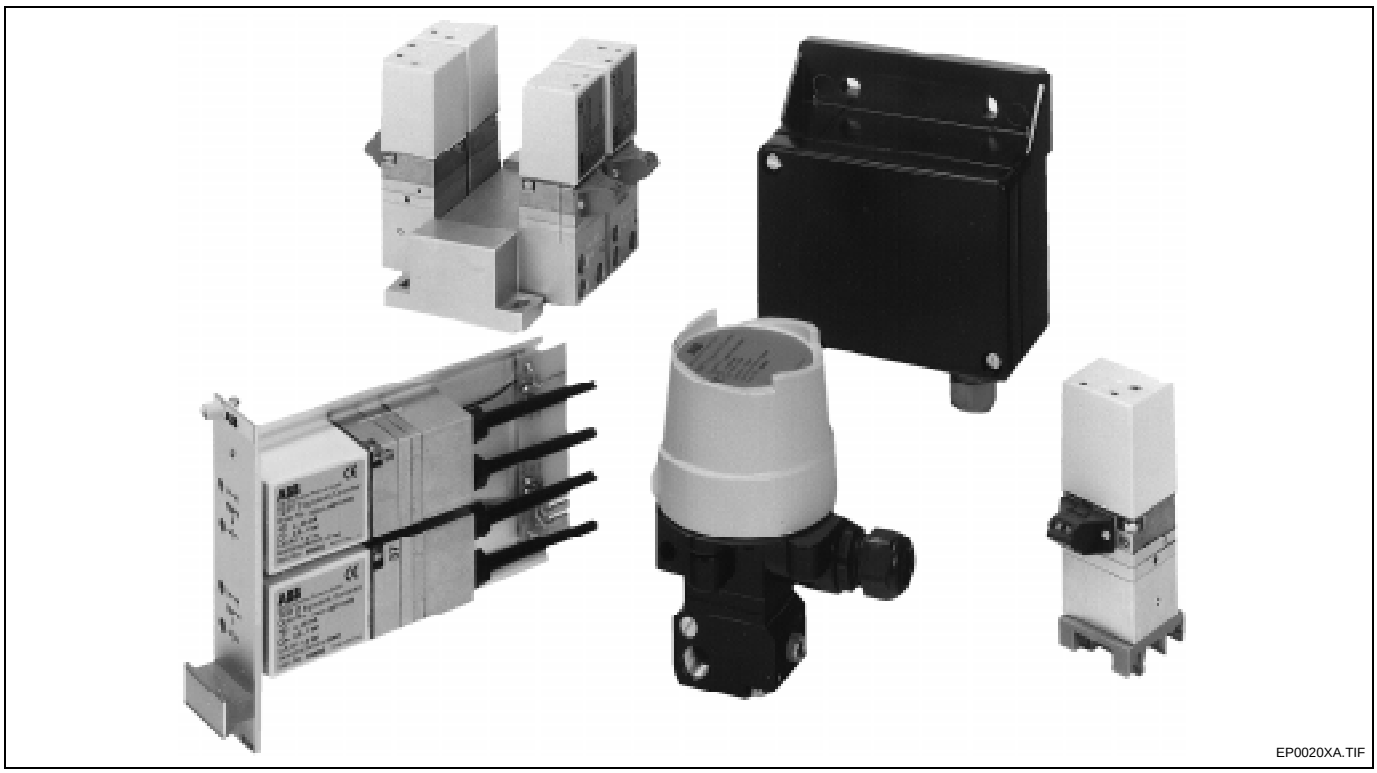
TEIP 11

I/P Signal Converter For Standard Signals 0...20 mA/4...20 mA To 0.2...1 bar/3...15 psi

10/18-0.10 EN



- **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 electronical 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

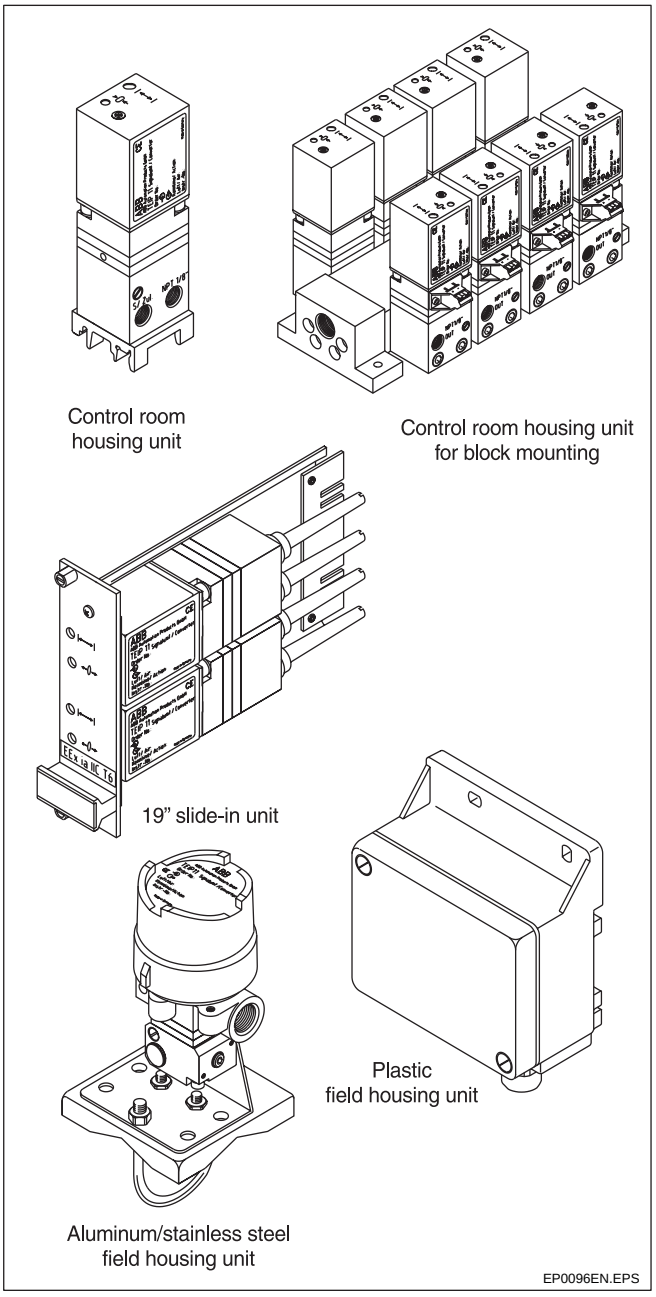
The TEIP 11 signal converters are available as slide-in units for 19" rack mounting. The slide-in unit is 3 HU high and 7 PU deep and can be assembled with 1 or 2 signal converters.

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 availalbe. 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 ohms at 20 °C, T_k + 0.4 %/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.)
≥ 5 kg/h = 4.1 Nm^3 /h = 2.4 scfm

Load characteristic to VDE/VDI 3520
≥ 0.95 kg/h = 0.9 Nm^3 /h = 0.5 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 ± 0.1 bar or 20 ± 1.5 psi (for output signal 1 bar or 15 psi)
2.5 ± 0.1 bar or 40 ± 1.6 psi (for output signal 2 bar or 30 psi)

Air consumption
≤ 0.2 kg/h = 0.16 Nm^3 /h = 0.1 scfm

Transmission data and influences

Characteristic
linear, direct or reverse action

Deviation: ≤ 0.5 %

Hysteresis: ≤ 0.3 %

Dead band: ≤ 0.1 %

Temperature
≤ 0.5 % / 10 K between -20 and +85 °C
≤ 2 % / 10 K between -55 and -20 °C

Air supply
≤ 0.3 % / 0.1 bar pressure variation

Mechanical vibration
≤ 1 % 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
≤ 0.5 % 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 11cable 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	18391 - 0319327
for 2 signal converters	18391 - 0319328
for 1 signal converter *)	18391 - 0319335
for 2 signal converters *)	18391 - 0319336
*) for 19" slide-in unit with CENELEC EEx ia IIC or intrinsically safe FM/CSA	
Cable gland EEx d, brass, M 20x1.5 thread	18391 - 0319343
Mounting bracket, stainless steel for wall mounting	18391 - 0319344
for wall or 2" pipe mounting	18391 - 0319345
(for mounting the aluminium or stainless steel field housing)	
Parts for block mounting	
Connection block for 4 converters *)	18391 - 7958243
Termination block with central supply air connection 3/8 NPT	18391 - 7958251
Termination block without connection	18391 - 7958245
*) Up to 4 connection blocks can be fitted together to block units carrying 4 – 8 – 12 – 16 converters	

Stock versions

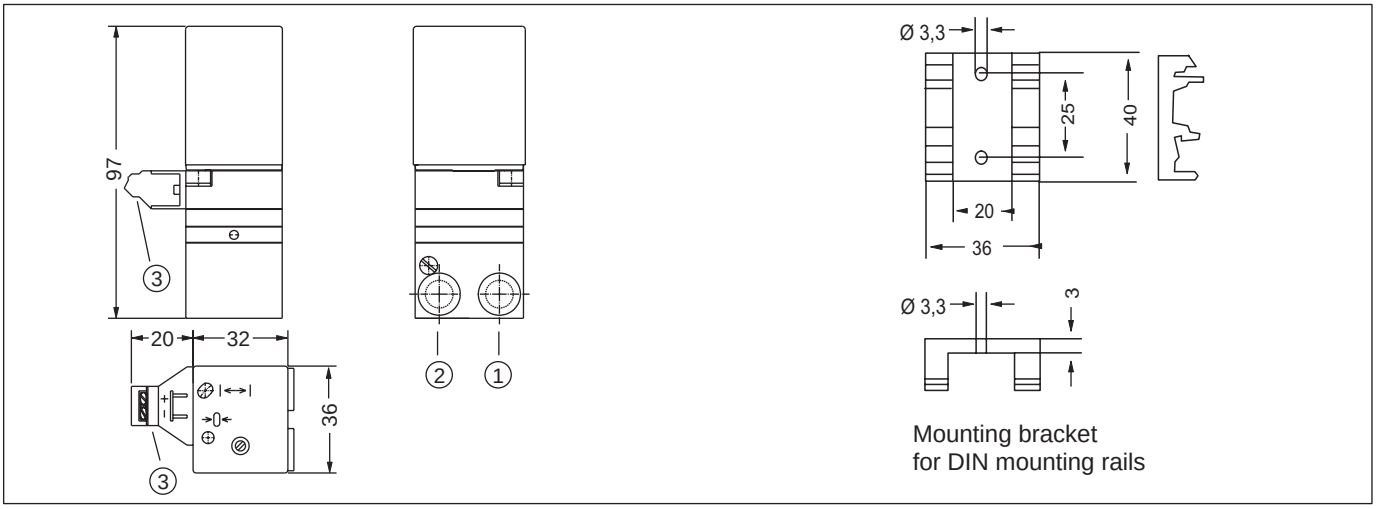
Signal converter TEIP 11
Control room housing IP 20 for rail mounting

Explosion protection	*Input*	*Output*	Catalog No
without	0 ... 20 mA	0.2 ... 1 bar,	V18311 - 1111101
		3 ... 15 psi	V18311 - 1112101
	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 1121101
		3 ... 15 psi	V18311 - 1122101
CENELEC EEx ia IIC	0 ... 20 mA	0.2 ... 1 bar,	V18311 - 3111101
		3 ... 15 psi	V18311 - 3112101
	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 3121101

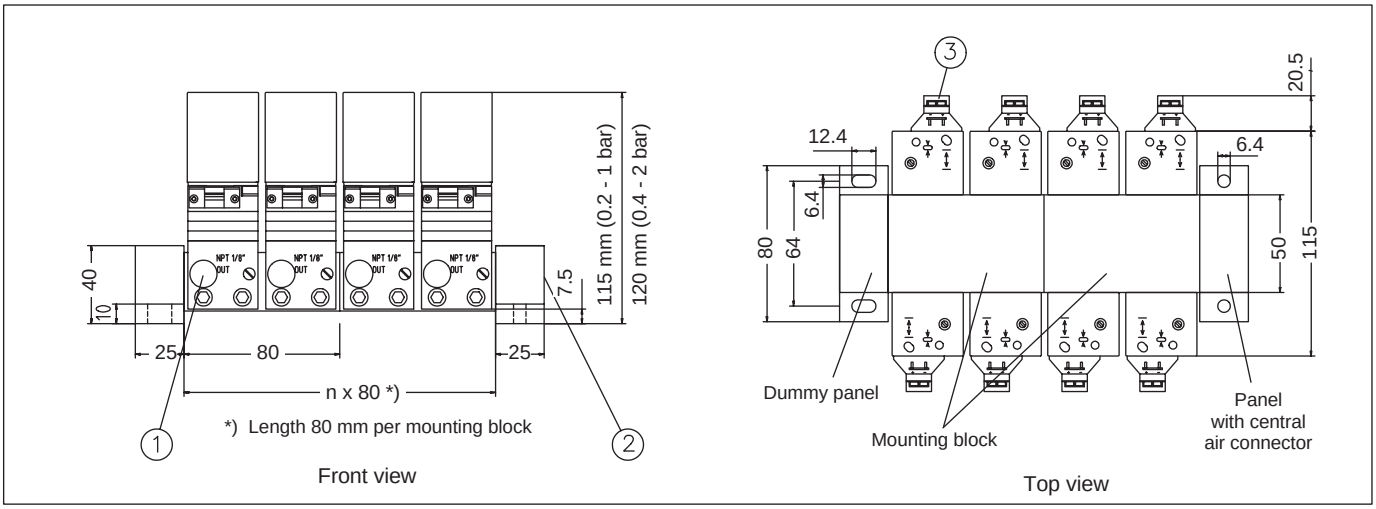
Field housing

Explosion protection	*Material*	*Input*	*Output*	Catalog No
without	Polyester	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 1621101
			3 ... 15 psi	V18311 - 1622101
	Aluminium	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 1821101
			3 ... 15 psi	V18311 - 1822101
CENELEC EEx ia IIC	Polyester	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 3621101
			3 ... 15 psi	V18311 - 3622101
	Aluminium	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 3821101
			3 ... 15 psi	V18311 - 3822101
	Stainless steel	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 3921101
CENELEC EEx d IIC	Aluminium	4 ... 20 mA	0.2 ... 1 bar	V18311 - 4821101
			3 ... 15 psi	V18311 - 4822101
	Stainless steel	4 ... 20 mA	0.2 ... 1 bar,	V18311 - 4921101

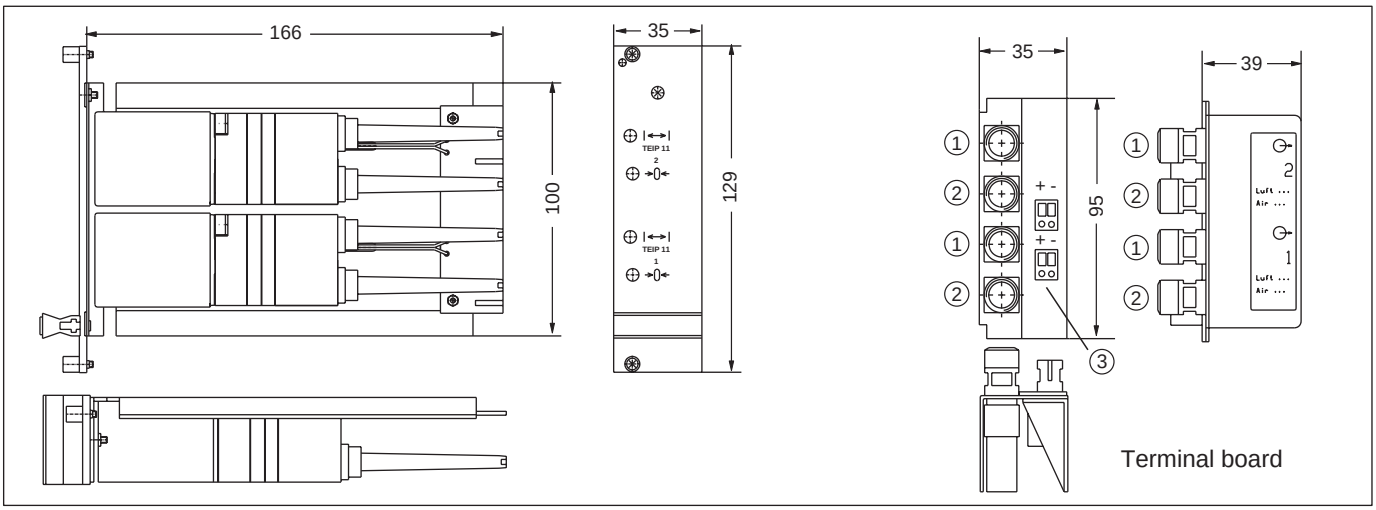
Dimensional drawings



Control room housing unit



Control room housing for block mounting



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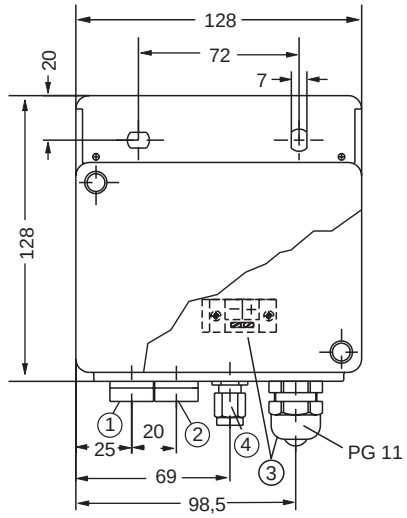
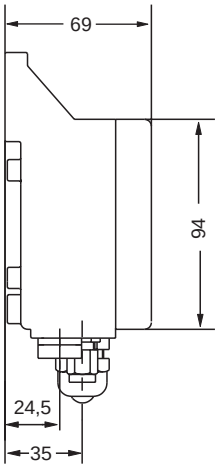
19" slide-in unit

Dimensional drawings

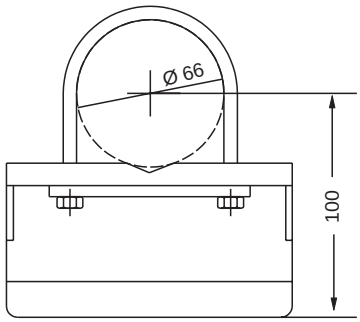


Front view



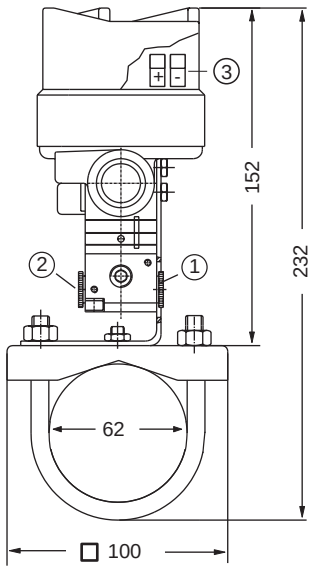
Side view

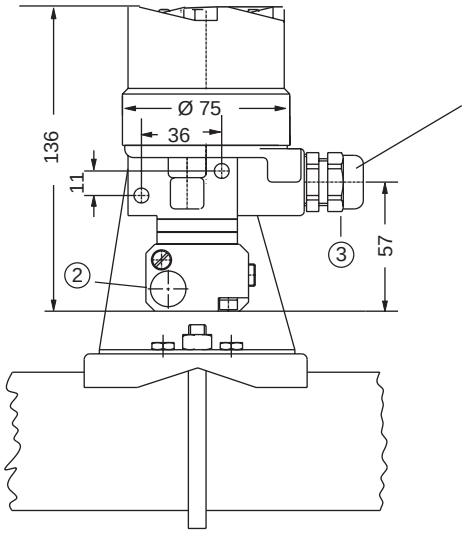
④ Connection only for models suitable for operation with inflammable gas, for evacuation of exhaust gas.



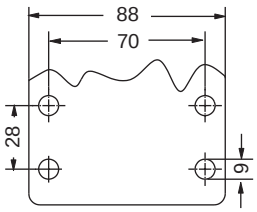
Top view

Plastic field housing unit





PG 13.5 cable gland
or thread M20 x1.5
or thread 1/2 NPT
(depending on type)



Profiled sheet
for wall mounting

EP0095EN.EPS

Aluminum or stainless steel field housing unit

Connections (all models)
① Output ② Air supply ③ Electrical connections

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Subject to technical changes
Printed in the Fed. Rep. of Germany
10/18-0.10 EN 10.99