

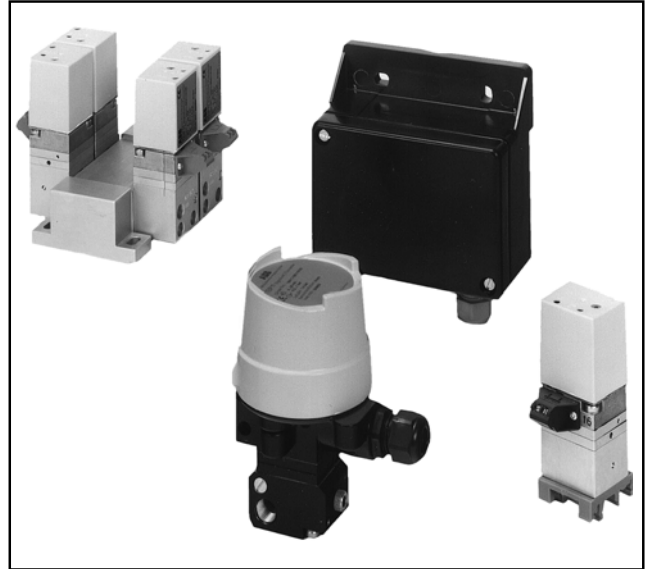
Actuators & Positioners

Electro-Pneumatic Converters

I/P Signal Converters - TEIP11

Model with Booster Stage

- **Reliable through well-proven concept**
 - More than 1,000,000 units 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. ATEX - FM/CSA, 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 (NEMA 4X)
- **Single unit**
 - for OEM applications (on request)



Series I/P Signal Converters
for Standard Signals
with Booster Stage

Construction & Mode of Operation

The Concept

The TEIP 11 series signal converter serves as 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 series 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 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

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.

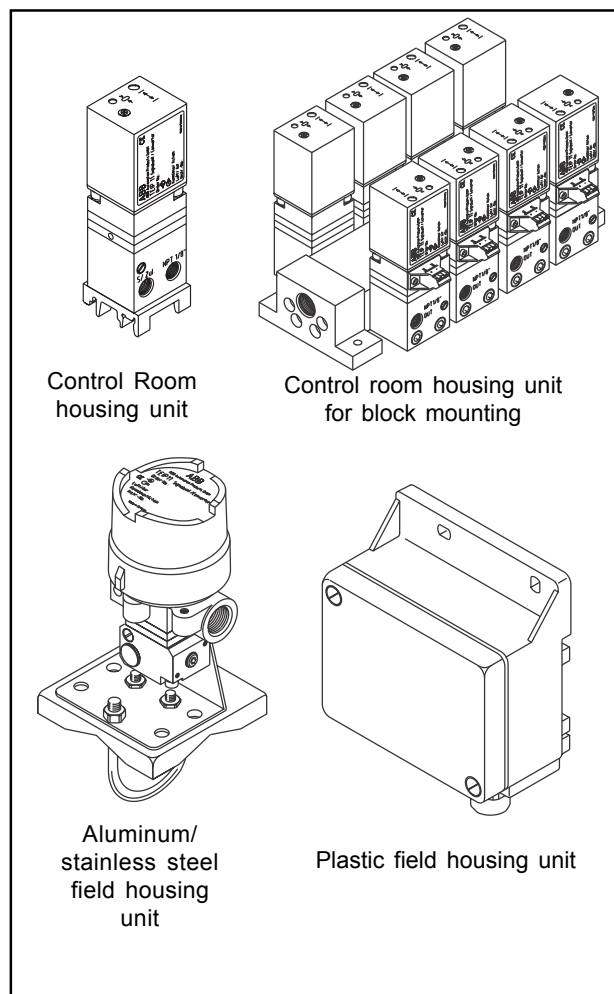
Field housing

The field housing unit is designed for mounting on site or in the field. Plastic housings (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 for use with inflammable gas instead of conventional compressed air.

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 (20psi) is needed for supply.



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

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

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

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: $\leq 0.5\%$

Hysteresis: $\leq 0.3\%$

Dead band: $\leq 0.1\%$

Temperature $\leq 0.5\% / 10 \text{ K between}$
-20 and +85°C
 $\leq 2\% / 10 \text{ K between}$
-55 and -20°C

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

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

Seismic vibration
Meets requirements to
DIN IEC 68-3-3 Class III for strong
and strongest earthquakes

Mounting orientation
 $\leq 0.5\% \text{ at } 90^\circ \text{ change}$

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

ATEX 1487X, intrinsically safe
2G EEx ia IIC T4/T5/T6
(for control room housing and field housing units)

ATEX E121X, flameproof
EEx d IIC T4/T5/T6
(only for "metal field housing" units)

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 **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

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

Aluminium/Stainless Steel Field Housing Unit

Material/Protection: Aluminium or stainless steel housing, IP 65 (NEMA 4X)

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", "ATEX intrinsically safe" and for "BRITISH Standards Ex N"
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

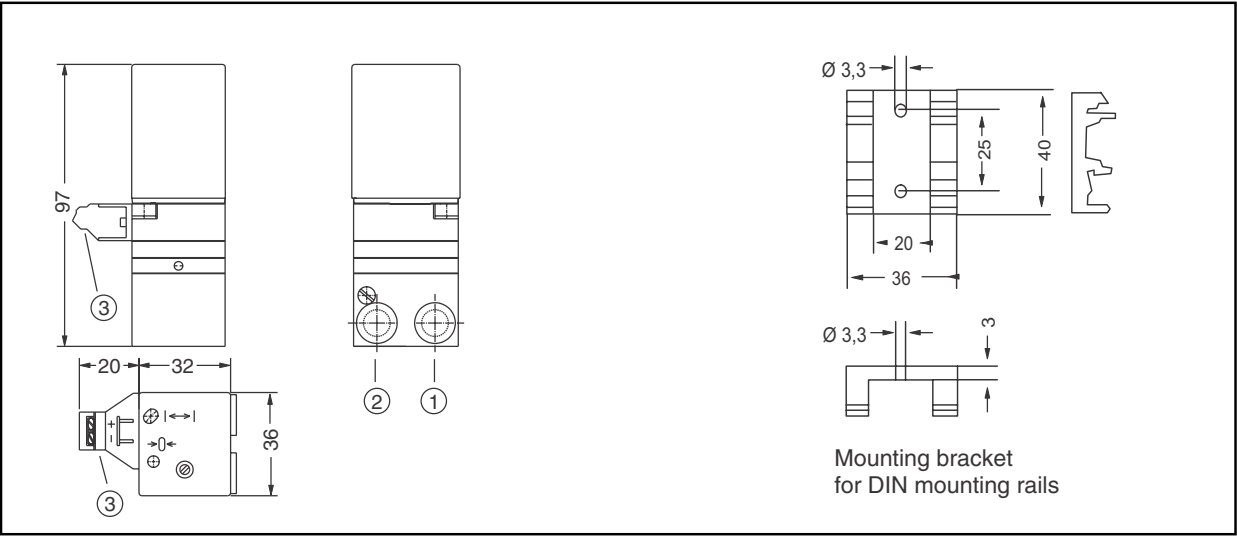
Accessories

EEx d cable gland
Made of brass, with M 20 x 1.5 thread

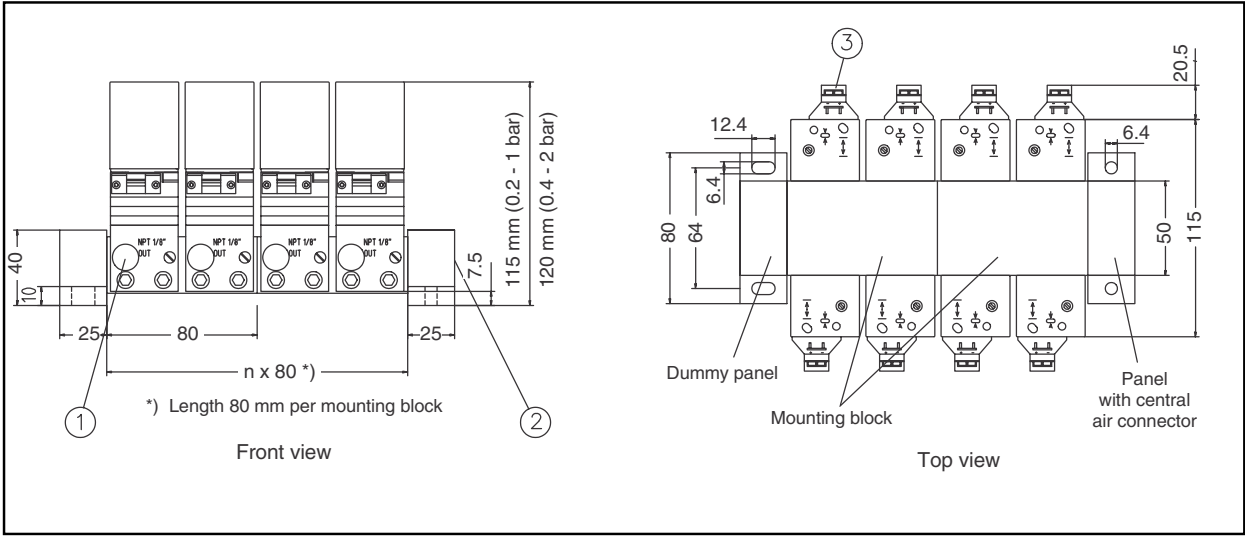
Stainless steel mounting bracket for wall-mounting / 2" pipe mount. For aluminium or stainless steel field housing

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

Dimensional Drawings

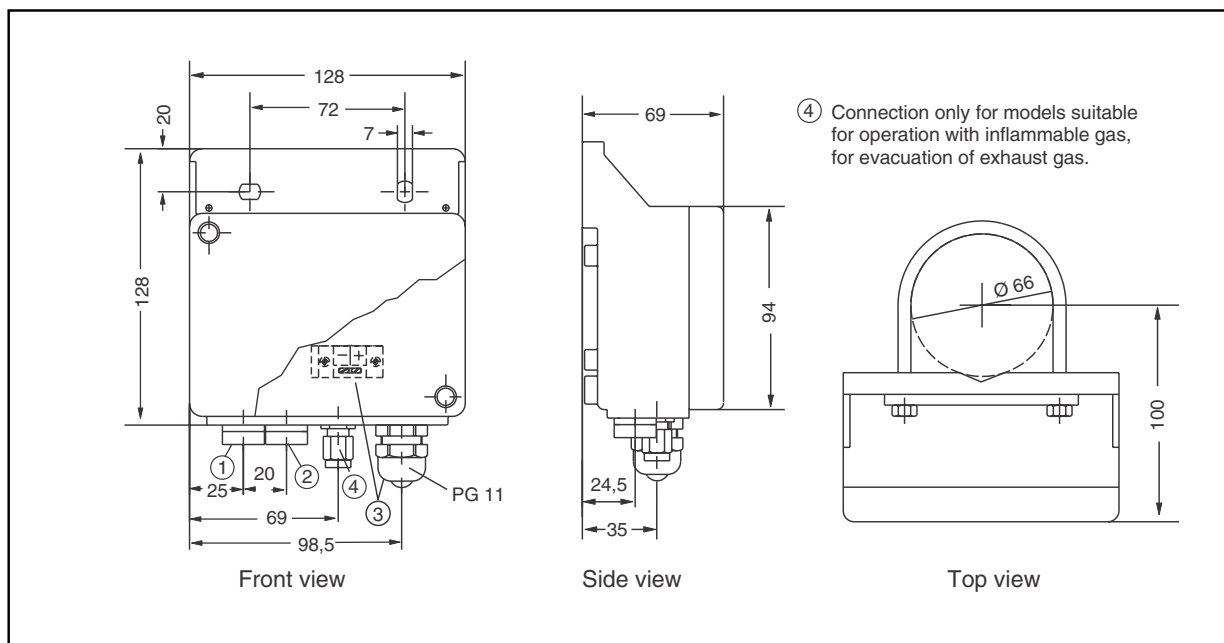


Control room housing unit - Type 22/06-65

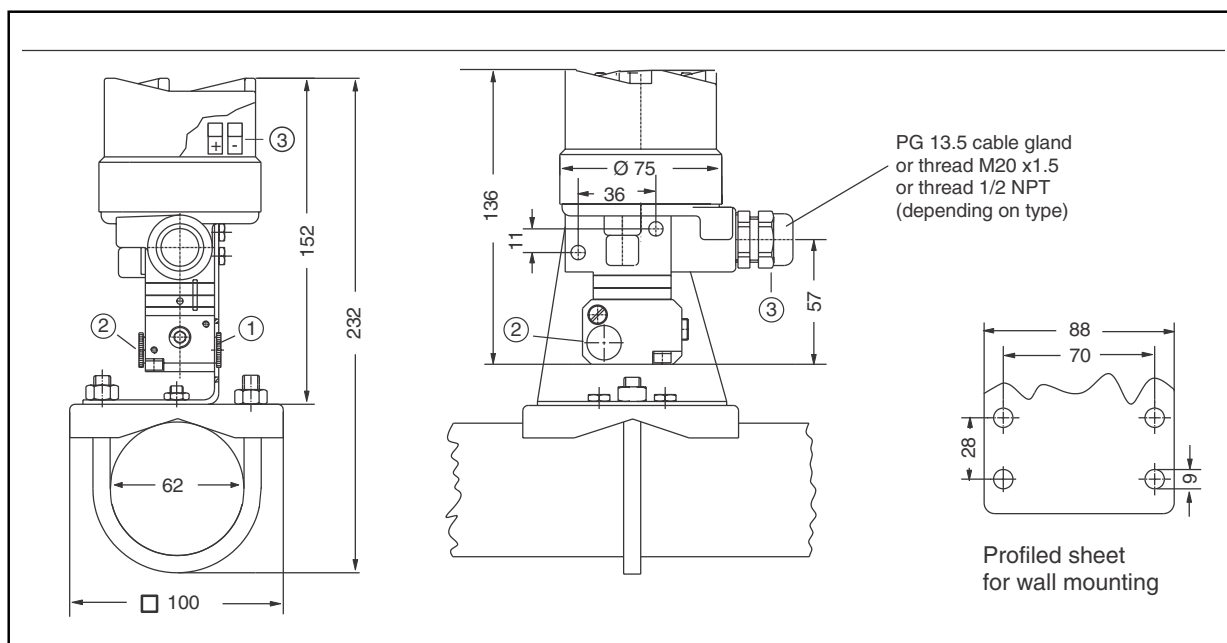


Control room housing for block mounting

Dimensional Drawings



Plastic field housing unit



Aluminium or stainless steel field housing unit - Types 22/06-68, 22/06-60, and NEMA 4X

Connections (all models)

① Output ② Air supply ③ Electrical connections



Filter Regulator

The Filter Regulator is just over 7” in height and 1-1/2” in diameter and can be easily nipple-mounted to our standard field mount units to provide a compact overall I/P-FR assembly. Mounting hardware, supply pressure gauges are offered separately.

The Filter Regulators utilize coalescing filter elements. Coalescing filter elements eliminate not only direct particles but also water and oil at a very high efficiency. The compressed air pushes the contaminants to the outside of the filter cartridge where it drips to the bottom of the bowl and is removed from the housing through a drain.

Part Number	Description
5229900 556025	Filter Regulator, 1/4” NPT port size, 1/8” gauge port, polycarbonate bowl, maximum operating pressure 150 psi, range 5-60 psi.

Filter Regulator Assembly

For factory installation of Filter Regulators and Accessories to Field Mount Units. All units are shipped completely assembled and included stainless steel mounting brackets. Separately specify the I/P of your choice.

Factory Assembled Filter Regulator, Mounting Bracket and Gauges for Metal Housed I/P.

Ordering Information:	I/P Signal Converter with Factory Assembled Filter Regulator, Gauges and Mounting Bracket
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Part Number	Description
5229900 500211	Filter Regulator Assembly with stainless steel hardware, 0-30 psi supply gauge, 0-15 psi output gauge
5229900 500212	Filter Regulator Assembly with stainless steel hardware, 0-30 psi supply gauge, 0-30 psi output gauge

Notes: All units are shipped completely assembled with stainless steel mounting brackets.

I/P Converter must be specified separately.

Ordering Information								
Model No.		V18311H-						
I/P Signal converter TEIP 11		(01 - 08)	09	10	11	12	13	14
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				
Field housing Polyester, IP 54			1	6				
Aluminum, IP 65 (Nema 4X)			1	8				
ATEX EEx ia IIC								
Control room housing IP 20 for rail mounting			3	1				
Control room housing IP 20 for block mounting			3	A				
Field housing Polyester, IP 54			3	6				
Aluminum, IP 65			3	8				
Stainless steel, IP 65			3	9				
ATEX EEx d IIC								
Field housing Aluminum, IP 65			4	8				
Stainless steel, IP 65			4	9				
BRITISH Standard Ex N for Zone 2								
Field housing Aluminum, IP65			5	8				
Stainless steel, IP 65			5	9				
FM/CSA for "Intrinsically safe"								
Control room housing, IP 20 for rail mounting			6	1				
Control room housing, IP 20 for block mounting			6	A				
FM/CSA "Intrinsically safe" and "explosion proof"								
Field housing Aluminum, IP 65 (Nema 4X)			7	8				
Stainless steel, IP 65 (Nema 4X)			7	9				
Input Signal								
Input Signal 0 ... 20 mA					1			
4 ... 20 mA					2			
Other (see BA No. 503, 504)					0			
Output Signal								
Output Signal 0.2 ... 1 bar					1			
3 ... 15 psi					2			
Other (see BA No. 508, 512)					0			
Characteristic								
Direct-action							1	
Reverse-action							2	
Space holder								0
Ambient Temperature								
-40... +85°C								1
-55...+85°C								2

CF = Consult factory

Standard Products =

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...12mA	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	
5...25 psi	5 1 0	
1...18 psi	5 1 1	
3...27 psi	5 1 2	
Accessories		
	Catalog No.	
Cable gland EEx d, brass, M 20 x 1.5 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		

CF = Consult factory

Standard Products =

Stock Versions				
Signal converter TEIP 11				
Control room housing IP 20 for rail mounting				
Explosion protection	Input	Output		
FM/CSA	4-20 mA	3-15 psi	V18311H-6122101	
FM/CSA	4-20 mA	1-18 psi	V18311H-6120101511	
FM/CSA	4-20 mA	3-27 psi	V18311H-6120101512	
FM/CSA	4-20 mA	6-30 psi	V18311H-6120101509	
Field housing (NEMA 4X)				
Explosion protection	Material	Input	Output	
without	Aluminum	4-20 mA	3-15 psi	V18311H-1822101
FM/CSA	Aluminum	4-20 mA	3-15 psi	V18311H-7822101
FM/CSA	Aluminum	4-20 mA	1-18 psi	V18311H-7820101511
FM/CSA	Aluminum	4-20 mA	3-27 psi	V18311H-7820101512
FM/CSA	Aluminum	4-20 mA	6-30 psi	V18311H-7820101509
FM/CSA	Stainless Steel	4-20 mA	3-15 psi	V18311H-7922101
FM/CSA	Stainless Steel	4-20 mA	1-18 psi	V18311H-792010511
FM/CSA	Stainless Steel	4-20 mA	3-27 psi	V18311H-792010512
FM/CSA	Stainless Steel	4-20 mA	6-30 psi	V18311H-7920101509
Manifold I/P Units for Block Mount (See Accessories below)				
I/P Converter	Input	Output		
I/P Converter	4-20 mA	3-15 psi	18311H-6A22101	
Accessories				
Connecting Block for 4 I/Ps (Max. 4 blocks can be linked in a series)			18391-7958243	
Terminating Block with common air supply (one required)			18391-7958251	
Terminating Block blank (one required)			18391-7958245	
Filter Regulator and Filter Regulator Assembly				
Filter Regulator			5229900 556025	
* Filter Regulator Assembly (30psi Supply / 15psi Output gage)			5229900 500211	
* Filter Regulator Assembly (30psi Supply / 30psi Output gage)			5229900 500212	
* Note - I/P Converter must be specified and priced separately .				
Units are shipped completely assembled with s/s mounting bracket filter regulator and gages				
Instruction Bulletin (one copy is supplied at no charge with order)			42/18-46-3XA	

Notes

ABB has Sales & Customer Support
expertise in over 100 countries worldwide

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