CONVERTÍ INSTALACIONES ELÉCTRICAS NO SEGURAS EN INSTALACIONES ATEX.

STAHL

PRODUCTOS ELÉCTRICOS PARA ZONAS EXPLOSIVAS

ISpac - STAHL

LA INSTALACIÓN SE VUELVE SEGURA A PESAR QUE LOS COMPONENTES NO SEAN ATEX.

- » ENTRADAS Y SALIDAS INTRINSECAMENTE SEGURAS [EEx ia] IIC/IBB.
- » AISLACIÓN GALVÁNICA ENTRE MÓDULOS DE I/O Y FUENTES.
- » MÓDULOS PARA RAIL-DIN O SISTEMA VÍA PAC CARRIER.
- » APTOS PARA INSTALACIÓN EN ZONA 2 RESP. DIV. 2.

SIEMENS APRUEBA LA UTILIZACIÓN DEL ISpac PARA APLICACIONES CON SIMATIC PCS 7 Y ET200M.

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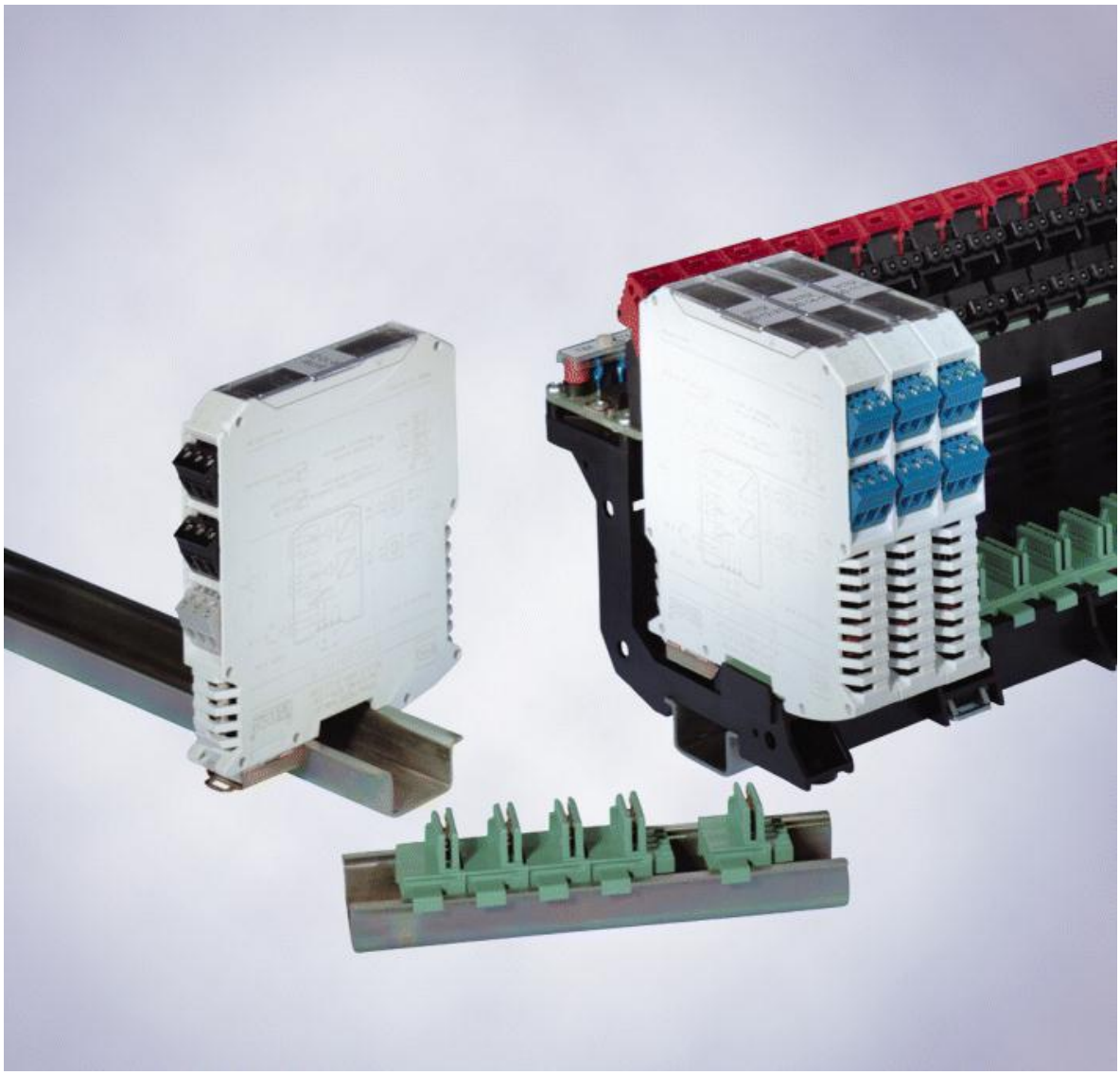


Engineering Guideline

Intrinsically safe isolators ISpac

SIL Safety Integrity Level
IEC 61508 IEC 61511

for Emerson DeltaV SIS

A unique solution designed for the DeltaV SIS

The complete solution – pac-Carrier and the specified Ex i / I.S. isolators – has been designed in cooperation with Emerson's DeltaV SIS specialists. The isolators for the discrete input and discrete output have been modified according to the requirements of safety related applications. The results are isolators which offer so-called line fault transparency.

In contrast to usual isolators these new devices are able to detect short circuit or line break in the field and report those failures back to the DeltaV SIS system directly via the signal channel. For analogue signals as well as for discrete signals the operator of the DeltaV SIS gets access to the condition of all field circuits no matter if a Ex i / I.S. isolation is required or not.

The pac-Carrier has been customized in several steps to the specific needs of the DeltaV SIS system. It allows for maximum flexibility. Each slot of the pac-Carrier can be equipped individually with the isolator corresponding to the channel type configured in the DeltaV SIS Logic Solver. As a result the pac-Carrier can be adapted to any I/O configuration of the DeltaV SIS Logic Solver. Non Ex i / I.S. signals can be easily integrated by means of an additional terminal block.

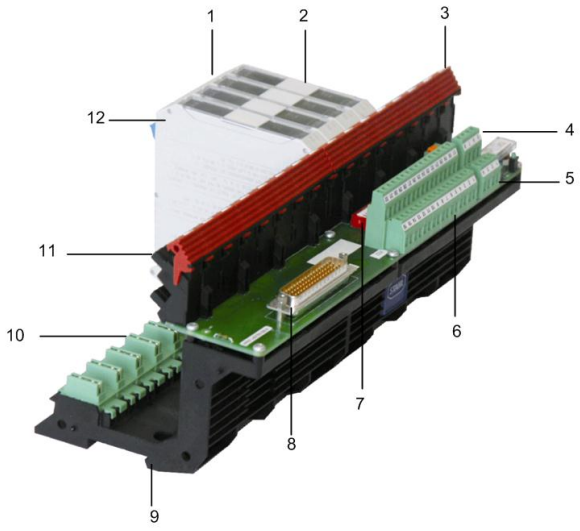
Test accomplished

In order to ensure a reliable interworking with the DeltaV SIS system the ISpac solution was thoroughly tested by Emerson. The solution passed the test.

Integrated solution pac-Carrier and single channel Ex i / I.S. isolator

Your benefits

- A flexible system for the integration of Ex i / I.S. signals
- Tested by Emerson's DeltaV SIS specialists for compatibility
- Complete line fault transparency - no blind spots
- Compact and rugged installation
- Zone 2 / Div 2 installation for DeltaV SIS and Ex i / I.S. isolation made by R. STAHL

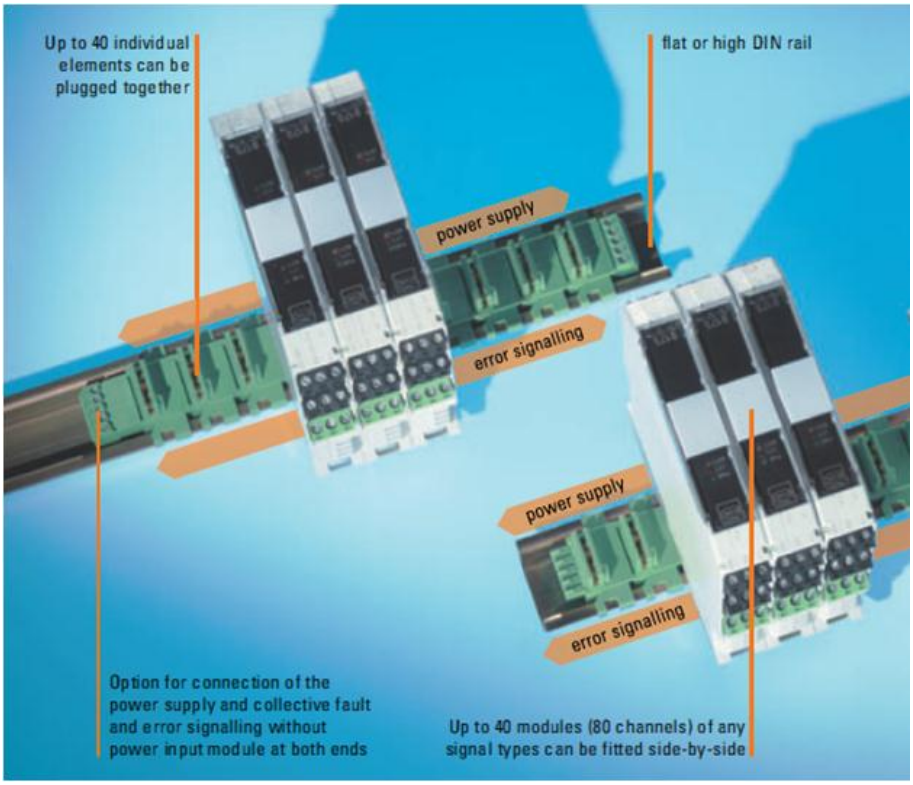


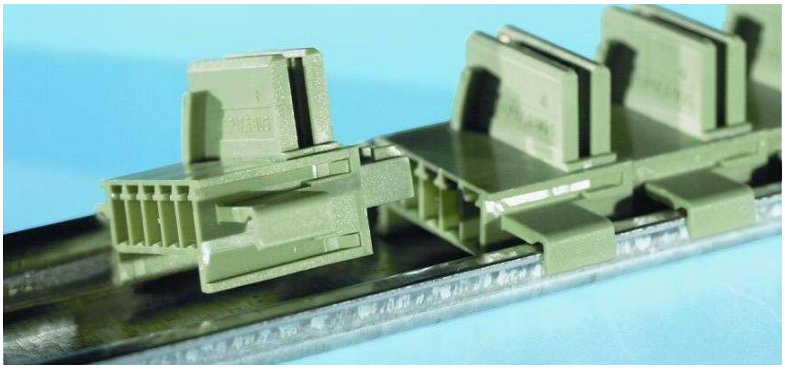
Example of 16 slots pac-Carrier

1. Detachable connectors
   - Screw terminals
   - Cage clamp terminals
2. Labeling for module, slot and carrier
3. Ejector mechanism
4. Redundant and fused supply
5. Power supply failure and line fault signaling via relay contact
6. Additional interface for field signal connection w/o Ex i / I.S. isolator
7. DIP switch for selection between AI, AO, DI or DO.
8. System cable plug
9. Installation on DIN rail or mounting plate
10. Integrated pac bus for power supply and line-fault signaling
11. Reliable snap-in mechanism, without tool
12. Single slot, any signal mixture

Stand-alone isolators on DIN rail

R.STAHL's compact ISpac Ex i / I.S. isolator system provides the entire, sophisticated functionality required for process automation and safety systems in hazardous locations subject to the risk of gas and dust explosion. It offers solutions for all conceivable requirements made of point-to-point transmission of process signals. There is a device with one or two channels for all processes and standard applications. Stand-alone application on single DIN rails, group installation of 20, 30 or more devices, transmission of HART signals or use in SIL applications: always the same design with consistent installation procedures. This drastically simplifies your planning procedures and wiring. The consequence of this flexibility is an unrivalled level of economy and efficiency.





The ISpac modules are available for all functions, both as single-channel devices and as two-channel devices. Most of the components of R.STAHL's ISpac Ex i isolator system can be used in applications necessitating SIL 2 or SIL 3.

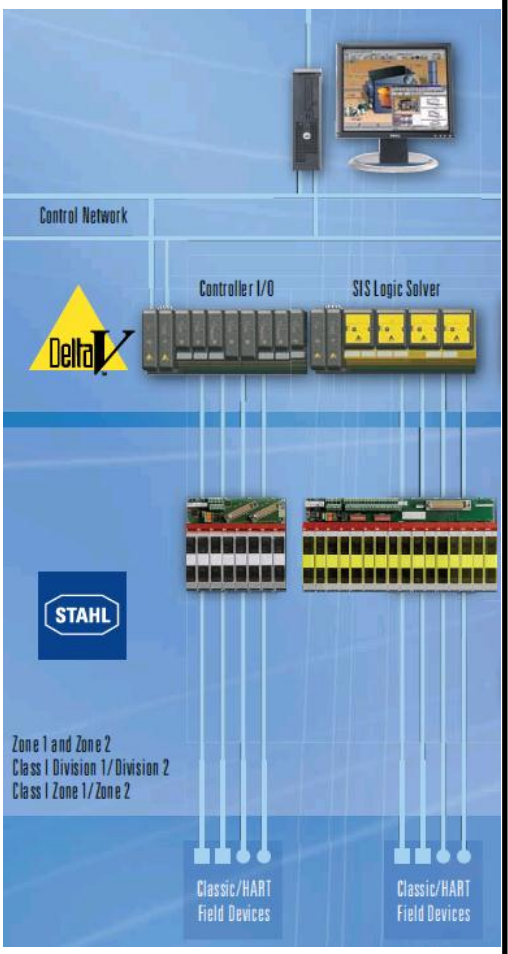
Customized solutions for Emerson

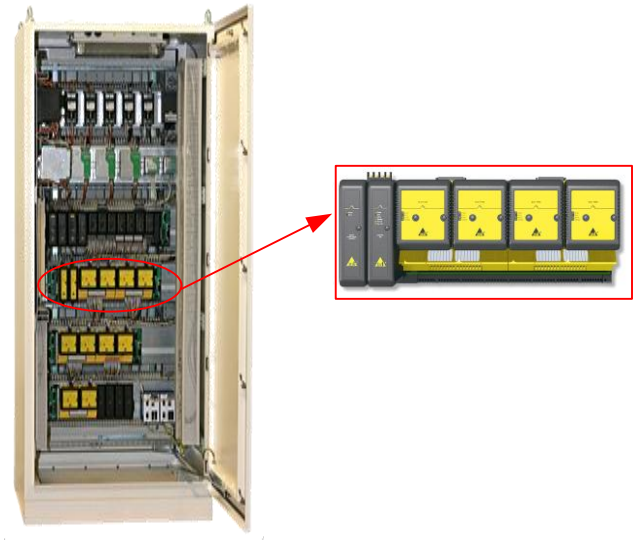
R. STAHL offers a wide range of customized solutions which allow the user to integrate field signals into Emerson´s DeltaV and DeltaV SIS in an easy and cost effective manner. The solutions designed for Emerson cover the different ways of connecting field devices to process control and safety systems nowadays.

In addition to the products the R. STAHL Competence Centre provides the full range of services: consulting, engineering, commissioning and maintenance in order to contribute to Emerson's overall project business. We do not only regard ourselves as a manufacturer and supplier of components and systems, but also as a provider of comprehensive services.

Our engineers have many years of experience, from the engineering to the handling of the smallest details, which is beneficial for you and your customer.

R. STAHL is able to manufacture completely equipped I.S. system cabinets for control room or field installation. In addition to our approved R. STAHL standard components additional components from certified suppliers are used.





Example of a customer specific field station for an Emerson system made by STAHL

Cooperation with STAHL provides the following benefits:

- Selection of the explosion protection method which fits best your needs – technically and economically
- Competent consulting and engineering
- In-house manufacturing ensures maximum flexibility and short delivery times
- Complete range of interface solutions – barriers, isolators, remote I/O, fieldbus, HMI and CCTV

Content

Integrated solution pac-Carrier and single channel Ex i / I.S. isolator

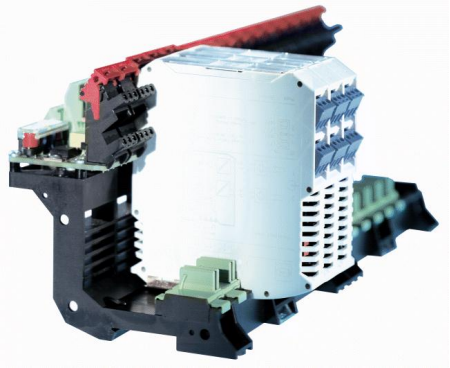
DeltaV SIS				STAHL pac-Carrier			
Signal type	**Card type**	**Channels**	**Slots**	**Cable type**	**pac-Carrier type**	**ISpac**	**page**
DI, DO, AI AO	SLS 1508	16	16	9195/C-006	9195/16A–EP1–04A4	DI: 9170/10-14-12 DO: 9175/10-12-12 9175/10-14-12 9175/10-16-12 AI: 9160/13-10-11 AO: 9165/16-11-11 Rev C	7-12

Stand-alone Isolators on DIN rail (without pac-Carrier)

Signal type	Channels	Description	ISpac	page
DI	1	Switching repeater with electrical output (NAMUR EN 60947-5-6, 35 V / 50 mA) with line fault transparency (LFT)	9170/10-14-12	12-15
	2		9170/20-14-12	
DO	1	Binary output with line fault transparency (LFT) for I_{max} = 60 mA	9175/10-12-12	16-27
	1	Binary output with line fault transparency (LFT) for I_{max} = 45 mA	9175/10-14-12	
	1	Binary output with line fault transparency (LFT) for I_{max} = 35 mA	9175/10-16-12	
AI	1	Transmitter supply unit 0/4 mA…20 mA with HART	9160/13-10-11	28-32
	2		9160/23-10-11	
	1/2	Transmitter supply unit with Single input 0/4 mA…20 mA and dual output with HART	9160/19-10-11	
AO	1	isolating repeater 0/4 mA…20 mA with HART	9165/16-11-11 Rev C	34-36
	2		9165/26-11-11 Rev C	

Please note: Only single channel isolators can be mounted on pac-Carrier 9195.
All types (single / dual channel / signal duplicator) can be used for DIN rail installation without pac-Carrier.

pac-Carrier
Type 9195 / 16A – EP1 – 04A4



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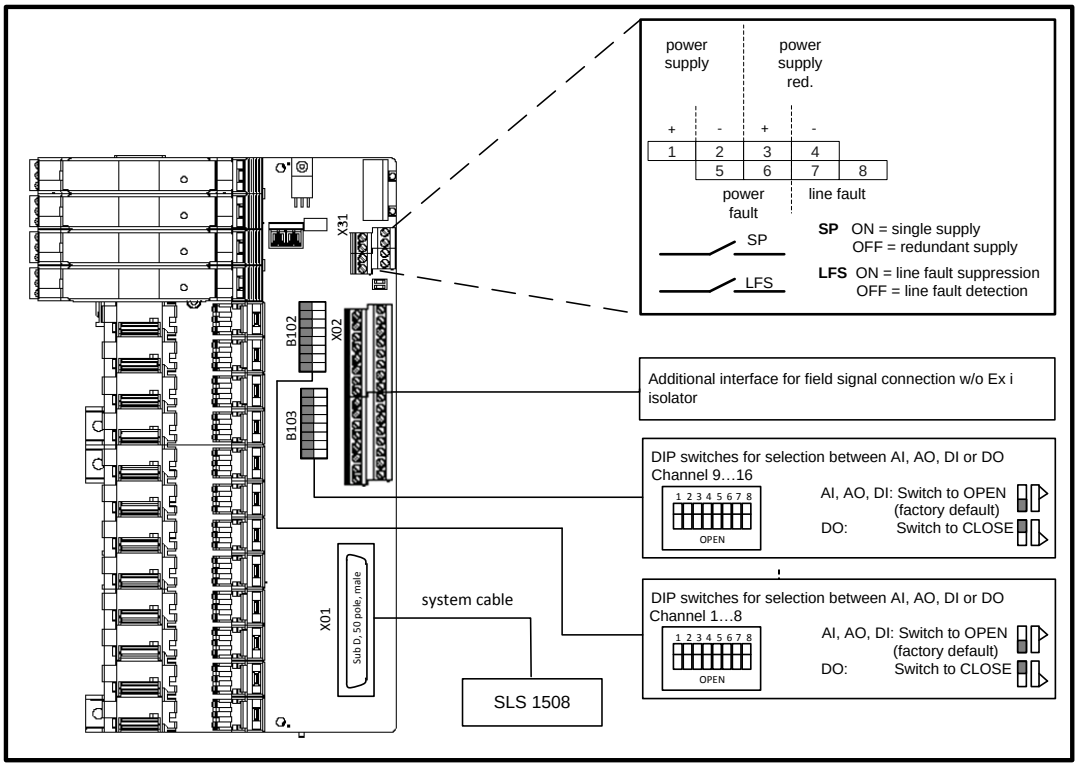
For Emerson DeltaV SIS

- Signal types: DI, DO, AI, AO
- pac-Carrier for 16 modules, up to 16 signals
- ISpac isolators :
  DI 9170/10-14-12
  DO 9175/10-12-12, 9175/10-14-12, 9175/10-16-12
  AI 9160/13-10-11
  AO 9165/16-11-11 Rev C can be used
- Customized system cables type 9195/C-006 with Sub-D for connection on pac-Carrier and wires to the DeltaV SIS
- Redundant power supply with fault signalization contact and exchangeable fuses
- Horizontal or vertical installation
- Simple installation on DIN rail or mounting plate
- Various labeling possibilities
- Fast and reliable installation of the isolators without tools
- Comfortable exchange of the isolators with secured ejector mechanism
- Installation possible in Zone 2 and Div. 2

Comfortable and simple integration of the Ex I / I.S. isolators ISpac into Emerson / DeltaV SIS safety systems via system specific connection boards and system cables.

System overview

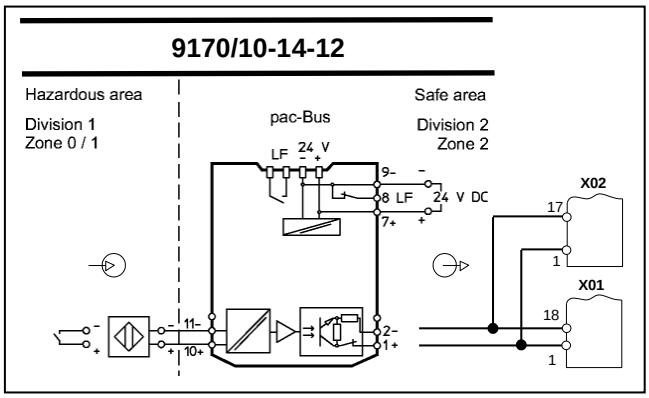


Technical data	
Certificates	BVS 03 ATEX E213 X
Explosion protection	⟨Ex⟩ II 3 G Ex nA nC II T4
Installation	In Zone 2, Div. 2 and in the safe area
Power supply	**(X31)**
Nominal voltage U_N	24 V DC (19 V … 31,2 V)
Redundant supply	yes, decoupled with diodes
Indication	2 LED green „PWR1“; „PWR2“
Fuse	2 x TR5; T 2,0 A; exchangeable, for primary and redundant supply
Polarity reversal protection	yes
Connection to automation system	**(X01)**
Connection	1 x socket Sub-D 50 pole for customized cable type 9195/C-006
Number of channels	16
Connection field devices – None Ex i / I.S.	**(X02)**
Connection	Screw terminal
Number of channels	16 (3 PINs per channel)
Connection field devices – Ex i / I.S.	
Connection	at the terminals of the Ex i / I.S. isolators (see “signal loops”)
Number of channels	16
Error messaging	**(X31)**
Power supply failure PF	Contact (35 V / 100 mA), closed in good conditions
Line fault LF (of IS pac modules)	Contact (35 V / 100 mA), closed in good conditions
Setting switch „SP“	Power failure message suppressed for redundant supply (single supply)
Setting switch „LFS“	Line fault message suppressed
Ambient conditions	
Ambient temperature	max. - 20 °C ... + 70 °C (see specification of Ex I/ I.S. isolators)
Storage temperature	- 40 °C ... + 80 °C
Relative humidity (no condensation)	≤95 %
Mechanical data	
Weight	approx. 320 g
Mounting type	on DIN rail (NS35 / 15, NS35 / 7.5) or mounting plate (4 x screw M6)
Mounting position	horizontal or vertical
Casing / Terminal protection class	IP 00 / IP 20
Casing material	PA 6.6
Fire protecting class (UL-94)	V0

Signal loops

The diagrams below show typical applications. Please refer to the connection list to get the entire connection scheme. Basic technical parameters of the ISpac isolating repeaters can be found at the end of this document. The detailed specifications
can be downloaded at: www.ispac.info.

Switching repeater (DI)
with Line Fault Transparency
for NAMUR proximity switches and contacts
- electronic output

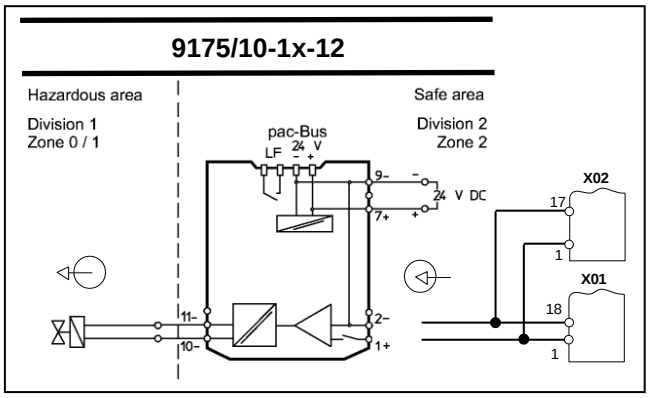


Digital output (DO)
with Line Fault Transparency
for solenoid valves and LED´s

Please note, that the current of the line fault detection may cause problems with specific types of solenoid valves. Valves may not switch off even if the output of the digital output is in the operating mode OFF. In this case the line fault detection must be deactivated. See 7.2.

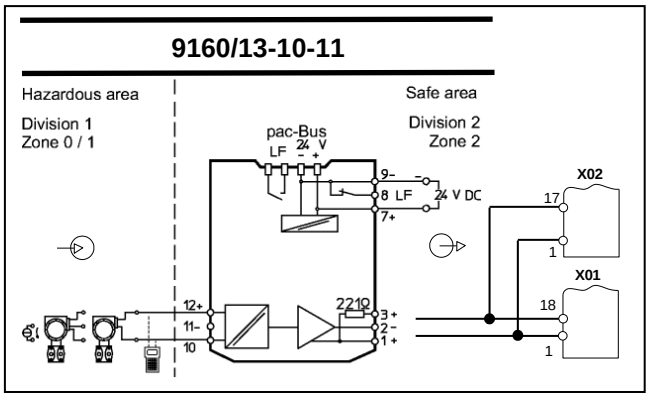
Please check the holding current of the solenoid valve by means of the individual spec sheet.

Line fault detection circuit ISpac 9175: Current: 0,5...1,1 mA



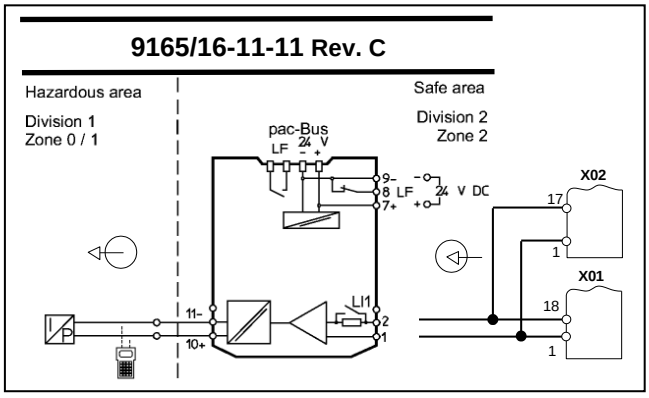
X = 2, 4 und 6

Transmitter supply unit (AI)
for 2-, 3-wire transmitter and mA sources
for 2-wire transmitter with HART



Isolating repeater (AO)
for control valves, i/p-converters or indicators
bi-directional HART communication.

For safety applications only 4…20 mA signals are permitted



SIL specification

ISpac type	Function	SIL	Tested by	Test report Number	SFF	PFD	Tproof
9170/10-14-12	DI	2	EXIDA	Stahl 05/08-34 R009 (V2, Rev. R1)	89%	6,25E-04	5
9175/10-1x-12	DO	3	EXIDA	Stahl 07/10-01R012 (V1, Rev. R0)	97%	3,85E-04	5
9160/13-10-11	AI	2	EXIDA	Stahl 05/08-34 R008 (V2, Rev. R3)	73%	4,46E-04	1
9165/16-11-11RevC	AO	2	EXIDA	Stahl 04/04-03 R004 (V3, Rev. R0)	82%	9,51E-04	3
9195/16 A-EP1-04A4		3	EXIDA	Stahl 04/04-03 R002 (V1, Rev. R1.0)	91%	2.04E-05	10

Please find further parameters in the SIL reports. Download at www.ispac.info.

Accessories and Spare Parts			
Designation	Illustration	Description	**Order number**
Cover yellow transparent (10 pieces)	 01955E00	The yellow covers mark the isolators used for SIL applications. Delivered in packages of 10 pieces.	**200914**
System cable	Customized system cables type 9195/C-006 with Sub-D for connection on pac-Carrier and wires to the DeltaV SIS. Please specify the required length.		**9195/C-006**

Dimension drawings (all dimensions in mm) - subject to alterations

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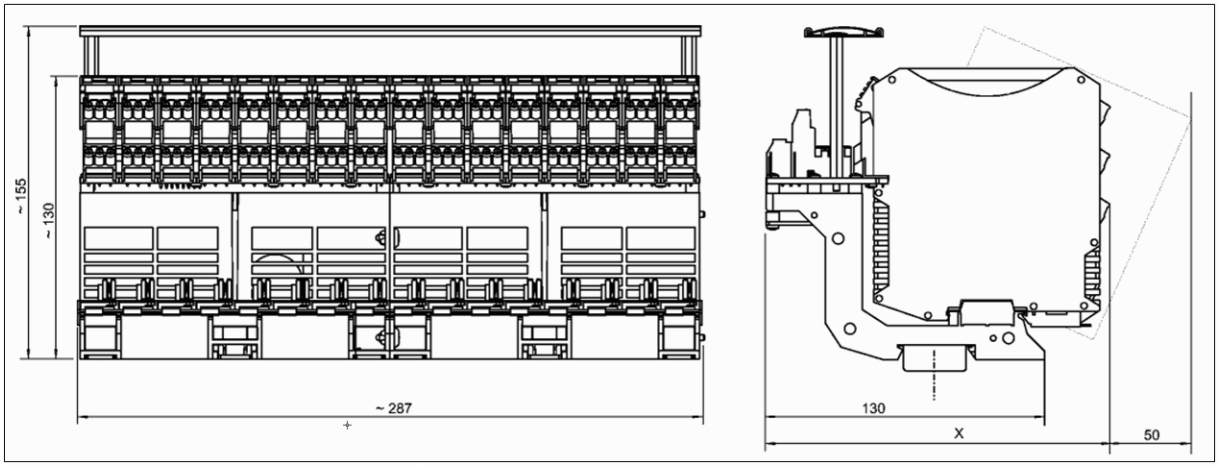

	Dimension x
Screw terminals	176 mm
Cage clamp terminals	186 mm

Please note: In order to snap in the ISpac modules an extra space of approx. 50 mm is required.
Please read the “ISpac engineering guideline“ carefully before you start to engineer the enclosures with incorporated ISpac modules with or without pac-Carriers. The “ISpac engineering guideline“ can be downloaded from: www.ispac.info.

Connection list

Connection to field devices (Ex i / I.S.)

terminal Ex I / I.S. ISpac Modules			channel	carrier slot	input / output no.	switch no		X01 pin no (Sub-D 50)	polarity	X02 terminal no (screw)	Cable 9195/C-006 color code	SLS 1508 terminal no
DI: 9170 DO: 9175 AO: 9165	polarity	AI: 9160				B102	B103					
10	+	12	1	1	1	1		1	+	1	White	A1
11	-	10						18	-	17	Brown	B1
								34			Green	C1
10	+	12	2	2	2	2		2	+	2	Yellow	A2
11	-	10						19	-	18	Gray	B2
								35			Pink	C2
10	+	12	3	3	3	3		3	+	3	Blue	A3
11	-	10						20	-	19	Red	B3
								36			Black	C3
10	+	12	4	4	4	4		4	+	4	Purple	A4
11	-	10						21	-	20	gray-pink	B4
								37			red-blue	C4
10	+	12	5	5	5	5		5	+	5	white-green	A5
11	-	10						22	-	21	brown-green	B5
								38			white-yellow	C5
10	+	12	6	6	6	6		6	+	6	yellow-brown	A6
11	-	10						23	-	22	white-gray	B6
								39			gray-brown	C6
10	+	12	7	7	7	7		7	+	7	white-pink	A7
11	-	10						24	-	23	pink-brown	B7
								40			white-blue	C7
10	+	12	8	8	8	8		8	+	8	brown-blue	A8
11	-	10						25	-	24	white-red	B8
								41			brown-red	C8
10	+	12	9	9	9		1	9	+	9	white-black	A9
11	-	10						26	-	25	brown-black	B9
								42			gray-green	C9
10	+	12	10	10	10		2	10	+	10	yellow-gray	A10
11	-	10						27	-	26	pink-green	B10
								43			yellow-pink	C10
10	+	12	11	11	11		3	11	+	11	green-blue	A11
11	-	10						28	-	27	yellow-blue	B11
								44			green-red	C11
10	+	12	12	12	12		4	12	+	12	yellow-red	A12
11	-	10						29	-	28	green-black	B12
								45			yellow-black	C12
10	+	12	13	13	13		5	13	+	13	gray-blue	A13
11	-	10						30	-	29	pink-blue	B13
								46			gray-red	C13
10	+	12	14	14	14		6	14	+	14	pink-red	A14
11	-	10						31	-	30	gray-black	B14
								47			pink-black	C14
10	+	12	15	15	15		7	15	+	15	blue-black	A15
11	-	10						32	-	31	red-black	B15
								48			white-brown-black	C15
10	+	12	16	16	16		8	16	+	16	yellow-green-black	A16
11	-	10						33	-	32	gray-pink-black	B16
								49			blue-red-black	C16
								17 *)		--	white-green-black	(GND)
								50 *)		--	green-brown-black	(GND)

*) connector body

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