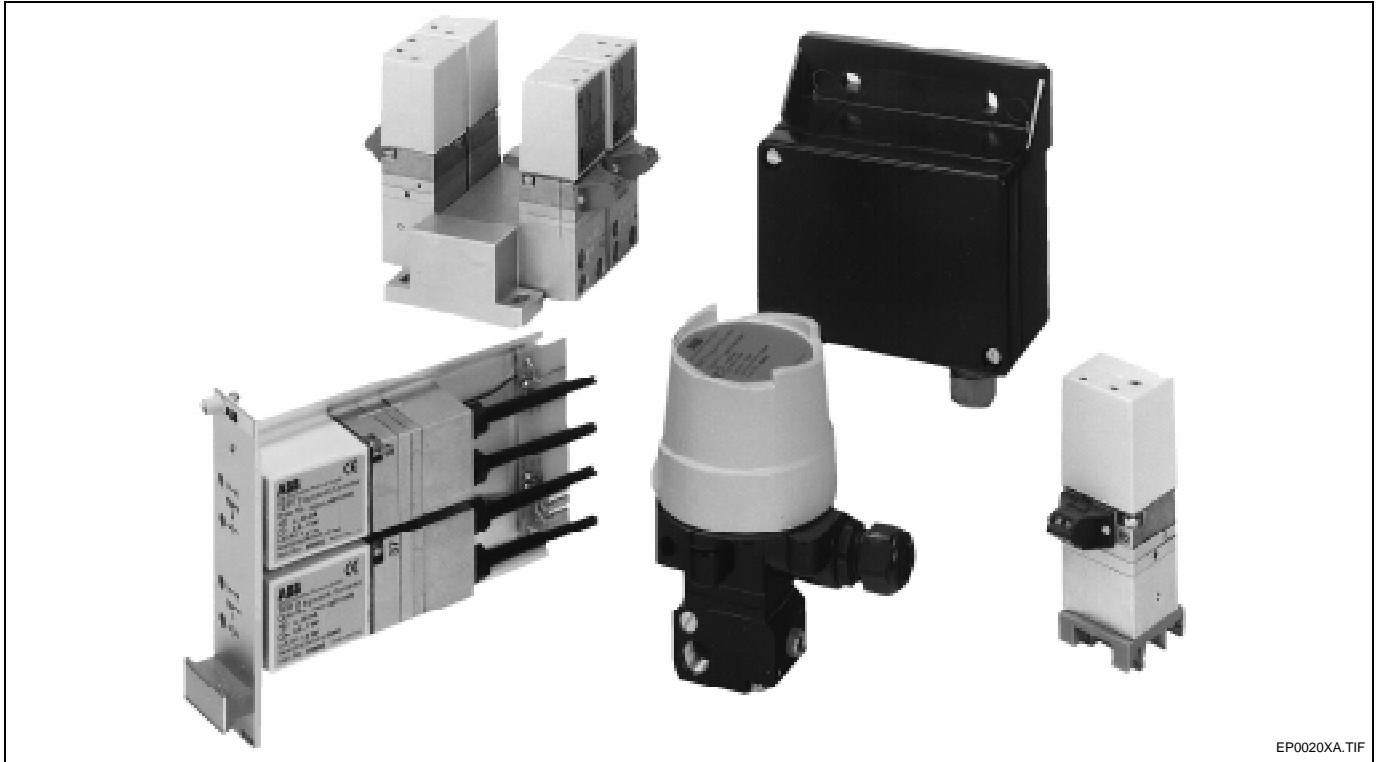


10/18-0.10 EN



EP0020XA.TIF

- **Reliable through well-proven concept**
More than 750 000 times in use
- **Compact design**
Small dimensions, low weight
- **Robust in terms of construction and function**
Influence of shock and vibration < 1 % at 10 g
- **Various signal ranges**
Input e.g. 0 ... 20 mA or 4 ... 20 mA
Output 0.2 ... 1 bar or 3 ... 15 psi
- **Complies with the following directives**
EMC directive 89/336/EEC as of May 1989
EC directive for the CE conformity certificate
- **Wide operating temperature range**
From -40 °C (optionally -55 °C) to +85 °C
- **Explosion protection certificates, for worldwide use**
e.g. CENELEC - FM - CSA,
Intrinsically safe or flameproof
- **Various models**
 - Control room housing, IP 20, for rail mounting,
 - Control room housing, IP 20, for block mounting,
 - 19" slide-in unit, 3HU 7PU, with 1 or 2 signal converters,
 - Plastic field housing, IP 54
 - Aluminium or stainless steel housing, IP 65
- **Single unit**
For OEM applications (on request)

Construction and mode of operation

The concept

The TEIP 11 signal converter is a link between electrical or electronic and pneumatic systems, converting electrical to pneumatic standard signals, e.g. 4...20 mA to 0.2...1 bar. Signal conversion is analog, using the patented force balancing principle.

The TEIP 11 signal converter's special features are its quite small dimensions, and its high functional stability even under shocks and vibrations. It can be exposed to up to 10 g without the functions being influenced by more than 1 %.

The appropriate housing version can be selected from various models, according to the respective mounting conditions. Intrinsically safe and flameproof encapsulated devices for use in hazardous areas are also available. Various international explosion protection certificates allow for use throughout the world.

Several input and output signal ranges are possible for signal conversion (see specifications under section "Technical data"). Only compressed air of 1.4 bar is needed for supply.

The models

Control room housing for rail mounting

The control room housing unit for rail mounting is the simple low-cost model. It is mounted with a socket that fits on all conventional EN rails. The housing with a plastic cover has an IP 20 protection.

Control room housing for block mounting

The control room housing unit for block mounting is the space-saving version, allowing to arrange various converters very close to each other. Special features are the central air supply through a mounting block and the nonreturn valves in the air supply connections of the attached signal converters.

Up to 4 signal converters can be mounted to each of the mounting blocks needed for block mounting. If required, 2, 3, or 4 mounting blocks can be combined, such that blocks of 4-8-12-16 signal converters are formed. Due to the nonreturn valves individual signal converters can be added or removed while the system is running.

19" slide-in unit

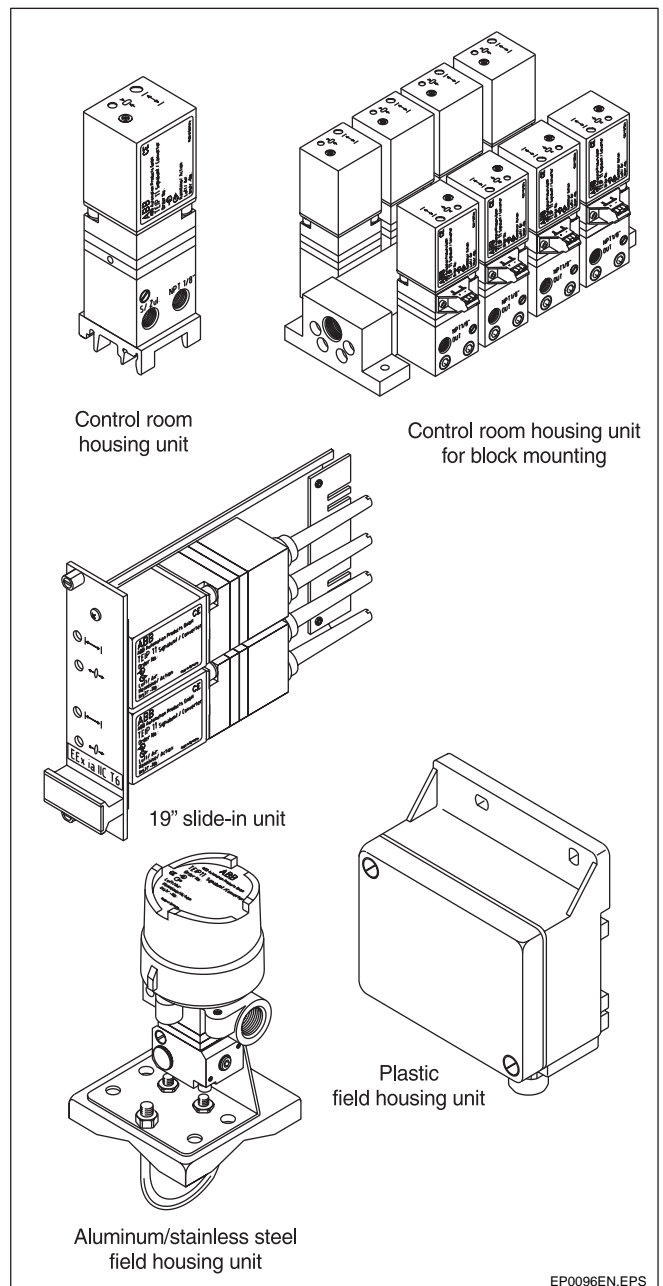
The TEIP 11 signal converters are available as slide-in units for 19" rack mounting. The slide-in unit is 3 HU high and 7 PU deep and can be assembled with 1 or 2 signal converters.

In addition to the slide-in unit, a special terminal board is needed. It is used for connecting the wires and pipes on the back.

Field housing

The field housing unit is designed for mounting on site or in the field. Plastic housings (IP54), aluminium housings (IP65) and stainless steel housings (IP65) are available. The units are suitable for both wall mounting and 2" pipe mounting.

A special version in a plastic housing can be supplied with inflammable gas instead of conventional compressed air.



Technical Data

Input

Signal range

0...20 mA or 4...20 mA
0...10 mA or 10...20 mA or 4...12 mA or 12...20 mA
(other ranges on request)

Input resistance

$R_{ii} = 260 \text{ ohms at } 20 \text{ }^\circ\text{C, } T_k + 0.4 \text{ } \%/K$

Overload limit

30 mA (refer to specifications under "Explosion protection"
for devices with explosion protection approval)

Capacitance/Inductance

negligible

Output

Signal range

0.2...1 bar or 3...15 psi
0.4...2 bar or 6...30 psi
(other ranges on request)

Air capacity (max.)

$\geq 5 \text{ kg/h} = 4.1 \text{ Nm}^3/\text{h} = 2.4 \text{ scfm}$

Load characteristic to VDE/VDI 3520

$\geq 0.95 \text{ kg/h} = 0.9 \text{ Nm}^3/\text{h} = 0.5 \text{ scfm}$

Air supply

Instrument air

free of oil, water and dust to DIN/ISO 8573-1
pollution and oil contents according to Class 3
dew point 10 K below operating temperature

Supply pressure

$1.4 \pm 0.1 \text{ bar or } 20 \pm 1.5 \text{ psi}$ (for output signal 1 bar or 15 psi)
 $2.5 \pm 0.1 \text{ bar or } 40 \pm 1.6 \text{ psi}$ (for output signal 2 bar or 30 psi)

Air consumption

$\leq 0.2 \text{ kg/h} = 0.16 \text{ Nm}^3/\text{h} = 0.1 \text{ scfm}$

Transmission data and influences

Characteristic

linear, direct or reverse action

Deviation:

$\leq 0.5 \text{ } \%$

Hysteresis:

$\leq 0.3 \text{ } \%$

Dead band:

$\leq 0.1 \text{ } \%$

Temperature

$\leq 0.5 \text{ } \%$ / 10 K between -20 and +85 °C

$\leq 2 \text{ } \%$ / 10 K between -55 and -20 °C

Air supply

$\leq 0.3 \text{ } \%$ / 0.1 bar pressure variation

Mechanical vibration

$\leq 1 \text{ } \%$ up to 10 g and 20...80 Hz

Seismic vibration

meets requirements to DIN IEC 68-3-3 class III for strong and
strongest earthquakes

Mounting orientation

$\leq 0.5 \text{ } \%$ at 90 ° change

Step response

10...90 % and 90...10 % 0.6 sec

5...15 % and 15... 5 % 0.25 sec

45...55 % and 55...45 % 0.2 sec

85...95 % and 95...85 % 0.15 sec

Complies with the following directives

EMC directive 89/336/EEC as of May 1989

EC directive for CE conformity certification

Environmental capabilities

Climate class

GPF or FPF to DIN 40040

Temperature- 40...+85 °C or -55...85 °C

for operation, storage or transportation

Relative humidity 75 % average, 95 % short-time

non-condensing

Observe the following limits:

1. For operation in hazardous areas observe the max. temperature limits specified under "Explosion protection".
2. For operation in hazardous areas and temperatures below 20 °C observe the special mounting conditions specified in the explosion protection certificate. .

Explosion protection

CENELEC, intrinsically safe (all models)

EEx ia IIC T4/T5/T6, PTB No. Ex-93.C.2104X

(for control room housing and field housing units)

EEx ia IIC T4/T5/T6, BVS No. 90.C.2001X

(for 19" slide-in unit)

CENELEC, flameproof (only for "metal field housing" units)

EEx d IIC T4/T5/T6, BVS-No. 90.C.2016X

Observe the following limits for the temperature classes:

Temperature class	Max. short circuit current	Max. ambient temperature
T6	50 mA	60 °C
T6	60 mA	55 °C
T5	60 mA	70 °C
T5	100 mA	55 °C
T4	120 mA	45 °C
T4	60 mA	85 °C
T4	100 mA	85 °C
T4	120 mA	80 °C
T4	150 mA	70 °C

BRITISH Standards (only for "metal field housing" units)

Ex N II T6 for Zone 2, Certificate SSA 914012

FM "intrinsically safe"

(all models **except for** "metal field housing" units)

I.S.: CL I / Div 1 / Grp A B C D

N.I.: CL I / Div 2 / Grp A B C D

FM "intrinsically safe" (only for "metal field housing" units)

I.S.: CL I-II-III / Div 1 / Grp A B C D E F G

N.I.: CL I / Div 2 / Grp A B C

S.: CL II / Div 2 / Grp G

S.: CL III / Div 2

FM "explosion proof" (only for "metal field housing" units)

X.P.: CL I / Div 1 / Grp A B C D

D.I.P.: CL II III / Div 1 Grp E F G

CSA 2 "intrinsically safe"

(all models **except for** "metal field housing" units)

I.S.: CL I / Div 1 / Grp A B C D

CL I / Div 2 / Grp A B C D

CSA "intrinsically safe" (only for "metal field housing" units)

I.S.: CL I / Div 1 / Grp A B C D

CL II / Div 1 / Grp E F G

CL III

CL I / Div 2 / Grp A B C D

CL II / Div 2 / Grp E F G

CSA "explosion proof" (only for "metal field housing" units)

X.P.: CL I / Div 1 / Grp B C D

CL II / Div 1 / Grp E F G

Other explosion protection approvals on request

Technische Daten

Control room housing unit

Material/protection
Aluminium housing, IP 20, with plastic cap

Mounting
Rail EN 50022 - 35 x 7.5
 EN 50035 - G 32
 EN 50045 - 15 x 5

Electrical connection
2-pole screw terminal for 2.5 mm²

Pneumatic connection
two 1/8 NPT threads for air supply and output

Mounting orientation: any

Weight: 0.25 kg

Dimensions: see dimensional drawing

Control room housing unit for block mounting

Material/protection
Aluminium housing, IP 20, with plastic cap

Mounting
blockwise, with special mounting blocks (accessory parts),
max. 4 mounting blocks with 4 signal converters, each

Electrical connection
2-pole screw terminal for 2.5 mm²

Pneumatic connection
3/8 NPT thread for air supply
(connected to central connection block)
1/8 NPT for output
(on each signal converter)

Mounting orientation: any

Weight: 0.3 kg (each signal converter)

Dimensions: see dimensional drawing

19" slide-in unit

Material
Aluminium housing with plastic cap,
slide-in board and front panel made of aluminium

Protection
IP 20 front, IP 00 rear

Slide-in module
3 HU high, 7 PU, with 1 or 2 signal converters ,
mounting with quick-release fastener
or M 2.5 screws on front panel
connector plugs for current and air on the back

Terminal board (separate accessory part)
Connector plugs for current and air at 19" slide-in module
2-pole screw terminal for 2.5 mm²
two 1/8 NPT threads for air supply and output

Mounting orientation: any

Weight: 0.6 kg with 1 signal converter
 0.9 kg with 2 signal converters

Dimensions: see dimensional drawings

Plastic field housing unit

Material/protection
Housing made of polyester, black, IP 54

Mounting
Wall mounting or 2"-pipe mounting
(2"-pipe mounting only to vertical pipes)

Electrical connection
2-pole screw terminal for 2.5 mm² in housing;
with Pg 11 cable gland

Pneumatic connection
Two 1/8 NPT threads for air supply and output

Mounting orientation: any

Weight: 1.0 kg

Dimensions: see dimensional drawings

Aluminium/stainless steel field housing unit

Material/protection
Aluminium or stainless steel housing, IP 65

Surface
Aluminium housing, varnished, two-component varnish
Bottom part of housing varnished black, RAL 9005
Cover light gray, RAL 9002

Stainless steel housing
Electropolished

Mounting
Wall mounting or 2" pipe mounting
with separate stainless steel mounting bracket (accessory part)

Electrical connection
2-pole screw terminal for 2.5 mm² in housing
with PG 13.5 cable gland
for "standard", "CENELEC intrinsically safe" and
for "BRITISH Standards Ex N"
with M 20x1.5 threads
for "CENELEC EEx d" (on request cable gland with Ex d
certificate as accessory part)
with 1/2 NPT thread
for FM/CSA

Pneumatic connection
two 1/4 NPT threads for air supply and output

Mounting orientation: any

Weight: 0.62 kg with aluminium housing
 1.20 kg with stainless steel housing

Dimensions: see dimensional drawings

Accessories

Terminal board for 19" slide-in unit,
Screw terminal for electrical connection,
1/8 NPT thread for pneumatic connection

EEx d cable gland
Made of brass, with M 20x1.5 thread

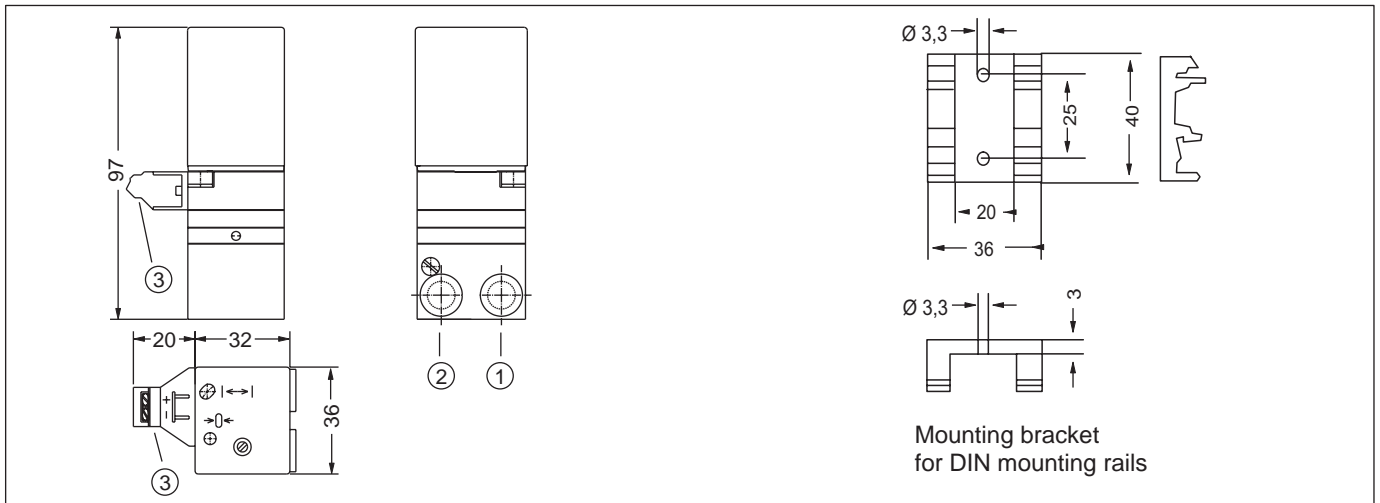
Stainless steel mounting bracket for wall-mounting/ 2" pipe mount.
For aluminium or stainless steel field housing

Material for block mounting
Mounting block for 4 signal converters
Panel with central 3/8 NPT air connection
Dummy panel

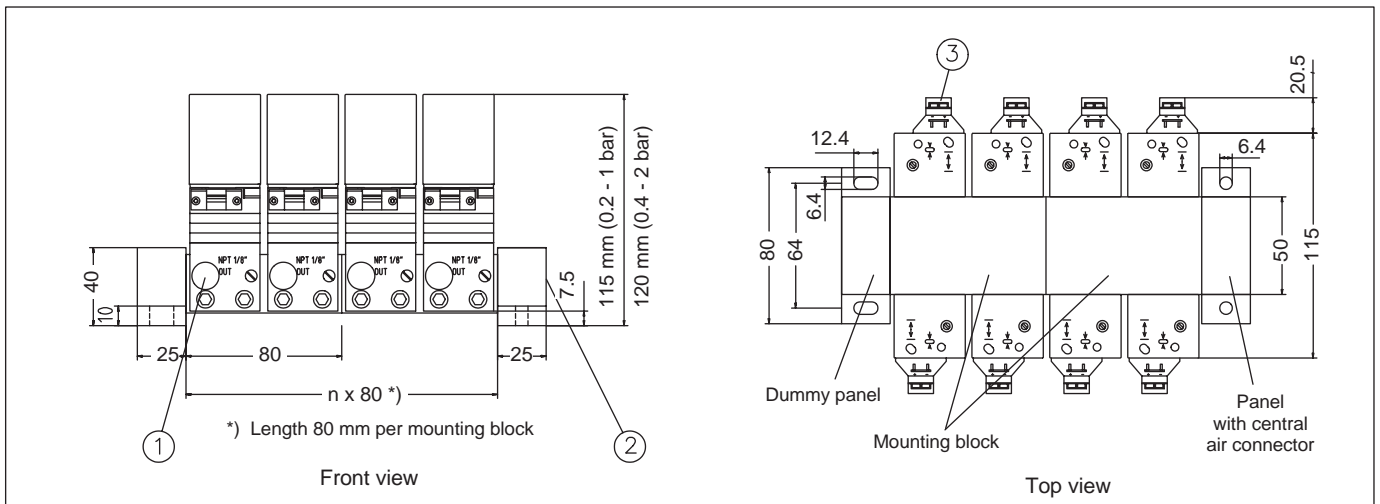
Ordering information										
					Catalog No					
I/P Signal converter TEIP 11					V18311-					
Design/Explosion protection										
without explosion protection										
Control room housing IP 20 for rail mounting					1	1				
Control room housing IP 20 for block mounting					1	A				
19" slide-in unit, 1 signal unit, Quick-release fastener					1	2				
Screwed					1	3				
2 signal units, Quick-release fastener					1	4				
Screwed					1	5				
Field housing Polyester, IP 54					1	6				
Aluminium, IP 65					1	8				
CENELEC EEx ia IIC										
Control room housing IP 20 for rail mounting					3	1				
Control room housing IP 20 for block mounting					3	A				
19" slide-in unit, 1 signal unit, Quick-release fastener					3	2				
Screwed					3	3				
2 signal units, Quick-release fastener					3	4				
Screwed					3	5				
Field housing Polyester, IP 54					3	6				
Aluminium, IP 65					3	8				
Stainless steel, IP 65					3	9				
CENELEC EEx d IIC										
Field housing Aluminium, IP 65					4	8				
Stainless steel, IP 65					4	9				
BRITISH Standards Ex N for Zone 2										
Field housing Aluminium, IP 65					5	8				
Stainless steel, IP 65					5	9				
FM/CSA "intrinsically safe"										
Control room housing IP 20 for rail mounting					6	1				
Control room housing IP 20 for block mounting					6	A				
19" slide-in unit, 1 signal unit, Quick-release fastener					6	2				
Screwed					6	3				
2 signal units, Quick-release fastener					6	4				
Screwed					6	5				
FM/CSA "intrinsically safe" and "explosion proof"										
Field housing Aluminium, IP 65					7	8				
Stainless steel, IP 65					7	9				
Input signal										
Input signal 0 ... 20 mA						1				
4 ... 20 mA						2				
Output signal										
Output signal 0.2 ... 1 bar						1				
3 ... 15 psi						2				
Characteristic										
Direct-action						1				
Reverse-action						2				
Space holder										
						0				
Ambient temperature										
-40 ... + 85 °C						1				
-55 ... + 85 °C						2				

Additional ordering information				
		BA No		
Operation with inflammable gas (only for signal converter EEx ia IIC with polyester field housing)		4 8 0		
Input signals 4 ... 12 mA		5 0 3		
12...20 mA		5 0 4		
Other input signals on request				
Output signals 0.4 ... 2 bar		5 0 8		
6 ... 30 psi		5 0 9		
Other output signals on request				
Accessories				
		Catalog No		
Terminal board for 19" slide-in unit, with screw terminal for 1 signal converter for 2 signal converters for 1 signal converter *) for 2 signal converters *) *) for 19" slide-in unit with CENELEC EEx ia IIC or intrinsically safe FM/CSA		18391 - 0319327 18391 - 0319328 18391 - 0319335 18391 - 0319336		
Cable gland EEx d, brass, M 20x1.5 thread		18391 - 0319343		
Mounting bracket, stainless steel for wall mounting for wall or 2" pipe mounting (for mounting the aluminium or stainless steel field housing)		18391 - 0319344 18391 - 0319345		
Parts for block mounting Connection block for 4 converters *) Termination block with central supply air connection 3/8 NPT Termination block without connection *) Up to 4 connection blocks can be fitted together to block units carrying 4 – 8 – 12 – 16 converters		18391 - 7958243 18391 - 7958251 18391 - 7958245		
Stock versions				
		Catalog No		
Signal converter TEIP 11 Control room housing IP 20 for rail mounting				
Explosion protection	Input	Output		
without	0 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 1111101 V18311 - 1112101	
	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 1121101 V18311 - 1122101	
CENELEC EEx ia IIC	0 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 3111101 V18311 - 3112101	
	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 3121101	
Field housing				
Explosion protection	Material	Input	Output	
without	Polyester	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 1621101 V18311 - 1622101
	Aluminium	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 1821101 V18311 - 1822101
CENELEC EEx ia IIC	Polyester	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 3621101 V18311 - 3622101
	Aluminium	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 3821101 V18311 - 3822101
CENELEC EEx d IIC	Stainless steel	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 3921101 V18311 - 4821101
	Aluminium	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 4822101 V18311 - 4921101
	Stainless steel	4 ... 20 mA	0.2 ... 1 bar, 3 ... 15 psi	V18311 - 4921101

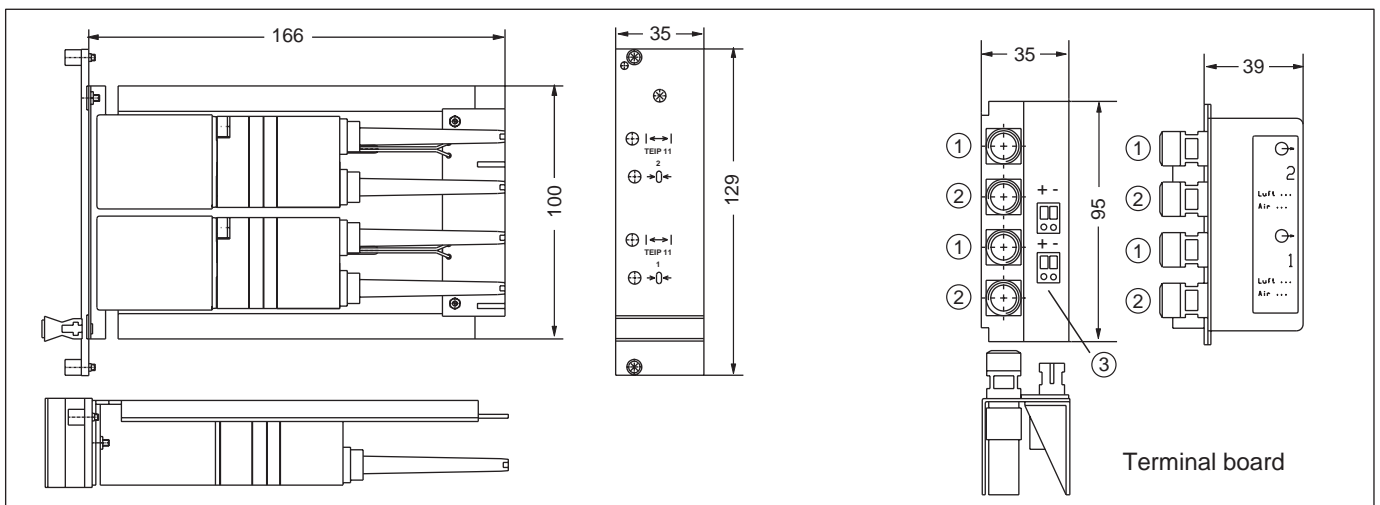
Dimensional drawings



Control room housing unit



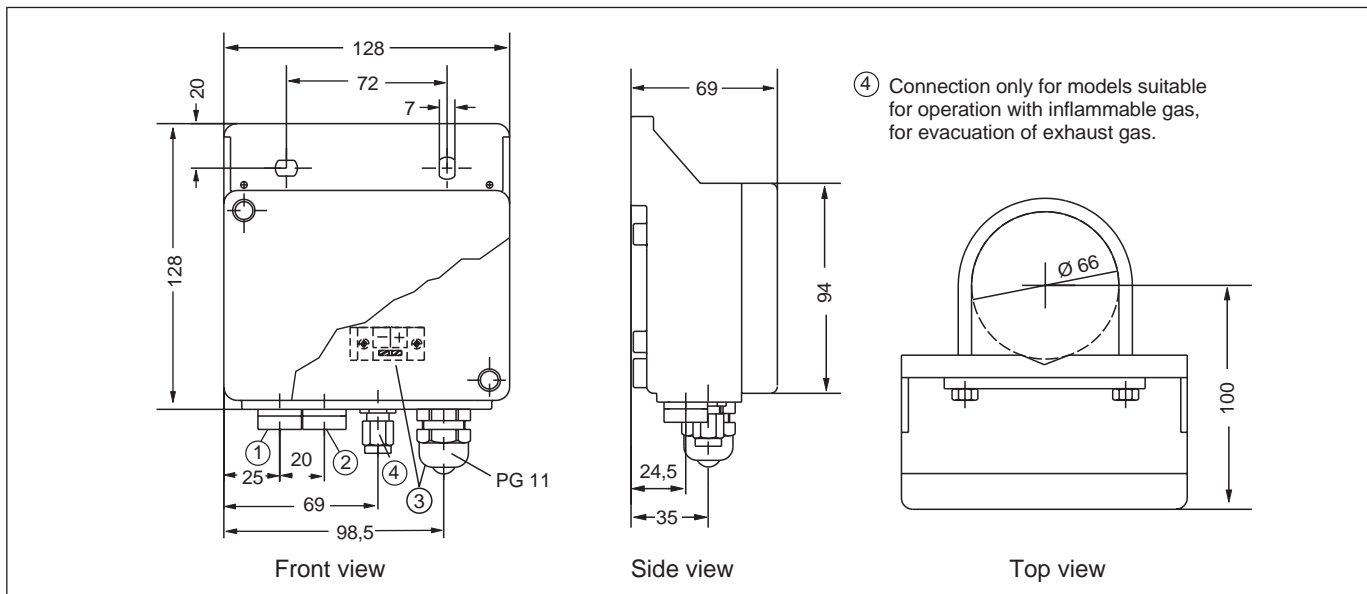
Control room housing for block mounting



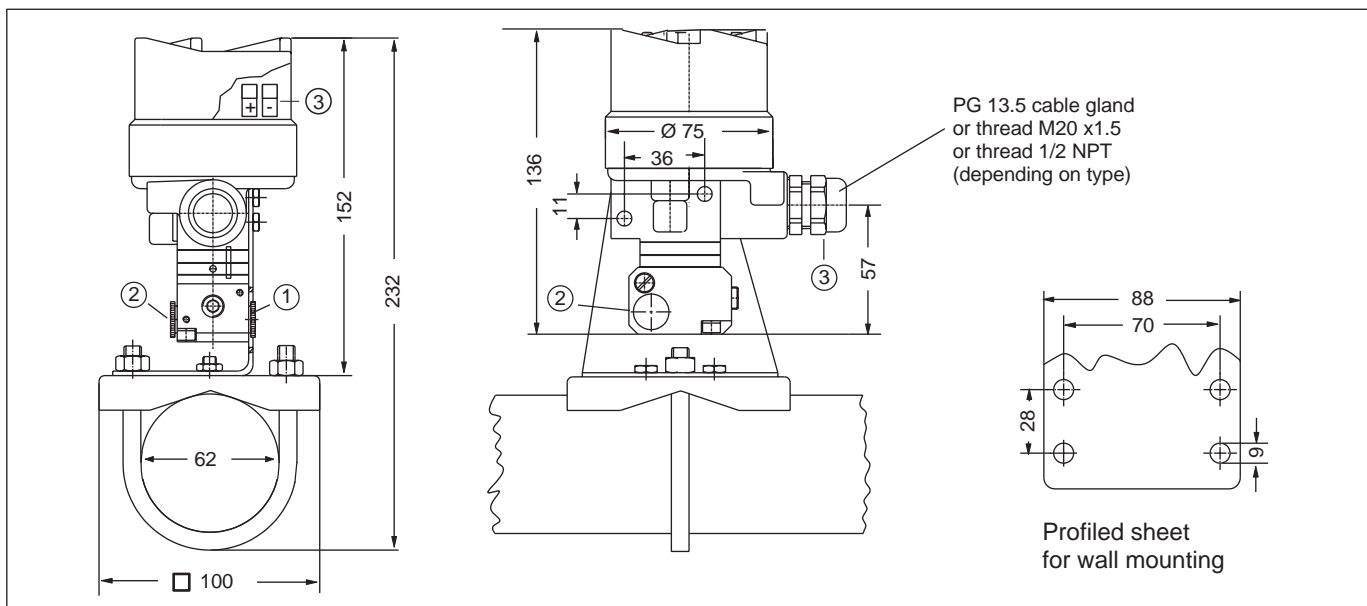
19" slide-in unit

EP0094EN.EPS

Dimensional drawings



Plastic field housing unit



EP0095EN.EPS

Aluminum or stainless steel field housing unit

Connections (all models)

① Output ② Air supply ③ Electrical connections



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