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Instrumentation - Products and Applications

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Instrumentation – Products and Applications

Instrumentation

- Safety barriers
- I.S. Isolators
  - DIN rail mounting
  - Eurocards
  - Modules
- Remote I/O
- Operating and monitoring systems
- Instrumentation systems

The instrumentation we have on offer is found on the following pages: Products, consultation and services concerning intrinsic safety.

Benefit from our decades of experience in the development, manufacture and use of I.S. products.
In Chapter 2 we present our selection of off-the-shelf safety barriers.

In Chapter 3 you will find our I.S. interfaces with galvanic isolation in three different mechanical designs: for DIN rail mounting, Eurocards and plug-in modules.

Since 1987 we have worked intensively with field bus technology: in Chapter 4 you will find everything that you should know about our field-station VOS 200. VOS 200? A remote I/O for installation in Zone 1. In addition, we present our newest product I.S. 1.

Terminals for operating and monitoring in the industrial and explosion-protected version are illustrated in Chapter 5.

Last but not least, we have combined consultation, system engineering and services for you in our Competence Center instrumentation systems (Turn to Chapter 6).

Instrumentation – Products and Applications
Product Overview

Chapter 2: Safety barriers

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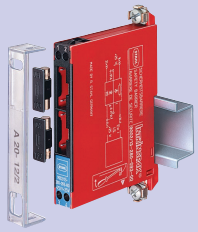

INTRINSPAK

- Extensive program for standard instrumentation applications and for general applications
- 1 or 2 channels
- Exchangeable back-up fuse - one single nominal value for all safety barriers
- Snap-on mounting; simultaneous connection to potential equalisation/ground
- Short-circuit-proof
- Global certifications

Chapter 3: I.S. Isolators

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I.S. Isolators (DIN rail mounting)

ICS PAK

- System with broad functionality
- Easy mounting on DIN rail or mounting plate
- Inputs or outputs, intrinsically safe [EEx ia] IIC
- Global certifications
- Galvanic isolation between input, output and power supply

I.S. Isolators (Eurocards)

ICS 1000

- Standard format Eurocard 19", 4 TE, 3 HE
- High packing density through multi-channel devices
- Simple plug-in mounting in racks
- Possibility of prepackaged mounting in system racks
- Client-specific system solutions

I.S. Isolators (Modules)

ICS modul

- Simple, prepackaged assembly in module carriers with 16 or 32 signals
- Plug-in modules with many functions
- Field connections with plugs or plug-in terminals
- System cable to the control system
- Signal duplication or signal loo-pin via terminals
- Galvanic isolation between input, output and power supply
- Inputs or outputs, intrinsically safe [EEx ia] IIC

Chapter 4: Remote I/O

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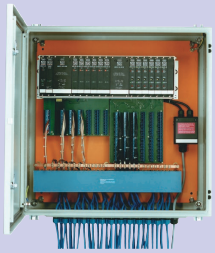
Fieldstation VOS 200



ICS mux

- Remote I/O for installation in Zone 1
- Inputs and outputs, intrinsically safe I.S.
- AI, AO, HART, DI, DO, temperature, frequency
- HART communication with PC software
- Redundancy for field bus, central unit, power supply
- Hot swap under Ex-conditions for all units
- Communication: Modbus, Profibus DP etc.
- Mechanics, terminals, field housing freely configurable

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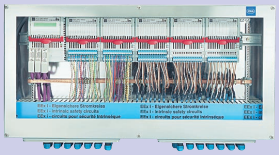
Chapter 4: Remote I/O (continued)

Remote I/O System



- Modular Remote I/O system for DIN rail mounting
- Installation in Zone 1 or Zone 2 / Div 2 or in the safe area
- Simple engineering through PowerBus
- Devices: BusRail, CPU & power module, various I/O modules
- Input and output. Intrinsically safe I.S.
- HART-communication for transmitters and control valves
- Redundancy for field bus and CPU & Power Module
- Hot swap under Ex-conditions for all modules
- Communication: Modbus, Profibus DP etc.
- Service bus for configuration, fault diagnosis, HART-communication
- Field housing freely configurable

Chapter 5: Operating and Monitoring Systems

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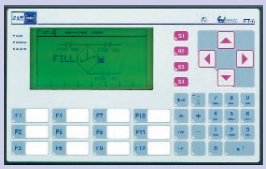
Terminals for industrial areas

- Various displays (text, graphics, colour graphics)
- Possibility of connecting bar code readers
- High functionality
- Simple and comfortable engineering
- Large selection of connections to PLC/DCS
- Integrated multi-lingual capability and help functions

Terminals for hazardous areas



- For use in Zone 1 and Zone 2
- Various displays (text, graphics, colour graphics)
- Possibility of connecting I.S. bar code readers
- High functionality
- Simple and comfortable engineering
- Large selection of connections to PLC/DCS
- Integrated multi-lingual capability and help functions

Chapter 6: Instrumentation Systems

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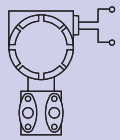
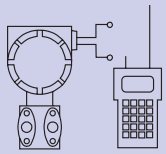
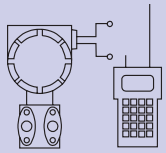
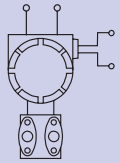
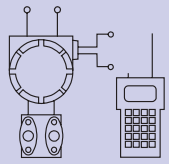
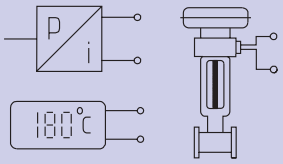
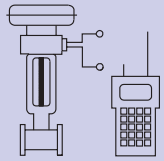
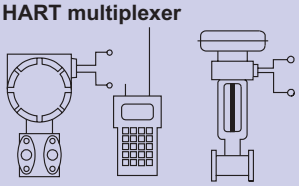
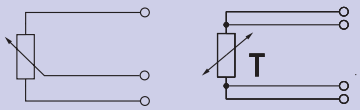
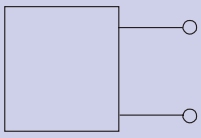
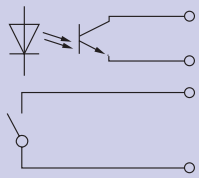
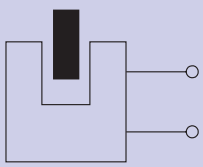
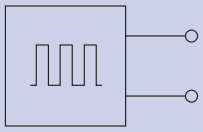
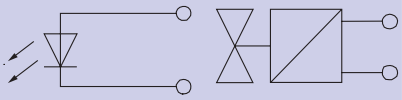
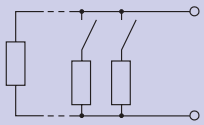
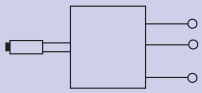
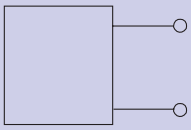
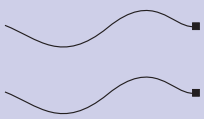
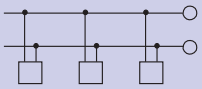
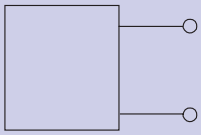
The competence center instrumentation systems completes our service.
Here you will find engineers dealing with project management:

- Consulting
- Engineering
- Cabinet design and manufacture
- Commissioning
- Service
- Training

Application / field device in hazardous areas	Safety barriers	I.S. Isolators			Remote I/O in hazardous areas	
	INTRINSPAK	ICS IPAK	ICS 1000	ICS modul	ICS mux	IS.1
	DIN rail mounting	DIN rail mounting	Euro-cards	Modules	Euro-cards	Modules
2-wire transmitter 	**9002/13-280-110-00** Page 2/6 **9001/51-280-091-14** Page 2/2	**9303/11** Page 3/4	**9601/.1** Page 3/61	**9103/.1** Page 3/66	**9541** Page 4/8	**9460** Page 4/25
2-wire HART transmitter 	**9002/13-280-110-00** Page 2/6 **9001/51-280-091-14** Page 2/2	**9303/13** Page 3/4	**9601/.3** Page 3/61	**9103/.3** Page 3/66	**9541** Page 4/8	**9461** Page 4/25
2-wire SMART transmitter 	**9002/13-280-110-00** Page 2/6 **9001/51-280-091-14** Page 2/2	**9303/15** Page 3/4	**9601/.5** Page 3/61			
4-wire transmitter 	**9002/34-280-000-00** Page 2/6	**9318/11** Page 3/12	**9615/.8** Page 3/61	**9118/11** Page 3/74	**9541** Page 4/8	**9460** Page 4/25
4-wire HART transmitter 	**9002/34-280-000-00** Page 2/6				**9541** Page 4/8	**9461** Page 4/25
i/p converter, control valve, indicator 	**9001/01-280-110-10** Page 2/2 **9002/13-280-110-00** Page 2/6	**9311** Page 3/8 **9318/12** Page 3/14	**9615** Page 3/61 **9618** Page 3/61	**9111** Page 3/70 **9118/12** Page 3/76	**9561** Page 4/15	**9465** Page 4/25
i/p converter, HART control valve 	**9001/01-280-110-10** Page 2/2 **9002/13-280-110-00** Page 2/6	**9318/16** Page 3/18		**9118/16** Page 3/78	**9561** Page 4/15	**9466** Page 4/25

Application / field device in hazardous areas	Safety barriers	I.S. Isolators			Remote I/O in hazardous areas	
	INTRINSPAK	ICS PAK	ICS 1000	ICS modul	ICS mux	IS.1
	DIN rail mounting	DIN rail mounting	Euro-cards	Modules	Euro-cards	Modules
HART multiplexer 				**9148** Page 3/84	**9548** Page 4/11	
Resistance thermometer (RTD) **Potentiometer** 	**9002/22-032-300-11** Page 2/4 **9002/22-093-040-00** Page 2/4	**9324** Page 3/22 **9326** Page 3/26	**9623** Page 3/62	**9124** Page 3/80	**9543** Page 4/10	**9480** Page 4/25
Thermocouple 	**9002/22-093-300-00** Page 2/3	**9324** Page 3/22 **9323** Page 3/20	**9623** Page 3/62	**9124** Page 3/80	**9542** Page 4/9	**9481** Page 4/25
mV signal 	**9002/22-093-300-00** Page 2/3	**9323** Page 3/20				
Contact, opto coupler output 	**9001/01-252-057-14** Page 2/3 **9001/01-252-060-14** Page 2/3	**9350** Page 3/36 **9250** Page 3/30 **9251** Page 3/32	**9650** Page 3/62	**9150** Page 3/86	**9551** Page 4/12	**9470** Page 4/25
NAMUR proximity switch 		**9350** Page 3/36 **9250** Page 3/30 **9251** Page 3/32	**9650** Page 3/62	**9150** Page 3/86	**9551** Page 4/12	**9470** Page 4/25
Pulse signal voltage 	**9001/03-280-000-10** Page 2/5	**9350/10-24** Page 3/36	**9650/.0-24** Page 3/62	**9150/10-24** Page 3/86	**9555** Page 4/13	

Application / field device in hazardous areas	Safety barriers	I.S. Isolators			Remote I/O in hazardous areas	
	INTRINSPAK	ICS IPAK	ICS 1000	ICS modul	ICS mux	ISI
	DIN rail mounting	DIN rail mounting	Euro-cards	Modules	Euro-cards	Modules
Solenoid valve, LED indicator 	**9001/01-252-100-14** Page 2/3 **9002/13-252-121-04** Page 2/3	**9351** Page 3/40	**9651** Page 3/62	**9151** Page 3/90	**9571** Page 4/14	**9475** Page 4/25
Fire & gas detector 	**9001/01-280-165-10** Page 2/5	**9311/52** Page 3/8	**9615/.2** Page 3/61	**9111/52** Page 3/70	**9581** Page 4/16 **9541** Page 4/8	
Vibration sensor 	**9002/00-260-138-00** Page 2/6	**9307** Page 3/6				
Intrinsically safe field bus RS 485, RS 422 		**9373/11** Page 3/48 **9373/21** Page 3/50			**9503** Page 4/18	**9440** Page 4/25
Intrinsically safe field bus fiber optic 		**9372/11** Page 3/44 **9372/21** Page 3/46				
Intrinsically safe field bus IEC H1 		**9375** Page 3/52				
Intrinsically safe power feed of a load 	**9004** Page 2/5	**9381** Page 3/54			**9581** Page 4/16	

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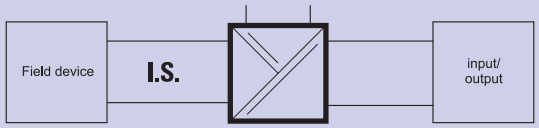
Performance class	Operating and Monitoring Systems	
	ProVicom	Exicom
	Safe area	Hazardous area
Text 	**MT-40** **MT-60** **MT-80** Page 5/4	**ET-4** Page 5/5
Graphics 	**MT-50** **MT-120** Page 5/4	**ET-6** **ET-9752** Page 5/5
Visualisation 	**MT-300** Page 5/4	**ET-8** Page 5/5

Selection of I.S. interfaces - I.S. safety engineering

Case I: Engineering of an I.S. interface with active input or output

The I.S. interface should be selected such that the safe maximum values of the I.S. interface (U_m, I_m and P_m) are less than, and the values C_a and L_a are greater than the safe maximum values of the field device.
These values (U_{max}, I_{max}, C_i and L_i) are to be derived from the test certificate of the field device.

Otherwise, the national standards for the installation of intrinsically safe circuits should be applied.



$U_{max} \geq U_m$
$I_{max} \geq I_m$
$P_{max} \geq P_m$

$C_i \leq C_a$
$L_i \leq L_a$

To be used for the following interconnections:

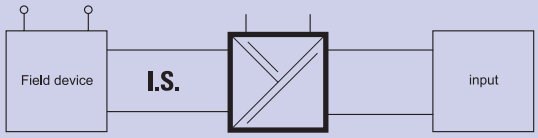
Field device (selection)	Isolator	ICS PAK	ICS 1000	ICS modul
2-wire transmitter	Transmitter supply unit	9303	9601	9103
Control valve i/p converter analog/digital indicator	mA isolating repeater (I.S. output)	9311 9318/12 9318/16	9615/.1; 9615/.2; 9615/.4 9618/12	9111 9118/12 9118/16
Fire & gas detector	mA isolating repeater (I.S. output)	9311/52	9615/.2	9111/52
mV source	mV isolating repeater	9323	–	–
Vibration sensor	Isolating repeater for vibration sensors	9307	–	–
NAMUR proximity switch	Switching repeater	9350/.0-1. 9250 9251	9650/.0-1.	9150/.0-1.
Solenoid valves Indicator light	Binary output	9351	9651	9151
Intrinsically safe load	Intrinsically safe power supply	9381	–	–

Case II: Engineering of an I.S. interface with passive input

The safe maximum values of the field device (U_{max}, I_{max}) must not exceed the maximum connectable values (U_m, I_m) of the I.S. interface.
These values are to be derived from the respective test certificates.

Moreover, the interconnection of field device and I.S. interface must not exceed the intrinsic safety limits (highest permissible values for total voltage, current, capacitance and inductance, see ignition curves).

Otherwise, the national specifications for the installation of intrinsically safe circuits should be applied.



$U_{max} \leq U_m$
$I_{max} \leq I_m$
$P_{max} \leq P_m$

To be used for the following interconnections:

Field device (selection)	Isolator	iCS PAK	iCS 1000	iCS modul
3/4-wire transmitter	mA isolating repeater (I.S. input)	9318/11	9615/.8	9118/11
Pulse signal source	Switching repeater (with passive input)	9350/10-24-10	9650/.0-24-10	9150/10-24-10

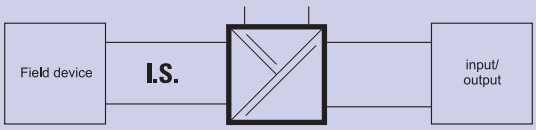
Case III: Engineering of an I.S. interface connected to a simple electrical apparatus

Simple electrical apparatus: An electrical component or a combination of components of simple design with precisely known electrical parameters that does not affect the intrinsic safety of the circuit in which it(they) is(are) to be installed.

Simple electrical apparatuses can be:
a) Passive components, for example, switches, junction boxes, resistors and simple semiconductor components;
b) Sources of stored energy with precisely known parameters, for example, capacitors or inductors, the values of which are taken into account, if the overall safety of the system is assessed;
c) Energy sources, for example thermocouples and photocells that generate no more than 1,5 V, 100 mA and 25 mW. Inductors or capacitors that are contained in these sources must be taken into account as in b).

Their interconnection with an I.S. interface is therefore likewise intrinsically safe (EN 60 079-14).

Otherwise, the national standards for the installation of intrinsically safe circuits should be applied.



To be applied for the following interconnections:

Field device (selection)	Isolator	iCS PAK	iCS 1000	iCS modul
Thermocouples	Multi-purpose transmitters mV isolating repeaters	9324 9323	9623 –	9124 –
Resistance thermometers, Potentiometers	Multi-purpose transmitters Resistance isolating repeaters	9324 9326	9623 –	9124 –
Contacts, opto coupler output	Switching repeaters	9350 9250 9251	9650	9150

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