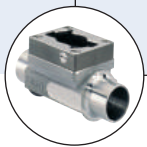


## INLINE Flowmeter for hazardous area II 1 G/D - II 3 GD - I M1



Type SE30 Ex can be combined with...



### Type S030

INLINE sensor fitting  
with PVDF paddle-wheel



### Type S070

Positive displacement  
flowmeter sensor fitting



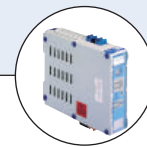
### Type 8025

Universal flow transmitter  
remote version



### Type 8611

PI flow controller on  
Solenoid valve



### Intrinsic safety barrier

with NAMUR input



### PLC

with NAMUR input

- Flowmeter with NAMUR or NPN/PNP output signal
- Mounting, dismounting of electronics by a Quarter-Turn
- Protection-  $\text{Ex}$ : intrinsic safety approvals for use in  
Zone: 0, 1, 2 - Gas (G)  
20, 21, 22 - Dust (D)  
M1, M2

The intrinsic safety flowmeter SE30 Ex for continuous flow measurement is especially designed for use in neutral, slightly aggressive, solid-free liquids, in hazardous environments.

The flowmeter SE30 Ex is made up of an electronic module and a measuring element, either a sensor fitting S030 or a sensor fitting S070, quickly and easily connected together by a Quarter-Turn.

The flowmeter detects the paddle-wheel (S030) or oval gear (S070) rotation, modulates the current of the power supply line according to NAMUR standard or produces an NPN/PNP output signal (depends on model). To operate the NAMUR signal, an intrinsic safety interface should be connected to the flowmeter SE30 Ex. The connection to another device in the safe area depends on the used flowmeter model.

Technical data	
<b>General data</b>	
<b>Compatibility<sup>1a)</sup></b>	with sensor fittings S030 or S070 (see corresponding data sheet)
<b>Materials</b>	
Housing, cover	PC (NPN/PNP version); PPS (NAMUR version) glass fibre reinforced PA, with silicone seal Sensor fitting using restriction see "SAFETY INSTRUCTIONS - NOTICE OF ATEX INSTRUCTIONS", page 6
Cable plug	
Wetted parts materials	
Sensor fitting S030 <sup>1a)</sup>	
Body	Brass, stainless steel, PVDF
Paddle-wheel	PVDF
Axis and bearings	Ceramics
Seal	FKM
Sensor fitting S070 <sup>1a)</sup>	
Body	Aluminium, stainless steel
Rotor	PPS, aluminium, stainless steel
Shaft	Stainless steel
Seal	FKM (EPDM or PTFE on request)
<b>Electrical connection</b>	Cable plug acc. to EN 175301-803 (supplied)
<b>Voltage supply cable</b>	between 0.5 mm <sup>2</sup> and 1.5 mm <sup>2</sup> cross section; max. 50 m length, shielded
<b>Electrical data</b>	
<b>Power supply<sup>1b)</sup></b>	8 - 15 V DC (NAMUR version) 12 - 36 V DC (NPN/PNP version)
<b>Current consumption (with sensor)</b>	max. 7 mA (NAMUR version); 30 mA (NPN/PNP version)
<b>Output</b>	Depends on the device model and application area: - 2-wire current modulation according to Namur (250 Hz max.) - NPN/PNP (100 mA max., 250 Hz max.)
<b>Reversed polarity (of DC)</b>	Protected

1. Refer to the rubric "SAFETY INSTRUCTIONS - NOTICE OF ATEX INSTRUCTIONS", page 6

a) to choose the appropriate sensor fitting for the area of application

b) to choose the supply adapted to the area of application

Complete device data (sensor fitting + electronic module)	
<b>Pipe diameter</b>	DN06 to DN50 (depends on the sensor fitting model)
<b>Measuring range</b> S030 sensor fitting S070 sensor fitting	0.5 to 1200 l/min (velocity 0.3 to 10 m/s) 2 to 350 l/min (viscosity > 5 cps) 3 to 300 l/min (viscosity < 5 cps)
<b>Medium temperature max.</b>	80°C (176°F)
<b>Fluid pressure max.</b> S030 sensor fitting S070 sensor fitting	PN10 (PVDF), PN16 (stainless steel, brass - PN40 on request) PN55 (for DN15-DN25) / PN18 (for DN40-DN50) / PN10 (for flange version)
<b>Viscosity</b> S030 sensor fitting S070 sensor fitting	300 cSt. max / 1% max. pollution 1 Pa.s max (higher on request)
<b>Accuracy</b> S030 + Electronics SE30 Ex Teach-In (via remote transmitter 8025) Standard K-factor S070 + + Electronics SE30 Ex	±0.5% of F.S.* (at 10 m/s) ±(0.5% of F.S. + 2.5% of Reading)* ±0.5% of Reading
<b>Linearity</b>	±0.5% of F.S.* (at 10 m/s)
<b>Repeatability</b> S030 sensor fitting S070 sensor fitting	0.4% of Reading* 0.3% of Reading*
Environment	
<b>Ambient temperature</b>	-15 to +60°C (5°F to 140°F) (operating and storage)
<b>Relative humidity</b>	≤ 80%, without condensation

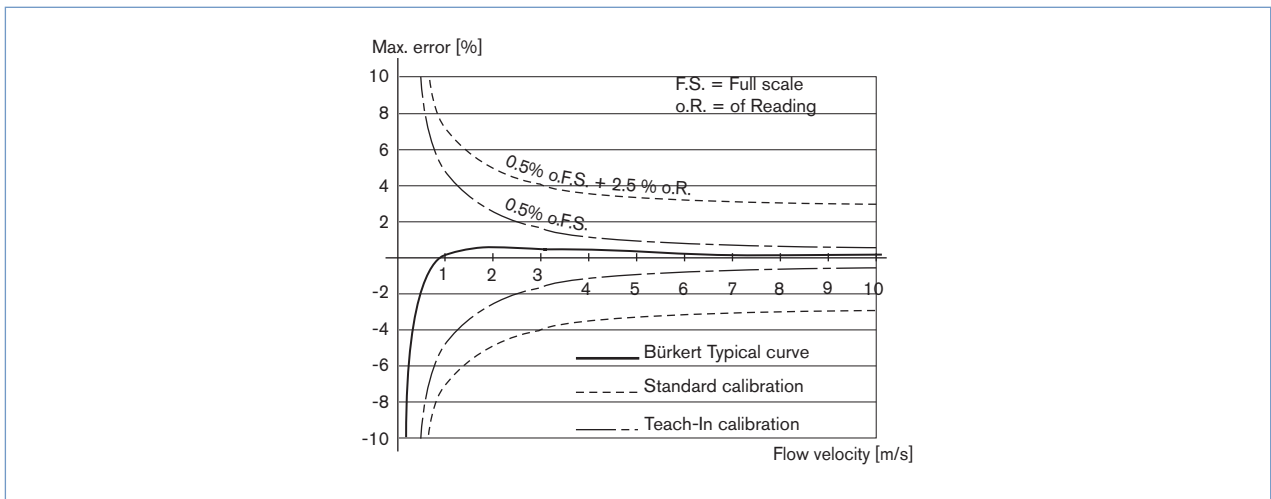
Standards, directives and approvals	
<b>Protection class</b>	IP67 with connector plugged-in and tightened acc. to EN 60529
<b>Standard and directives</b> ATEX  EMC  Pressure (with S030 sensor fitting)  NAMUR	see "SAFETY INSTRUCTIONS - NOTICE OF ATEX INSTRUCTIONS", page 6  EN 61000-6-3 EN 61000-6-2 Complying with article 3 of Chap. 3 from 97/23/CE directive.*  EN 60947-5-6

\* For the 97/23/CE pressure directive, the device can only be used under following conditions (dependent on max. pressure, pipe diameter and fluid).

Type of fluid	Conditions
Fluid group 1, §1.3.a	DN ≤ 25 only
Fluid group 2, §1.3.a	DN ≤ 32 or DN > 32 and PN*DN ≤ 1000
Fluid group 1, §1.3.b	PN*DN ≤ 2000
Fluid group 2, §1.3.b	DN ≤ 200

\* Under reference conditions i.e. measuring fluid = water, ambient and water temperature = 20°C (68°F), applying the minimum inlet and outlet pipe straights, matched inside pipe dimensions.  
F.S. = Full scale (10 m/s)

### Accuracy diagram

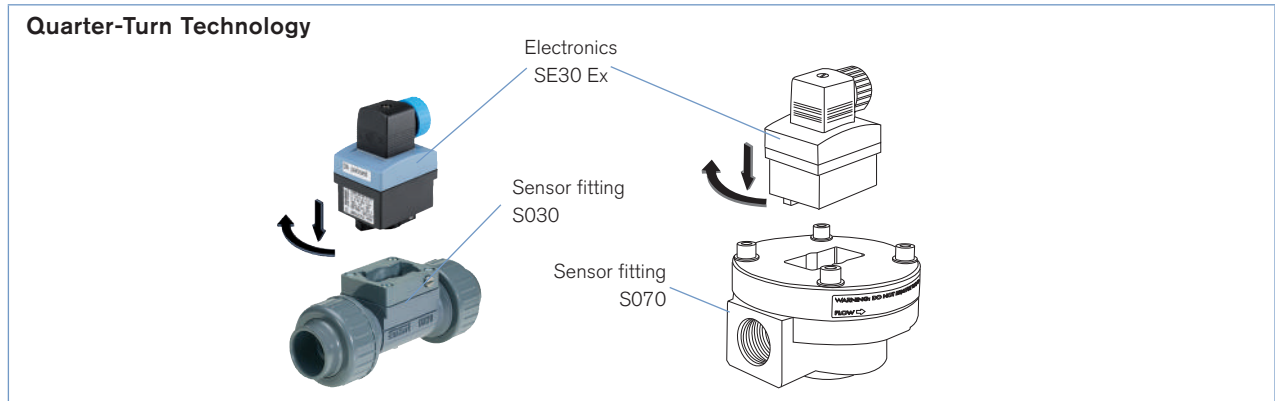


## Design

The flowmeter consists of an electronic module SE30 Ex associated to a sensor fitting S030 or S070 respectively with integrated measurement paddle-wheel or oval gear. This connection is made by means of a Quarter-Turn.

When liquid flows through the pipe, the sensor fitting with paddle-wheel or oval gear is set in rotation modulating the current according to NAMUR standard. The modulated frequency of this signal is proportional to the flow.

This signal is converted, by the connected type NAMUR intrinsic safety barrier, into a frequency signal on its open collector output. The electrical connection of the flowmeter is made via a cable plug EN 175301-803 (Type 2508).



## Installation into S030 sensor fitting

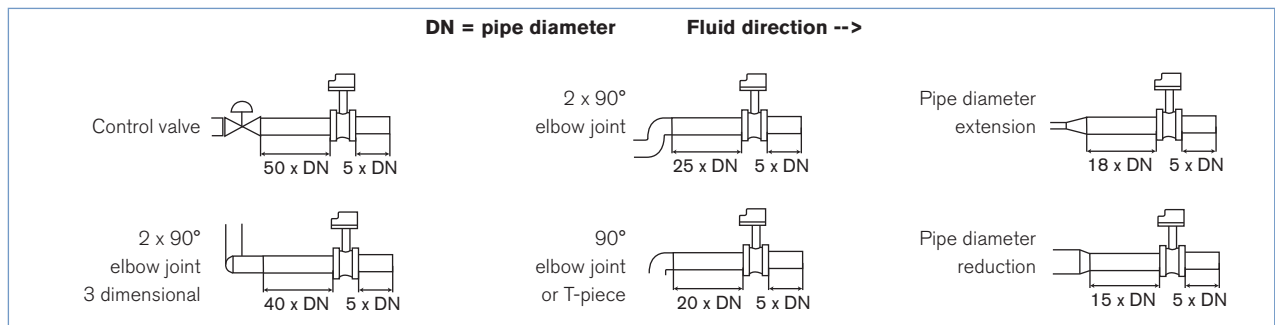


The SE30 Ex electronics can easily be installed into any Bürkert INLINE sensor fitting system S030 with integrated PVDF paddle-wheel.

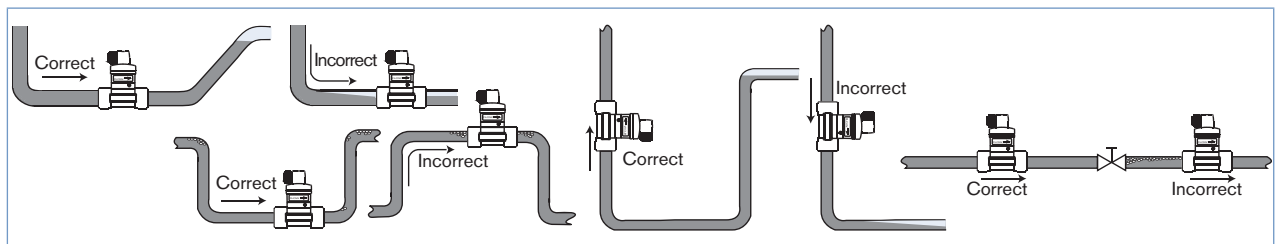
Minimum straight upstream and downstream distances must be observed. According to the pipe's design, necessary distances can be bigger or use a flow conditioner to obtain the best accuracy.

For more information, please refer to EN ISO 5167-1.

EN ISO 5167-1 specifies the straight inlet and outlet distances that must be complied with when installing sensor fittings in pipelines in order to achieve calm flow conditions. The most important layouts that could lead to turbulence in the flow are shown below, together with the associated minimum inlet and outlet distances. These ensure calm, problem-free measurement conditions at the measurement point.



The device can be installed into either horizontal or vertical pipes.













Pressure and temperature ratings must be respected according to the selected sensor fitting material.

The suitable pipe size is selected using the diagram Flow/Velocity/DN.

The device is not designed for gas flow measurement.



Overview of hazardous areas depending on SE30 Ex flowmeter models (according to ATEX)

	Equipment for explosive atmospheres (surface industries) - GROUP II					
	Very high level of protection		High level of protection		Normal level of protection	
	Gas Zone 0 Explosive atmospheres present continuously, long periods or frequently	Dust Zone 20 Explosive atmospheres present continuously, long periods or frequently	Gas Zone 1 Explosive atmospheres are likely to occur	Dust Zone 21 Explosive atmospheres are likely to occur	Gas Zone 2 Explosive atmospheres are unlikely to occur or present only infrequently and for a short period only	Dust Zone 22 Explosive atmospheres are unlikely to occur or present only infrequently and for a short period only
<p>This equipment can be installed in some potentially explosive atmospheres (surface industries or mines depending on the model) and is in compliance with the 94/9/CE directives.</p>						
<p><b>CATEGORY 1</b></p> <p><b>SE30 Ex - Namur II 1 G/D (Item no. 552 901)</b></p> <p>EEx ia IIC T6 - IP6X T80°C associated with PVDF, brass, stainless steel or aluminium sensor fittings</p>	<p>to use with intrinsic safety barrier with Namur input*</p> 	<p>to use with intrinsic safety barrier with Namur input*</p> 	<p>to use with intrinsic safety barrier with Namur input*</p> 	<p>to use with intrinsic safety barrier with Namur input*</p> 	<p>to use with intrinsic safety barrier with Namur input*</p> 	<p>to use with intrinsic safety barrier with Namur input*</p> 
<p><b>CATEGORY 3</b></p> <p><b>SE30 Ex - II 3 GD - NPN/PNP (Item no. 552 353)</b></p> <p>Ex nA IIC T4 Gc Ex tc IIIC T135°C Dc IP6X associated with PVDF, brass, stainless steel or aluminium sensor fittings</p>	<p><b>Not to be used</b></p>	<p><b>Not to be used</b></p>	<p><b>Not to be used</b></p>	<p><b>Not to be used</b></p>	<p>to use with a 12 - 36 V supply source</p>	<p>to use with a 12 - 36 V supply source</p>
	Equipment for explosive atmospheres (Mines) - GROUP I					
	Firedamp mines zone M1 Very high level of protection			Firedamp mines zone M2 High level of protection		
<p><b>CATEGORY 1</b></p> <p><b>SE30 Ex - Namur I M1 (Item no. 553 455)</b></p> <p>EEx ia only associated with brass or stainless steel sensor fittings</p>	<p>to use with intrinsic safety interface with Namur input*</p> 			<p>to use with intrinsic safety interface with Namur input*</p> 		
	<p>and with a mechanical protection cover</p> 			<p>and with a mechanical protection cover</p> 		


\* **Note:** The open circuit voltage for the NAMUR input must be included between 8 and 15 V.

## Safety orders - Notice of ATEX instructions

The appropriate SE30 Ex model is dependent of the installation environment.

### Model SE30 Ex Namur (Item no. 552 901) Group II - Category 1 for potentially explosive zones of gas (0, 1 and 2) and dust (20, 21 and 22)

#### ATEX marking identification and ATEX installation zones

CE 0102  II 1 GD Ex ia IIC T6  
Ex iaD 20 IP6X T80°C  
ambient T: 0°C ≤ Ta ≤ 60°C  
LCIE 04 ATEX 6070 X

#### • Special conditions for a safe use

The device is intrinsic safety certified according to EN 60079-1 - (2007). It may be installed in potentially explosive atmospheres: zones 0, 1 or 2 and zones 20, 21 or 22.

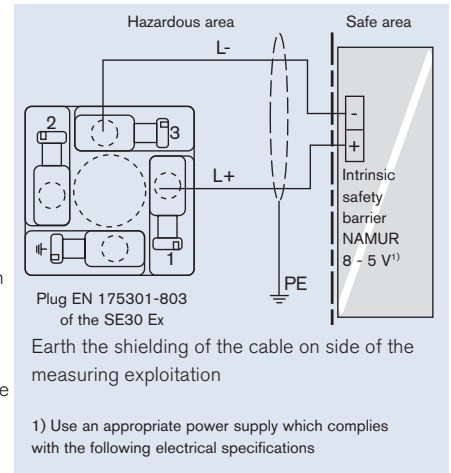
The connector can only be connected to certified intrinsic safety equipment.  
This combination must be compatible with intrinsic safety rules (see electrical safety data in the table under the adjacent connection diagram).

The ambient temperature of use must always be between these limits: from 0 to +60°C.



Compatible mechanical assembly and fluid connections:

**Use PVDF, brass, stainless steel or aluminium sensor fitting only.  
Any other connection is prohibited.**




#### Electrical safety data

<b>Ui (V)</b>	≤ 15 V
<b>Ii (mA)</b>	≤ 50 mA
<b>Pi (mW)</b>	≤ 188 mW
<b>Ci</b>	≤ 1.2 nF
<b>Li</b>	≅ 0

### Model SE30 Ex Namur (Item no. 553 455) Group I - Category 1 for firedamp mines M1

#### • ATEX marking identification and ATEX installation zones

CE 0102  I M1 Ex ia  
ambient T: 0°C ≤ Ta ≤ 60°C  
LCIE 04 ATEX 6070 X

#### • Special conditions for a safe use

The device is intrinsic safety certified for firedamp mines according to EN 50020.  
It may be installed in potentially explosive atmospheres: zone M1.

The connector can only be connected to certified intrinsic safety equipment.  
This combination must be compatible with intrinsic safety rules (see electrical safety data in the table under the adjacent connection diagram).

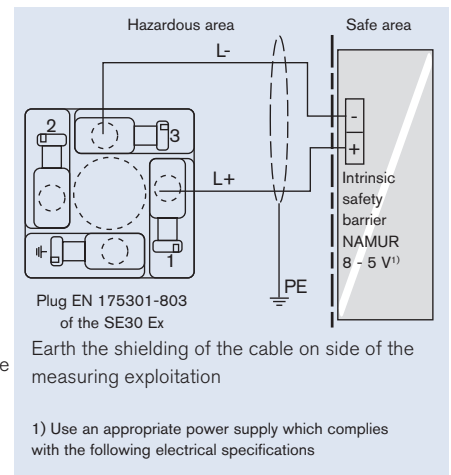
The ambient temperature of use must always be between these limits: from 0 to +60°C



Compatible mechanical assembly and fluid connections:

**Use brass or stainless steel sensor fitting only.  
Any other connection is prohibited.**

The appliance must be protected from a mechanical damage. Mechanical protection with order code 553 519 must be used. This protection is mounted on the flowmeter by using an appropriate bracket (not included in our delivery).




#### Electrical safety data

<b>Ui (V)</b>	≤ 15 V
<b>Ii (mA)</b>	≤ 50 mA
<b>Pi (mW)</b>	≤ 188 mW
<b>Ci</b>	≤ 1.2 nF
<b>Li</b>	≅ 0

## Safety orders - Notice of ATEX instructions

### Model SE30 Ex NPN/PNP (Item no. 552 353) Group II - Category 3 for potentially explosive zones of gas (2) and dust (22)

#### • ATEX marking identification and ATEX installation zones

CE 0102  II 3 GD  
 Ex nA IIC T4 Gc  
 Ex tc IIIC T135°C Dc IP6X  
 ambient T: 0°C ≤ Ta ≤ 50°C  
 INERIS 04 ATEX 3015X

#### • Special conditions for a safe use

The device is ATEX certified according to EN 60079-0, EN 60079-15 and EN 60079-31.  
 It may be installed in potentially explosive atmospheres: zones 2 or 22.

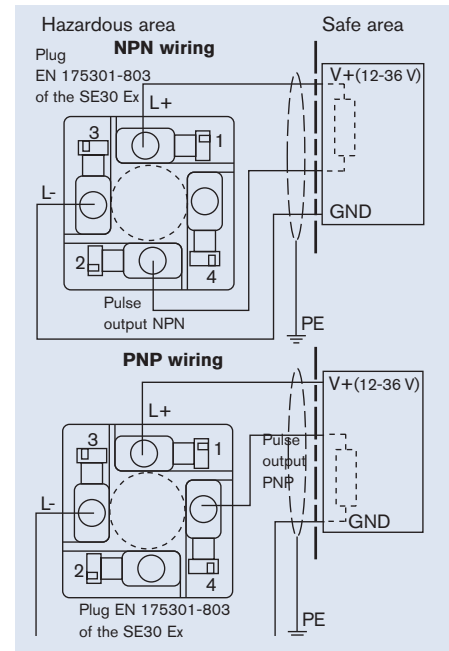
The connector may be connected to a 12 - 36 V supply source.

The ambient temperature of use must always be between these limits: from 0 to +50°C.



Compatible mechanical assembly and fluid connections:

**PVDF, brass, stainless steel, aluminium sensor fittings can be used.  
 Any other connection is prohibited.**

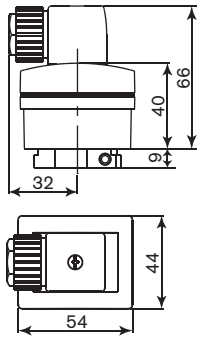


#### Electrical safety data on power supply line (L+/L-)

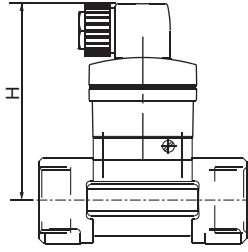
<b>U max.</b>	36 V
<b>I max.</b>	30 mA
<b>P max.</b>	108 mW

## Dimensions [mm]

## Electronics SE30 Ex

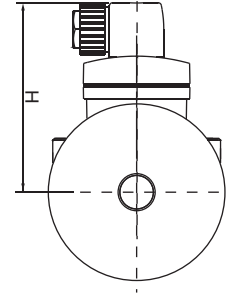


## Mounted on S030 sensor fitting



DN	H
06	95.5
08	95.5
15	100.5
20	98.0
25	98.0
32	102.0
40	105.5
50	112.0

## Mounted on S070 sensor fitting



Orifice	H
15*	101
25	116
40	133
50	151

\* Only with threaded connection

## Ordering chart - flowmeter Type SE30 Ex for sensor fitting S030 or S070 (has to be ordered separately)

Specifications	Voltage supply	Outputs	Electrical connection	Item no.
SE30 Ex - Namur II 1 G/D for explosive gas and dust environments: zones 0, 1 or 2 and 20, 21 or 22	8 - 15 V DC - via an intrinsic safety barrier with NAMUR input*	Namur current modulation - 2-wire	1 cable plug EN 175301-803	552 901
SE30 Ex - II 3 GD for explosive gas and dust environments: zones 2 or 22	12 - 36 V DC	NPN / PNP	1 cable plug EN 175301-803	552 353
SE30 Ex - Namur IM 1 for fiery mines	8 - 15 V DC - via an intrinsic safety barrier with NAMUR input*	Namur current modulation - 2-wire	1 cable plug EN 175301-803	553 455

\* The open circuit voltage for the NAMUR input must be included between 8 and 15 V.

## Ordering chart - spare parts for flowmeter Type SE30 Ex (has to be ordered separately)

Specifications	Item no.
Cable plug EN 175301-803 with blue cable gland and silicone seal (Type 2508)	167 526
Mechanical protection in stainless steel for mining application (80 x 80 x 80)	553 519



## Safety barrier



- 2 or 4 channels, intrinsic safety digital inputs: proximity detectors NAMUR, contacts...
- Rail mount on hat profile 35 mm
- All connections by removable screw terminals

Specifications	
<b>Digital inputs</b>	Each of the 4 x intrinsic safety inputs can be configured independently for a contact or a proximity detector NAMUR as per DIN 19234.
<b>Intrinsic safety inputs</b>	Proximity detector NAMUR as per DIN 19234 or free potential contacts, relays, pressure or temperature switches or push buttons in hazardous area.
<b>Non intrinsic safety recopy outputs</b>	According to the type of sensor and the chosen logic: a green LED on the front panel displays a free-potential contact for each channel without common wire.  Collector cut-off power: 15 V - 60 mA - 0.9 VA - 350 Hz
<b>Selection of the sensor type</b>	Inductive / capacitive intrinsic safety certified NAMUR proximity detector or free-potential contacts.
<b>Selection of the logic</b>	By a mini-DIP choice of active proximity switches or when contact is NO (Normally Open) or NC (Normally Closed).
<b>Fault detector</b>	For all inputs configured as NAMUR, all models are provided with fault detector (broken line or short-circuit). In faulty case, the green front LED switches off, the contact of the defective channel opens and the red LED corresponding to the defective channel switches on. Other channels are not affected.
<b>Power supply</b>	24 V DC $\pm 10\%$ 230 V AC $\pm 10\%$ 1 front panel yellow LED is "ON" when supply is active
<b>Consumption</b>	5 VA

Specifications (continued)	
<b>Connections</b>	All connections by removable screw terminals. Supply distribution by means of a flat cable from one unit to the next one.
<b>Classification for explosive areas</b>	Intrinsic safety associated apparatus. It must be installed in safe area and connected to materials installed in zone 0, 1 or 2 - Gas (G) or in zone 20, 21 or 22 - Dust (D) Classification according to ATEX 94/9/CE: $\text{Ex}$ I/II (M1)/(1) G/D [EEx ia] IIC Safety parameters see EC-type certificate LCIE 00ATEX 6034X
<b>Ambient Temperature</b>	Operating: -20 to +60°C Storage: -20 to +50°C (recommended) -40 to +80°C
<b>Dimensional and mechanical</b>	Housing for symmetrical DIN rail (hat profile 35 mm as per standard NFC63015 / EN50022) - Depth: 120 mm ; Width on rail 29.5 mm ; - Height: 90 mm - 145 mm overall including space for cables. Minimal distance between rails: 180 mm.
<b>Installations conditions</b>	Mounting on DIN rail: must take into account thermal dissipation and risk of overheating generated by housings installed side by side. In case of a high concentration inherent safety barrier, we recommend to leave a free space of 10 mm between each group of 8 units (horizontal rail) and between each group of 4 units (vertical rail).  Mounting inside a cabinet: It is recommended to close the electrical cabinet and to ensure a circulation of fresh air even by means of an air conditioner to keep the inside temperature at the level compatible with the recommended operating temperature among the units.

## Ordering chart intrinsic safety barrier

Classifications for explosive areas	Voltage supply	Outputs	Number of channels	Item no.
ATEX 94/9/CE $\text{Ex}$ I/II (M1)/(1) G/D [EEx ia] IIC	24 V DC	open collector, 15 V, 60 mA	2, with Namur input	553 456
		open collector, 15 V, 60 mA	4, with Namur input	553 457
	230 V AC	open collector, 15 V, 60 mA	2, with Namur input	553 458
		open collector, 15 V, 60 mA	4, with Namur input	553 459

Interconnection possibilities with the flowmeter Type SE30 Ex

SE30 Ex with marking II 1 G/D and I M1

Potentially Explosive Zone



**Type SE30 Ex**  
Electronics + S030



**Type SE30 Ex**  
Electronics + S070

Intrinsic safety barrier with Namur input



**Type 8025 -**  
Batch transmitter  
wall-mounted or panel-mounted version



**Type 8032 -**  
Flow transmitter  
wall-mounted version



**Type 8025 -**  
Universal transmitter  
wall-mounted or panel-mounted version



PLC

SE30 Ex with marking II 3 GD

Potentially Explosive Zone



**Type SE30 Ex**  
Electronics + S030



**Type SE30 Ex**  
Electronics + S070



**Type 8025 -**  
Batch transmitter  
wall-mounted or panel-mounted version



**Type 8032 -**  
Flow transmitter  
wall-mounted version



**Type 8025 -**  
Universal transmitter  
wall-mounted or panel-mounted version



PLC