I/P signal converter
TEIP11-PS

Operating Instructions
42/18-46-EN

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Rev. G

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1 Safety

1.1 General Safety Information

The “Safety” chapter provides an overview of the safety aspects to be observed for the operation of the device.

The device is built based on state-of-the-art technology and is operationally safe. It was tested and left the factory in a proper state. The requirements in the manual as well as the documentation and certificates must be observed and followed in order to maintain this state for the period of operation.

The general safety requirements must be complied with completely during operation of the device. In addition to the general information, the individual chapters of the manual contain descriptions about processes or procedural instructions with specific safety information.

Only the observance of all safety information enables the optimal protection of personnel as well as the environment from hazards and the safe and trouble-free operation of the device.

1.2 Intended use

The TEIP11-PS is used to control pneumatic actuators or pneumatic positioners for positioning valves. It also converts input current proportionally into a compressed air signal. The TEIP11-PS may be used in accordance with Explosion-protection relevant, page 23 as well as Technical data, page 24. All other use is improper use.

Repairs, alterations and enhancements or the installation of replacement parts is only permissible as far as described in the manual. Further actions must be verified with ABB Automation Products GmbH. Excluded from this are repairs performed by ABB-authorized specialist shops.

1.3 Technical limits

The device is designed for use exclusively within the stated values on the name plate and in the technical specifications (see "Technical Specifications" chapter and/or data sheet). These must be complied with accordingly, e.g.:

• The maximum operating temperature may not be exceeded.
• The permitted operating temperature may not be exceeded.
• The housing protection system must be observed.
1.4 Warranty provision

A use contrary to the device’s stipulated use, disregarding of this manual, the use of under-qualified personnel as well as unauthorized alterations excludes the manufacturer of liability from any resulting damages. The manufacturer’s warranty expires.

1.5 Labels and symbols

1.5.1 Symbols and warnings

**Danger – <Serious damage to health / risk to life>**

One of these symbols in conjunction with the “Danger” warning indicates an imminent danger. If it is not avoided, death or serious injury will result.

**Warning – <Bodily injury>**

The symbol in conjunction with the “Warning” message indicates a possibly dangerous situation. If it is not avoided, death or serious injury could result.

**Caution – <Slight injuries>**

The symbol in conjunction with the “Caution” message indicates a possibly dangerous situation. If it is not avoided, slight or minor injury can result. May also be used for property damage warnings.

**Notice – <Property damage>!**

The symbol indicates a possibly damaging situation. If it is not avoided, the product or something in its area can be damaged.

**Important**

The symbol indicates operator tips or especially useful information. This is not a message for a dangerous or damaging situation.
1.5.2 Name plate

![Diagram of a name plate with labels 1 through 6]

Fig. 1

1 Full name of model
2 Order code
3 Input signal
4 Output signal
5 Supply pressure
6 Serial number

1.6 Operator liability

The operators must strictly observe the applicable national regulations in their countries with regards to installation, function tests, repairs, and maintenance of electrical devices.

1.7 Personnel qualification

The installation, commissioning and maintenance of the device may only be carried out through trained specialist personnel authorized by the plant operator. The specialist personnel must have read and understood the manual and comply with its instructions.
1.8 Returning devices

Use the original packaging or a suitably secure packaging for returning the device for repair or for recalibration. Include the properly filled out return form (see attachment) with the device.

According to EC guidelines for hazardous materials, the owner of hazardous waste is responsible for its disposal or must observe the following regulations for its shipping:

All delivered devices to ABB Automation Products GmbH must be free from any hazardous materials (acids, alkali, solvents, etc.).

1.9 Disposal

ABB Automation Products GmbH actively promotes environmental consciousness and has an operational management system in accordance with DIN EN ISO 9001:2000, EN ISO 14001:2004 and OHSAS 18001. Our products and solutions should have minimum impact on the environment and persons during manufacture, storage, transport, use and disposal.

This includes the environmentally friendly use of natural resources. Through its publications ABB conducts an open dialog with the public.

This product/solution is manufactured from materials that can be reused by specialized recycling companies.

1.9.1 Information on WEEE directive 2002/96/EC (Waste Electrical and Electronic Equipment)

This product/solution is not subject to the WEEE directive 2002/96/EC and relevant national laws (e.g., ElektroG in Germany).

Dispose of the product/solution directly in a specialized recycling facility and do not use the municipal garbage. Only privately used products may be disposed of in the municipal garbage according to the WEEE directive 2002/96/EC. Proper disposal prevents negative effects on people and the environment, and supports the reuse of valuable raw materials.

If it is not possible to dispose of old equipment properly, ABB Service can accept and dispose of returns for a fee.

1.10 Transport safety information

Check the devices for possible damage that may have occurred from improper transport. Damages in transit must be recorded on the transport documents. All claims for damages must be claimed without delay against the shipper and before the installation.
1.11 Storage conditions

The units must be stored in dry and dust-free conditions.
The storage temperature should be between -20 °C (-4 °F) and 70 °C (158 °F).
The storage time is basically indefinite, however, the warranty conditions stipulated in the order confirmation of the supplier are valid.

1.12 Installation safety information

- Only qualified specialists who have been trained for these tasks are authorized to mount and adjust the I/P signal converter, and to make the electrical connection.
- When working on the I/P signal converter always observe the locally valid accident prevention regulations and the regulations concerning the construction of technical installations.

1.13 Electrical installation safety information

**Important**

The I/P signal converter has been manufactured and tested in accordance with DIN EN 61010-1 “Safety Requirements for Electronic Equipment” and has been supplied in a safe condition.

The electrical connection may only be performed by authorized specialist personnel according to the electrical plans.

Observe the electrical connection information in the manual, otherwise the electrical protection can be affected.

The secure isolation of contact-dangerous electrical circuits is only guaranteed when the connected devices fulfil the requirements of the DIN VDE 0106 T.101 (basic requirements for secure isolation).

For secure isolation, run the supply lines separated from contact-dangerous electrical circuits or additionally isolate them.
2 Explosion-protection safety precautions

Requirements/conditions for safe use of explosion-proof I/P signal converters (type doc. 900771)

Important
Prior to mounting check to ensure that the specifications in terms of safety and control applicable to the I/P signal converter will not be exceeded.

• When making the electrical connections observe the specifications in the section "Technical data" and the specifications in the explosion protection certificate.
• The device must be supplied with instrument air that is free of oil, water and dust. Do not use flammable gas nor oxygen or oxygen-enriched gas.
• Do not open the device immediately after switch-off. Wait for at least 4 minutes.

Warning - Potential damage to parts!
Handle the cover with care. Otherwise, the thread may be damaged, canceling the explosion protection.

Important
Use only cable glands with full Ex d approval for EEx d operation.

• Secure the cable and tube entries against turning and loosening by using security adhesive of medium strength.
• If the signal converter is used at an ambient temperature above 60 °C (140°F) or below -20 °C (-4 °F), use cable entries and cables approved for a service temperature corresponding to the maximum ambient temperature increased by 10 K or corresponding to the minimum ambient temperature, respectively.

Warning - Potential damage to parts!
Devices that comply in new condition with "Ex ia" and "Ex d" protection classes should not be used in intrinsically safe "Ex ia" applications once they have been commissioned and used in an environment with "Ex d" protection, since the electronics may have been damaged.

This is why the instruments must be marked permanently (e.g., cross out or paste over Ex i).
Thermal specifications for explosion protection class Ex ia
(doc no. 901068 or doc no. 901069)
The following limit values for the temperature classes must be observed for the intrinsically safe versions:

<table>
<thead>
<tr>
<th>Temp.- class</th>
<th>Input current</th>
<th>Ambient temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>50 mA</td>
<td>-55 ... 60 °C (-67 ... 140 °F)</td>
</tr>
<tr>
<td>T6</td>
<td>60 mA</td>
<td>-55 ... 55 °C (-67 ... 131 °F)</td>
</tr>
<tr>
<td>T5</td>
<td>60 mA</td>
<td>-55 ... 70 °C (-67 ... 158 °F)</td>
</tr>
<tr>
<td>T4</td>
<td>60 mA</td>
<td>-55 ... 85 °C (-67 ... 185 °F)</td>
</tr>
<tr>
<td>T5</td>
<td>100 mA</td>
<td>-55 ... 55 °C (-67 ... 131 °F)</td>
</tr>
<tr>
<td>T4</td>
<td>100 mA</td>
<td>-55 ... 85 °C (-67 ... 185 °F)</td>
</tr>
<tr>
<td>T5</td>
<td>120 mA</td>
<td>-55 ... 45 °C (-67 ... 113 °F)</td>
</tr>
<tr>
<td>T4</td>
<td>120 mA</td>
<td>-55 ... 80 °C (-67 ... 176 °F)</td>
</tr>
<tr>
<td>T4</td>
<td>150 mA</td>
<td>-55 ... 70 °C (-67 ... 158 °F)</td>
</tr>
</tbody>
</table>

Thermal specifications for explosion protection class Ex d
The following limit values for the temperature classes must be observed for Ex d versions (doc. no. 900771):

<table>
<thead>
<tr>
<th>Temp.- class</th>
<th>Input current</th>
<th>Ambient temp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>50 mA</td>
<td>-40 ... 55 °C (-40 ... 131 °F)</td>
</tr>
<tr>
<td>T5</td>
<td>50 mA</td>
<td>-40 ... 70 °C (-40 ... 158 °F)</td>
</tr>
<tr>
<td>T4</td>
<td>40 mA</td>
<td>-40 ... 85 °C (-40 ... 185 °F)</td>
</tr>
</tbody>
</table>
3 Design and function

The I/P signal converter transforms electrical signals into pneumatic standard signals, e.g., 4…20 mA in 0.2…1 bar (3…15 psi). It is, thus, a connecting link between the electrical/electronic and the pneumatic systems. The patented signal conversion principle is based on the force balance method.

![Diagram of the I/P signal converter](image)

**Fig. 2**

1. Coil  
2. Yoke  
3. Air gap  
4. Magnets  
5. Flapper  
6. Nozzle  
7. Throttle  
8. Converter stage  
9. Lever arm  
10. Potentiometer  
11. Resistance  
12. Filter  
13. Air supply

**Functionality**

Force balancing takes place at the lever arm which is pivoted with a tension band at (9). The coil (1) and yoke (2) generate a magnetic field in the air gap (3) which applies a force to the magnet (4) on the lever arm. The force changes in proportion to the current (input signal) flowing through the coil (1).

On the other side of the lever arm a counterforce is applied through the dynamic air pressure present at the air nozzle (6). The force is controlled in such a way that a balance of the two torques is achieved. If a torque imbalance occurs, the lever arm is rotated. This rotation changes the air gap between the nozzle (6) and the flapper (5) and, thus, the dynamic air pressure. Air is permanently supplied to the nozzle (6) through the throttle (7). The 1:1 converter stage (8) converts the dynamic air pressure into a 0.2…1 bar or 3…15 psi output signal.
Supply air

During operation the pneumatic unit needs a steady supply of air (13) according to device specifications. Zero adjustment can be done on the tension band suspension (9), and range adjustment on the potentiometer (10).

Special features

Special features of the I/P signal converter are its relatively small dimensions and high operational stability when subjected to shock and vibration. The stability is due to the light weight (only 100 mg) of the moving system, which consists of the lever arm with the magnet (4) and the flapper (5) with balancing weight.

Filter

The air filter (12) prevents malfunctions caused by polluted air. Note that the filter capacity is only sufficient for collecting dirt that occurs occasionally (e.g. residual dirt in the air pipes at first use). It is no substitute for proper air conditioning.

Deliverables

For details on the deliverable signal converter models and their accessories, please refer to data sheet 10/18-0.10 EN, which also includes the catalog numbers of the individual items.
4 Installation

4.1 Operating conditions at installation site

**Important**

Prior to mounting check to ensure that the specifications in terms of safety and control applicable to the I/P signal converter will not be exceeded at the installation location.


4.2 Delivery scope

- Check the delivery for completeness, signs of damage, model and scope immediately upon arrival.
- Check whether the delivery is in accordance with your order.

**Accessories**

The following loose accessories are delivered with the unit as extra items:

- Mounting bracket for the aluminum or stainless steel field housing unit (for wall or 2" pipe mounting)
- Cable entry for signal converter with “Ex d” explosion protection

4.3 Mounting the model with control room housing for rail mounting

This model is snap-mounted on a DIN top-hat rail.

![Control room housing unit for rail mounting](image)

Fig. 3: Control room housing unit for rail mounting

The I/P signal converter has a special mounting base. Due to its universal design, it is suitable for mounting to EN 50022 - 35x7.5, EN 50045 - 15x5 and EN 50035 - G32 rails.

**Vertical top-hat rail**

For vertical rails, the electrical connection for the device should preferably be on the left.

**Horizontal top-hat rail**

For horizontal rails, the electrical connection for the device should preferably be facing up.
4.4 Mounting the model with control room housing for block mounting

For this design, a special connection block is used to mount the device.

![Control room housing unit for block mounting](image.png)

**Fig. 4: Control room housing unit for block mounting**

**Design**

The connection block is designed for mounting max. 4 I/P signal converters. The connection blocks can be expanded to units of 2, 3 or 4 blocks to allow for block units with 4, 8, 12 or 16 I/P signal converters.

**Mounting**

The material for forming the block units is delivered separately for self-installation; in addition to the connection blocks, it includes the necessary screws and seals (O-rings).

**Air supply**

The air supply for the connected devices is provided via a central connection block. In the air supply for the connection block, there is a non-return coupling for every single I/P signal converter. This allows connection sites to remain unused, and individual I/P signal converters can be deinstalled or installed.
4.5 Mounting the model with the plastic field housing unit

The plastic housing is suitable for installation on-site.

![Fig. 5: Plastic field housing unit](image)

**Mounting types**

Devices can be mounted on walls or vertically in a 2” pipe.

The connections for the input and output signals should be facing down to keep out moisture.

---

**Danger - Risk to life due to suffocation**

For versions used with flammable gas, the installation must be performed outdoors or in a well-ventilated building.

When installing the device in buildings, the exhaust must be routed outdoors.
4.6 Mounting the model with aluminum or stainless steel field housing unit

The sturdy housing can be installed outdoors without protection.

Fig. 6: Aluminum / stainless steel field housing unit

Mounting

Position the unit so that the cable gland is oriented towards the bottom or horizontally to reduce moisture penetration.

Accessories

A mounting bracket is provided as an accessory for installation. The mounting bracket is available in two versions:

• For wall mounting only
• Universal for wall or 2” pipe installation
5 Electrical connection

Important
For electrical installation, the following standards, data and documents must be observed:
• the relevant regulations and safety standards pertaining to the installation and operation of electrical systems.
• the additional regulations, standards and directives governing the installation and operation of explosion-proof systems, if explosion-proof devices are used.
• the values for the electrical connection in section Technical data, page 24.
• for explosion-proof devices also observe the specifications in the explosion protection certificate

5.1 Signal cables

Do not run signal cables close to power lines.

Important
Power lines produce interference in their near vicinity, which impairs the signals transmitted on the line.

5.2 Cable glands

Cable entries of different types are provided:
• Plastic field housing unit
• Pf 11 cable gland

Aluminum or stainless steel field housing unit
• Standard / EEx ia Cable gland ½” NPT
• EEx d Tap hole M20 x 1.5
• FM / CSA "intrinsically safe" / "Explosion proof" Tap hole ½” NPT

Important
Use only cable glands with full Ex d approval for EEx d operation (partly approved cable glands labeled “U” are NOT sufficient).
Fix the screwed-in Ex d cable gland with glue to secure it against loosening. Loctite 242/243 or similar glues are suitable.
5.3 Position of the terminals

The electrical connection is provided by 2-pole screw terminals for cables with a max. cross-sectional area of 2.5 mm² (14 AWG).

For control room housing unit for rail and block mounting

The terminals are located on the side of the housing.

Plastic, aluminum or stainless steel field housing unit

The terminals are located inside the housing. The field housing unit must be opened to connect the cable.

5.4 Connection

Do not reverse polarity when connecting the cable.
6 Pneumatic connection

**Important**

The I/P signal converter must be supplied with instrument air that is free of oil, water and dust.

The purity and oil content should meet the requirements of Class 3 according to DIN/ISO 8573-1.

The pressure dew point should be 10 K under the lowest operating temperature.

For versions with plastic housing and when used with flammable gas, an additional line must be added to route the gas to a safe site.

The control room housing has 1/8, 1/4 or 3/8 NPT holes (for air supply and output) (see the specifications in section Technical data, page 24).

The connections for air supply and output are marked accordingly.

**Warning - Potential damage to parts!**

The recommended pipe dimension is 6 x 1 mm. Dust, splinters or any other particles must be blown off the pipe before connecting.

The supply pressure for the device has to be set as follows:

**For output 0.2 ... 1 bar (3 ... 15 psi)**

\[ 1,4 \pm 0.1 \text{ bar (20 } \pm \text{ 1.5 psi)} \]

The max. allowable overload limit for the supply pressure is 4 bar (60 psi).

**Warning - Potential damage to parts!**

Provisions should be made to ensure that in the event of an error the pressure does not rise above 4 bar (60 psi).

7 Startup Operation

The I/P signal converter is ready for operation immediately after installation and connection. No further adjustment is required.
8 Maintenance

Important
Note that the supplied instrument air must be free of oil, water and dust according to DIN/ISO 8573-1 to ensure trouble-free operation.

It is recommended to regularly check the built-in textile filter (if present) for the degree of pollution and the signal conversion to see if the values are still within the tolerance.

8.1 Replacing the filter element

If the supply air for the signal converter has not been conditioned properly (supplied air must be clean and dry in accordance with Technical data, page 24), the built-in textile filter protects the sensitive air nozzles and throttles from being obstructed with dirt and fluids from being held back.

However, the filter capacity suffices only for occasionally collecting little dirt. In case of a pollution over a longer time the filter gets choked.

Fig. 7: Air filter (sectional drawing)

1 Air intake 3 Screw plug
2 Filter element 4 Air outlet

Important
Switch off the air supply before replacing the filter element.

1. Switch off the air supply.
2. Remove the screw plug and pull out the filter element using tweezers (see Fig. 7).
   Spare filter elements can be ordered from ABB Service.
3. Insert the new filter element and tighten the screw plug.
   The I/P signal converter is ready to operate immediately after the filter element has been replaced. No further measures - like readjustment - are required.
4. Switch on the air supply.

Important
The I/P signal converter with plastic housing is not equipped with a filter element due to its design.
8.2 Readjusting the signal conversion

The signal converters are delivered in an adjusted condition. After longer operating periods, however, the tolerance limits may be exceeded due to aging or drift. This can be eliminated by readjustment.

Fig. 8: Adjustment screws

Important
When using a field housing unit first remove the cover to access the screws.

The signal converter can be readjusted with 2 adjustment screws (see Fig. 8).

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting of range</td>
</tr>
<tr>
<td>2</td>
<td>Setting of zero point</td>
</tr>
</tbody>
</table>
9 Explosion-protection relevant information

Explosion protection
ATEX / GOST Russia / GOST Ukraine, intrinsically safe (all designs)

2G EEx ia IIC /T4/T5/T6 TÜV 1487x (for the control room housing and field housing unit)

ATEX / GOST Russia / GOST Ukraine, flameproof (metal field housing only)
EEx d IIC T4/T5/T6

Observe the following limits for the temperature classes, see section Explosion-protection safety precautions.

FM "intrinsically safe" (not 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" (for field housing units only)
I.S.: CL I-II/II / 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" (for metal field housing units only)
X.P.: CL I / Div 1 / Grp A B C D
D.I.P.: CL II III / Div 2 / Grp E F G

CSA "intrinsically safe" (not for metal field housing units)
I.S.: CL I / Div 1 / Grp A B C D
I.S.: CL I / Div 2 / Grp A B C D

CSA "intrinsically safe" (for metal field housing units only)
I.S.: CL I / Div 1 / Grp A B C D
I.S.: 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" (for metal field housing units only)
IX.P.: CL I / Div 1 / Grp B C D
CL II / Div 2 / Grp E F G

Gost

Explosion protection requirements
ATEX EEx ia or EEx d
FM/CSA intrinsically safe
FM/CSA explosion proof
GOST EEx ia or EEx d (Russia / Ukraine)

Other explosion protection certificates on request
10 Technical data

10.1 Input (electric)

Signal range
0 … 20 mA or 4 … 20 mA
0 … 10 mA or 10 … 20 mA
4 … 12 mA or 12 … 20 mA
(additional ranges available upon request)

Input resistance
R_i = 260 \Omega at 20 °C (68 °F), T_k + 0.4 %/K

Overload limit
30 mA (see specifications “Explosion protection” for Ex devices)

Capacitance/Inductance
negligible

10.2 Output (pneumatic)

Signal range
0.2 … 1 bar (3 … 15 psi)

Air capacity
\geq kg/h = 4.1 Nm^3/h = 2.4 scfm

Load power acc. to VDE / VDI 3520
\geq 0.95 kg/h = 0.9 Nm^3/h = 0.5 scfm

10.3 Power supply (pneumatic)

Instrument air
free of oil, water and dust acc. to DIN / ISO 8573-1
pollution and oil content according to Class 3
Pressure dew point 10 K below operating temperature

Supply pressure
1.4 ± 0.1 bar (20 ± 1.5 psi)

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

10.4 Transmission data and influences

Characteristic
linear, direct or reverse action

Power supply
\leq 0.3% / 0.1 bar (1.5 psi) change in pressure

Mechanical vibration
\leq 1% to 10 g and 20 … 80 Hz

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

Mounting orientation
Zero point \leq 0.4% at 90° change of position

Step response
10 … 90 % and 90 … 10 % 0,6 s
5 … 15 % and 15 … 5 % 0,25 s
45 … 55 % and 55 … 45 % 0,2 s
85 … 95 % and 95 … 85 % 0,15 s

10.5 Operating conditions at installation site

Ambient temp.
depending on the ordered model
-40 … 85 °C (-40 … 185 °F)
-55 … 85 °C (-67 … 185 °F)
For Ex d
-40 … 85 °C (-40 … 185 °F)

Required protection
IP 20 For control room housing unit for rail or block mounting
IP 54 For plastic housing
IP 65 For aluminum or stainless steel field housing unit

Installation position
any

10.6 Environmental capabilities

Climate class
GPF or FPF acc. to DIN 40040
Temperature
-55 … 85 °C (-67 … 185 °F)
-45 … 85 °C (-49 … 185 °F)
for operation, storage or transport
Relative humidity
75 % mean, 95% short-term
no condensation
10.7 Design for rail mounting

Material/protection
Housing IP 20
aluminum with plastic cap

Mounting
Rail mounting
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 (14 AWG)

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

Weight
0.25 kg (0.55 lb)

Dimensions
Refer to dimensioned drawings

10.8 Design for block mounting

Material/protection
Housing IP 20
aluminum with plastic cap

Mounting
In block format with special connection block (accessory),
max. 4 connection blocks each with 4 converters

Electrical connection
2-pole screw terminal for 2.5 mm² (14 AWG)

Pneumatic connection
3/8 NPT threads for air supply
(main connection to connection block)
1/8 NPT threads for output
(on each individual signal converter)

Installation position
any

Weight
0.3 kg (0.66 lb)

Dimensions
Refer to dimensioned drawings

10.9 Design for field-mount housing (plastic)

Material/protection
Housing, polyester, black, IP 54

Mounting
Wall mount or 2" pipe installation
(2" pipe installation for vertical pipes only)

Electrical connection
2-pole screw terminal for 2.5 mm² (14 AWG) in housing,
Cable gland Pg 11 for cable entry

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

Air outlet
For gas exhaust with 6 mm (0.24 inch) cut or crimp connection

Installation position
any

Weight
1.0 kg (2.20 lb)

Dimensions
Refer to dimensioned drawings
10.10 Design for field-mount housing (aluminum / stainless steel)

Material/protection
Aluminum or stainless steel housing IP 65

Surface
Aluminum housing
painted with dual component coating
Lower section, black, RAL 9005
Screw-on cap Pantone 420

Stainless steel housing
electrolytically polished

Mounting
Wall mount or 2" pipe installation
With stainless steel mounting bracket (accessory)

Electrical connection
2-pole screw terminal for 2.5 mm² (14 AWG) in housing,
Cable gland NPT 1/2" for cable entry

for ATEX intrinsically safe
Threads M20 x 1.5 for cable entry

for ATEX EEx d:
(on request cable gland with Ex d certificate as accessory)
Cable entry NPT 1/2" for cable entry with FM/CSA

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

Weight
0.62 kg (1.37 lb) with aluminum housing
1.20 kg (2.65 lb) with stainless steel housing

Dimensions
Refer to dimensioned drawings

10.11 Accessories

Cable gland EEx d
brass, with M20 x 1.5 threads

Mounting angle of stainless steel for wall or 2" pipe installation
for aluminum or stainless steel field housing unit

Material for block mounting
Connection block for 4 converters
Dummy panel with central air connector 3/8 NPT
Dummy panel

10.12 Spare parts

Except for the textile filter, the signal converter is wear free and does not require maintenance.
10.13 Dimensioned drawings

10.13.1 Design for control room housing unit for rail mounting

Fig. 9: Measurements in mm (inch)
1 Electrical connections
2 Filter
3 Output
4 Supply air
5 Mounting bracket for DIN rails
10.13.2 Control room housing unit for block mounting

Fig. 10: Measurements in mm (inch)

1 Output
2 Supply air
3 Filter
4 Electrical connections
5 Panel with central air connector
6 Mounting block
7 Dummy panel

1) Design 0.2 ... 1 bar (2.90 ... 14.50 psi)
2) Design 0.4 ... 1 bar (5.80 ... 14.50 psi)
3) Length 80 mm (3.15 inch) for each mounting block
10.13.3 Design for field-mount housing (plastic)

Fig. 11: Measurements in mm (inch)
1. Electrical connections
2. Connection only with design for operation with combustible gas for diverting the escaping gas / 6 mm (0.24) screw terminal connection
3. Supply air
4. Output

FREE TRADE OF TECHNOLOGY
10.13.4 Aluminum or stainless steel field-mount housing unit

![Diagram of the housing unit]

Fig. 12: Measurements in mm (inch)

1. Ground terminals
2. Supply air
3. Electrical connections
4. Output
5. Filter
6. Profiled sheet for wall mounting
11 Appendix

11.1 Certificates

Translation

EC-Type Examination Certificate

- Directive 94/9/EC -
Equipment and protective systems intended for use in potentially explosive atmospheres

DMT 02 ATEX E 121 X

(4) Equipment: I/P-converter type Doc. 900771
(5) Manufacturer: ABB Automation Products GmbH
(6) Address: D 32425 Minden

The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 02.2067 EG.

The Essential Health and Safety Requirements are assured by compliance with:

EN 50014:1997+A1-A2 General requirements
EN 50011:2000 Flameproof enclosure

If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for its use specified in the schedule to this certificate.

This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance with Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

The marking of the equipment shall include the following:

Ex II 2G Ex d IIC T4/TS/T6
Deutsche Montan Technologie GmbH
Eisen, dated 28. June 2002

Signed: Jockers
DMT-Certification body

Signed: Eickhoff
Head of special services unit
Appendix to

EC-Type Examination Certificate

DMT 02 ATEX E 121 X

15.1 Subject and type

1/P-converter type Doc. 900771

15.2 Description

The converter serves for the transformation of an injected DC current into a proportional pressure. As pressure media neither flammable gases nor Oxygen or Oxygen enriched gas mixtures are used. Optionally, a control unit, type of protection Intrinsic Safety (EEEx ia IIC T6/T5/T4; TÜV 99 ATEX 1487 X), may be used.

15.3 Parameters

15.3.1 Electrical data (non intrinsically safe supply)
Nominal current ≤ 50 mA

15.3.2 Electrical data (intrinsically safe supply)
As per TÜV 99 ATEX 1487 X

15.3.4 Thermometric data

Supply (compressed air)
Output signal ≤ 10 bar

15.3.4.1 Thermal data (non intrinsically safe supply)
Maximum input current 50 50 50 mA
Ambient temperature range -40 °C up to 55 70 85 °C
Temperature class T6 T5 T4

15.3.5 - Thermal data (intrinsically safe)

Maximum input current 59 60 69 69 100 100 120 120 150 mA
Ambient temperature range -40 °C up to 60 55 70 85 85 85 45 80 70 °C
Temperature class T6 T6 T5 T4 T5 T4 T4 T4 T4

(16) Test and assessment report

BVS PP 02.2067 EG as of 28.06.02

(17) Special conditions for safe use

17.1 The 1/P converter is designed for use at an ambient temperature range of –40 °C up to 85 °C at maximum.

17.2 If the 1/P Converter is used at an ambient temperature above 60 °C or below –20 °C, cable circuits and cable approved for a service temperature corresponding to the maximum ambient temperature increased by 10 K respectively corresponding to the minimum ambient temperature shall be used.

Page 2 of 3 to DMT 02 ATEX E 121 X

This certificate may only be reproduced in its entirety and without change
AeT Technologiepark 1, 6330 Escazú, Teléfono (506) 272-1410, Teléfono (506) 272-1416
17.3.1 Variants with intrinsically safe control unit shall not be used intrinsically safe once they have been used in type of protection flameproof enclosure from a non intrinsically safe supply.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

45307 Essen, 28. June 2002
BVS-Wo/Ar A 20010773

Deutsche Montan Technologie GmbH

[Signatures]

DMT-Certification body

[Signature]

Head of special services unit
1st Supplement
(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
DMT 02 ATEX E 121 X

Equipment: I/P-converter type Doc. 900771
Manufacturer: ABB Automation Products GmbH
Address: D - 32425 Minden

Description
The IP-converter may be used alternatively with the following pneumatic data:
Supply (compressed air) \( \leq 2.5 \text{ bar} \)
Output signal \( \leq 2 \text{ bar} \)

Test and assessment report
BVS PP 02.2067 EG as of 03.09.2002

Deutsche Montan Technologie GmbH
Eisen, dated 01.09.2002

signed: Jockers
DMT-Certification body

signed: Lelendecker
Head of special services unit
We confirm the correctness of the translation from the German original.  
In the case of arbitration only the German wording shall be valid and binding.

45307 Essen, 03.09.2002
BVS-Wit/Mi  A20020478

Deutsche Montan Technologie GmbH

[Signatures]

DMT-Certification body  Head of special services unit
EC-TYPE EXAMINATION CERTIFICATE

(1) Equipment or Protective System intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

TÜV 99 ATEX 1487 X

(4) Equipment or Protective System:
I/P transformer type Doc 901068 and 901069

(5) Manufacturer:
Hartmann & Braun GmbH & Co. KG
Geschäftsbereich Gerätelehre

(6) Address:
D-30179 Hannover, Hackethalstr. 7

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Hannover/Sachsen-Anhalt e.V., TÜV Certification Body No. 0032 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report No. 99/PX23890.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50 014:1997
EN 50 020:1994

(10) If the sign "X" is placed after the certification number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

(12) The marking of the equipment or protective system shall include the following:

Il 2 G EEx ia IIC T6

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30179 Hannover

Head of the Certification Body

This certificate may only be reproduced without any change, schedule included.
Excerpts or changes must be allowed by the TÜV Hannover/Sachsen-Anhalt e.V.
(14) **EC-TYPE EXAMINATION CERTIFICATE Nº TÜV 99 ATEX 1487 X**

(15) **Description of equipment or protective system**

The I/P transformer type Doc 001068 and 001069 is used for the transformation of an impressed direct current of the range of 0 ... 20 mA into a proportional pressure. The proportional pressure can be used for the control of pneumatically adjustable devices resp. mechanisms of every manner.

**Electrical data**

Supply circuit: in type of protection "Intrinsic Safety" EEx ia IIC

(terminal +,-) only for the connection to certified intrinsically safe circuits

The permissible ambient temperature range in dependence of the temperature class and of the input current has to be taken from the following table:

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Input current</th>
<th>Ambient temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>50 mA</td>
<td>-55°C to +60°C</td>
</tr>
<tr>
<td>T6</td>
<td>60 mA</td>
<td>-55°C to +55°C</td>
</tr>
<tr>
<td>T6</td>
<td>60 mA</td>
<td>-55°C to +70°C</td>
</tr>
<tr>
<td>T4</td>
<td>60 mA</td>
<td>-55°C to +85°C</td>
</tr>
<tr>
<td>T5</td>
<td>100 mA</td>
<td>-55°C to +55°C</td>
</tr>
<tr>
<td>T4</td>
<td>100 mA</td>
<td>-55°C to +85°C</td>
</tr>
<tr>
<td>T6</td>
<td>120 mA</td>
<td>60°C to +48°C</td>
</tr>
<tr>
<td>T4</td>
<td>120 mA</td>
<td>-55°C to +80°C</td>
</tr>
<tr>
<td>T4</td>
<td>150 mA</td>
<td>-55°C to +70°C</td>
</tr>
</tbody>
</table>

The effective internal inductance and capacitance is negligibly small.

(16) Test documents are listed in the test report Nº 89/PX23890.

(17) **Special condition for safe use**

1. When using combustible gas as auxiliary energy the I/P transformer type Doc 901069 has to erected outdoors.
2. The fed gas has to be kept free of air or oxygen in such a way that it is ensured that no potentiagonally explosive atmosphere can occur.
3. The gas must always be purged outwards.

(18) **Essential Health and Safety Requirements**

no additional ones
Translation

2. SUPPLEMENT to
EC-TYPE EXAMINATION CERTIFICATE No. TÜV 99 ATEX 1487 X

of the company: ABB Automation Products GmbH
Schillerstraße 72
D-32425 Minden

When operated with combustible gases the I/P transformer type DOC 901069 as pneumatic auxiliary power may be installed outdoors resp. indoors when sufficient ventilation is given (see 17 „Special conditions for safe use“).

All other data apply unchanged.

(10) The test documents are listed in the test report Nr. 04YEX551065-1.

(17) Special conditions for safe use
When operated with combustible gases the I/P transformer type DOC 901069 as pneumatic auxiliary power has to be installed outdoors resp. indoors when sufficient ventilation is given.

The supplied gas has to be kept free of air or oxygen so that it cannot form an explosive atmosphere.

The exhaust gases must always be exhausted outside.

(18) Essential Health and Safety Requirements
no additional ones

TÜV NORD CERT GmbH & Co. KG
TÜV CERT Certification Body
Am TÜV 1
D-30521 Hannover
Tel.: 0511 986-1476
Fax: 0511 986-2555

Hanover, 2004-07-08

Head of the Certification Body
Ex Grenzwerte für TEIP11 und TZIM
Ex limit values for TEIP11 and TZIM

<table>
<thead>
<tr>
<th>I_i (mA)</th>
<th>U_i (V)</th>
<th>P_i (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>42,5</td>
<td>2,125</td>
</tr>
<tr>
<td>60</td>
<td>38,8</td>
<td>2,328</td>
</tr>
<tr>
<td>100</td>
<td>30</td>
<td>3,0</td>
</tr>
<tr>
<td>120</td>
<td>28</td>
<td>3,36</td>
</tr>
<tr>
<td>150</td>
<td>25,5</td>
<td>3,825</td>
</tr>
</tbody>
</table>

Innere Induktivität und Kapazität vernachlässigbar.
The effective internal inductance and capacitance is negligibly small.

Die Werte wurden ermittelt aus:
The values are determined from:

Ex-Zertifikat TÜV 99 ATEX 1487 X
Ex certification TÜV 99 ATEX 1487 X

EN 50020 Teil 7, Anhang A, Tabelle A.1
EN 50020 part 7, annex A, table A.1

Zulässiger Kurzschlussstrom entsprechend der Spannung und der Gerätegruppe, für
Permissible short circuit current according to the voltage and device group for devices of
Betriebsmittel der Gruppe IIIC mit einem Sicherheitsfaktor von 1,5.
group IIIC with a safety factor of 1.5.

ABB Automation Products GmbH, Schillerstr. 72, D 32425 Minden
Tel. +49 571 830-0, Fax +49 571 830 1860
Certificate of Compliance

Certificate: 1138768  
Master Contract: 203012  
Project: 1339747  
Date Issued: July 12, 2002  

Issued to: ABB Automation Products GmbH  
Schillerstraße 72  
D-32425 Minden  
GERMANY  
Attention: Dr. Wolfgang Scholz

The products listed below are eligible to bear the CSA Mark shown

Issued by: R. Wildish  
Authorized by: Nick Alfano  
Operations Manager

PRODUCTS

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

Class I, Div 2, Groups A, B, C and D:

Model 2206-XX and 2206-6X I/P converters and Model TZIM Positioner; input rated 4-20mA, 40V dc max; Temp Coded T3C.

Note: The devices (ie. those Certified for Class I, only) are for installation in suitable enclosures as acceptable to the local authority having jurisdiction.
Appendix

Certificate: 1138/68
Project: 1339747

CLASS: 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations

Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, Div. 1:

Models 22/06-99, 22/06-99-X, 22/06-66, 22/06-66, 22/06-66, 22/06-66, and 22/06-66. I/P converters; input rated 4-20mA, 40V dc max; Intrinsically safe when connected through one CSA Certified Zener barrier, rated 32 Vmax, 400 ohms min; 30 Vmax, 330 ohms min; 29.5 Vmax, 305 ohms min.; 28 Vmax, 270 ohms min; 25 Vmax, 200 ohms min; 22 Vmax, 150 ohms min; or 12 Vmax, 40 ohms min; when connected per ABB Connection Diagram 900842; Temp Coded T3C.

Class I, Div. 1, Groups C, T; Class II, Div 1, Groups F, G; Class III, Div 1:

Models 22/06-99, 22/06-99-X, 22/06-66, 22/06-66, 22/06-66, 22/06-66, and 22/06-66. I/P converters; input rated 4-20mA, 40V dc max; Intrinsically safe when connected through one CSA Certified Zener barrier, rated 33 Vmax, 200 ohms min; 30 Vmax, 150 ohms min.; or 28 Vmax, 120 ohms min; when connected per ABB Connection Diagram 900842; Temp Coded T3C.

Class I, Div. 1, Groups A, B, C and D:

Model 22/06-XX and 22/06-XX I/P converters and Model TZIM Positioner; input rated 4-20mA, 40V dc max; Intrinsically safe when connected to one CSA Certified Zener barrier rated 32 Vmax, 400 ohms min; 30 Vmax, 330 ohms min; 29.5 Vmax, 305 ohms min.; 28 Vmax, 270 ohms min; 25 Vmax, 200 ohms min; 22 Vmax, 150 ohms min; 12 Vmax, 40 ohms min; when connected per ABB Connection Diagram 900842; Temp Coded T3C.

Model TZIM Positioner; input rated 4-20mA, 40V dc max; Intrinsically safe when connected to one CSA Certified Zener barrier, rated 33 Vmax, 400 ohms min; 30 Vmax, 330 ohms min; 29.5 Vmax, 305 ohms min.; 28 Vmax, 270 ohms min; 25 Vmax, 200 ohms min; 22 Vmax, 150 ohms min; 12 Vmax, 40 ohms min.; when connected per ABB Connection Diagram 900988; Temp Coded T3C.

Class I, Div. 1, Groups C and D:

Model 22/06-XX and 22/06-XX I/P converters and Model TZIM Positioner; input rated 4-20mA, 40V dc max; Intrinsically safe when connected to one CSA Certified Zener barrier, rated 33 Vmax, 200 ohms min; 30 Vmax, 150 ohms min.; or 28 Vmax, 120 ohms min; when connected per ABB Connection Diagram 900842; Temp Coded T3C.

Model TZIM Positioner; input rated 4-20mA, 40V dc max; Intrinsically safe when connected to one CSA Certified Zener barrier, rated 33 Vmax, 200 ohms min; 30 Vmax, 150 ohms min.; or 28 Vmax, 120 ohms min; when connected per ABB Connection Diagram 900988; Temp Coded T3C.

Note: These devices (ie. those Certified for Class I, only) are for installation in suitable enclosures as acceptable to the local authority having jurisdiction.
APPLICABLE REQUIREMENTS

<table>
<thead>
<tr>
<th>CSA Std C22.2 No.</th>
<th>No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>142-M1987</td>
<td>157-92</td>
<td>Process Control Equipment</td>
</tr>
<tr>
<td>213-M1987</td>
<td>213-M1987</td>
<td>Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations</td>
</tr>
</tbody>
</table>

MARKINGS

- CSA Monogram;
- Company name;
- Model number;
- Serial number;
- Electrical rating;
- Hazardous locations designation, and the words
- Maximum ambient;
- The symbol Exia;
- The words "INTRINSICALLY SAFE/SECURITE INTRINEQUE"
- Reference to Installation Instructions
- Caution re Substitution of Components
- Caution re Disconnection of Circuits
- Caution re keeping cover tight while circuits are live.
Supplement to Certificate of Compliance

Certificate: 1138768

Master Contract: 203012

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

<table>
<thead>
<tr>
<th>Project</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1339747</td>
<td>July 12, 2002</td>
<td>Update to cover alternative construction of coil protection circuitry.</td>
</tr>
<tr>
<td>1139766</td>
<td>Jan. 12, 2001</td>
<td>Model 22/06 Series I/P converters and Model TZIM Positioner (Transfer of report LR 83572-2)</td>
</tr>
</tbody>
</table>

DOD 8/WD-2002/0101
Appendix

APPROVED PRODUCT/SPECIFICATION TESTED - REVISION REPORT OR ADDRESS/CONTACT CHANGE REPORT

SENDER: Forward with updated drawings or other appropriate change information to the attention of the Approvals Division. Original will be returned showing course of action taken.

Additional forms may be requested by writing to the attention of the Factory Mutual Research Stock Room.

Please type below. Attention of Company Name, Address, City, State & Zip Code.

Attn: Heinfried Neuhaus, R&D Engineer
ABB Automation Products GmbH
Schillerstrasse 72
D-32425 Minden
Germany

Phone: +49 571 930-1963  Fax: +49 571 930-1880

DISTRIBUTION

UP Signal Converters Type 2206, 2208 and Positioners T3IM Ex, T3ID-Ex and T3ID-EXP

YES □ NO □

DOES THIS REVISION RESULT IN MODEL TYPE NO?
CHANGE TO THE CURRENT APPROVAL SHEET LISTED?

□ YES □ NO □
INDICATE FACTORY MUTUAL RESEARCH JOB
IDENTIFICATION (IF AFFECTED)

□ J1 1P34AE, SY346AX, 1PB47AX,
□ DD507AE, OR332AE, 2Z5A2AE,
□ 2B044AE, OR834AE, 186A9AX

□ YES & NO □

REVISED DETAILS

Name change from: Hartmann & Braun GmbH & Co KG to: ABB Automation Products GmbH.

Production has moved early 2009.

from: Hachenhalstrasse 7, D-30179 Hannover, Germany
to: Schillerstrasse 72, D-32425 Minden, Germany

Phone: +49 571-830-0

□ YES □ NO

Production facility Hannover will be closed.

□ YES □ NO

Revisions of label artwork and control documents to include ABB logo

Contact Person will be further:

Dr. Thomas Kiehr, R&D Manager
Heinfried Neuhaus, R&D Engineer
Demi Swede, QA Manager

□ YES □ NO

REASON FOR CHANGES/COMMENTS
Hartmann & Braun GmbH & Co. KG/Sensycon GmbH is now part of the ABB company.

BELOW FOR FACTORY MUTUAL RESEARCH USE

ABB Automation Products GmbH is already listed in the Approval Guide, however, only under Alteau, Germany site.

With this Revisions Report the products presently listed in the Approval Guide under Sensycon GmbH will now be listed under their new name ABB Automation Products GmbH under their Minden, Germany site separately (and not added to the Alteau, Germany site.)

Revisions to the label and Control Drawings do not affect safety.

See new Approval Guide Listing on back.

CDL's Updated

□ YES □ NO

REVISION ACCEPTED

□ YES □ NO

EXAMINED BY

□ YES □ NO

DATE

□ YES □ NO

SIGNATURE

□ YES □ NO

CERTIFIED FACTORY MUTUAL RESEARCH

□ YES □ NO

FORWARD TO:

Factory Mutual Research
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

T: 781 762 4300  F: 781 762 9375
http://www.fmglobal.com

ATTENTION:

DATE

□ YES □ NO

CERTIFIED FACTORY MUTUAL RESEARCH JOB
IDENTIFICATION (IF AFFECTED)

□ J1 1P34AE, SY346AX, 1PB47AX,
□ DD507AE, OR332AE, 2Z5A2AE,
□ 2B044AE, OR834AE, 186A9AX

□ YES □ NO

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□ DD507AE, OR332AE, 2Z5A2AE,
Appendix

Factory Mutual Research
Report Revision J.I. 300820R

Below is a copy of how the ABB Automation Products GmbH, Minden, Germany products will be listed in the Approval Guide:

ABB Automation Products GmbH Schillerstrasse 72, D-32425 Minden, Germany

**Model 22/06-6a. I/P Signal Converter.**

IS / I / I / BCD — 900842 / I, 900843 / I, 900844 / I; Entity;
N I / I / 2 / ABCD;

Entity Parameters:
V_{in} = 40 \text{ V}, Imax = 125 \text{ mA}, C_i = 0 \text{ F}, L_i = 1.0 \text{ mH}.

a = 1, 2, 3, 4 or 5.

**Model 22/06-6a. I/P Signal Converter.**

IS / I, I, I, I / ABCDEFG — 900842 / I, 900843 / I, 900844 / I; Entity;
N I / I / 2 / ABCD;
S / I / I / 2 / G, S / I / I / 2

Entity Parameters:
V_{in} = 40 \text{ V}, Imax = 125 \text{ mA}, C_i = 0 \text{ F}, L_i = 1.0 \text{ mH}.

a = 6, 7, 8 or 9.

**Models 22/06-a. I/P Signal Converter.**

XP / I / I / BCD;
DIP / I, I, I / 1 / EFG

a = 66, 67, 68, 69, 99 or 99-1.

**Models 22/08-18, 21/13-18 and 21/13-28. I/I Signal Converter.**

XP / I / I / ABCD;
DIP / I, I, I / EFG

**Model TZID-EXP. Intelligent Positioner.**

XP / I / I / BCD; DIP / I, I, I / 1 / EFG

**Model TZID Ex. Smart Positioner.**

IS / I, I, I, I / ABCDEFG — 900925 / I; Entity;
N I / I / 2 / ABCD;
S / I / I / 2 / FG, S / I / I / 2

Entity Parameters:
V_{oc} = 40 \text{ V}, I_{sc} = 205 \text{ mA}, L_a = 2.4 \text{ mH}, L_a = 30 \text{ H}.

**Model TZIM Ex. Positioner.**

IS / I / I / ABCD — 900988 / 2; Entity;
N I / I / 2 / ABCD

Entity Parameters:
V_{max} = 40 \text{ V}, Imax = 125 \text{ mA}, C_i = 0, L_i = 1 \text{ mH}.

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11.2 Permits and certifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
</table>
| CE mark | The CE mark indicates that the device complies with the following directives and their basic safety requirements:  
• CE mark on the nameplate of I/P signal converter.  
  – Conforms with EMC directive 89/336/EEC.  
  – Conforms with the machinery directive 2006/42/EC.  
By placing the CE mark on its devices, ABB Automation Products GmbH declares its conformance with these directives. |
| Ex approvals | The symbol indicates devices with an ignition-proof design.  
For devices in Ex design, according to identification on an additional nameplate, the following also applies:  
  – Conforms with ATEX directive 94/9/EC.  
By placing the CE mark on its devices, ABB Automation Products GmbH declares its conformance with this directive. |

Important
All documentation, declarations of conformity and certificates are available in the download area of ABB Automation Products GmbH.
www.abb.com/instrumentation
Statement about the contamination of devices and components

The repair and/or maintenance of devices and components will only be performed when a completely filled out explanation is present.

Otherwise, the shipment can be rejected. This explanation may only be filled out and signed by authorized specialist personnel of the operator.

Customer details:

Company:

Address:

Contact person: Telephone:

Fax: E-Mail:

Device details:

Type: Serial no.:

Reason for the return/description of the defect:

Was this device used for working with substances which pose a threat or health risk?

☐ Yes ☐ No

If yes, which type of contamination (please place an X next to the applicable items)

- biological ☐ corrosive/irritating ☐ combustible (highly/extremely combustible) ☐
- toxic ☐ explosive ☐ other toxic substances ☐
- radioactive ☐

Which substances have had contact with the device?

1. 

2. 

3. 

We hereby certify that the devices/parts shipped were cleaned and are free from any dangerous or poisonous materials.

City, Date Signature and company stamp
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