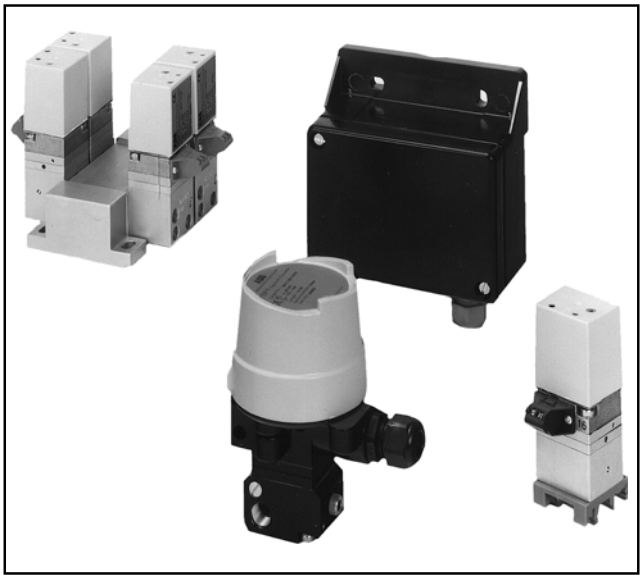
Data Sheet
D-API-IPboosted(TEIP11)_2a

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.

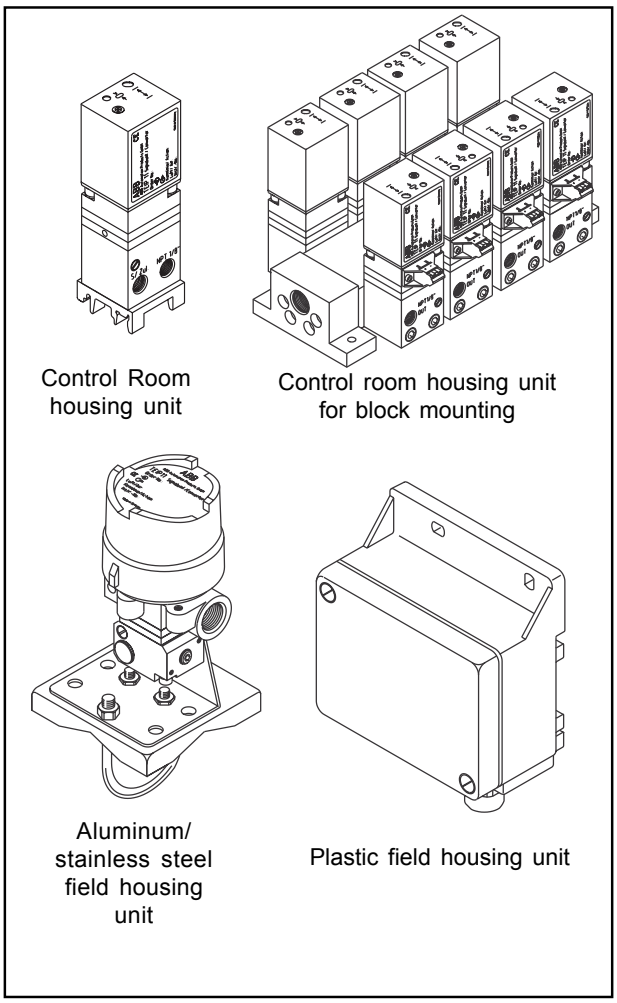
Field housing

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.



Control Room housing unit

Control room housing unit for block mounting

Aluminum/ stainless steel field housing unit

Plastic field housing unit

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 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%

Hyseresis: ≤ 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

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
CLIII
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

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 2² pipe mounting with separate stainless steel mounting bracket (accessory part)

Electrical Connection: 2-pole screw terminal for 2.5 mm^2 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

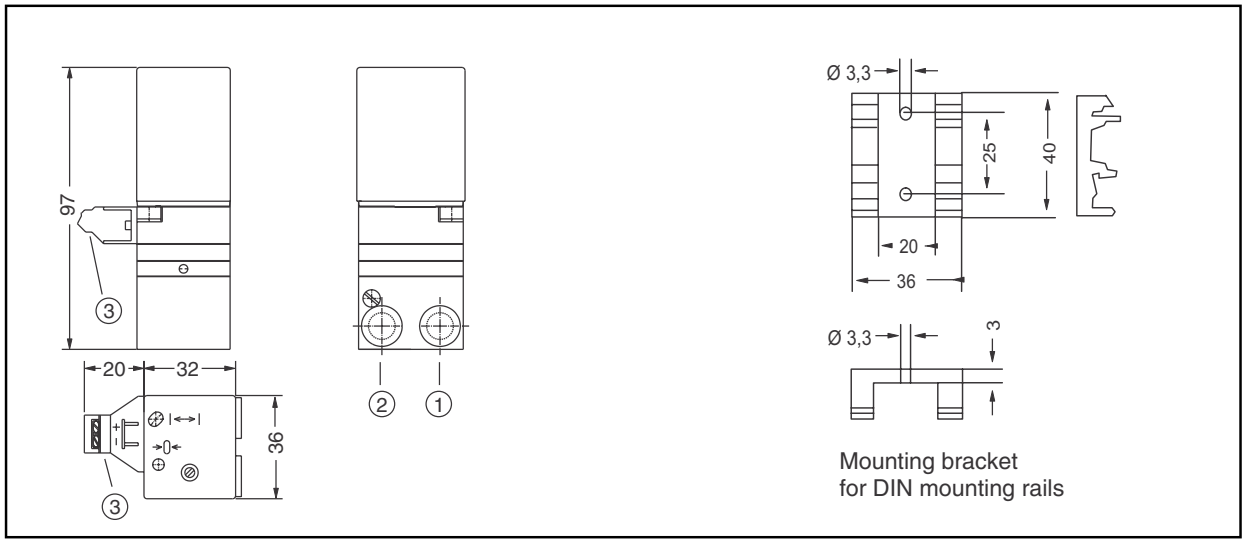
Accessories

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

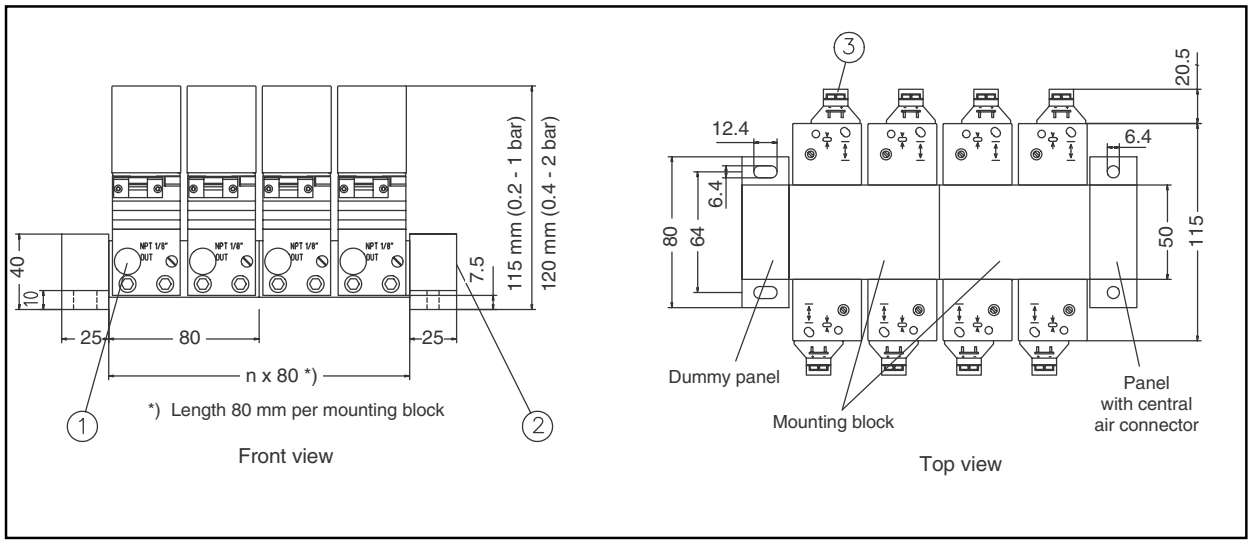
Stainless steel mounting bracket for wall-mounting / 2″ pipe mount. For aluminium or stainless steel field housing

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

Dimensional Drawings

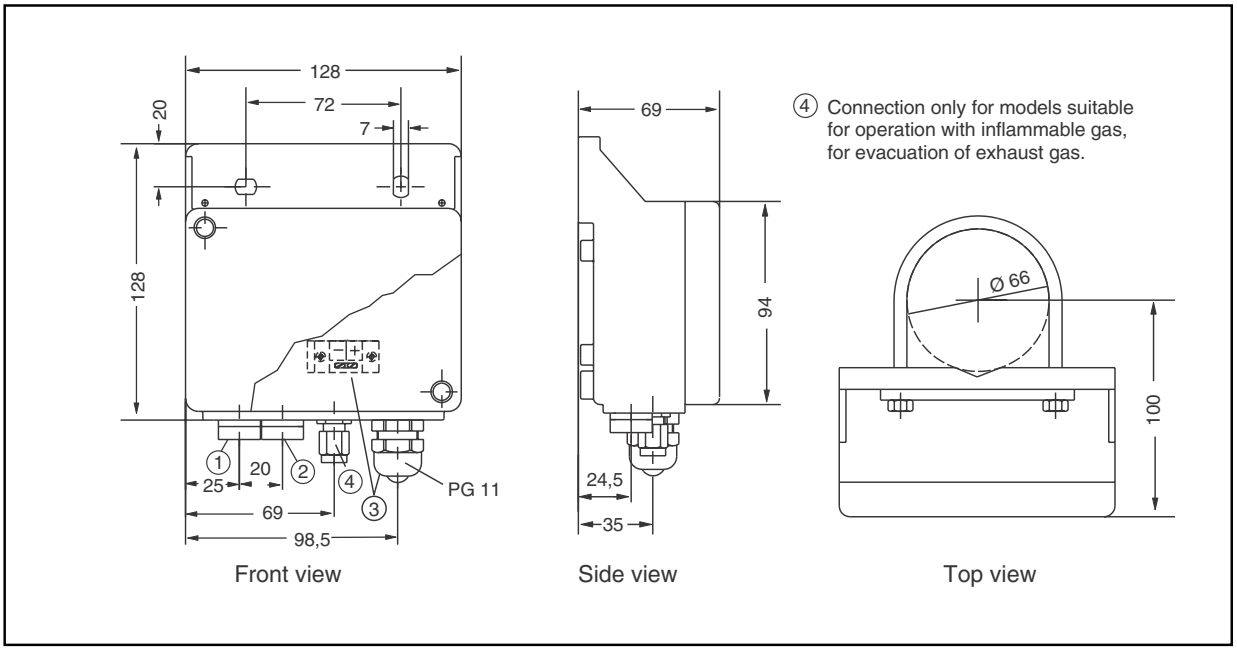


Control room housing unit - Type 22/06-65

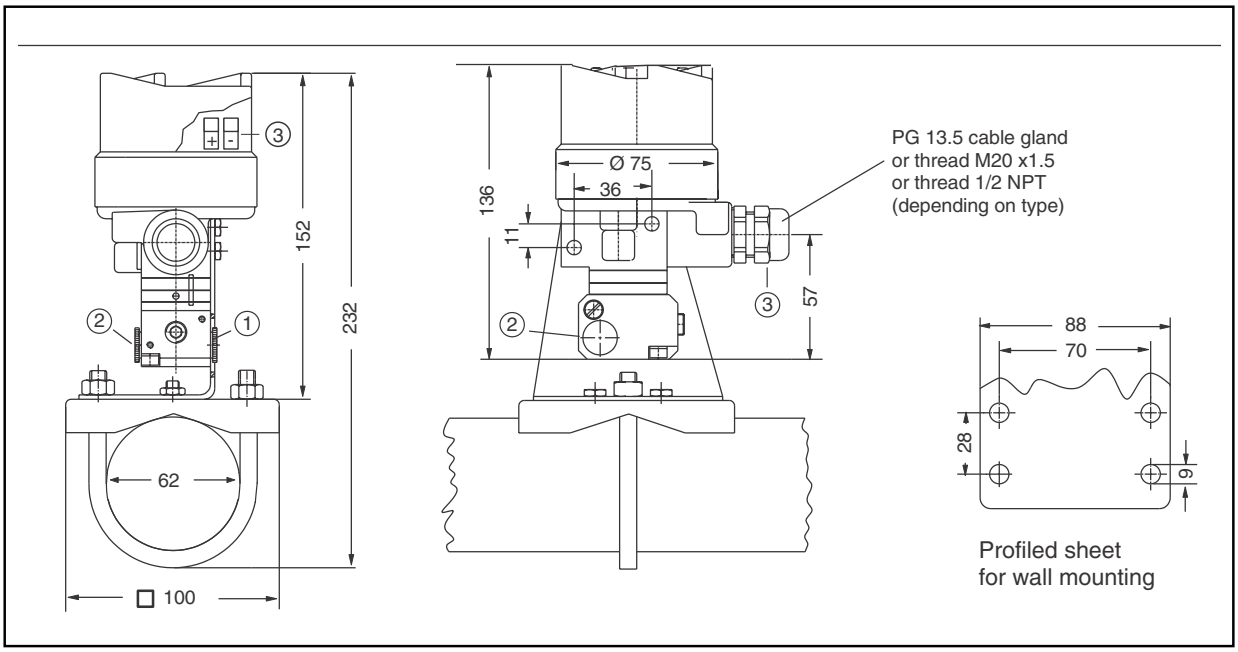


Control room housing for block mounting

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

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	15
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… +85ºC								1
-55…+85ºC								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
Terminationg 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

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