Data Sheet
10/18-0.10 EN

I/P Signal Converter for Standard Signals
TEIP11-PS

Current 0...20 mA/4...20 mA,
to air pressure 0.2...1 bar/3...15 psi

- **Reliable through well-proven concept**
  - More than 1,000,000 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**
  - ATEX, FM/CSA, GOST
    Intrinsically safe or flameproof
- **Various models**
  - Control room housing, IP 20, for rail mounting
  - Control room housing, IP 20, for block mounting,
  - 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

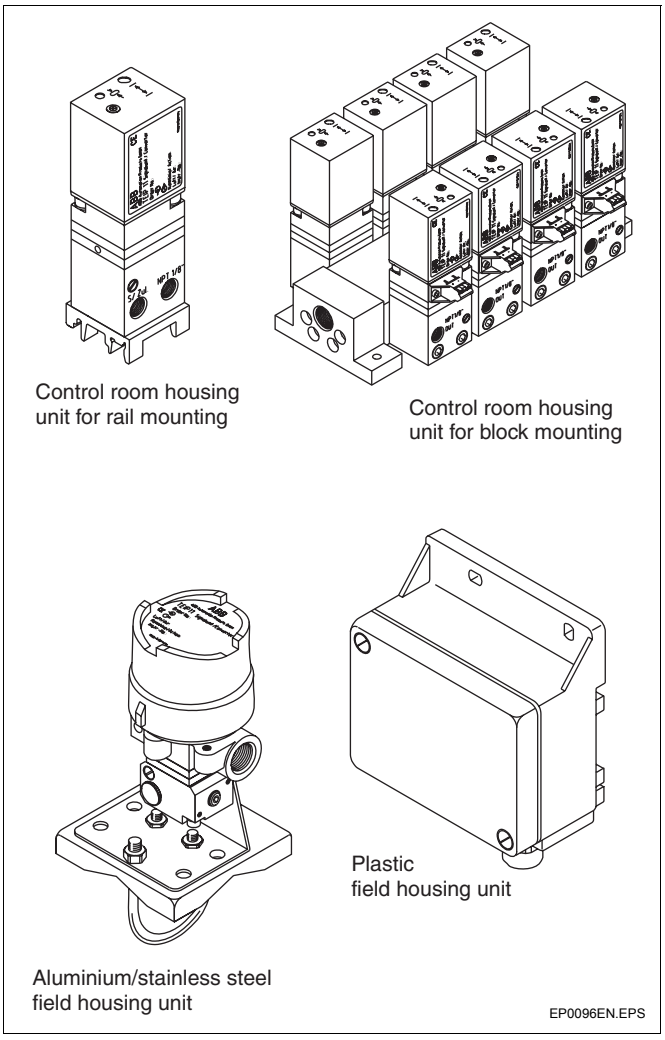
The control room housing unit for block mounting is the space-saving version, allowing to arrange various converters very close to each other. Special features are the central air supply through a mounting block and the nonreturn valves in the air supply connections of the attached signal converters.

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.

Field housing

The field housing unit is designed for mounting on site or in the field. Plastic housings (IP 54), aluminium housings (IP 65) and stainless steel housings (IP 65) 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_i = 260 ohms at 20 °C, Tk + 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 zone
≤ 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

Explosion protection

ATEX, intrinsically safe (all models)
EEx ia IIC T4/T5/T6 (for control room housing and field housing units)

ATEX, flameproof (only for metal field housing units)
EEx d IIC T4/T5/T6

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

FM “intrinsically safe” (all models <u>except for</u> 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 <u>except for</u> 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

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 mm^2

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 mm^2

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

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 mm^2 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 mm^2 in housing
with 1/2 NPT cable gland
for "ATEX intrinsically safe"
with M 20 x 1.5 threads
for "ATEX 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

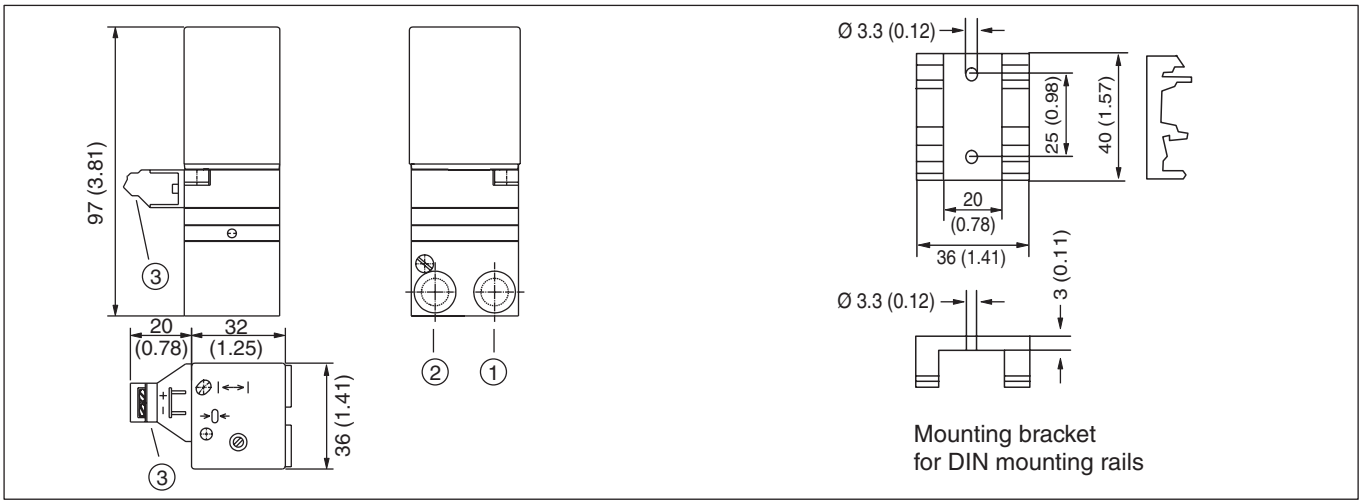
Accessories

EEx d cable gland
Made of brass, with M20 x 1.5 thread

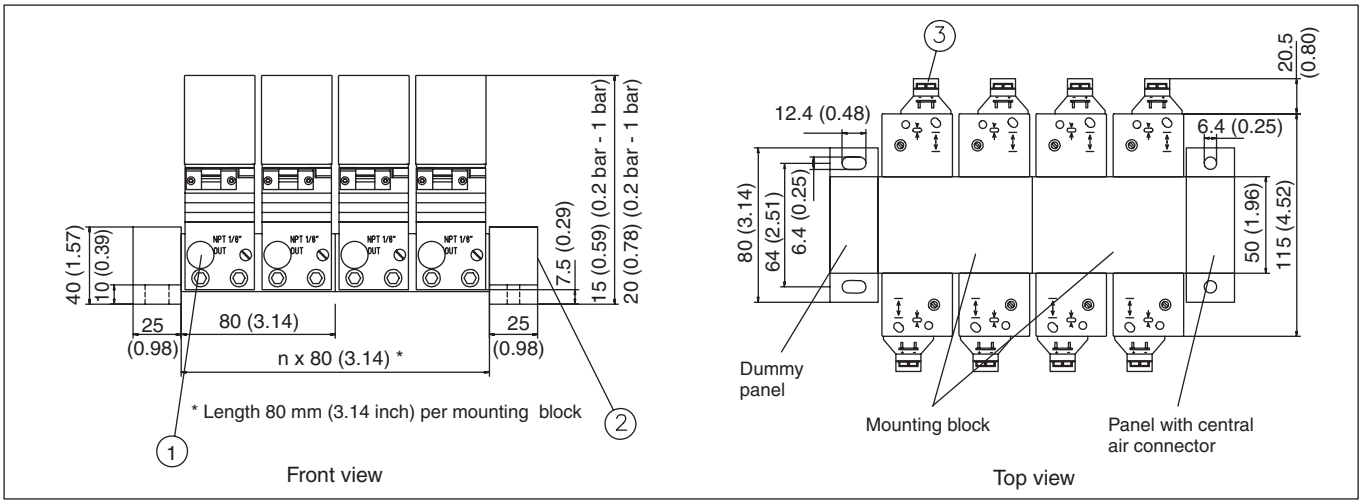
Stainless steel mounting bracket for wall-mounting/ 2" pipe mounting
For aluminium or stainless steel field housing

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

Dimensional drawings Measurements in mm (inches)



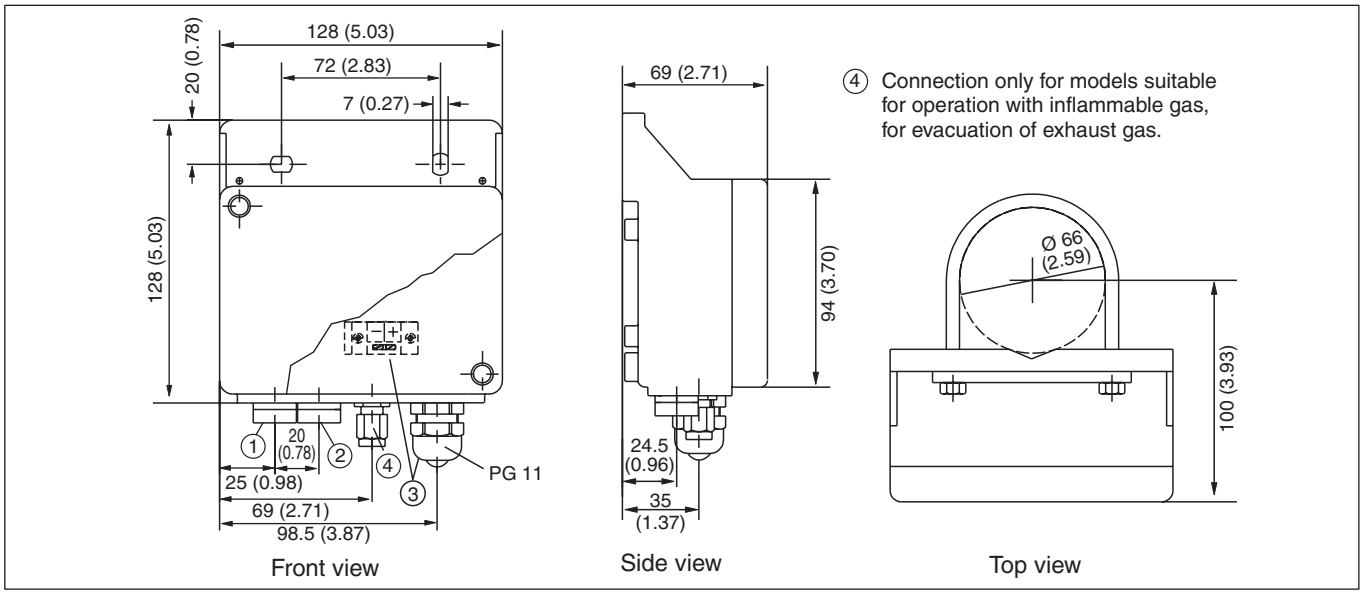
Control room housing unit



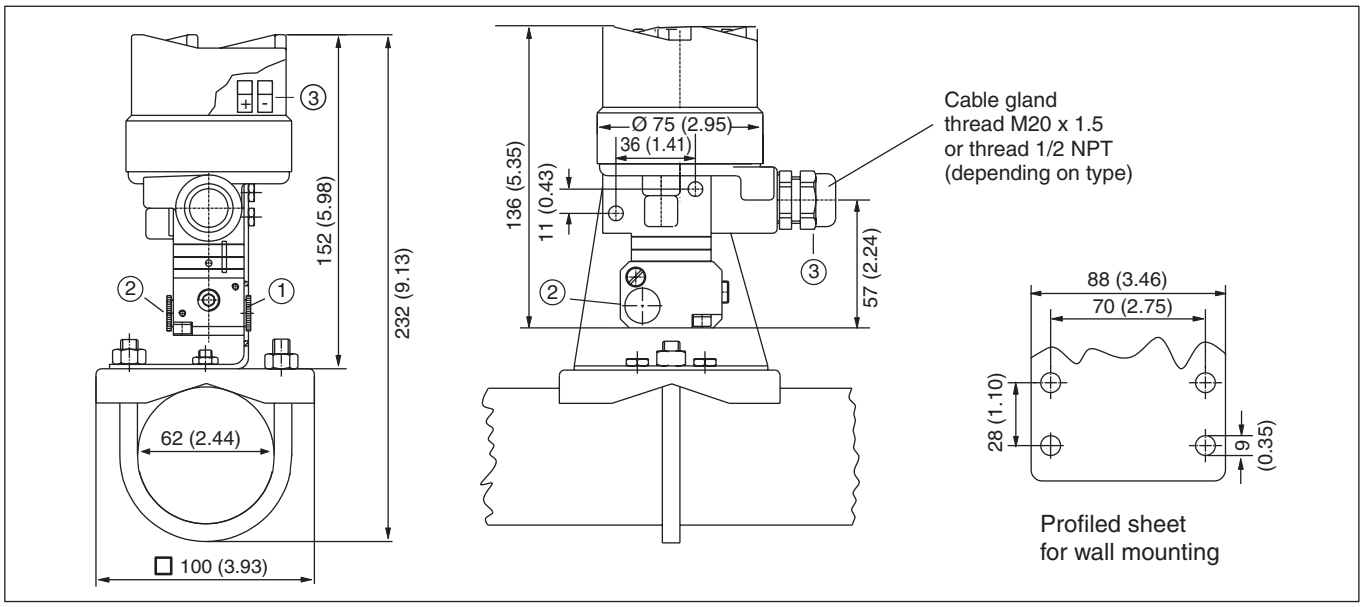
Control room housing for block mounting

EP0094EN.EPS

Dimensional drawings Measurements in mm (inches)



Plastic field housing unit



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Aluminium or stainless steel field housing unit

Connections (all models):

① Output ② Air supply ③ Electrical connections

Ordering information

I/P Converter	Variant digit No.	1- 8	9	10	11	12	13	14	15	Code			
TEIP11-PS	Catalog No.	**V18311H-**						**0**					
Explosion protection													
without explosion protection			1										
ATEX EEx ia IIC			3										
ATEX EEx d IIC		1)	4										
FM/CSA "intrinsically safe"		2)	6										
FM/CSA "intrinsically safe" and "explosion proof"		1)	7										
Design													
Control room housing IP 20 for rail mounting				1									
Control room housing IP 20 for block mounting				A									
Field housing	Polyester, IP 54			6									
	Aluminium, IP 65			8									
	Stainless steel, IP 65			9									
Input signal													
Input signal	0 ... 20 mA				1								
	4 ... 20 mA				2								
	Other input signal				0								
Output signal													
Output signal	0.2 ... 1 bar					1							
	3 ... 15 psi					2							
	Other output signal					0							
Characteristic													
Direct-action							1						
Reverse-action							2						
Ambient temperature													
-40 ... + 85 °C									1				
-55 ... + 85 °C									2				

Additional ordering information					
		Code			
Certificate of compliance					
Certificate of compliance with the order acc. to EN 10204-2.1 (DIN 50049-2.1)		CF1			
Certificate of compliance with the order acc. to EN 10204-2.1 (DIN 50049-2.1) with item description		CF2			
Test Report acc. to EN 10204-2.2 (DIN 50049-2.2)		CF3			
Constructors test certificate					
Constructors test certificate O acc.to DIN 55350-18-4.2.2		CH1			
Constructors test certificate M acc.to DIN 55350-18-4.2.2 with item description		CH3			
Constructors test certificate M acc.to DIN 55350-18-4.2.2 with item description and diagram		CH4			
Inspection certificate					
Inspection certificate 3.1B acc. to EN 10204 with max. deviation		CBA			
Inspection certificate 3.1B acc. to EN 10204 with add. data and item description		CBB			
Test certificate					
Test certificate & Letter of conformity with item description		CTC			
Device identification label					
includes lettering	(plain text, max. 16 letters)				
stainless steel	18.5 x 65 mm	MK1			
sticker	11 x 25 mm	MK3			
Operation with inflammable gas	3)	480			
Input signal	4 ... 12 mA	503			
	12...20 mA	504			
	Other input signals on request				
Output signal	0.4 ... 2 bar	508			
	6 ... 30 psi	509			
	Other output signals on request				

1) only with aluminium or stainless steel field housing
2) not with field housing
3) only for signal converter EEx ia IIC with polyester field housing

Accessories

TEIP11-PS		Catalog No.	Code			
Cable gland EEx d, brass, M 20x1.5 thread		319343				
Mounting bracket, stainless steel	for wall mounting	319344				
	for wall or 2" pipe mounting	319345				
(for mounting the aluminium or stainless steel field housing)						
Parts for block mounting						
Connection block for 4 converters	4)	7958243				
Termination block with central supply air connection 3/8 NPT		7958251				
Termination block without connection		7958245				

Ex stock versions

				Catalog No.	Code			
I/P Converter TEIP11-PS								
Control room housing IP 20 for rail mounting								
Explosion protection		Input	Output					
without		0 ... 20 mA	0.2 ... 1 bar	V18311H - 1111101				
			3 ... 15 psi	V18311H - 1112101				
		4 ... 20 mA	0.2 ... 1 bar	V18311H - 1121101				
			3 ... 15 psi	V18311H - 1122101				
ATEX EEx ia IIC		0 ... 20 mA	0.2 ... 1 bar	V18311H - 3111101				
			3 ... 15 psi	V18311H - 3112101				
		4 ... 20 mA	0.2 ... 1 bar	V18311H - 3121101				
Field housing								
Explosion protection	Material	Input	Output					
without	Polyester	4 ... 20 mA	0.2 ... 1 bar	V18311H - 1621101				
			3 ... 15 psi	V18311H - 1622101				
	Aluminium	4 ... 20 mA	0.2 ... 1 bar	V18311H - 1821101				
			3 ... 15 psi	V18311H - 1822101				
ATEX EEx ia IIC	Polyester	4 ... 20 mA	0.2 ... 1 bar	V18311H - 3621101				
			3 ... 15 psi	V18311H - 3622101				
	Aluminium	4 ... 20 mA	0.2 ... 1 bar	V18311H - 3821101				
			3 ... 15 psi	V18311H - 3822101				
	Stainless steel	4 ... 20 mA	0.2 ... 1 bar	V18311H - 3921101				
ATEX EEx d IIC	Aluminium	4 ... 20 mA	0.2 ... 1 bar	V18311H - 4821101				
			3 ... 15 psi	V18311H - 4822101				
	Stainless steel	4 ... 20 mA	0.2 ... 1 bar	V18311H - 4921101				

4) up to 4 connection blocks can be fitted together to block units carrying 4-8-12-16 converters

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