

BEx1 IP67 ZONE 1 INSTALLATION ON THE NEXT LEVEL



Profinet IO modules IP 67 Ex i and Ex e



IECEx • ATEX • UKEX • North America • DNV

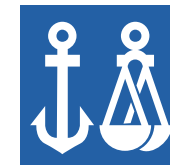


BEx1 IP67 ZONE 1 INSTALLATION ON THE NEXT LEVEL



BEx1 IP67 is the next generation on Compact, Ultra-Rugged Remote IO modules at BEx-Solution.

The modules have been designed to be used in harsh environments, including off-shore Oil, gas rigs, tanker, chemical manufacturing facilities and paints and coatings factories.



Approved



BEx1 IP67 ZONE 1 INSTALLATION ON THE NEXT LEVEL



BEx1 IP67 modules can be installed directly in Zone 1/21 hazardous areas and connect to instrumentation from Zone 0/20 (Ex i version).

With **no additional enclosure required**, the modules lend themselves ideally to mounting on even the most compact hazardous area rated machines and skids, cutting wiring down to a minimum.



BEx1 IP67 EX APPROVALS



Module Ex i



[Link to product](#)

EPS 19 ATEX 1 219 X
EPS 22 UKEX 1 045 X
 II 2(1) G Ex eb mb [ia Ga] IIC T4 Gb
II 2(1) D Ex tb [ia Da] IIIC T110°C Db
IECEX EPS 19.0093X
Ex eb mb [ia Ga] IIC T4 Gb
Ex tb [ia Da] IIIC T110°C Db

*In pending:
Class I, Division 2, Groups A, B, C, D
Class I, Zone 1, AEx eb mb [ia Ga] IIC T4 Gb
Class II, Division 2, Groups F, G
Zone 21, AEX tb [ia Da] IIIC T110°C Db

IECEX



ATEX



UKEX



North America



Intertek

Module Ex e



[Link to product](#)

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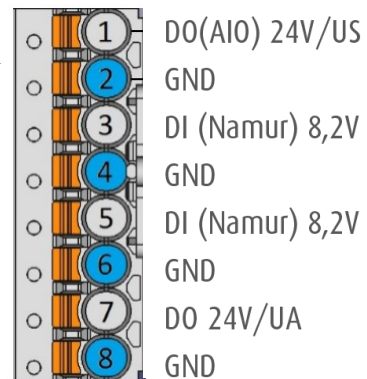
BEx1 IP67 IO CHANNELS



Module Ex i



8x

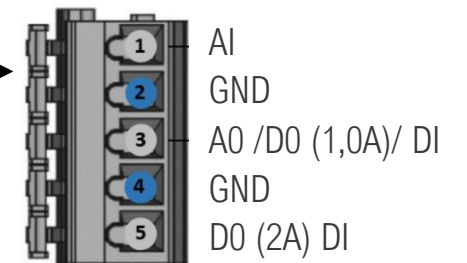


AI 4...20mA (0...25mA)
AO 4...20mA (0...25mA)
DI 8,2V Namur Sensoren
DO 24V (I_{max} = 25mA)

Module Ex e



8x

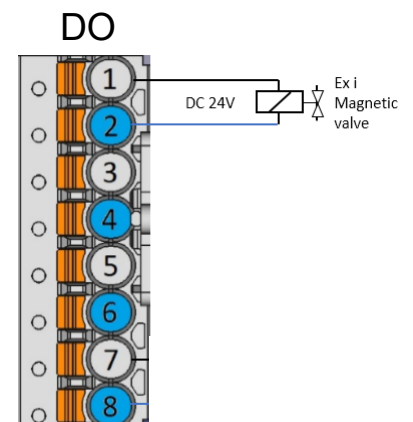
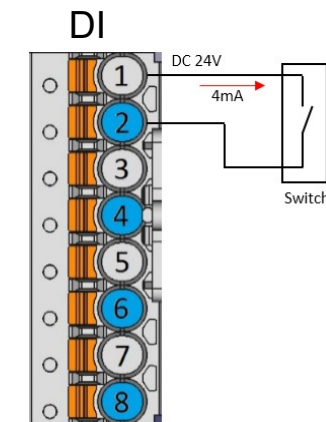
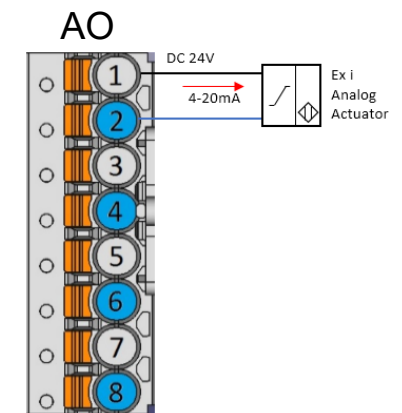
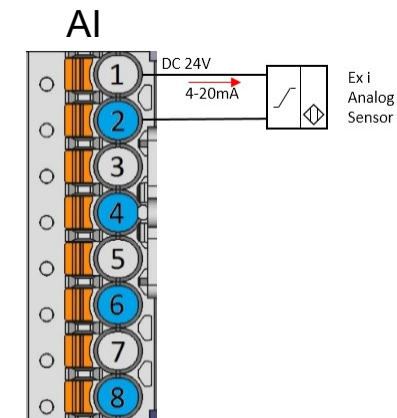
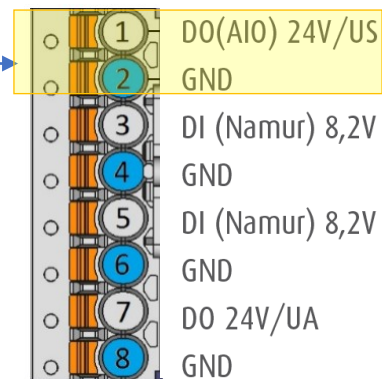


DI 24V
DO 24V (I_{max} Pin3 = 1,0A / Pin5 = 2A)
AI 24V 4..20mA (0..25mA)
AO 24V 4..20mA (0..25mA)

Multifunction of Pin 1 on module Ex i



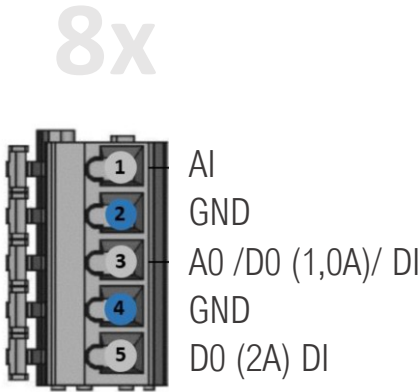
8x



BEx1 IP67 MULTIFUNCTIONAL



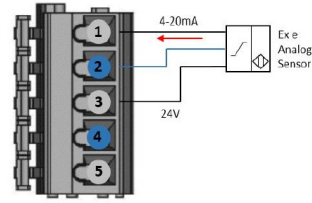
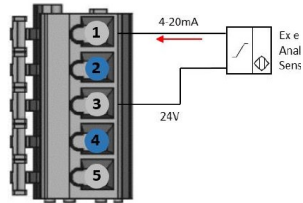
Multifunction on module Ex e



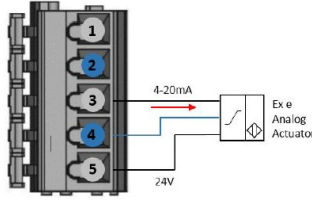
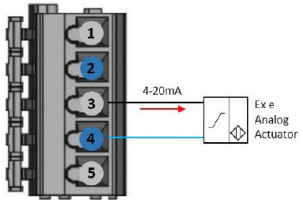
2 wire connection

3 wire connection

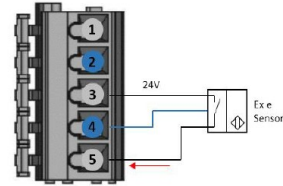
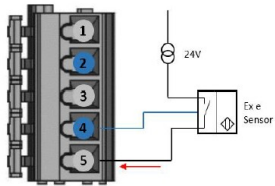
AI



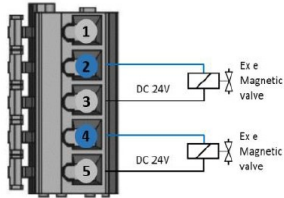
AO



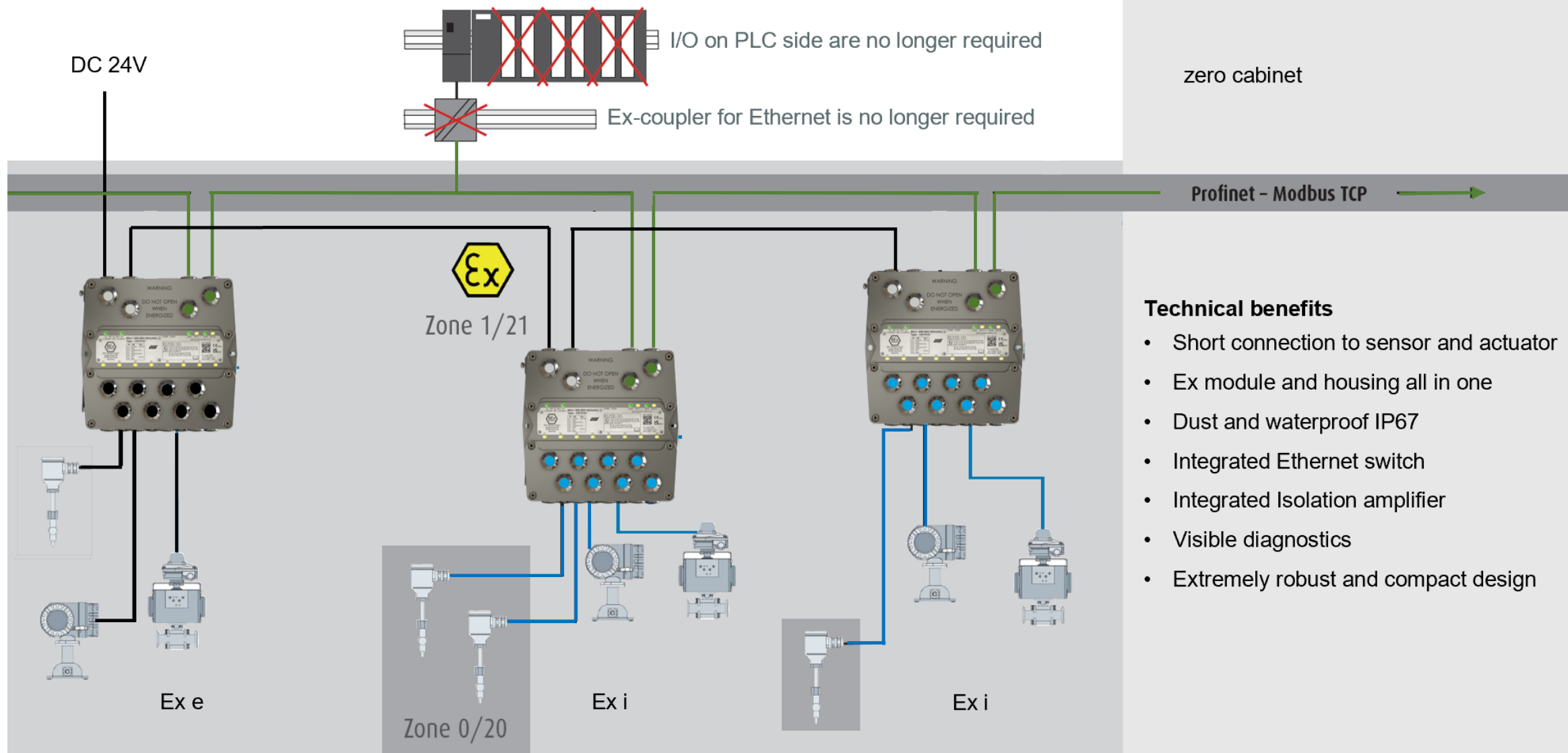
DI



DO



BEx1 IP67 DECENTRALIZED SOLUTION



Comprehensive diagnostics for each channel

- Open load detection
- Prefault detection
- Short circuit detection

⇒ Status via LEDs and Ethernet

IO parametrization /settings

21	22	23	24	25	26
Switch mode X1-X8	AO->DO X1-X8 Type *00 Pin 3	DO->AO X1-X8 Type *01 Pin 1 Type *04 Pin 3	DO->AI X1-X8 Type *01 Pin 1	DO->DI X1-X8 Type *04 Pin 3	DO->DI X1-X8 Type *04 Pin 5

9 IO Data Profinet

64 Input byte – (Modul → SPS)

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
High AI X1 Pin1	Low AI X2 Pin1	AI X3 Pin1	AI X4 Pin1	AI X5 Pin1	AI X6 Pin1	AI X7 Pin1	AI X8 Pin1								

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
DI X1-X8 Pin1	DI X1-X8 Pin3	DI X1-X8 Pin5	DI X1-X8 Pin7	Res	Res	Res	Res	Internal voltage	Internal temperature	Internal temperature	Internal temperature	Internal temperature	High Operating hour counter	Low	
								U _S	U _A	8V2	sign	value			

32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow	Current flow
X1 Pin5	X2 Pin5	X3 Pin5	X4 Pin5	X5 Pin5	X6 Pin5	X7 Pin5	X8 Pin5	X1 Pin7	X2 Pin7	X3 Pin7	X4 Pin7	X5 Pin7	X6 Pin7	X7 Pin7	X8 Pin7

48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Modul Diag	Open load	Prefault	Short circuit	Serial number											
	X1-X8 Pin1	X1-X8 Pin3	X1-X8 Pin5	X1-X8 Pin7	X1-X8 Pin1	X1-X8 Pin3	X1-X8 Pin5	X1-X8 Pin7	X1-X8 Pin1	X1-X8 Pin3	X1-X8 Pin5	X1-X8 Pin7			

64 Output byte – (SPS → Modul)

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
High AO X1	Low AO X2	AO X3	AO X4	AO X5	AO X6	AO X7	AO X8								

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ON/OFF X1-X8 Pin 1	ON/OFF X1-X8 Pin 3	ON/OFF X1-X8 Pin 5	ON/OFF X1-X8 Pin 7	Res	Switch mode X1-X8 Type *00 Pin 3	AO->DO X1-X8 Type *01 Pin 1 Type *04 Pin 3	DO->AO X1-X8 Type *01 Pin 1 Type *04 Pin 3	DO->AI X1-X8 Type *01 Pin 1 Type *04 Pin 3	DO->DI X1-X8 Type *01 Pin 1 Type *04 Pin 3	DO->DI X1-X8 Type *04 Pin 5	Res	Res	Res	Res	Res

32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res

48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res	Res

All „Res“ Bytes have to be „0“. The channels can be switched on via bytes 16 to byte 19!

Remark: Example on Ex i module



High integration

- Worldwide Ex approved*
- Standardization
- Small footprint
- Decentralized Installation
- Scalable
- Easy software integration

Cost and time saving

- Less engineering
- Speed up commissioning
- Shorter time to market
- Reducing installation
- Reducing down times

Technical benefits

- Short connection to sensor and actuator
- Ex module and housing all in one
- Dust and waterproof IP67
- Integrated Ethernet switch
- Integrated isolation amplifier
- Visible diagnostics
- Extrem robust housing made by aluminium electroplated
- Fully potted $\Rightarrow$ high vibration resistance, no condensation in the module
- Temperature range $-40^{\circ}\text{C} \dots +70^{\circ}\text{C}$



- Datasheet
- Manual
- Certification
- GSDML-file
- FB TIA function blocks
- EPLAN P8 Macro
- CAD STEP files

<https://www.bex-solution.com/en-gb/downloads>

BEx1 IO module IP67 Ex i for Zone 1/21



BEx1 Explosion protection

EPS 19 ATEX 1 219 X
EPS 22 UKEX 1 045 X
E 211) 0 Ex ib mb [a] Ga] IIC T4 Gb
E 211) 0 Ex ib [a] Ga] IIC T110°C Db
IECEX EPS 19.0093X
Ex ib mb [a] Ga] IIC T4 Gb
Ex ib [a] Ga] IIC T110°C Db

Class I, Division 2, Groups A, B, C, D
Class I, Zone 1, AEx ib mb [a] Ga] IIC T4 Gb
Class II, Division 2, Groups F, G
Zone 21, AEx ib [a] Ga] IIC T110°C Db

Power supply

Operation voltage U₀/U₁ DC 18...30V
Current module DC 450 mA
Current actuator supply I_a DC 300 mA
Power dissipation max. 15 W
Reverse polarity protection Yes
LED Voltage > 18V Green
LED Undervoltage Red

Fieldbus data

Addressing Profinet via DCP
Addressing Modbus TCP/IP DHCP or fix
Transfer Rate 10/100 MB/s
Delay in signal change < 10 ms
LED status change Green
LED Ethernet status ACT Yellow
LED Modbus status Green / Red
LED digital output on Yellow
LED error detection Red

Ambient conditions

Operating temperature -40°C ... +70°C
Storage temperature -40°C ... +80°C
Enclosure type (EN 60529) IP66 / IP67

Mechanical data

Dimensions (LxWxH) 214 x 206 x 115 mm
Mounting holes Ø 6.5
Mounting space 200 mm
Weight approx. 5400 g
Housing material Aluminium (electroplated)
Housing marking laser engraving
Vibration (EN 60068) 20g
Shock (EN 60068) 50g
Cable glands (stainless steel) M20x1.5

Feature

- Fully potted – extreme robust
- 10 variations 16DI (DO DO/AO)
- 16DI Namur / 16DO
- 16DI Namur / 16DO / 16AO
- 16DI Namur / 16DO / Reducing Mode
- None configuration on module required
- Separate power supply for sensor and actuator
- Comprehensive diagnostics for each channel
 - open load detection
 - prefault detection
 - short circuit detection
- Galvanic separation between channel and system
- Internal temperature monitoring
- Operating hour counter

Compact IO module for Ex Zone 1/21 with Profinet or Modbus TCP/IP.
The module includes busnode, isolating amplifier and 32 intrinsically safe analog and digital IO channels on smallest space.
BEx1 module can be installed directly in Zone 1/21 and connects sensors and actuators from Zone 0/20.

Customer value

- For optimal combining of intrinsically safe signals in the lower field level.
- Allows very short cable lengths to the sensor/valve and reduces wiring which means significant cost and time savings during installation and maintenance.
- The Ethernet connection is designed with increased safety. An Ex media converter in the safe area is no longer required and the full channel performance can be used.

The ATEX certified system with field enclosure is designed for installation in Zone 1/21 and connects sensors and actuators from Zone 0/20.
BEx1 includes busnode, isolating amplifier and 32 intrinsically safe analog and digital IO channels on smallest space.

Design field enclosure

Material Stainless steel 1.4541 (A4)

Enclosure type IP 65

Dimensions 302 x 302 x 121 mm

Certification TPE 07 ATEX 1901 1

Type of protection E 2110 Ex mb [a] Ga] IIC T4 Gb
E 22 Ex b IIC T4 Gb

Ambient temperature -40°C ... +54°C

Consist of:
1. BEx1 Remote IO module
2. Cable gland M20x1.5 (4-13 mm)
3. Cable gland M20x1.5 (4-13 mm)
4. Wall mounting bracket

The use of application and temperature range will be extended by different housing materials like Polyester or Aluminium.

Individual designs are short term possible via our system partner Exapt.
BEx1 module datasheet, manual and certificates see download page <https://www.bex-solution.com/downloads>

BEx1 IO Box for Ex Zone 1/21



Application

- Chemical Industry
- Pharma
- Oil- and Gas Industry
- Industrial wastewater treatment

IO variations

- 16DI Namur / 16DO / 16AO / 16DO
- 16DI Namur / 16DO / 16AO
- 16DI Namur / 16DO / 16AO / Reducing Mode

Communication

Profinet or Modbus TCP

BEx1 IO Box provides plant and machine manufacturer for the first time a decentralized and compact solution with Profinet or Modbus TCP/IP for hazardous area Zone 1/21.

Customer value

- For optimal combining of intrinsically safe signals in the lower field level.
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BEx1 module datasheet, manual and certificates see download page <https://www.bex-solution.com/downloads>

Downloads

Documents	German	English
Ex1 IO Box		
ve terminal		
data sheet		
iEx manual		
Conformity		
Conformity		
Certificate EX 1 248 X		
BEx2 EU-Type Examination Certificate EPS 19 ATEX 1 248 X		
f Conformity PS 19.0093X		
f Conformity PS 19.0111X		
NO Profinet		
GSDML	German	English
GSDML zip-file		
EPLAN	Deutsch	Englisch
N P8 Macro		
Description		

BEx Remote IO Module



Manual

INNOVATION

Research

Improvement

Concept

Configuration

Installation

Setup

Communication

Technical Data

BEx1 ICPV10 Ex i Remote IO Ventilinsel



Exapt zertifizierter Systembau in Ex i Festgehäuse

FESTO zertifizierte Ex i Ventilinsel

BEx-Solution innovative Ex Remote IO Module mit Busanbindung

Geprüfte Systembau von Exapt FESTO

Mit der 3 in 1 Lösung steht dem Anlagen- und Maschinenbauer erstmalig eine dezentrale und kompakte Remote IO Ventilinsel zur Verfügung, die pneumatische Antriebe für den explosionsgefährdeten Bereich Zone 1/21 zur Verfügung stellt.

Kundenutzen

- Kompakt - Einfach - Schnell
- Zentrale Ethernet-Anbindung, Zentrale Druckluft-Anbindung
- Dezentrale Montage in der Anlage - garantiert kurze Wege zu den Sensoren und den pneumatischen Endgeräten
- Keine Druckluft-Verschönerung innerhalb des Gehäuses
- Kostenersparnis und weniger Installationsaufwand

Anwendungen

- Lackieranlagen
- Pharmazeutische Anlagen
- Trocknungsanlagen
- Schüttgut- und Schüttgut-Transportanlagen
- Industrielle Hochdrucksysteme
- Kälteanlagen

Funktionen

- 8 montierte und verstellbare Magnetventile
- Ex 3/2-, 5/2- oder 5/3-Wegeventile
- 4x 3/2-Wegeventile
- oder Kombiventile (16 Ventifunktionen auf Anfrage)
- 8 Namur-Eingänge für Stellungsschalter (16 Eingänge auf Anfrage)

BEx1 IP67 ZONE 1 INSTALLATION ON THE NEXT LEVEL



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