHz	x	x	x
Output			
0/4 mA ...20 mA	x	x	x
Limit value			
2 x NO (contact per channel)	x		x
Pulse output			
One NO selectable	x		x
Power supply			
24 V DC	x	x	x
Open-circuit and short-circuit			
Line fault detection	x	x	x
Potential free relay contact	x	x	x
Galvanic isolating			
Between input, output and power supply	x	x	x

Analog Input "AI"

Type	Ex i											Non-Ex i					
	9160/13-10-11	9160/19-10-11	9160/23-10-11	9160/13-11-11	9160/19-11-11	9160/23-11-11	9162/13-11-12	9162/13-11-14	9163/13-11-11	9163/13-10-11	9163/23-11-11	9163/23-10-11	9160/13-11-61	9160/19-11-61	9160/23-11-61	9162/13-11-62	9162/13-11-64
Function																	
Transmitter supply unit with HART	x	x	x	x	x	x	x	x					x	x	x	x	x
Isolating repeater for 4-wire Transmitter	x	x	x	x	x	x	x	x					x	x	x	x	x
Isolating repeater for 4-wire Transmitter with HART									x	x	x	x					
Installation																	
Zone 2 und 22	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ex i Interfaces [Zone 0 und 20]	x	x	x	x	x	x	x	x	x	x	x	x					
Number of channels	1	1	2	1	1	2	1	1	1	1	2	2	1	1	2	1	1
Duplicate signal		x			x									x			
Input																	
[Ex ia] IIC	x	x	x	x	x	x	x	x	x	x	x	x					
Exi: 0/4 mA...20 mA with HART	x	x	x	x	x	x	x	x	x	x	x	x					
0/4 mA...20 mA with HART													x	x	x	x	x
Output A																	
0/4 mA...20 mA with HART				x	x	x	x	x	x		x		x	x	x	x	x
Passive with HART	x	x	x							x	x						
Output B																	
Passive without HART		x															
Passive with HART			x														
0/4 mA...20 mA					x									x			
0/4 mA...20 mA with HART						x									x		
Limit value contact																	
2 x NO							x	x								x	x
Number of wire																	
2-wire HART transmitter	x	x	x	x	x	x	x	x					x	x	x	x	x
2- & 3-wire transmitter	x	x	x	x	x	x	x	x					x	x	x	x	x
4-wire HART transmitter									x	x	x	x					
4-wire transmitter and mA-Sources	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
active 2-wire Inputs	x	x	x	x	x	x		x	x	x	x	x	x	x	x		x
SIL 2 (IEC 61508)																	
Power supply	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
24 V DC	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x
Open-circuit and short-circuit	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Line fault detection	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Potential free relay contact																	
Galvanic isolating	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Between input, output and power supply																	

Analog Output “AO”

Type	Ex i								Non-Ex i			
	9165/16-11-11	9165/26-11-11	9167/11-11-00	9167/21-11-00	9167/13-11-00	9167/23-11-00	9167/14-11-00	9167/24-11-00	9165/16-11-61	9165/16-11-61	9167/13-11-50	9167/23-11-50
Function												
Isolating repeaters are used in the intrinsically safe operation of control valves, i/p-converters or indicators.....	x	x	x	x	x	x	x	x	x	x	x	x
Installation												
In Zone 2	x	x	x	x	x	x	x	x	x	x	x	x
Ex i Interfaces [Zone 0 und 20]	x	x	x	x	x	x	x	x				
Number of channels	1	2	1	2	1	2	1	2	1	2	1	2
Input												
0/4 mA...20 mA with HART	x	x	x	x	x	x	x	x	x	x	x	x
Output												
Exi: 0/4 mA...20 mA with HART	x	x	x	x	x	x	x	x				
0/4 mA...20 mA with HART									x	x	x	x
U _o / I _o / P _o (15,7 V / 60 mA / 233 mW)			x	x								
U _o / I _o / P _o (18,8 V / 107 mA / 503 mW)							x	x				
U _o / I _o / P _o (25 V / 99 mA / 613 mW)					x	x						
U _o / I _o / P _o (25,6 V / 96 mA / 605 mW)	x	x										
Min. load resistance R_L 150 Ω	x	x										
Max. load resistance R_L												
360 Ω			x	x								
590 Ω							x	x				
800 Ω					x	x					x	x
SIL (IEC 61508)												
SIL 2	x	x							x	x		
SIL 3			x	x	x	x	x	x			x	x
Power supply												
24 V DC	x	x							x	x		
Loop power			x	x	x	x	x	x			x	x
Open-circuit and short-circuit												
Line fault detection	x	x							x	x		
Potential free relay contact	x	x							x	x		
Galvanic isolating												
Between input and output			x	x	x	x	x	x	x	x	x	x
Between input, output and power supply	x	x										

Digital Input "DI"

Type	Ex i																
	9170/10-11-11	9170/10-11-21	9170/20-10-11	9170/20-11-11	9170/20-10-21	9170/20-11-21	9170/10-12-11	9170/10-12-21	9170/10-13-21	9170/20-12-11	9170/20-12-21	9170/10-14-11	9170/20-14-11	9170/11-14-12	9170/21-14-12	9172/10-11-00	9172/20-11-00
Function																	
For intrinsically safe operation of contacts, optocoupler outputs etc.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Relay Ex i activation / Non-Ex i contact																x	x
Installation																	
In Zone 2	x		x	x	x							x	x	x	x	x	x
Ex i Interfaces [Zone 0 und 20]	x		x				x	x	x	x	x	x	x	x	x	x	x
Number of channels	1	1	2	2	2	2	1	1	1	2	2	1	2	1	2	1	2
Input intrinsically safe input																	
[Ex ia] IIC	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Output per channel																	
1 x Changeover (125 V / 1 A)			x		x												
1 x Changeover (250 V / 4 A)							x	x		x						x	x
2 x Changeover (125 V / 1 A)	x	x															
2 x Changeover (250 V / 4 A)						x			x		x						
2 x NO (125 V / 1 A)				x													
1 x Electronic (35 V/50mA)												x	x	x	x		
Transmission frequency																	
≤ 6 Hz							x	x	x	x	x						
≤ 15 Hz	x	x	x	x	x	x										x	x
≤ 10 kHz												x	x	x	x		
SIL 2 (IEC 61508)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Power supply																	
24 V DC	x		x	x			x			x		x	x	x	x		
110 V ... 230 V		x			x	x		x	x		x						
Loop power																x	x
Line fault transparency (LFT)															x	x	
Open-circuit and short-circuit																	
Line fault detection	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Potential free relay contact	x		x	x	x		x			x		x	x	x	x		
Galvanic isolating																	
Between input and output																x	x
Between input, output and power supply	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

Digital Output "DO"

Type	With power supply(9175)									Loop power (9176 & 9172)												
	9175/10-12-11	9175/20-12-11	9175/10-12-12	9175/10-14-11	9175/20-14-11	9175/10-14-12	9175/10-16-11	9175/20-16-11	9175/10-16-12	9176/10-12-00	9176/20-12-00	9176/10-14-00	9176/20-14-00	9176/10-15-00	9176/20-15-00	9176/10-16-00	9176/20-16-00	9176/10-17-00	9176/20-17-00	9172/11-11-00	9172/21-11-00	
Function																						
Binary output for the intrinsically safe operation of Ex i solenoid valves or indicators.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Relay for Non-Ex i Activation / Ex i Contact																				x	x	
Installation																						
in Zone 2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Ex i Interface [Zone 0 und 20]	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Number of channels	1	2	1	1	2	1	1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	
Intrinsically safe output																						
[Ex ia] IIC	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
[Ex ib] IIC	x	x		x	x		x	x		x	x	x	x	x	x	x	x					
Ex i , 1 changeover (125 V / 4 A; 30 V / 4 A)																				x	x	
Max. Output current (I_{A max})																						
29 mA														x	x							
35 mA							x	x	x							x	x					
40 mA																		x	x			
45 mA				x	x	x					x	x										
58 mA														x								
60 mA	x	x	x							x	x											
Parallel interconnection 70 mA								x									x					
Parallel interconnection 80 mA																			x			
Parallel interconnection 90 mA					x							x										
Parallel interconnection 120 mA		x									x											
Internal resistance R_i																						
130 Ω				x	x	x						x	x									
150 Ω	x	x	x								x	x										
460 Ω																			x	x		
250 Ω							x	x	x							x	x					
320 Ω														x	x							
Parallel interconnection 65 Ω					x								x									
Parallel interconnection 75 Ω		x									x											
Parallel interconnection 125 Ω								x									x					
Parallel interconnection 160 Ω															x							
Parallel interconnection 230 Ω																				x		
NO-load voltage (U_A)																						
10 V	x	x	x							x	x											
17,5 V				x	x	x						x	x									
25 V							x	x	x					x	x	x	x	x	x			
SIL (IEC 61508)																						
SIL2			x		x				x												x	x
SIL3	x	x		x	x		x	x		x	x	x	x	x	x	x	x	x	x			
Power supply																						
24 V DC	x	x	x	x	x	x	x	x	x													
Loop power										x	x	x	x	x	x	x	x	x	x	x	x	
Line fault transparent (LFT)																						
Open-circuit and short-circuit			x			x			x													
Line fault detection	x	x	x	x	x	x	x	x	x													
Potential free relay contact	x	x	x	x	x	x	x	x	x													
Galvanic isolating																						
Between input and output	x	x ^{*)}	x	x	x ^{*)}	x	x	x ^{*)}	x	x	x	x	x	x	x	x	x	x	x	x	x	
Between input, output and power supply	x	x	x ^{**)}	x	x ^{**)}	x	x	x ^{**)}	x	x	x	x	x	x	x	x	x	x	x	x	x	

*) No galvanic isolating between outputs

**) No galvanic isolating between output and power supply

Temperature input "TAI"

Type	Ex i														Non-Ex i					
	9180/10-77-11	9180/20-77-11	9180/11-77-11	9180/21-77-11	9182/10-51-11	9182/20-51-11	9182/10-59-11	9182/10-59-13	9182/10-59-13	9182/10-50-12	9182/20-50-12	9182/10-51-12	9182/10-51-14	9182/10-51-61	9182/20-51-61	9182/10-51-63	9182/10-59-63	9182/10-51-62	9182/10-51-64	
Function																				
Resistance Isolator for intrinsically safe operation of Pt 100 resistance thermometer or other resistance sensors	x	x	x	x																
Temperature Transmitter for intrinsically safe operation of temperature sensors					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Installation																				
In Zone 2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Ex i interfaces [Zone 0 und 20]	x	x	x	x	x	x	x	x	x	x	x	x	x							
Number of channels	1	2	1	2	1	2	1	1	1	1	2	1	1	1	2	1	1	1	1	
Sensor (Ex i input)																				
Pt 100 Resistance Isolator	x	x																		
Pt 1000 Resistance Isolator			x	x																
Most currently available sensors can be connected, such as Pt 100, Pt 500, Pt 1000, Ni 100, thermocouples and resistance transmitters					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Output																				
0/4 mA...20 mA active					x	x			x			x	x	x	x	x		x	x	
0/4 mA...20 mA passive							x	x									x			
Resistance value	x	x	x	x																
Limit value contact (per channel)																				
2 x NO										x	x	x	x					x	x	
Configuration																				
PC					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
DIP-switches					x	x	x							x	x					
Power supply																				
24 V	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
SIL 2 (IEC 61508)								x	x				x			x	x		x	
Open-circuit and short-circuit																				
Line fault detection	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Potential free relay contact	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Galvanic isolating																				
Between input, output and power supply	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

Fieldbus Isolating Repeater

Type	Ex i				NON-Ex i
	9185/11-35-10	9186/12-1-11	9186/15-12-11	9186/25-12-11	9185/12-45-10
Function					
Fieldbus Isolating Repeater to separate intrinsically safe or non intrinsically safe RS 422 / RS 485 fieldbus from non intrinsically safe RS 232, RS 422, RS 485 interface	x				x
Fibre Optic Isolating Repeater to build-up fibre optic network structures in hazardous areas		x	x	x	
Installation in					
Zone 1		x	x		
Zone 2, 22	x			x	x
Ex i Interfaces [Zone 1 und 21]	x				
LWL Interfaces [Zone 0 und 20]		x	x	x	
RS 485 Interfaces Zone 1 und 21]		x			
Transmission speed					
1,2 kbit/s...1,5 Mbit/s	x	x			x
9,6 kbit...1,5 Mbit/s			x	x	
Automatic setting Profibus DP	x				
Interfaces field area					
Intrinsically safe bus connection via RS 485 IS (PNO)	x	x	x	x	
Intrinsically safe optical interface			x	x	
Interfaces safe area					
RS 485, RS 422, RS 232	x				x
Intrinsically safe optical interface		x			
Network structure					
Line structure		x	x	x	
Point-to-Point Structure		x	x	x	
Ring structure		x		x	
Bitrefresh	x				x
Power supply					
24 V UC	x				
Line fault detection		x	x	x	
Galvanic isolating					
Between input, output and power supply	x	x	x	x	x