

# MOUNTING AND OPERATING INSTRUCTIONS



## EB 6116 EN

Translation of original instructions



## Type 6116 Electropneumatic Converter for Direct Current Signals

Edition October 2021

**CE EAC** Ex  
certified

## Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices. The images shown in these instructions are for illustration purposes only. The actual product may vary.

- For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- If you have any questions about these instructions, contact SAMSON's After-sales Service (aftersalesservice@samsongroup.com).



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at [www.samsongroup.com](http://www.samsongroup.com) > **Downloads** > **Documentation**.

### Definition of signal words

#### **DANGER**

*Hazardous situations which, if not avoided, will result in death or serious injury*

#### **WARNING**

*Hazardous situations which, if not avoided, could result in death or serious injury*

#### **NOTICE**

*Property damage message or malfunction*

#### **Note**

*Additional information*

#### **Tip**

*Recommended action*

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# 1 Safety instructions and measures

## Intended use

The Type 6116 i/p Converter is used to convert a direct current input signal into a pneumatic output signal for measuring and control tasks. The i/p converter is particularly suitable as an intermediate element between electric measuring devices and pneumatic controllers or between electric control devices and pneumatic control valves.

The device is designed to operate under exactly defined conditions (e.g. input signal, pressure). Therefore, operators must ensure that the device is only used in operating conditions that meet the specifications used for sizing the device at the ordering stage. In case operators intend to use the device in applications or conditions other than those specified, contact SAMSON.

SAMSON does not assume any liability for damage resulting from the failure to use the device for its intended purpose or for damage caused by external forces or any other external factors.

→ Refer to the technical data and nameplate for limits and fields of application as well as possible uses.

## Reasonably foreseeable misuse

The device is not suitable for use outside the limits defined during configuration and by the technical data. Furthermore, the following activities do not comply with the intended use:

- Use of non-original spare parts
- Performing service and repair work not described

## Qualifications of operating personnel

The device must be mounted, started up, serviced and repaired by fully trained and qualified personnel only; the accepted industry codes and practices must be observed. According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible hazards due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.

## Personal protective equipment

We recommend checking the hazards posed by the plant and the process medium being used (e.g. ► GESTIS (CLP) hazardous substances database).

## **Safety instructions and measures**

- Provide protective equipment (e.g. safety gloves, eye protection) appropriate for the material safety data sheet.
- Check with the plant operator for details on further protective equipment.

### **Revisions and other modifications**

Revisions, conversions or other modifications of the product are not authorized by SAMSON. They are performed at the user's own risk and may lead to safety hazards, for example. Furthermore, the product may no longer meet the requirements for its intended use.

### **Warning against residual hazards**

To avoid personal injury or property damage, operators and operating personnel must prevent hazards that could be caused in the device by the process medium and operating pressure by taking appropriate precautions. Plant operators and operating personnel must observe all hazard statements, warnings and caution notes in these mounting and operating instructions, especially for installation, start-up and service work.

### **Responsibilities of the operator**

Operators are responsible for proper use and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions as well as the referenced documents to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third parties are not exposed to any danger.

### **Responsibilities of operating personnel**

Operating personnel must read and understand these mounting and operating instructions as well as the referenced documents and observe the specified hazard statements, warnings and caution notes. Furthermore, operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

### **Referenced standards, directives and regulations**

Devices with a CE marking fulfill the requirements of the Directives (see the 'Certificates' chapter):

- Type 6116-0: 2014/30/EU, 2011/65/EU
- Type 6116-1: 2014/30/EU, 2014/34/EU, 2011/65/EU
- Type 6116-2: 2014/30/EU, 2014/34/EU, 2011/65/EU

Devices with an EAC marking fulfill the requirements of the Regulations (see the 'Certificates' chapter):

- TR CU 004/2011
- TR CU 020/2011

For electrical installation, observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use. In Germany, these are the VDE regulations and the accident prevention regulations of the employers' liability insurance.

For installation in hazardous areas, observe the relevant standards that apply in the country of use. Standard applicable in Germany: EN 60079-14 (VDE 0165, Part 1) Explosive Atmospheres – Electrical Installations Design, Selection and Erection.

The maximum permissible values specified in the EC type examination certificates apply when interconnecting intrinsically safe electrical equipment ( $U_i$  or  $U_0$ ,  $I_i$  or  $I_0$ ,  $P_i$  or  $P_0$ ,  $C_i$  or  $C_0$  and  $L_i$  or  $L_0$ ).

### Referenced documentation

The following documents apply in addition to these mounting and operating instructions:

- Safety Manual ► SH 6116 for use in safety-instrumented systems

## 1.1 Notes on possible severe personal injury

### DANGER

#### **Risk of fatal injury due to the ignition of an explosive atmosphere.**

Incorrect installation, operation or maintenance of the i/p converter in potentially explosive atmospheres may lead to ignition of the atmosphere and ultimately to death.

- The following regulations apply to installation in hazardous areas: EN 60079-14 (VDE 0165, Part 1).
- Installation, operation or maintenance of the i/p converter must only be performed by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.

**Loss of Ex d protection due to opening the enclosure cover or damage to the cover's thread and/or the connecting thread.**

- The enclosure cover must be firmly closed during operation.
- Put the i/p converter out of operation when its cover thread or connecting thread is damaged. Replace it with a new device.

## 1.2 Notes on possible personal injury

### **WARNING**

The i/p converter poses no hazard with possible personal injury.

- Check with the plant operator for details on possible personal injury which could be caused by the plant and ambient conditions (e.g. process medium, temperature).

## 1.3 Notes on possible property damage

### **NOTICE**

**A zero shift may occur due to shocks.**

Shocks can cause a zero shift which impairs the correct functioning.

- Protect the device against external influences (e.g. impact, shocks).
- Check zero, if necessary (see Chapter 6).

**Risk of malfunction due to failure to comply with air quality requirements.**

An insufficient air quality may lead to the output signal not being proportional to the input signal.

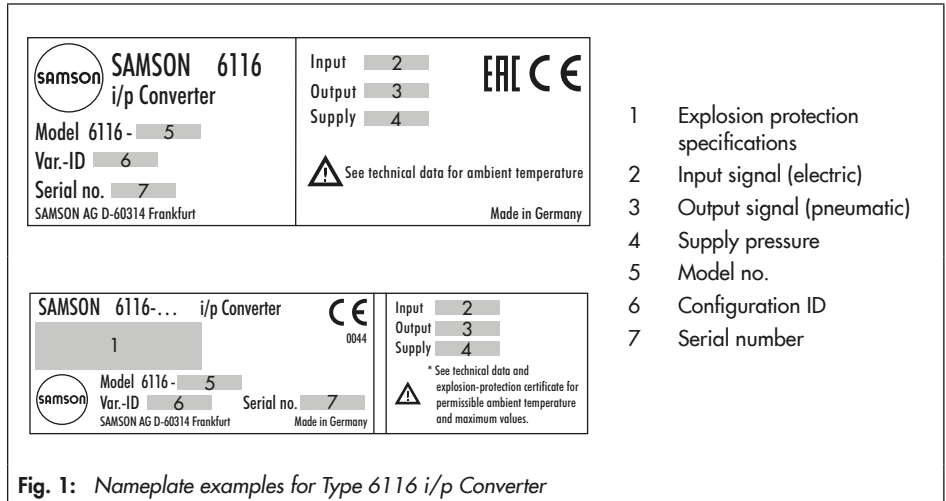
- Make sure that the air quality complies with the requirements (see Chapter 3.2).
- Check the air filter and separator installed in the upstream air reducing station regularly.



## 2 Markings on the device

### 2.1 Nameplate

The nameplates shown were up to date at the time of publishing of this document. The nameplates on the device may differ from the ones shown.



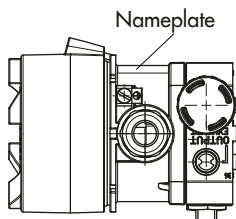
**i Note**

The Type 6109 and Type 6112 i/p Modules have their own nameplate which differs from the nameplate on the i/p converter.

## Markings on the device

### Location of the nameplate

The nameplate is affixed with grooved pins to the side of the i/p converter.



**Fig. 2:** *Location of the nameplate*

## 2.2 Article code

Order no.	Type 6116-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Explosion protection	Without	0															
	ATEX <sup>1)2)</sup> II 2G Ex ia IIC T6 Gb	1											1/2				
	ATEX <sup>3)</sup> II 2G Ex d IIC T6; II 2G Ex d IIC T6/T5/T4 Gb	2															
	CSA <sup>5)12)</sup> Class I, Groups B, C, D; Class II, Groups E, F, G; Class III; Type 4 Enclosure	3			0	1...5		1/2		0...3							
	FM <sup>5)12)13)</sup> Class I, Groups B, C, D; Class II, Groups E, F, G; Class III							1		0/3							
	CSA <sup>11)</sup> Ex ia IIC T6; Class I, Zone 0; Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III; Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2, Groups E, F, G; Class III; Type 4 Enclosure	4											3				
	FM <sup>1)</sup> IS, Class I, II, III; Div. 1, Groups A-G; Class I, Zone 0, AEx ia IIC; NI, Class I, Div. 2, Groups A, B, C, D; Type 4X Enclosure																
	IECEX <sup>4)6)</sup> Ex d IIC T6/T4	5					0	1/2		1		0/2					
	IECEX <sup>1)</sup> Ex ia IIC T6; Ex nA IIC T6	6	2										2				
	JIS <sup>4)</sup> Ex d IIC T6	7					0	1/2									
i/p converter module	Type 6109 <sup>4)</sup>	1	0	1	0	1	1										
	Type 6112	2															
Input	4 to 20 mA		0	1													
	4 to 12 mA <sup>1)11)</sup>		2	0	3												
	12 to 20 mA, without switch-off electronics <sup>1)7)11)</sup>		2	0	4												
	0 to 20 mA, without switch-off electronics <sup>7)</sup>		2	0	5												
	4 to 20 mA, without switch-off electronics <sup>7)</sup> for positioner attachment		0	6													
Output	0.2 to 1.0 bar				0	1											
	3 to 15 psi				0	2											
	0.4 to 2.0 bar	2			0	4											
	6 to 30 psi	2			0	5											
Special ranges <sup>8)</sup>	Initial value 0.1 to 0.4 bar; span 0.75 to 1.00 bar	2			1	1											
	Initial value 0.1 to 0.4 bar; span 1.00 to 1.35 bar	2			1	2											
	Initial value 0.1 to 0.4 bar; span 1.35 to 1.81 bar	2			1	3											
	Initial value 0.1 to 0.8 bar; span 1.81 to 2.44 bar	2			1	4											
	Initial value 0.1 to 0.8 bar; span 2.44 to 3.28 bar	2			1	5											
	Initial value 0.1 to 0.8 bar; span 3.28 to 4.42 bar	2			1	6											
	Initial value 0.1 to 1.2 bar; span 4.42 to 5.94 bar	2			1	7											
	Initial value 0.1 to 1.2 bar; span 5.94 to 8.00 bar	2			1	8											

## Markings on the device

Order no.	Type 6116-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Direction of action	Increasing/increasing									1						
	Increasing/decreasing <sup>1)</sup>									2						
Electrical connection	½-14 NPT									1						
	M20x1.5									2						
Pneumatic connection	Positioner attachment (without booster) <sup>9)</sup>		0	6	0	1	1			0	0	0				
	¼-18 NPT									1						
	ISO-228/1 - G ¼									2						
Degree of protection	Without (vent for positioner attachment)		0	6	0	1	1			0	0	0				
	IP 54									1						
	IP 65									2						
	Type 4 <sup>10)</sup>									3						
Output pressure gauge	Without										0					
	With <sup>1)</sup>										1					
Temperature range	T <sub>min</sub> ≥ -25 °C (Type 6109 standard)	1												0		
	T <sub>min</sub> ≥ -45 °C (Type 6112 subjected to routine test, metal cable gland)	2												1		
	T <sub>min</sub> ≥ -40 °C (Type 6112 standard)	2												2		
Special version	Without													0	0	0
	IECEx approval: Ex d IIC T6/T5/T4 Gb	2												2	5	1
	EAC Ex approval: on request	1/2												2	5	2
	KCS approval, Korea: on request	5												2	6	2

<sup>1)</sup> Not for positioner attachment

<sup>2)</sup> With degree of protection IP 54/IP 65 only

<sup>3)</sup> Supply pressure max. 6 bar; output 5.6 bar

<sup>4)</sup> Only with 0.2 to 1 bar/3 to 15 psi

<sup>5)</sup> With ½ NPT electrical connection, degree of protection NEMA 4 or positioner attachment

<sup>6)</sup> With ½ NPT electrical connection, degree of protection IP 65 or positioner attachment

<sup>7)</sup> Without switch-off electronics and without potentiometer for zero point and span correction

<sup>8)</sup> Specify setting range, e.g. "set to 0.1 to 4 bar"; output pressure max. 8 bar. Initial value raised to max. 3.0 bar (special version)

<sup>9)</sup> Only with Ex d or explosion-proof according to CSA and FM standards

<sup>10)</sup> Only explosion-proof or intrinsically safe according to CSA and FM standards

<sup>11)</sup> 4 to 12 mA and 12 to 20 mA input only up to 4.0 bar span

<sup>12)</sup> Only with 0.2 to 1 bar (3 to 15 psi) and 0.4 to 2 bar (6 to 30 psi) output

<sup>13)</sup> Type 6116-3: version T<sub>min</sub> = -45 °C only FM certification Class I, Div. 1, Groups B, C, D

### 3 Design and principle of operation

The Type 6116 i/p Converter is used to convert a direct current input signal into a pneumatic output signal for measuring and control tasks. The i/p converter consists of an Type 6109 or Type 6112 i/p Converter Module and a downstream volume booster.

The input is a load-independent direct current of 4 to 20 mA or 0 or 20 mA. The output is a pneumatic signal of 0.2 to 1 bar or other signal ranges up to max. 8 bar.

#### Principle of operation (see Fig. 4)

When operated, the supplied direct current  $i$  flows through the plunger coil (2) located in the field of a permanent magnet (3). At the balance beam (1), the force of the plunger coil, which is in proportion to the current, is balanced against the force of the dynamic backpressure  $p_K$ , which is produced on the flapper (6) by the air jet leaving the nozzle

(7). The supply air (SUPPLY 8) flows to the bottom chamber of the volume booster (8). A certain amount of air determined by the diaphragm position flows past the sleeve (9) and leaves through the output (OUTPUT 36).

As the input current and the forces acting on the plunger coil increase, the flapper plate (6) moves closer to the nozzle (7). This causes the backpressure and the cascade pressure  $p_K$  upstream of the restriction (8.2) to increase until the cascade pressure corresponds with the input current. The cascade pressure increases until it corresponds with the input current.

The increasing backpressure pushes the diaphragm (10) and the plug sleeve (9) downwards. As a result, the supply air causes the output pressure  $p_A$  to increase until a new state of equilibrium is reached in the diaphragm chambers.

When the backpressure  $p_K$  drops, the diaphragm moves upwards, releasing the plug sleeve. The output pressure  $p_A$  can escape through the sleeve and vented over EXHAUST until the forces are equal again.

#### Switch-off electronics

Devices with an input range from 4 to 20 mA have a slide switch which activates the switch-off electronics (see Fig. 5). This function allows the input signal to be set to 0 mA when the signal falls below the switching point of 4.08 mA. This causes the pneumatic output to be vented to approximately 100 mbar. This guarantees, for example the tight shut-off function of a valve. This function requires a characteristic which passes

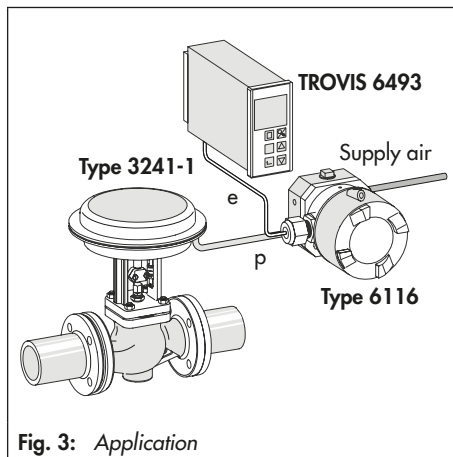
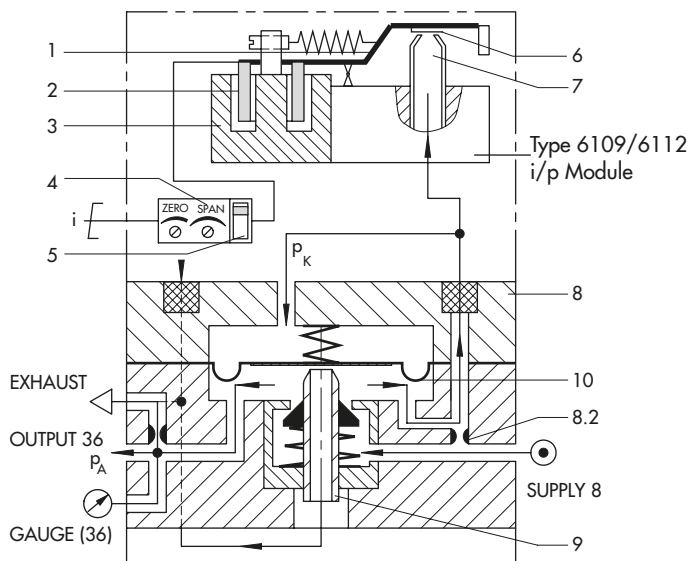


Fig. 3: Application

## Markings on the device



- 1 Balance beam
- 2 Plunger coil
- 3 Permanent magnet
- 4 Zero point and span adjusters (only in version with electronics)
- 5 Slide switch for switch-off electronics (only in version with electronics)
- 6 Flapper plate
- 7 Nozzle
- 8 Volume booster
- 8.2 Fixed restriction
- 9 Sleeve
- 10 Diaphragm
- $p_A$  Output pressure
- $p_K$  Backpressure (cascade pressure)
- ⊙ Supply air

Fig. 4: Functional diagram

through the zero point, for example at an output signal of 0.2 to 1 bar.

If the characteristic line does not pass through zero (e.g. for an allocated output signal from 0.8 to 2.7 bar), the pneumatic output is vented to a remaining pressure of approx. 0.3 bar when the switch-off electronics are activated.

### 3.1 Versions

**i Note**

The nameplate and article code provide details on the device version (see Chapter 2).

#### Versions for safe areas

- Type 6116-0 ...

#### Versions for hazardous areas

- **Type 6116-1...** Ex i acc. to ATEX and GOST (EAC)
- **Type 6116-2...** Ex d acc. to ATEX, IEC and GOST (EAC)
- **Type 6116-3...** Explosion-proof acc. to CSA and FM standards
- **Type 6116-4...** Intrinsically safe according to CSA and FM standards
- **Type 6116-5...** Explosion Proof/IEC/Australia/Korea
- **Type 6116-6...** Intrinsically safe/IEC/Australia
- **Type 6116-7...** Ex d acc. to JIS standard/Japan

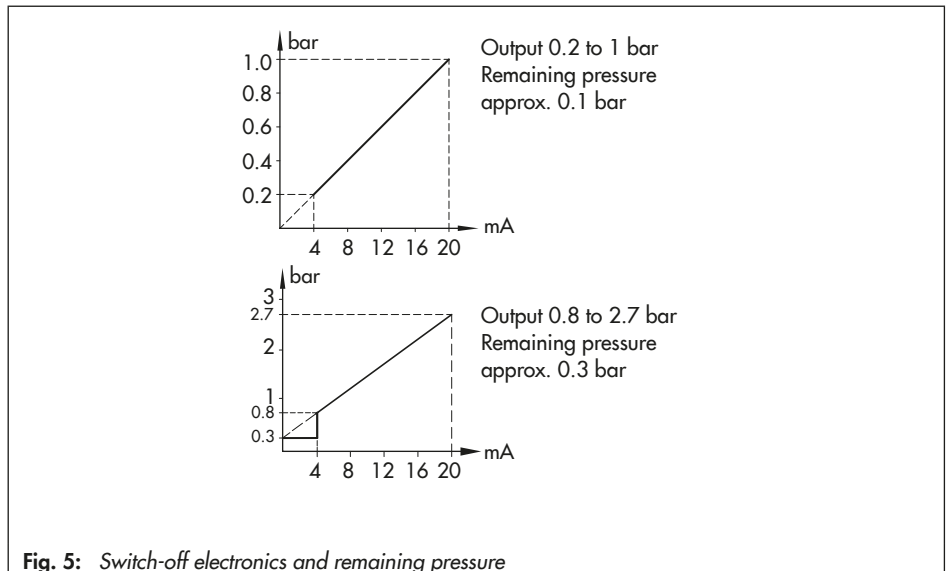


Fig. 5: Switch-off electronics and remaining pressure

## Design and principle of operation

### Further versions

- **Type 6116-x2xxxxxxxx1...** :
  - Temperatures down to -45 °C
- **Type 6116-0...**:
  - AS-interface connection with Type 6150 Slave
  - Voltage input (e.g. 0 to 10 V) with Type 6151 u/i Module
- **Electropneumatic converter without booster or switch-off electronics:**

Converters can be combined with SAMSON **Type 3760**, **Type 3766-000** (model index .02 and higher) and Type 4765 Pneumatic Positioners. See Chapter 5.5.

  - **Type 6116-xx060111000xxxx** for attachment to p/p positioners (½ NPT connection)
  - **Type 6116-xx060112000xxxx** for attachment to p/p positioners (M20x1.5 connection)
- **Type 6116-xx06011x000xxxx (for positioner attachment)**

(with Type 6109 i/p Converter Module only)

Input: 4 to 20 mA, other signals on request, internal resistance approx. 200 Ω at 20 °C

Output: 0.2 to 1 bar for positioner


Other data same as standard version



### 3.2 Technical data

No explosion protection	<b>Type 6116-0</b>
With explosion protection	<b>Types 6116-1/-2/-3/-4/-5/-6/-7</b>
<b>Input</b> <sup>5)</sup>	4 to 20 mA, other signals on request Minimum current >3.6 mA, load impedance ≤6 V (corresponding to 300 Ω at 20 mA) Versions with explosion protection: load impedance 7 V (corresponding to 350 Ω at 20 mA) Versions without switch-off electronics: $R_i = 200 \Omega \pm 7.5 \%$
<b>Output</b> <sup>5)</sup>	0.2 to 1 bar (3 to 15 psi) (Type 6109 i/p Converter Module) 0.4 to 2 bar (6 to 30 psi) (Type 6112 i/p Converter Module) Special ranges adjustable according to customer specifications: <b>Output range = Initial value</b> <sup>10)</sup> + <b>Span <math>\Delta p</math> with Type 6112 i/p Module</b> 0.1 to 0.4 bar + 0.75 to 1.0 bar Module A 0.1 to 0.4 bar + 1.0 to 1.35 bar Module B 0.1 to 0.4 bar + 1.35 to 1.81 bar Module C 0.1 to 0.8 bar + 1.81 to 2.44 bar Module D 0.1 to 0.8 bar + 2.44 to 3.28 bar Module E 0.1 to 0.8 bar + 3.28 to 4.42 bar Module F 0.1 to 1.2 bar + 4.42 to 5.94 bar Module G 0.1 to 1.2 bar + 5.94 to 8.0 bar Module H <sup>9)</sup>
Max. air output capacity <sup>3)</sup>	2.0 m <sup>3</sup> /h with an output of 0.6 bar (0.2 to 1.0 bar) 2.5 m <sup>3</sup> /h with an output of 1.2 bar (0.4 to 2.0 bar) 8.5 m <sup>3</sup> /h with an output of 5.0 bar (0.1 to 8.0 bar)
<b>Supply air</b>	At least 0.4 bar above the upper signal pressure range value, max. 10 bar without supply pressure regulator, max. 6 bar for Ex d version
Air quality acc. to ISO 8573-1: 2001	Maximum particle size and density: Class 4 · Oil content: Class 3 Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Air consumption <sup>2)</sup>	0.08 m <sub>n</sub> <sup>3</sup> /h at 1.4 bar 0.1 m <sub>n</sub> <sup>3</sup> /h at 2.4 bar Max. 0.26 m <sub>n</sub> <sup>3</sup> /h at 10 bar
<b>Characteristic</b>	Characteristic: Output linear to input
Hysteresis	≤0.3 % of final value
Deviation from terminal-based conformity	≤1 % of upper range value (for upper range values up to 5 bar); more exact values on request ≤1.5 % of upper range value (for upper range values above 5 bar)
Effect in % of the upper range value	Supply air: 0.1 %/0.1 bar <sup>2)</sup>
	Alternating load, supply air failure, interruption of the input current: <0.3 %
	Ambient temperature: lower range value <0.03 %/K, span <0.03 %/K

## Design and principle of operation

Dynamic response	
Limiting frequency	5.3 Hz
Phase shift	-130°
Variable position	Max. 3.5 % depending on how the device is attached: ±1 % in horizontal position (Type 6109) Max. 1 % depending on how the device is attached: ±0.3 % in horizontal position (Type 6112)
Ambient conditions, degree of protection, compliance and weights	
Storage temperature	-45 to +80 °C
Ambient temperature <sup>11)</sup>	
With Type 6109	-30 to +70 °C <sup>6)</sup> ; -30 to +60 °C <sup>11)</sup>
With Type 6112	-40 to +70 °C <sup>6)7)</sup> ; -40 to +60 °C <sup>11)7)</sup>
Degree of protection	IP 54 <sup>4)</sup> , IP 65 <sup>8)</sup> , Type 4
Conformity	
Explosion protection	
ATEX, IECEx, ...	Refer to Table 1
Materials	
Enclosure	Die-cast aluminum, chromated and plastic coated
Cable gland (standard) <sup>12)</sup>	Black polyamide (6 to 12 mm clamping range, -20 to +80 °C)
Weight	
	0.85 kg

<sup>1)</sup> Details (including electric specifications and installation instructions) in Chapter 10.2 (EC type examination certificate)

<sup>2)</sup> Measured with average output pressure

<sup>3)</sup> Measured with 2 m hose with 4 mm inside diameter

<sup>4)</sup> Observe recommended mounting position.

<sup>5)</sup> See Chapter 3.1 when combined with a positioner

<sup>6)</sup> Devices without explosion protection

<sup>7)</sup> Special versions down to -45 °C available on request

<sup>8)</sup> Possible by using accessories

<sup>9)</sup> The maximum possible output pressure is 8 bar.

<sup>10)</sup> Initial value raised up to 3.0 bar (special version)






<sup>11)</sup> Metal cable glands and vent plugs are required for temperatures below -20 °C.

<sup>12)</sup> Devices with type of protection "Flameproof enclosure" are delivered without cable gland.

## Dimensions

The dimensions for the i/p converters are included on the next pages.

**Table 1:** Summary of explosion protection approvals

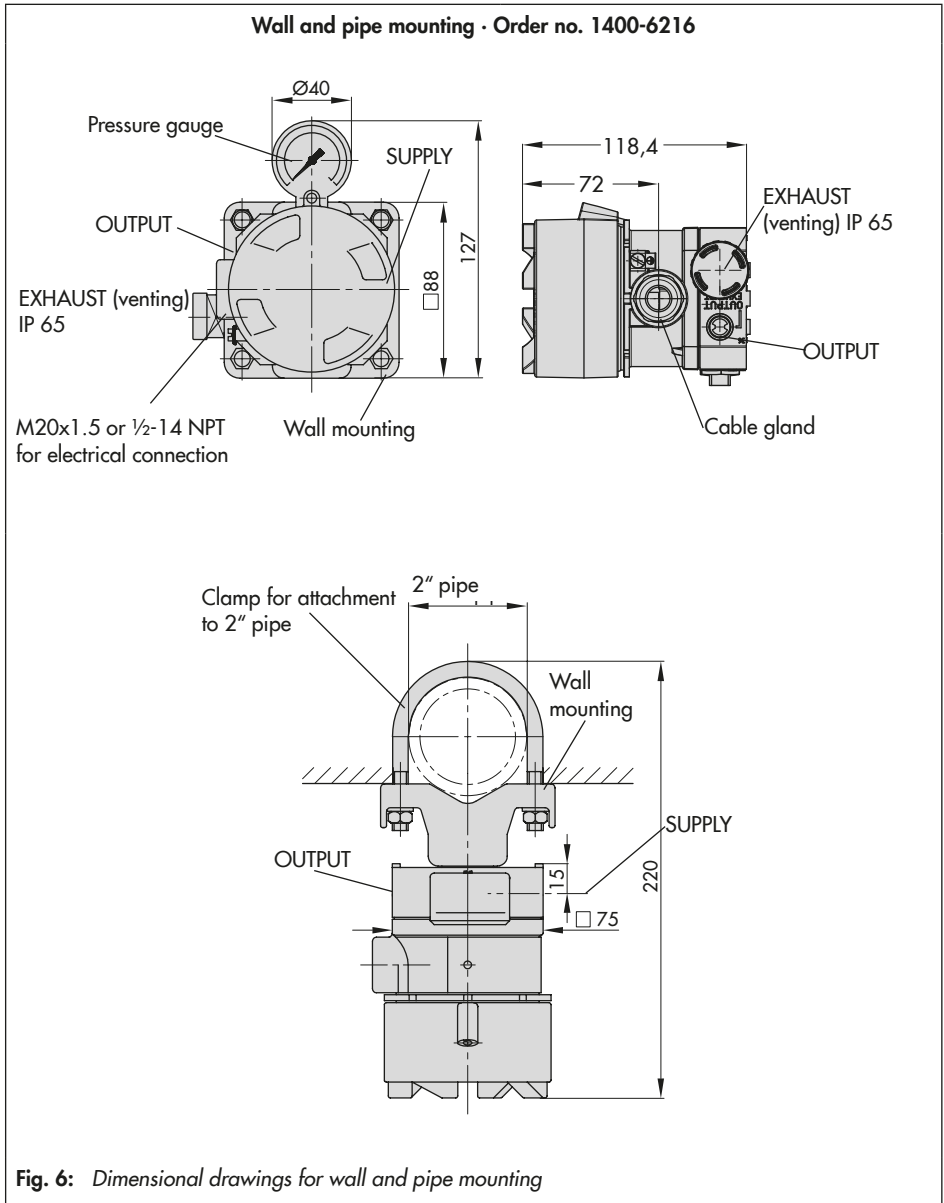
Type	Certification			Type of protection/comments
1	 1)	Number Date	PTB 02 ATEX 2199 2003-03-07	II 2 G Ex ia IIC T6 Gb
		Number Date Valid until	RU C-DE.HA65. B.00701/20 2020-08-19 2025-08-18	1Ex ia IIC T6...T4 Gb X
	<b>TR CMU 1055</b>	Number Date Valid until	ZETC/38/2021 2021-07-26 2024-07-25	II 2G Ex ia IIC T6 Gb
2	 1)	Number Date	PTB 98 ATEX 1024 X 2002-07-03	II 2 G Ex d IIC T6
	 1)	Number Date	BVS 14 ATEX E 104 X 2014-06-27	II 2 G Ex d IIC T6/T5/T4 Gb
	<b>IECEx</b>	Number Date	IECEx BVS 14.0066X 2014-07-01	Ex d IIC T6/T5/T4 Gb
		Number Date Valid until	RU C-DE.HA65. B.00701/20 2020-08-19 2025-08-18	1Ex d IIC T6...T4 Gb X
	<b>TR CMU 1055</b>	Number Date Valid until	ZETC/38/2021 2021-07-26 2024-07-25	II 2G Ex d IIC T* Gb
3	<b>CSA</b>	Number Date	1471157 2014-11-14	Class I, Groups B,C,D; Class II, Groups E,F,G; Class III; Type 4 Enclosure
	<b>FM</b>	Number Date		Class I, Groups B, C, D Class I, Groups E, F, G Class III Type 4X Enclosure Type 6116 in version T <sub>min</sub> = -45 °C only FM certification Class I, Div. 1, Groups B, C, D

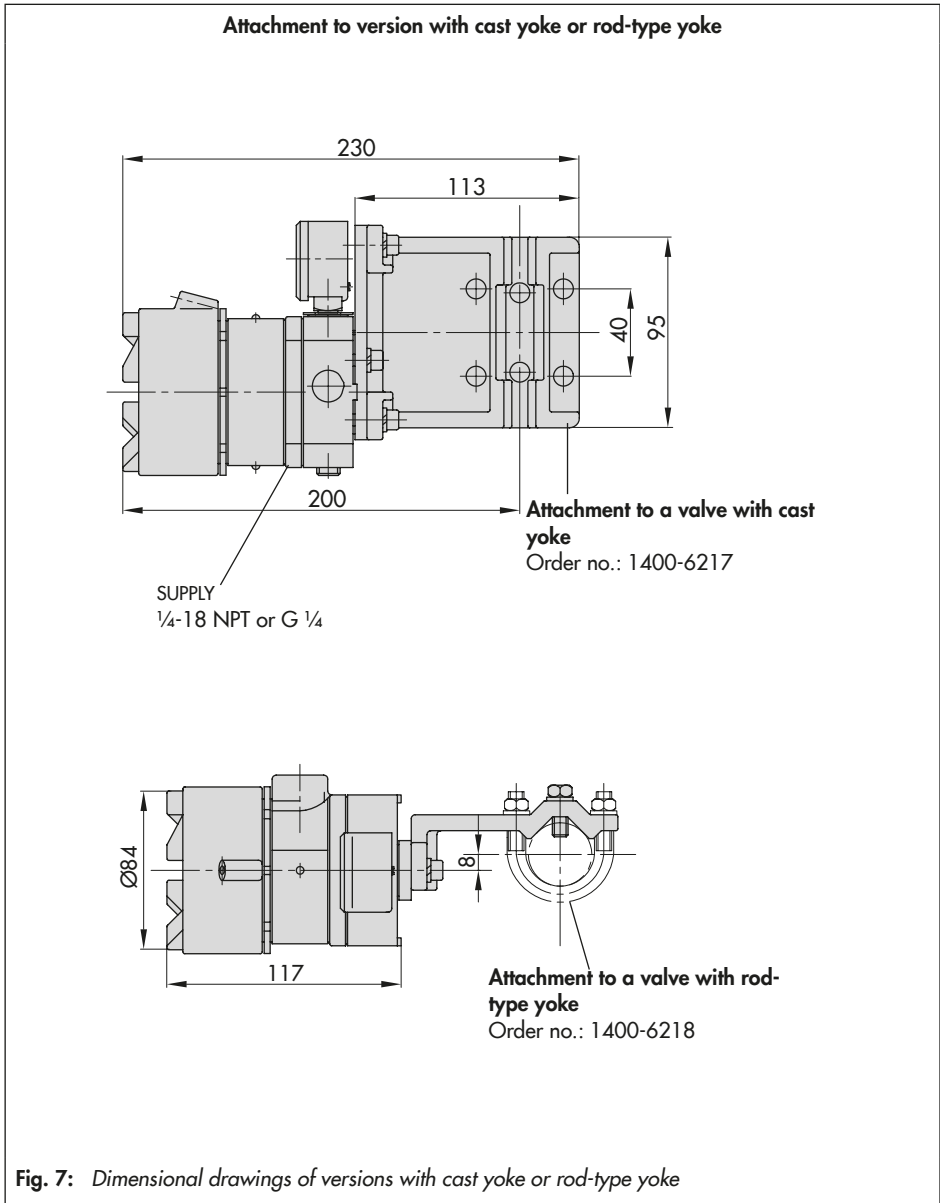
## Design and principle of operation

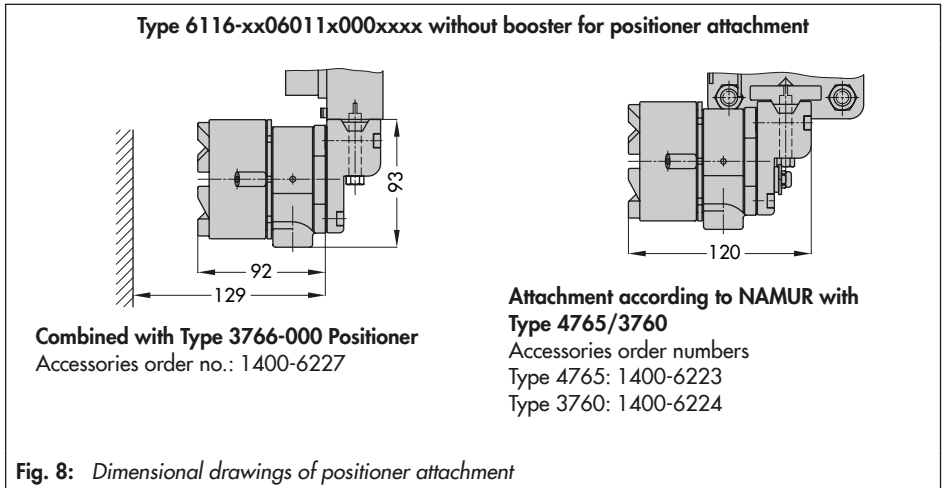
Type	Certification			Type of protection/comments	
6116	-4	<b>CSA</b>	Number	1607866	Ex ia IIC T6; Class I, Zone 0: Class I, Div. 1, Groups A,B,C,D; Class II, Div. 1, Groups E,F,G; Class III; Class I, Div. 2, Groups A,B,C,D; Class II, Div. 2, Groups E,F,G; Class III; Type 4 Enclosure
			Date	2005-09-16	
	-5	<b>FM</b>	Number	3020228	IS, Class I,II,III; Div. 1, Groups A,B,C,D,E,F,G Class I, Zone 0, AEx ia IIC NI, Class I, Div. 2, Groups A,B,C,D; S, Class II, Div. 2, Groups F,G; S, Class III; Type 4X Enclosure
			Date	2015-10-12	
	-5	<b>KCS Korea</b>	Number	11-KB4BO-0213	Ex d IIC T6/T4
Date			2011-10-24		
-6	<b>IECEx</b>	Valid until	2021-10-24	Ex d IIC T6/T4	
		Number	IECEx TSA 05.0015		
-6	<b>IECEx</b>	Date	2005-04-22	Ex ia IIC T6 Ex nA IIC T6	
		Number	IECEx TSA 05.0008X		
-7	<b>JIS <sup>2)</sup></b>	Date	2005-04-04	Ex d IIC T6	
		Number	TC 13622		
		Date	2017-05-20		
		Valid until	2020-05-19		

<sup>1)</sup> EC type examination certificate

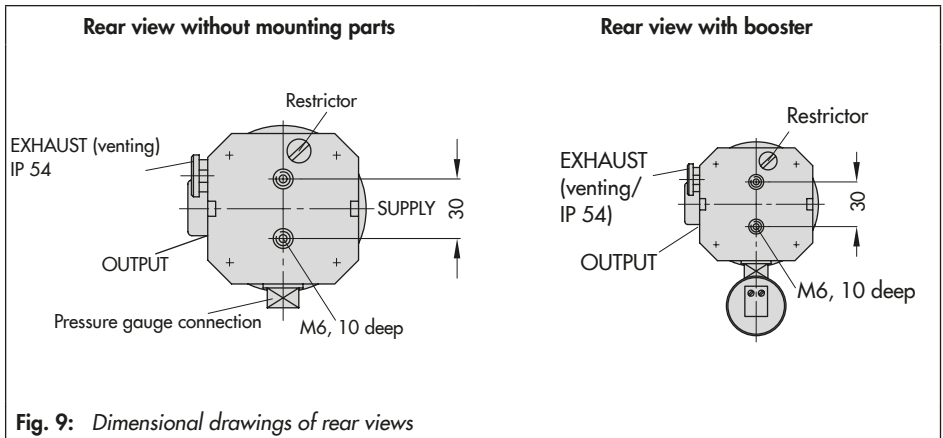
<sup>2)</sup> No longer available since 2020







**Fig. 8:** Dimensional drawings of positioner attachment



**Fig. 9:** Dimensional drawings of rear views

### 3.3 Accessories

**Table 2:** *Mounting accessories*

Spare parts/accessories	Order no.
Wall and pipe mounting	1400-6216
Mounting bracket (1.4301) for wall mounting	1400-7432
Mounting unit for Type 6116 in various versions	M6116
Attachment to Type 3766 <sup>1)</sup>	1400-6227
Attachment to Type 4765 <sup>1)</sup>	1400-6223
Attachment to Type 3760 <sup>1)</sup>	1400-6224
Mounting on cast yoke according to NAMUR <sup>1)</sup>	1400-6217
Mounting on rod-type yoke according to NAMUR <sup>1)</sup>	1400-6218
Male screw fitting G ¼ on hose with 4 mm inside diameter and 6 mm outside diameter, brass	8582-1452
Male screw fitting ¼ NPT on hose with 4 mm inside diameter and 6 mm outside diameter, brass	8582-1523
M20x1.5 cable gland, black polyamide (6 to 12 mm clamping range)	8808-1011
M20x1.5 cable gland, blue polyamide (6 to 12 mm clamping range)	8808-1012
M20x1.5 cable gland, nickel-plated brass (6 to 12 mm clamping range)	1890-4875
M20x1.5 cable gland, stainless steel 1.4305 (8 to 14.5 mm clamping range)	8808-0160
Cable gland ½ NPT, black polyamide (6 to 12 mm clamping range)	8808-0145
Cable gland ½ NPT, blue polyamide (6 to 12 mm clamping range)	8808-0146
Cable gland ½ NPT, nickel-plated brass (6 to 12 mm clamping range)	8808-0140
Vent plug G ¼, stainless steel 1.4404, IP66 (–45 to +80 °C)	1790-7253
Vent plug G ¼, stainless steel 1.4404, NEMA 4/Type 4 (–45 to +80 °C)	1790-9646

<sup>1)</sup> Only mounting part without assembly and without any possibly required piping. Order together with mounting unit (M6116).



**Table 3:** Accessories for subsequent pressure gauge mounting

Pressure gauge	Order no.
Pressure gauge: 0.2 to 1.2 bar pressure range	0080-0185
Pressure gauge: 0 to 6 bar pressure range	0080-0186
Pressure gauge: 0 to 10 bar pressure range	8520-0032
Pressure gauge: pressure range 0 to 0.6 MPa/0 to 6 kg/cm <sup>2</sup>	0800-0204
For all pressure gauges: screw fitting	0250-1090

**Table 4:** Accessories for positioner attachment

Positioner	Mounting instructions	Order no.
Type 3766-00 (model index .02 and higher)	Direct attachment to the positioner according to Fig. 13 (for positioner with M20x1.5 electrical connection)	1400-6227
	For older positioner models with PG 13.5	1400-6222
Type 4765	NAMUR attachment to the yoke of a control valve according to Fig. 14	1400-6223
Type 3760	Attachment to the yoke of the Type 3510 Micro-flow Valve according to Fig. 15 or to the NAMUR rib	1400-6224

### 4 Measures for preparation

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Compare the shipment received with the delivery note.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).

#### 4.1 Unpacking

- Do not remove the packaging until immediately before installation.
- Dispose of the packaging in accordance with the valid regulations.

#### 4.2 Transporting and lifting

##### Transport instructions

- Protect the device against external influences (e.g. impact).
- Protect the device against moisture and dirt.
- Observe the permissible ambient temperatures (see Chapter 3.2).

### 4.3 Storage

---

#### ! NOTICE

**Risk of device damage due to improper storage.**

- Observe the storage instructions.
  - Contact SAMSON in case of different storage conditions.
- 

#### Storage instructions

- Protect the device against external influences (e.g. impact).
- Protect the device against moisture and dirt. Store it at a relative humidity of less than 75 %. In damp spaces, prevent condensation. If necessary, use a drying agent or heating.
- Make sure that the ambient air is free of acids or other corrosive media.
- Observe the permissible ambient temperatures (see Chapter 3.2).
- Do not place any objects on the device.

#### 4.4 Preparation for installation

- Check the device for damage.
- Check the connections to make sure that they are clean.

## 5 Mounting and start-up

### **⚠ DANGER**

**Risk of fatal injury due to the ignition of an explosive atmosphere.**

*Incorrect installation, operation or maintenance of the i/p converter in potentially explosive atmospheres may lead to ignition of the atmosphere and ultimately to death.*

- *The following regulations apply to installation in hazardous areas: EN 60079-14 (VDE 0165, Part 1).*
- *Installation, operation or maintenance of the i/p converter must only be performed by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.*

### 5.1 Mounting orientation

- Install the converter horizontally with the pressure gauge (or screw plug) facing upward.

#### **i Note**

*If a different mounting position is used, the zero point must be corrected afterwards (see Chapter 6.1).*

- With degree of protection IP 54, make sure the vent plug is installed facing downward to the floor.

### 5.2 Installing i/p converters

The i/p converter can be mounted to a wall, pipe or directly to a control valve (see Fig. 11). Certain mounting accessories are required depending on the type of mounting (see Chapter 3.3).

### 5.3 Electrical connection

#### **⚠ WARNING**

**Incorrect connection at the terminals will render the explosion protection unsafe.**

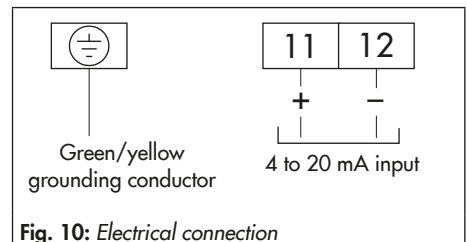
- *Observe the specifications in the explosion-protection certification.*
- *Do not undo the enameled screws in or on the enclosure.*

#### **ⓘ NOTICE**

**Compliance with the specified degree of protection not achieved due to insufficient sealing of the terminal compartment.**

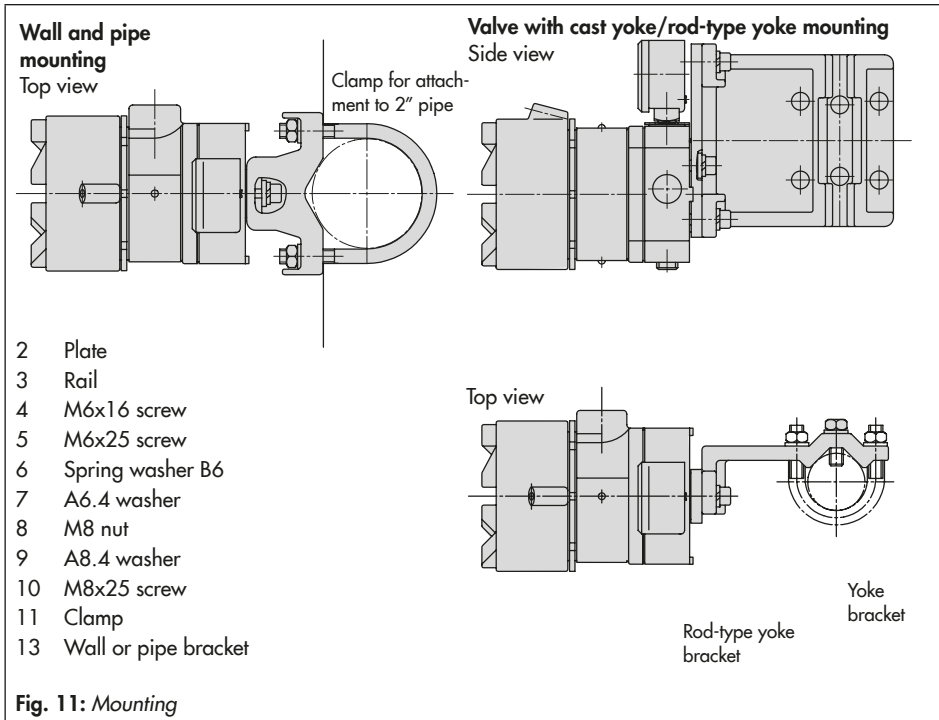
*Leakage to the terminal space may impair the degree of protection.*

- *Make sure that the cable entries are sealed and the cover is locked in position during operation.*



**Fig. 10:** Electrical connection

## Mounting and start-up



➔ For electrical installation, observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use. In Germany, these are the VDE regulations and the accident prevention regulations of the employers' liability insurance.

### Additional instructions for the electrical connection in hazardous areas

For installation in hazardous areas, observe the relevant standards that apply in the country of use. Standard applicable in Germany: EN 60079-14 (VDE 0165, Part 1) Ex-

plosive Atmospheres – Electrical Installations Design, Selection and Erection.

The maximum permissible values specified in the EC type examination certificates apply when interconnecting intrinsically safe electrical equipment ( $U_i$  or  $U_0$ ,  $I_i$  or  $I_0$ ,  $P_i$  or  $P_0$ ,  $C_i$  or  $C_0$  and  $L_i$  or  $L_0$ ).

### Connection

1. Unscrew the enclosure cover and connect the wires for the input signal to the terminals 11 (+) and 12 (–) using suitable cable glands or connectors.

No additional voltage supply is required.

**Ex d versions:** connect the device with an approved metal cable entry (certificate of conformity) or a seal box pipe. Fit approved versions (certificate of conformity) with permanently sealed cable entries.

2. Secure grounding conductor at the ground terminal located either inside or outside the enclosure.
3. Check the O-ring for damage.
4. Screw on the cover as far as it will go. Unscrew the cover until the first possible safety position (notch) is reached.
5. To lock the cover in position, tighten the cap screw.

## 5.4 Pneumatic connection

The supply air must meet the following requirements:

- Min. + 0.4 bar above the upper signal pressure range
- Max. 10 bar  
Type 6116-2: max. 6 bar (see EC type examination certificate in Chapter 10.2)
- Dry, free of oil and dust (see Chapter 3.2)

The pneumatic connections for supply air (SUPPLY 8) and output (OUTPUT 36) are designed as threaded ports with G ¼ or ¼"-18 NPT thread.

Customary fittings for metal tubing or plastic hoses can be used.

- ➔ Read the maintenance instructions for upstream air reducing stations.

- ➔ Blow through and clean all air pipes and hoses thoroughly before connecting them.

---

### ⓘ NOTICE

**Risk of property damage due to water entering the device.**

- ➔ *Make sure that no water can enter at the end of an extension of the venting pipe (minimum cross-section of  $28 \text{ mm}^2 = 6 \text{ mm}$  inside diameter) connected to either vent elbow piece or directly to the G or NPT connection.*
- 

## 5.5 Mounting the i/p converter to positioners

Analogue positioners with Ex d explosion protection can be implemented by combining a p/p positioner with a Type 6116-2 (Ex d) Converter.

In the Type 6116 Converter designed for positioner attachment, the connection to the positioner is used in place of the booster.

Another application involves upgrading p/p positioners to electropneumatic positioners (current signal input instead of the pneumatic signal).

- **Type 6116-xx010111000xxxx** with ½ NPT electrical connection
- **Type 6116-xx101012000xxxx** with M20x1.5 electrical connection

### 5.5.1 Principle of operation

When operated, the supplied direct current  $i$  flows through the plunger coil (2) located in the field of a permanent magnet (3). At the balance beam (1), the force of the plunger coil, which is in proportion to the current, is balanced against the force of the dynamic backpressure. The backpressure is produced on the flapper plate (6) by the air jet leaving the nozzle (7).

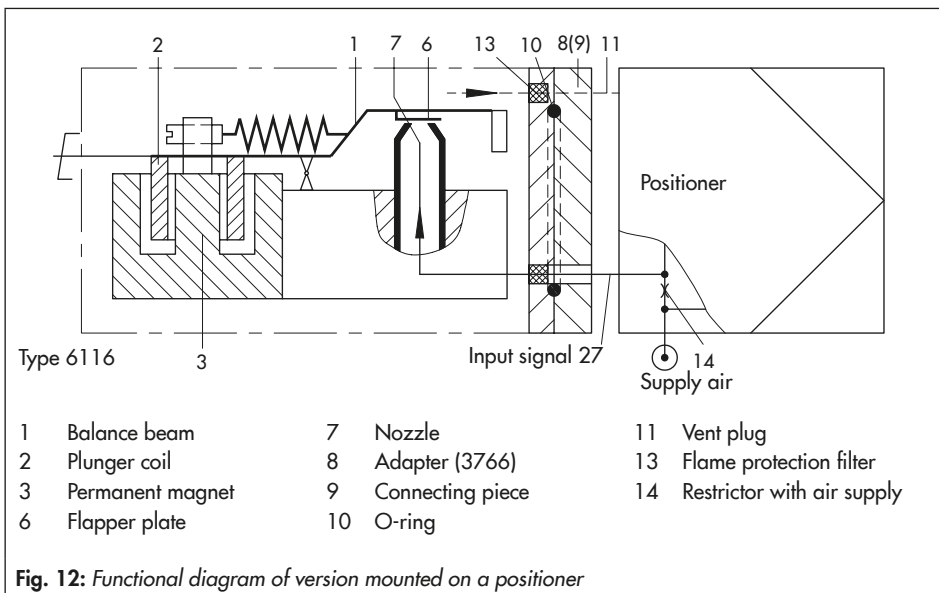
The air supply for the nozzle is taken from the pneumatic positioner (connection to the pneumatic input signal – input signal 27).

### 5.5.2 Accessories

Certain mounting accessories are required for attachment of a positioner (see Chapter 3.3).

### 5.5.3 Mounting position of the converter

- Mount the converter horizontally using the adapter (8, 9) onto the control valve or positioner. In this case, the cable entry must face sideways away from the control valve or positioner.
- Make sure the O-ring (10) to seal the enclosure is inserted correctly.



### 5.5.4 Electrical connection

Connect as described in Chapter 5.3.

### 5.5.5 Pneumatic connection

---

#### **i** Note

*Generally, the pneumatic connection of the i/p converter is established by connecting it to the pneumatic input of the positioner.*

---

#### **Type 3766-000 Positioner**

For direct attachment to the Type 3766-000 Positioner (Fig. 13), the converter is connected using the hollow screw with grommet (6) and threaded bushing (5). The second screw (7) is used to vent the converter over the positioner housing.

Before attaching the adapter (8) to the positioner, remove the M20 screw plug and the connecting nipple (input signal).

#### **Type 4765 and Type 3760 Positioners**

For Type 4765 and Type 3760 Positioners (Fig. 14 and Fig. 15) the 1/8 NPT threaded connection of the adapter (9) needs to be fitted with a suitable cable gland and must be connected to the input connection (input signal 27) of the positioner using a pipe or hose. Try to keep the connection as short and small as possible, e.g. 6x1 mm cross-section.

The second bore (G 1/4) serves as vent and needs to be equipped with the vent plug (11) included in the accessories.

#### **All positioners**

→ Remove the connecting plate (1) with sealing element (1.1) from the bottom of the housing and replace it with the connecting plate included in the accessories (see Chapter 3.3). Make sure that the sealing element is correctly inserted in the connecting plate. The filter must be located in front of the restrictor of the connecting plate.

→ **Type 4765 and Type 3766:** plug on silicone hose (4, see Fig. 13 and Fig. 14).

→ **Type 3760:** place on cap (4, see Fig. 15).

For SUPPLY 8 and OUTPUT 36 of the positioner, see associated positioner documentation.

### 5.5.6 Operation

Any adjustments to assign the travel of the control valve to the electric input signal must be made at the positioner separately from the converter module (see associated positioner documentation).

## Mounting and start-up

### Accessories (1400-6227)

- |     |                           |     |                  |
|-----|---------------------------|-----|------------------|
| 1   | Connecting plate          | 7   | Screw            |
| 1.1 | Sealing element           | 8   | Connecting piece |
| 1.2 | M3x16 screws              | 8.1 | M4x12 screw      |
| 4   | Hose                      | 8.2 | M4x40 screw      |
| 5   | Threaded bushing          | 10  | O-ring           |
| 6   | Hollow screw with grommet |     |                  |

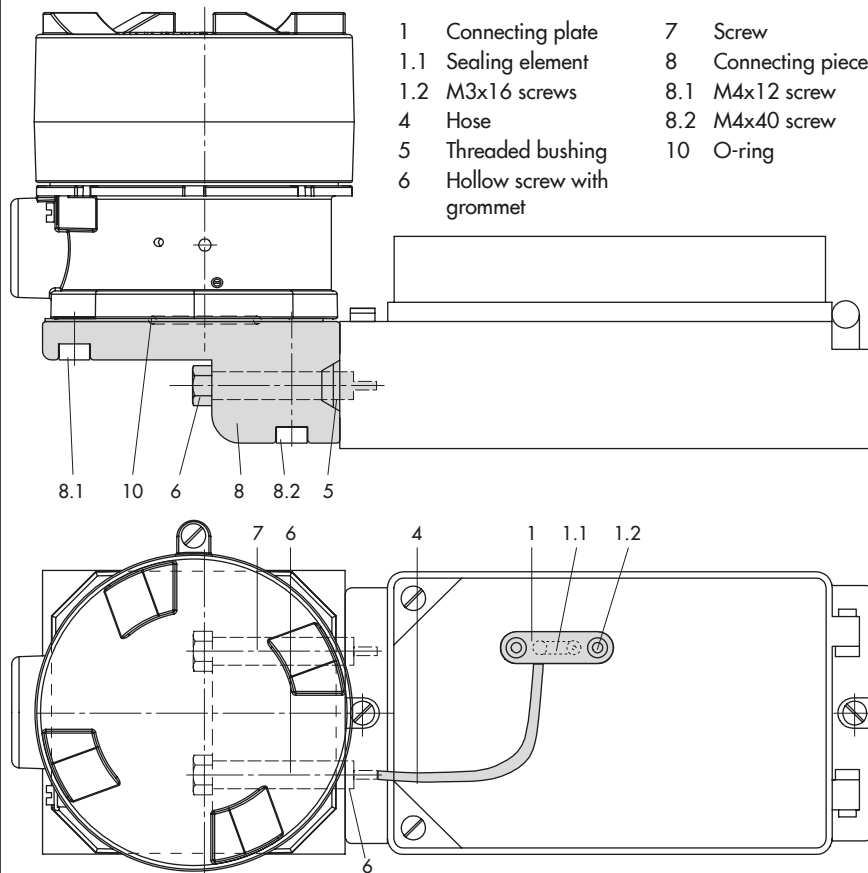
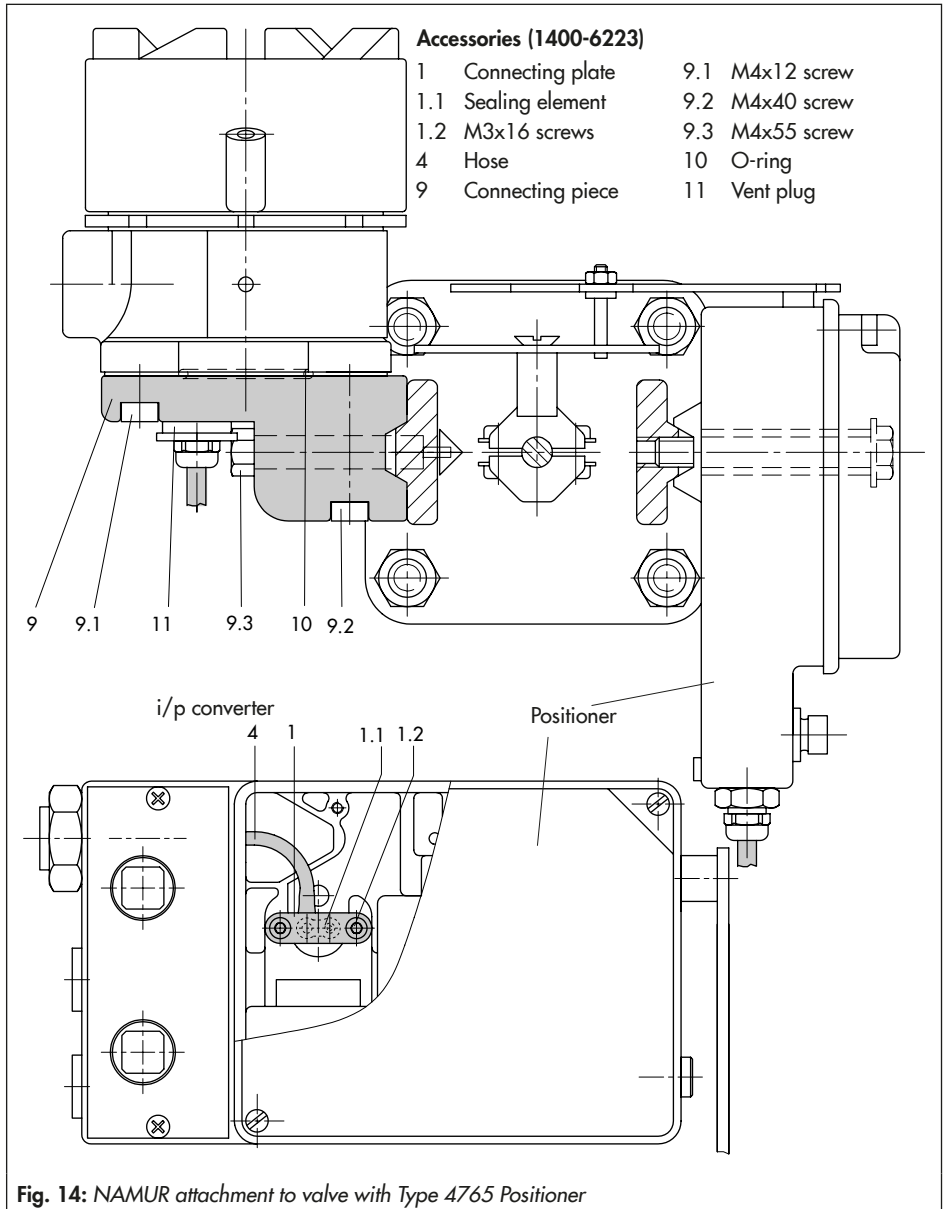


Fig. 13: Direct attachment to Type 3766 Positioner





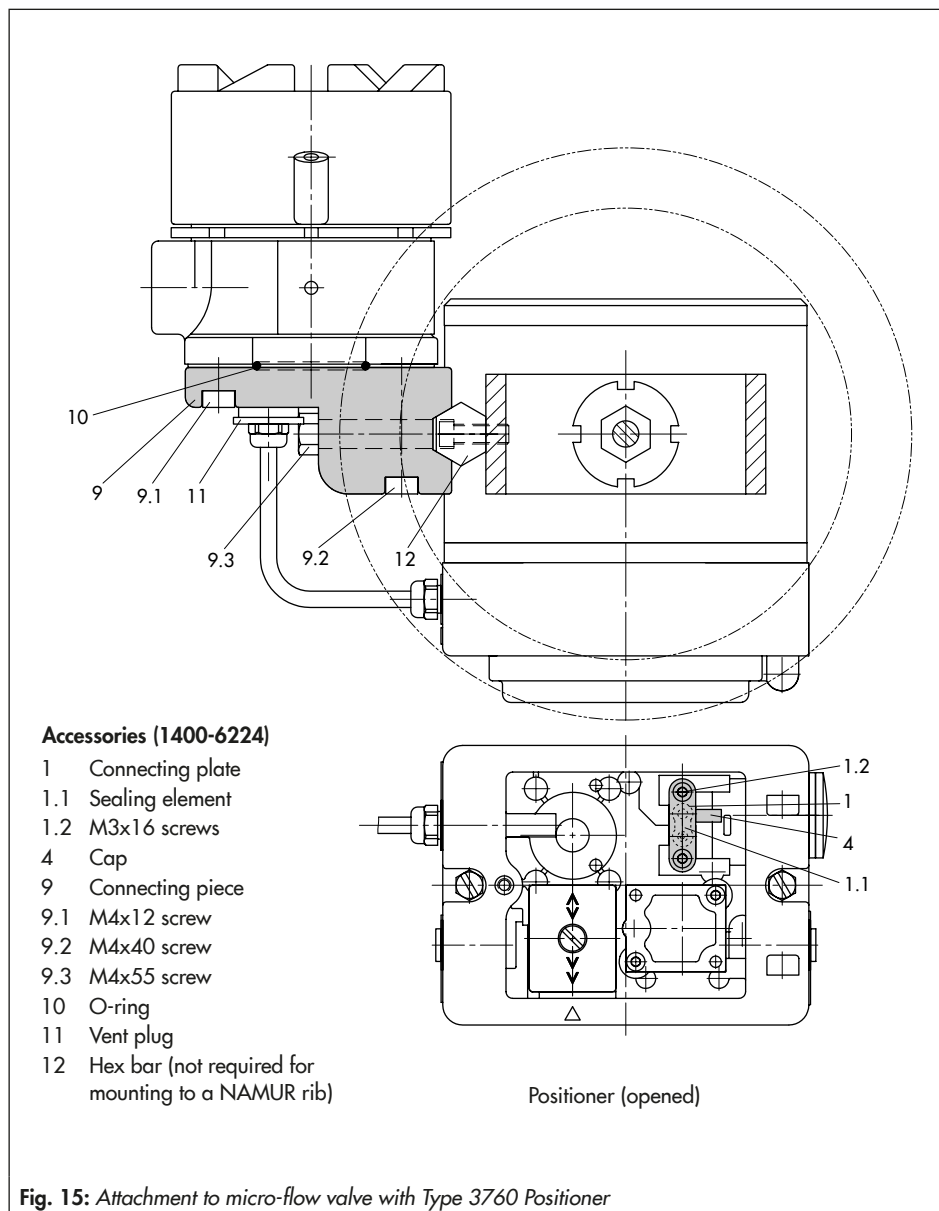


Fig. 15: Attachment to micro-flow valve with Type 3760 Positioner

## 6 Operation

### **⚠ DANGER**

**Risk of fatal injury due to the ignition of an explosive atmosphere.**

Incorrect installation, operation or maintenance of the i/p converter in potentially explosive atmospheres may lead to ignition of the atmosphere and ultimately to death.

- ➔ The following regulations apply to installation in hazardous areas: EN 60079-14 (VDE 0165, Part 1).
- ➔ Installation, operation or maintenance of the i/p converter must only be performed by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.

### **⚠ DANGER**

**Loss of Ex d protection due to opening the enclosure cover or damage to the cover's thread and/or the connecting thread.**

- ➔ The enclosure cover must be firmly closed during operation.
- ➔ Put the i/p converter out of operation when its cover thread or connecting thread is damaged. Replace it with a new device.

### **i Note**

The versions with a 0 to 20 mA input signal do not have any switch-off electronics nor a potentiometer to adjust zero. If the device does not have a potentiometer for zero, the

zero point can only be adjusted mechanically at the zero point adjuster (1.1). See Chapter 6.2.

Some versions also do not have a potentiometer to adjust the span.

## 6.1 Checking zero and span

The device converts the input signal proportionally into the output signal.

The signal ranges are specified on the nameplate (see Chapter 2.1).

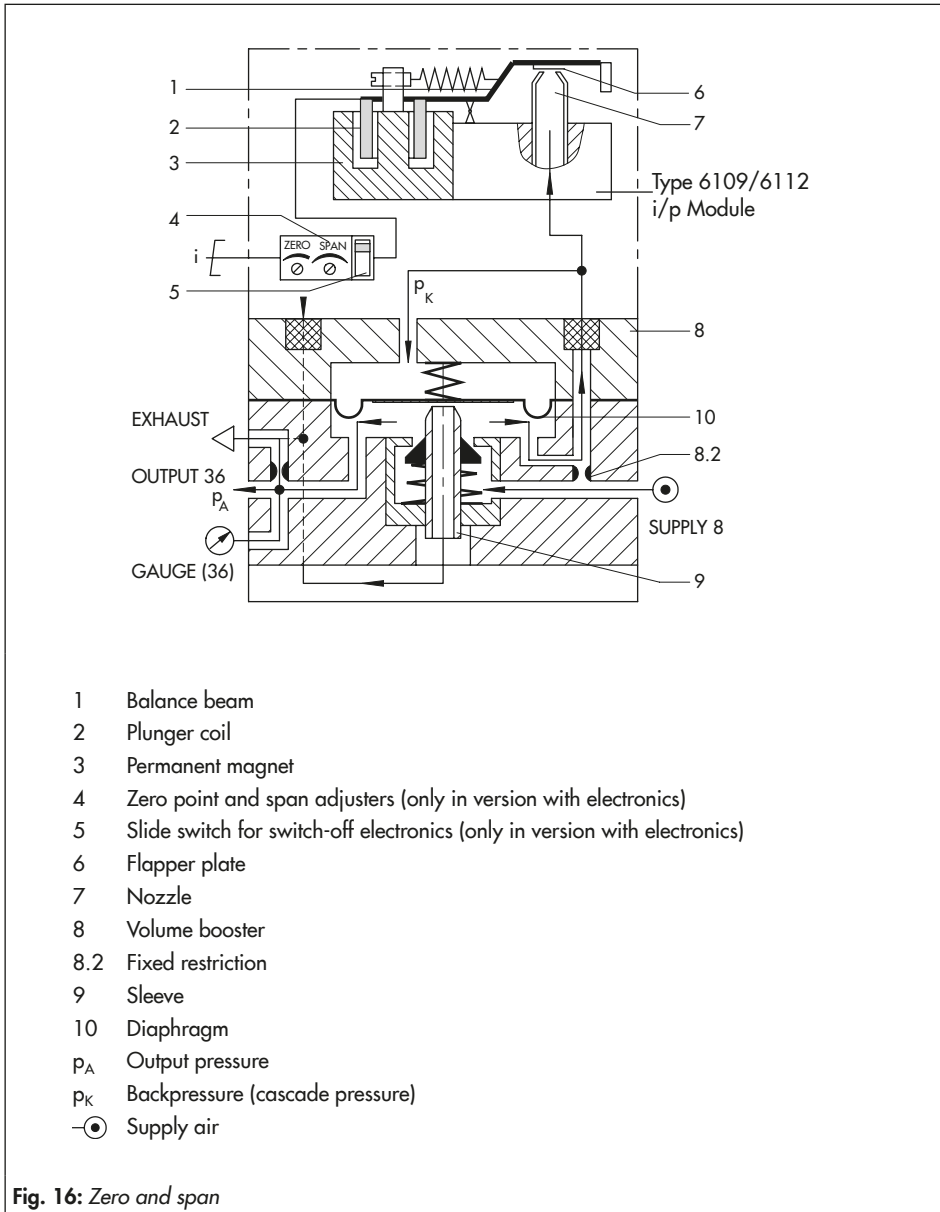
In case of a mounting position that is not horizontal or when the pressure gauge/screw plug does not face upwards, zero and span can be corrected by approx. 10 % using the electronics.

If the device does not work properly for any reason, check the zero and span.

The **ZERO** and **SPAN** potentiometers are accessible after opening the enclosure cover (see Fig. 16).

### 6.1.1 Checking zero

1. Unscrew the enclosure cover.
2. Connect a pressure gauge (minimum accuracy class 1) to the converter output.
3. Set the supply air to 0.4 bar above the upper output signal range value and apply it to the device.
4. Deactivate the switch-off electronics at the slide switch (5).
5. Set the input signal to the lower range value using a suitable ammeter.



- 1 Balance beam
- 2 Plunger coil
- 3 Permanent magnet
- 4 Zero point and span adjusters (only in version with electronics)
- 5 Slide switch for switch-off electronics (only in version with electronics)
- 6 Flapper plate
- 7 Nozzle
- 8 Volume booster
- 8.2 Fixed restriction
- 9 Sleeve
- 10 Diaphragm
- p<sub>A</sub> Output pressure
- p<sub>K</sub> Backpressure (cascade pressure)
- ⊙ Supply air

Fig. 16: Zero and span

**Example:** set it to 4 mA for 4 to 20 mA range = 0.2 to 1 bar. The output signal of the pressure gauge should now indicate 0.2 bar.

6. If this is not the case, readjust the zero point accordingly with the ZERO potentiometer.

## 6.1.2 Checking span

1. First check zero, if necessary (see Chapter 6.1.1).
2. Set the input signal to 20 mA (upper range value) using a suitable ammeter.

**Example:** the output signal at the pressure gauge should now indicate 1.0 bar for a 4 to 20 mA range = 0.2 to 1.0 bar.

3. If this is not the case, readjust the span accordingly with the SPAN potentiometer.

4. As the adjustment of zero and span influence each other, recheck both values and correct them, if necessary.

## 6.2 Zero adjustment (versions with 0 to 20 mA input signal)

If the device does not have a potentiometer for zero, the zero point can only be adjusted mechanically at the zero point adjuster (1.1).

- ➔ Remove the front cover.
- ➔ Insert a screwdriver through the hole in the cover of the Type 6112 i/p Module (see Fig. 16).

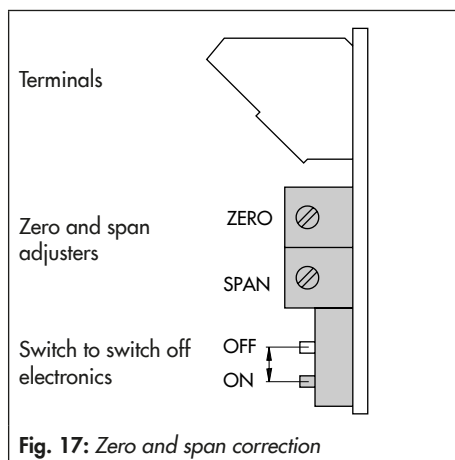


Fig. 17: Zero and span correction

## 7 Servicing

### **⚠ DANGER**

**Risk of fatal injury due to the ignition of an explosive atmosphere.**

*Incorrect installation, operation or maintenance of the i/p converter in potentially explosive atmospheres may lead to ignition of the atmosphere and ultimately to death.*

→ *The following regulations apply to installation in hazardous areas: EN 60079-14 (VDE 0165, Part 1).*

→ *Installation, operation or maintenance of the i/p converter must only be performed by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.*

The i/p converter requires no maintenance.

→ See Chapter 8 for troubleshooting.

### 7.1 Cleaning the restrictor

The restrictor (see Fig. 18) is located inside the enclosure. It can be accessed from the back of the device.

1. Unscrew the screw plug (Ø10).
2. Remove the restrictor.
3. To remove blockages, take the filter out of the restrictor and clean or replace it.

Component	Order no.
Filter	0550-0193
Restriction including filter	1390-0186

### 7.2 Cleaning pneumatic connections

→ Unscrew plastic-rimmed filters. Clean or renew them (order no. 0550-0213).

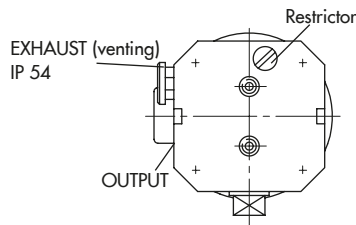


Fig. 18: Restrictor at the back

### 7.3 Servicing explosion-protected devices

If a part of the device on which the explosion protection is based needs to be serviced, the device must not be put back into operation until a qualified inspector has assessed it according to the requirements, has issued an inspection certificate or given the device a mark of conformity.

Inspection by a qualified inspector is not required if SAMSON performs a routine test on the device before putting it back into operation. Document the passing of the routine test by attaching a mark of conformity to the device.

Replace explosion-protected components only with original, routine-tested components by the manufacturer.

Devices that have already been used outside hazardous areas and are intended for future use inside hazardous areas must comply with the safety requirements placed on serviced devices. Before being operated inside hazardous areas, test the devices according to the specifications for servicing explosion-protected devices.

## 8 Malfunctions

Depending on the operating conditions, check the valve at certain intervals to prevent a possible failure before it can occur. Plant operators are responsible for drawing up an inspection and test plan.



**Tip**

SAMSON's After-sales Service can support you in drawing up an inspection and test plan for your plant.

**Table 5: Troubleshooting**

Malfunction	Possible reasons	Corrective action to be taken	Comments
No output signal despite changing the input signal	Supply air missing or not connected.	Check the supply air. See Chapter 5.4.	–
	Incorrect terminal assignment	Connect + and – terminals correctly. See Chapter 5.3.	<b>NOTICE</b> i/p converter does not need any extra voltage! Do <b>not</b> connect 24 V DC.
	Incorrect input signal	Connect correct signal.	Read nameplate: 0 to 20 mA or 4 to 20 mA.
	Restrictor clogged up.	Clean the restrictor (see Chapter 7.1).	–
Output signal does not change proportionally into the input signal.	Poor air quality.	Contact SAMSON's After-sales Service.	Make sure that the air quality complies with the requirements (see Chapter 3.2). Check the air filter and separator installed in the upstream air reducing station regularly.
	Mechanics jammed (e.g. due to mechanical shock)	Contact SAMSON's After-sales Service.	–
	Sintered filter in SUPPLY and OUTPUT connection clogged up with dirt.	Clean or exchange sintered filter.	–



Malfunction	Possible reasons	Corrective action to be taken	Comments
i/p converter constantly vents off air loudly	Connections for supply air and output at the i/p converter inadvertently reversed	Check pneumatic connections (see Chapter 7.2 and Chapter 5.4).	–
i/p converter does not reach 100 % output e.g. 20 mA input: output only 70 % instead of 100 %	Supply pressure too low.	Supply air must be 0.4 bar higher than the max. output signal (supply air = 0.4 bar)	Read nameplate: output 0.2 to 1 bar → Supply air at least 1.4 bar
	Input signal faulty	Check whether the input signal at the terminals reaches 100 % (100 % is e.g. 20 mA in standard version and 12 mA for split-range operation)	<b>NOTICE</b> The i/p converters have a load of max. 6 V (standard version) or max. 7 V (Ex ia version). Check specification concerning permissible load at the source of the input signal.
	Consumption of air capacity too high.	Adapt consumption of the air capacity according to the technical data (see Chapter 3.2).	–

**i Note**

Contact SAMSON's After-sales Service for malfunctions not listed in the table.

## 9 Decommissioning and removal

### **⚠ DANGER**

**Risk of fatal injury due to the ignition of an explosive atmosphere.**

*Incorrect installation, operation or maintenance of the i/p converter in potentially explosive atmospheres may lead to ignition of the atmosphere and ultimately to death.*

- The following regulations apply to installation in hazardous areas: EN 60079-14 (VDE 0165, Part 1).
- Installation, operation or maintenance of the i/p converter must only be performed by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.

### 9.1 Removing the i/p converters

1. Disconnect the supply voltage and supply pressure.
2. Remove the pneumatic and electrical connections.
3. Remove the i/p converter from the wall, pipe or control valve (depending on how it is mounted).

### 9.2 Disposal



SAMSON is a producer registered at the following European institution ► <https://www.ewrn.org/national-registers/national-registers>.  
WEEE reg. no.:  
DE 62194439/FR 025665

- Observe local, national and international refuse regulations.
- Do not dispose of components, lubricants and hazardous substances together with your other household waste.

#### **i Note**

We can provide you with a recycling passport according to PAS 1049 on request. Simply e-mail us at [aftersaleservice@samsongroup.com](mailto:aftersaleservice@samsongroup.com) giving details of your company address.

#### **💡 Tip**

On request, we can appoint a service provider to dismantle and recycle the product as part of a distributor take-back scheme.

## 10 Annex

### 10.1 After-sales service

Contact SAMSON's After-sales Service for support when malfunctions or defects arise.

#### **E-mail contact**

You can reach our after-sales service at [aftersaleservice@samsongroup.com](mailto:aftersaleservice@samsongroup.com).

#### **Addresses of SAMSON AG and its subsidiaries**

The addresses of SAMSON, its subsidiaries, representatives and service facilities worldwide can be found on our website (▶ [www.samsongroup.com](http://www.samsongroup.com)) or in all SAMSON product catalogs.

#### **Required specifications**

Please submit the following details:

- Order number and position number in the order
- Type and configuration ID
- Serial number
- Input and output ranges
- Installation drawing showing the exact location of the i/p converter

### 10.2 Certificates

The type examination certificates and EU declarations of conformity are included on the next pages.



TRANSLATION



(1) **EC TYPE EXAMINATION CERTIFICATE**

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres –  
**Directive 94/9/EC**

(3) EC Type Examination Certificate Number

**PTB 02 ATEX 2199**

(4) Equipment: Model 6116-1. I/P Converter

(5) Manufacturer: SAMSON AG

(6) Address: Weismüllerstr. 3, 60314 Frankfurt, Germany

(7) This equipment and any acceptable variation thereof are specified in the schedule to this certificate.

(8) The Physikalisch-Technische Bundesanstalt, notified body number 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirement 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: **PTB Ex 02-22374**

(9) The essential health and safety requirements are satisfied by compliance with

**EN 50014: 1997+A1+A2 EN 50020: 1994**

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

(11) According to the Directive 94/9/EC, this EC TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of the equipment.

The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt – Bundesallee 100 - D 38116 Braunschweig

Ptb.33-6116-1.doc

- (12) The marking of the equipment shall include the following:



Zertifizierungsstelle Explosionsschutz  
By order

Braunschweig, 07 March 2003

(Signature)

(Seal)

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(13)

## S c h e d u l e

(14)

**EC TYPE EXAMINATION CERTIFICATE No. PTB 02 ATEX 2199**

(15) **Description of Equipment**

The Model 6116-1.. I/P Converter serves for converting a load-independent current into a standard pressure signal in the 0.2 to 1 or 0.4 to 2 bar range respectively. It consists of an i/p module and a downstream pneumatic amplifier.

The Model 6116-1.. I/P Converter is a passive two-terminal network which may be connected to any certified intrinsically safe circuit, provided the permissible maximum values of  $U_i$ ,  $I_i$  and  $P_i$  are not exceeded.

For air supply non-combustible media are used.

The device is intended for use inside and outside of hazardous locations.

The correlation between equipment version, temperature classification, permissible ambient temperature ranges and maximum short-circuit currents is shown in the table below:

**Version with I/P Module 6109-1..**

Temperature class	Permissible ambient temperature range	Maximum short-circuit current
<b>T6</b>	-45 °C ... 60 °C	
<b>T5</b>	-45 °C ... 70 °C	85 mA
<b>T4</b>	-45 °C ... 80 °C	
<b>T5</b>	-45 °C ... 70 °C	100 mA
<b>T4</b>	-45 °C ... 80 °C	

**Version with I/P Module 6112-2..**

Temperature class	Permissible ambient temperature range	Maximum short-circuit current
<b>T6</b>	-45 °C ... 60 °C	85 mA or
<b>T5</b>	-45 °C ... 70 °C	100 mA or
<b>T4</b>	-45 °C ... 80 °C	120 mA

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Ptb.33-6116-1.doc

**Schedule to the EX Type Examination Certificate PTB 02 ATEX 2199**

**Electrical data**

**Version with I/P Module 6109-1.**

Signal Circuit  
(terminals 11/12)

Type of protection. Intrinsic safety EEx ia IIC  
only for connection to a certified  
intrinsically safe circuit

Maximum values:

$$\begin{aligned}U_i &= 28 \text{ V} \\I_i &= 85\text{mA or } 100 \text{ mA resp.} \\P_i &= 0,7 \text{ W}\end{aligned}$$

$$C_i = \text{negligible, } L_i = \text{negligible}$$

**Version with I/P Module 6112-2.**

Signal circuit  
(terminals 11/12)

Type of protection. Intrinsic safety EEx ia IIC  
only for connection to a certified  
intrinsically safe circuit

$$\begin{aligned}U_i &= 28 \text{ V} \\I_i &= 100 \text{ mA or } 85 \text{ mA resp.} \\P_i &= 0,7 \text{ W}\end{aligned}$$

$$C_i = \text{negligible, } L_i = \text{negligible}$$

**or**

$$\begin{aligned}U_i &= 25 \text{ V} \\I_i &= 120 \text{ mA} \\P_i &= 0,7 \text{ W}\end{aligned}$$

$$C_i = \text{negligible, } L_i = \text{negligible}$$

(16) Test report: **PTB Ex-02-22374**

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

None

The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt – Bundesallee 100 - D 38116 Braunschweig

Ptb.33-6116-1.doc

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

In compliance with the standards specified above

Zertifizierungsstelle Explosionsschutz  
By order

Braunschweig, 7 March 2003

(Signature) (seal)

Dr. Ing. U. Johannsmeyer  
Regierungsdirektor

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**1. SUPPLEMENT**

according to Directive 94/9/EC Annex III.6

**to EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2199**

**(Translation)**

Equipment: *i/p*-converter, type 6116-1..

Marking:  **II 2 G EEx ia IIC T6**

Manufacturer: SAMSON AG Mess- und Regeltechnik

Address: Weismüllerstr. 3, 60314 Frankfurt, Germany

Description of supplements and modifications

The *i/p*-converter of type 6116-1.. is used for the conversion of a load-independent current into a normalized pressure signal ranging from 0.2 to 1 bar or 0.4 to 2 bar respectively. It consists of an *i/p*-module and a downstream pneumatic amplifier.

The *i/p*-converter of type 6116-1.. is a passive two-terminal network that may be connected to all intrinsically safe circuits provided that the permissible maximum values for  $U_i$ ,  $I_i$  and  $P_i$  are not exceeded.

Non-flammable media are used as pneumatic auxiliary power.

The equipment is intended for the application inside and outside of hazardous areas.

For relationship between variant, temperature class, permissible ambient temperature ranges and maximum short-circuit current, reference is made to the following tables:

**Variant with *i/p*-module 6109-1..**

Temperature class	Permissible ambient temperature range	Maximum short-circuit current
T6	-45 °C ... 60 °C	85 mA
T5	-45 °C ... 70 °C	
T4	-45 °C ... 80 °C	
T5	-45 °C ... 70 °C	100 mA
T4	-45 °C ... 80 °C	

Sheet 1/3

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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ZSExt10101e.ddtm Stand 2013-02-13

**Variant with i/p-module 6112-2..**

Temperature class	Permissible ambient temperature range	Maximum short-circuit current
T6	-45 °C ... 60 °C	85 mA bzw.
T5	-45 °C ... 70 °C	100 mA bzw.
T4	-45 °C ... 80 °C	120 mA

Electrical data

**Variant with i/p-module 6109-1..**

Signal circuit ..... type of protection Intrinsic Safety Ex ia IIC  
 (terminals 11/12) only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 28 \text{ V}$   
 $I_i = 85 \text{ mA}$  or 100 mA  
 $P_i = 0.7 \text{ W}$   
 $C_i$  negligibly low  
 $L_i$  negligibly low

**Variant with i/p-module 6112-2..**

Signal circuit ..... type of protection Intrinsic Safety Ex ia IIC  
 (terminals 11/12) only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 28 \text{ V}$   
 $I_i = 85 \text{ mA}$  or 100 mA  
 $P_i = 0.7 \text{ W}$   
 $C_i$  negligibly low  
 $L_i$  negligibly low

or

$U_i = 25 \text{ V}$   
 $I_i = 120 \text{ mA}$   
 $P_i = 0.7 \text{ W}$   
 $C_i$  negligibly low  
 $L_i$  negligibly low

The future marking reads:

 II 2 G Ex ia IIC T6 Gb

# Physikalisch-Technische Bundesanstalt



Braunschweig und Berlin

## 1. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2199

Applied standards

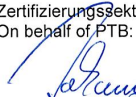
EN 60079-0:2009

EN 60079-11:2012

Test report: PTB Ex 14-23187

Zertifizierungssektor Explosionsschutz  
On behalf of PTB:

Braunschweig, March 3, 2014

  
Dr.-Ing. U. Johannsmeyer  
Direktor und Professor



Sheet 3/3

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EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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## TRANSLATION

### (1) EC TYPE EXAMINATION CERTIFICATE



(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres  
**Directive 94/9/EC**

(3) EC Type Examination Certificate Number

**PTB 98 ATEX 1024 X**

(4) Equipment: Model 6116-2 i/p-Converter

(5) Manufacturer: SAMSON AG Mess- und Regeltechnik

(6) Address: Weismüllerstr. 3  
D-60314 Frankfurt am Main

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

(8) The Physikalisch-Technische Bundesanstalt, notified body number 0102 in accordance with Article 9 of the Council Directive 94/9/Ex of 23 March 94, 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 confidential report: No. **PTB Ex 98-17013**.

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

**EN 50014:1997**

**EN 50018:1994**

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

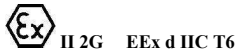
(11) This EC TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of the equipment.

The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt – Bundesallee 100 - D 38116 Braunschweig

Ptb.EC-6116-2.doc

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



Zertifizierungsstelle Explosionsschutz

Braunschweig, 30.04.1998

By order

(Signature)

(Seal)

Dr.-Ing. U. Klausmeyer  
Oberregierungsrat

The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

13)

## Schedule

(14)

**EC TYPE EXAMINATION CERTIFICATE No. PTB 98 ATEX 1024 X**

(15) **Description of Equipment**

The Model 6116 i/p- Converter serves for converting a current into a pressure signal in the 0.2 to 1 bar range. It consists of an i/p module followed by an amplifier. The pneumatic output signal is directly proportional to the input signal. The media used for the pneumatic system are non-combustible gases and vapours, whereas oxygen and/or gases enriched with oxygen shall not be used.

### **Technical data**

I<sub>N</sub> 4 ... 20 mA  
U<sub>N</sub> 1 ... 10 V

(16) **Test report**

PTB Ex 98-17013 comprising description (9 sheets), drawings (6 sheets) and test record (10 sheets).

(17) **Special conditions**

1. The Model 6116 i/p Converter shall be connected by suitable cable and conduit entries complying with the requirements specified in EN 50018 clauses 13.1 and 13.2 and for which a separate test certificate has been issued.
2. Cable entries (Pg glands) and plugs of simple construction shall not be used. When the i/p converter is connected by means of a conduit entry certified for this purpose, the associated sealing device shall be provided immediately at the enclosure.
3. Apertures not used shall be closed in compliance with EN 50018 clauses 11.9.

These notes shall be added to each apparatus in appropriate form.

### **Ambient temperature**

The maximum ambient temperature of the Model 6116 i/p Converter is +60 °C.

### **Routine test**

The routine tests specified in EN 50018 clauses 16.1 are not required according to clause 16.2 because the prescribed type test has been made at a pressure of four times the reference pressure.

The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt – Bundesallee 100 - D 38116 Braunschweig

Ptb.EC-6116-2.doc

(18) **Basic safety and health requirements**

Not applicable.

Zertifizierungsstelle Explosionsschutz

Braunschweig, 30.04.1998

By order

(Signature)

(Seal)

Dr.-Ing. U. Klausmeyer  
Oberregierungsrat

The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

**TRANSLATION**  
**ADDENDUM No.1**

in compliance with the Directive 94/9/Ec Annex III Clause 6  
to the EC Type Examination Certificate PTB No. 98 ATEX 1024 X

Equipment: Model 6116-2 i/p-Converter

Marking:  II G EEx d IIC T6

Manufacturer: SAMSON AG Mess- und Regeltechnik

Address: Weismüllerstr. 3  
D-60314 Frankfurt, Germany

**Description of the additions and modifications**

1. The range of use of the equipment is extended to a lowest ambient temperature of  $-45\text{ }^{\circ}\text{C}$ .
2. The mounting and operating instructions for the equipment are supplemented by the clauses specified under Section 4 of the examination documents.

**Test Report:** PTB Ex 01-11313

Zertifizierungsstelle Explosionsschutz  
(Signature) (Seal)

Braunschweig, 08 January 2002

#

Dr.-Ing. U. Klausmeyer  
Regierungsdirektor

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The results laid down in this test report refer exclusively to the test object and the technical documentation submitted. Test reports without signature and seal are invalid. This test report may be reproduced unaltered only. Extracts or amendments shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt – Bundesallee 100 - D 38116 Braunschweig

Ptb.EC-6116-2.doc





## Translation

# EC-Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
- (3) No. of EC-Type Examination Certificate: **BVS 14 ATEX E 104 X**
- (4) Equipment: **i/p - Converter type 6116-2\*\*\*\*\***
- (5) Manufacturer: **SAMSON AG**
- (6) Address: **Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this type examination certificate.
- (8) The certification body of DEKRA EXAM 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 14.2144 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:  
**EN 60079-0:2012 General requirements**  
**EN 60079-1:2007 Flameproof enclosure "d"**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.
- (11) 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.
- (12) The marking of the equipment shall include the following:

 **II 2G Ex d IIC T\* Gb**

\* see parameters for details

DEKRA EXAM GmbH  
Bochum, dated 2014-06-27

Signed: Simanski

\_\_\_\_\_  
Certification body

Signed: Dr. Wittler

\_\_\_\_\_  
Special services unit

(13) Appendix to

(14) **EC-Type Examination Certificate**  
**BVS 14 ATEX E 104 X**

(15) 15.1 Subject and type

i/p - Converter type 6116-2<sup>(\*)</sup>1<sup>(\*\*)</sup>2<sup>(\*\*\*)</sup>3<sup>(\*\*\*)</sup>4<sup>(\*\*\*)</sup>5<sup>(\*\*\*)</sup>6<sup>(\*\*\*)</sup>7<sup>(\*\*\*)</sup>8<sup>(\*\*\*)</sup>

- 1): i/p-Module
- 2): Input signal (electrical)
- 3): Output (pneumatic)
- 4): Operating direction
- 5): Connection thread
- 6): Pneumatic connection
- 7): Ingress of protection
- 8): Manometer

15.2 Description

The i/p-converter type 6116-2<sup>(\*)</sup>1<sup>(\*\*)</sup>2<sup>(\*\*\*)</sup>3<sup>(\*\*\*)</sup>4<sup>(\*\*\*)</sup>5<sup>(\*\*\*)</sup>6<sup>(\*\*\*)</sup>7<sup>(\*\*\*)</sup>8<sup>(\*\*\*)</sup> is designed to convert a current input signal in a pneumatic pressure output signal. The flameproof enclosure is made of an aluminium alloy, it is fitted with two stainless steel sintered flame arresters for comparative connection purposes.

The media is used for the pneumatic system are non-combustible gases and vapours. Gases enriched with oxygen shall not be used.

15.3 Parameters

Electric parameters

Nominal voltage	1...10	V
Nominal current	4...20	mA
Max. power dissipation	1.5	W

Pneumatic parameters

P <sub>max</sub> Inlet	6	bar
P <sub>max</sub> Outlet	5.6	bar

Thermal parameters

Ambient temperature / Temperature class	-45 °C ≤ T <sub>a</sub> ≤ 50 °C	T6
	-45 °C ≤ T <sub>a</sub> ≤ 65 °C	T5
	-45 °C ≤ T <sub>a</sub> ≤ 80 °C	T4

(16) Test and Assessment Report

BVS PP 14.2144 EG as of 2014-06-27

(17) Special conditions for safe use

For ambient temperatures of 80 °C, cable glands and connecting cables have to be used that are of a permitted service temperature of T<sub>a</sub> +3 K minimum. Nevertheless, those cable glands and connecting cables also need to be suitable for the lower temperatures.



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.

DEKRA EXAM GmbH  
44809 Bochum, 2014-06-27  
BVS-Siv/Mu A 20140043

Certification body

Special services unit

**Installation Manual for apparatus certified by CSA for use in hazardous locations.**

Electrical rating of intrinsically safe apparatus and apparatus for installation in hazardous locations.

**Table 1: Maximum values**

	$U_i$ or $V_{max}$	$I_i$ or $I_{max}$	$P_i$ or $P_{max}$	$C_i$	$L_i$
<b>Signal circuit</b>	28V	115mA	0,7W	0 nF	0 $\mu$ H

$$U_0 \text{ or } V_{0C} \leq U_i \text{ or } V_{max} / I_0 \text{ or } I_{0C} \leq I_i \text{ or } I_{max} / P_0 \leq P_i \text{ or } P_{max}; C_a \geq C_i \text{ and } L_a \geq L_i$$

**Table 2: CSA - certified barrier parameters of solenoid valve circuit**

<b>Barrier</b>	<b>Supply barrier</b>		<b>Evaluation barrier</b>	
	$V_{0C}$	$R_{min}$	$V_{0C}$	$R_{min}$
<b>Signal circuit</b>	$\leq 28V$	$\geq 280\Omega$	28V	#

**Table 3:** The correlation between temperature classification and permissible ambient temperature ranges is shown in the table below:

<b>Temperature class</b>	<b>Permissible ambient temperature range</b>
T6	60°C
T5	- 45°C ... 70°C
T4	80°C

**Intrinsically safe if installed as specified in manufacturer’s installation manual EB 6116 EN.**

**CSA- certified for hazardous locations**

**Ex ia IIC T6; Class I, Zone 0**

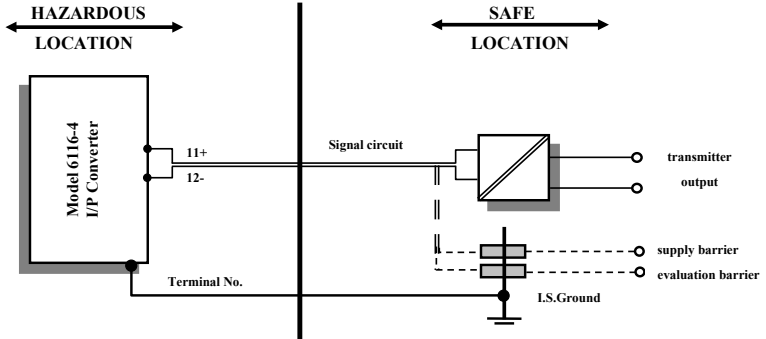
**Type 4 Enclosure**

**Class I; Groups A, B, C, D**

**Class II; Groups E, F + G; Class III**

**Notes:**

- 1.) The apparatus may be installed in intrinsically safe circuit only when used in conjunction with the CSA certified apparatus. For maximum values of  $U_i$  or  $V_{max}$ ;  $I_i$  or  $I_{max}$ ;  $P_i$  or  $P_{max}$ ;  $C_i$  and  $L_i$  of the various apparatus see Table 1.
- 2.) The apparatus may be installed in intrinsically safe circuit only when used in conjunction with the CSA certified intrinsically safe barrier. For barrier selection see Table 2.
- 3.) Installation shall be in accordance with the Canadian Electrical Code Part. 1.
- 4.) Use only supply wires suitable for 5°C above surrounding temperature.



Version: Model 6116-4 I/P Converter.

Supply and evaluation barrier CSA certified.

For the permissible maximum values for the intrinsically safe circuit see Table 1  
 For the permissible barrier parameters for the circuit see Table 2

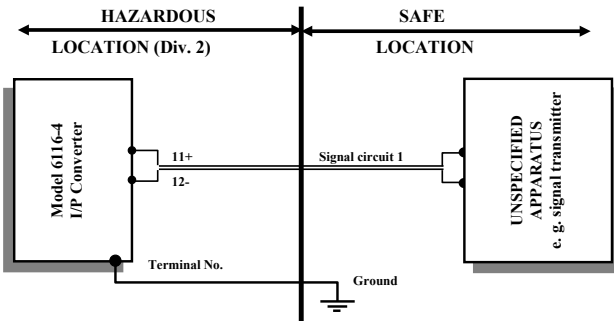
Cable entry M 20 x 1.5 or metal conduit according to drawing No. 1050 – 0539 T or 1050 – 0540 T

**CSA- certified for hazardous locations**

Class I; Div. 2, Groups A, B, C, D

Class II; Div. 2, Groups E, F + G, Class III

Type 4 Enclosure



**Notes:**

- 1.) For the maximum values for the circuit see Table 1 and 2.
- 2.) Cable entry only rigid metal conduit according to drawing No. 1050-0539 T and 1050-0540 T

Revisions Control Number: 2 January 2024

Addendum to EB 6116 EN

Installation Manual for apparatus approved by FM for use in hazardous locations.

Electrical rating of intrinsically safe apparatus and apparatus for installation in hazardous locations.

Table 1: Maximum values

	U <sub>i</sub> or V <sub>max</sub>	I <sub>i</sub> or I <sub>max</sub>	P <sub>i</sub> or P <sub>max</sub>	C <sub>i</sub>	L <sub>i</sub>
Signal circuit	28V	115mA	0,7W	0nF	0 μH

Notes: U<sub>0</sub> or V<sub>0C</sub> or V<sub>t</sub> ≤ U<sub>i</sub> or V<sub>max</sub> / I<sub>0</sub> or I<sub>0C</sub> or I<sub>t</sub> ≤ I<sub>i</sub> or I<sub>max</sub>  
 P<sub>0</sub> or P<sub>max</sub> ≤ P<sub>i</sub> or P<sub>max</sub>

Table 2: FM - approved barrier parameters of solenoid valve circuit

Barrier	Supply barrier			Evaluation barrier		
	V <sub>0C</sub>	R <sub>min</sub>	I <sub>0C</sub>	V <sub>0C</sub>	R <sub>min</sub>	I <sub>0C</sub>
Signal circuit	≤ 28V	≥ 280Ω	≤ 115mA	28V	#	0mA

Table 3: The correlation between temperature classification and permissible ambient temperature ranges is shown in the table below:

Temperature class	Permissible ambient temperature range
T6	60°C
T5	- 45°C ≤ t <sub>a</sub> ≤ 70°C
T4	80°C

Intrinsically safe if installed as specified in manufacturer’s installation manual EB 6116 EN.

FM- approved for hazardous locations

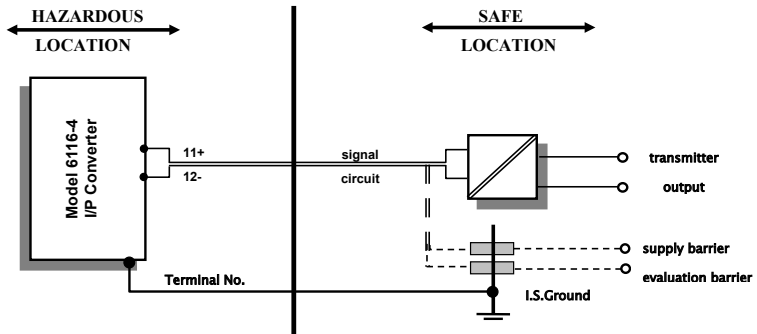
Class I, Zone 0, A Ex ia IIC T6

NEMA 4X

Class I, II, III, Division 1, Groups A, B, C, D E, F + G;

**Notes:**

- 1.) The apparatus may be installed in intrinsically safe circuit only when used in conjunction with the FM - approved apparatus. For maximum values of  $U_i$  or  $V_{max}$  ;  $I_i$  or  $I_{max}$  ;  $P_i$  or  $P_{max}$  ;  $C_i$  and  $L_i$  of the various apparatus see Table 1.
- 2.) The apparatus may be installed in intrinsically safe circuit only when used in conjunction with the FM -approved intrinsically safe barrier. For barrier selection see Table 2.
- 3.) Installation shall be in accordance with the National Electrical Code ANSI/NFPA 70 and ANSI/ISA RP 12.06.01
- 4.) Use only supply wires suitable for 5°C above surrounding temperature.



Version: Model 6116-4 I/P Converter.

Supply and evaluation barrier FM/CSA- approved.

For the permissible maximum values for the intrinsically safe circuit see Table 1

For the permissible barrier parameters for the circuit see Table 2

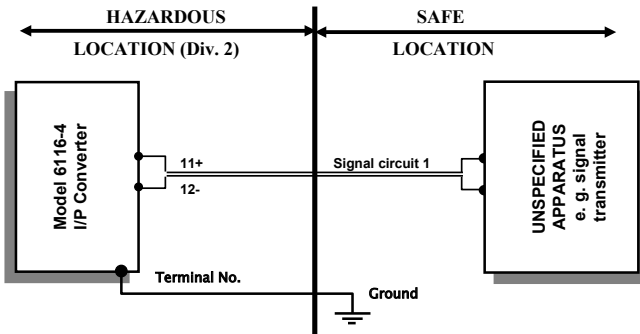
Cable entry M 20 x 1.5 or metal conduit according to drawing No. 1050 – 0539 T or 1050 – 0540 T

FM- approved for hazardous locations

Class I, Division 2, Groups A, B, C, D

Class II Division 2, Groups F + G, Class III

NEMA 4X



Notes:

- 1.) For the maximum values for the circuit see Table 1 and 2.
- 2.) Cable entry only rigid metal conduit according to drawing No. 1050-0539 T and 1050-0540 T
- 3.) The installation shall be in accordance with the National Electrical Code ANSI/NFPA 70





## EU Konformitätserklärung / EU Declaration of Conformity / Déclaration UE de conformité

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller/  
This declaration of conformity is issued under the sole responsibility of the manufacturer/  
La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.  
Für das folgende Produkt / For the following product / Nous certifions que le produit

**i/p-Umformer / i/p-Converter / Convertisseur i/p**  
**Typ/Type/Type 6116**

wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt /  
the conformity with the relevant Union harmonisation legislation is declared with/  
est conforme à la législation d'harmonisation de l'Union applicable selon les normes:

EMC 2014/30/EU

EN 61000-6-2:2005, EN 61000-6-3:2007  
+A1:2011, EN 61326-1:2013

RoHS 2011/65/EU

EN 50581:2012

Hersteller / Manufacturer / Fabricant:

SAMSON AKTIENGESELLSCHAFT  
Weismüllerstraße 3  
D-60314 Frankfurt am Main  
Deutschland/Germany/Allemagne

Frankfurt / Francfort, 2017-07-29

Im Namen des Herstellers/ On behalf of the Manufacturer/ Au nom du fabricant.

Hanno Zager  
Leiter Qualitätssicherung/Head of Quality Management/  
Responsable de l'assurance de la qualité

Dirk Hoffmann  
Zentralabteilungsleiter/Head of Department/Chef du département  
Entwicklungsorganisation/Development Organization

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Für das folgende Produkt / For the following product / Nous certifions que le produit

### i/p-Umformer / i/p-Converter / Convertisseur i/p Typ/Type/Type 6116-1...

entsprechend der EU-Baumusterprüfbescheinigung PTB 02 ATEX 2199 ausgestellt von der/  
according to the EU Type Examination PTB 02 ATEX 2199 issued by/  
établi selon le certificat CE d'essais sur échantillons PTB 02 ATEX 2199 émis par:

Physikalisch Technische Bundesanstalt  
Bundesallee 100  
D-38116 Braunschweig  
Benannte Stelle/Notified Body/Organisme notifié 0102

wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt /  
the conformity with the relevant Union harmonisation legislation is declared with /  
est conforme à la législation d'harmonisation de l'Union applicable selon les normes:

EMC 2014/30/EU	EN 61000-6-2:2005, EN 61000-6-3:2007 +A1:2011, EN 61326-1:2013
Explosion Protection 94/9/EC (bis/to 2016-04-19) Explosion Protection 2014/34/EU (ab/from 2016-04-20)	EN 60079-0:2009, EN 60079-11:2012
RoHS 2011/65/EU	EN 50581:2012

Hersteller / Manufacturer / Fabricant:

SAMSON AKTIENGESELLSCHAFT  
Weismüllerstraße 3  
D-60314 Frankfurt am Main  
Deutschland/Germany/Allemagne

Frankfurt / Francfort, 2017-07-29

Im Namen des Herstellers / On behalf of the Manufacturer / Au nom du fabricant.

*H. Zager*

Hanno Zager  
Leiter Qualitätssicherung/Head of Quality Management/  
Responsable de l'assurance de la qualité

*D. Hoffmann*

Dirk Hoffmann  
Zentralabteilungsleiter/Head of Department/Chef du département  
Entwicklungsorganisation/Development Organization



## EU Konformitätserklärung / EU Declaration of Conformity / Déclaration UE de conformité

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This declaration of conformity is issued under the sole responsibility of the manufacturer /  
La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.  
Für das folgende Produkt / For the following product / Nous certifions que le produit

**i/p-Umformer / i/p-Converter / Convertisseur i/p  
Typ/Type/Type 6116-2...**

entsprechend der EU-Baumusterprüfbescheinigung BVS 14 ATEX E 104 X ausgestellt von der/  
according to the EU Type Examination BVS 14 ATEX E 104 X issued by/  
établi selon le certificat CE d'essais sur échantillons BVS 14 ATEX E104 X émis par:

DEKRA EXAM GmbH  
Dinnendahlstraße 9  
D-44809 Bochum

Benannte Stelle/Notified Body/Organisme notifié 0158

wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt /  
the conformity with the relevant Union harmonisation legislation is declared with /  
est conforme à la législation d'harmonisation de l'Union applicable selon les normes:

EMC 2014/30/EU

EN 61000-6-2:2005, EN 61000-6-3:2007  
+A1:2011, EN 61326-1:2013

Explosion Protection 94/9/EC (bis/to 2016-04-19)

Explosion Protection 2014/34/EU (ab/from 2016-04-20)

EN 60079-0:2012, EN 60079-1:2007

RoHS 2011/65/EU

EN 50581:2012

Hersteller / Manufacturer / Fabricant:

SAMSON AKTIENGESELLSCHAFT  
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D-60314 Frankfurt am Main  
Deutschland/Germany/Allemagne

Frankfurt / Francfort, 2017-07-29

Im Namen des Herstellers/ On behalf of the Manufacturer/ Au nom du fabricant.

Hanno Zager  
Leiter Qualitätssicherung/Head of Quality Management/  
Responsable de l'assurance de la qualité

Dirk Hoffmann  
Zentralabteilungsleiter/Head of Department/Chef du département  
Entwicklungsorganisation/Development Organization

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**EB 6116 EN**



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