

Explosion-Proof Certification Manual

S451/S453 Ex

**Thermal Mass Flow Meter
for Heavy Duty and Ex Applications**



Revision: 2024-1

Last modifications: October, 2024



This document contains important information for the installation and operation of the flow meter in explosive environments. Please read the instructions carefully and follow the instructions stated in this manual.

In case of any different specifications between this Ex Documentation and the Instruction Manual, the specification in the Ex documentation is valid!

1 Warnings



Important information

The installation and the supply connection must be done in compliance with national regulations for devices used in potentially explosive atmospheres.

The compliance with all of the technical data of the device is mandatory (see also nameplate).

Only qualified specialists who are trained in Ex-related issues are allowed to install, connect the electricity and maintain the device.

The device should be opened in a non-explosive atmosphere or in a de-energized state where a delay of 5 minutes after power down has to be ensured.

No connection of service-kit or any other devices are permitted if the atmosphere is considered to be explosive.

When opening the enclosure make sure that no dust or moisture enters into the casing.

Ensure that cable entries are tightly sealed.

Materials which come in contact with the medium are of stainless steel 1.4404 / 316L and of sealing rubber NBR.



Special attention

The device must be connected to the potential equalization system. Please refer to section 2.3 Potential Equalization.

**Special conditions requirements**

- Repairs of the flameproof joints may only be made by the manufacturer or on behalf of the manufacturer and on his own responsibility. Repair in compliance with the values in IEC 60079-1 is not accepted.
- The equipment has been assessed with an U_m of 30V DC and shall be installed in accordance with the latest installation requirements of IEC 60079-14 for intrinsically safe equipment for EPL "Gb".
- The end user shall make sure the medium temperature range has no significant influence on the ambient temperature so that may cause a failure of explosion-proof performance of the equipment.
- The equipment must only be wiped with a damp cloth.
- The quality of the fasteners of the metal head must be at least A2-70.

2 Installation

2.1 Important Notes

To all terminals of the flow meter, only devices with ratings $U_m \leq 30 \text{ V DC}$ and $I_m \leq 500 \text{ mA}$ are allowed to be connected.

The flow meter can only be used in the permitted temperature class.

For ambient temperatures below -20°C , cables, drain plugs, cable glands and cable entries must be suitable and certified.

Cables and pipe entries must be certified (Ex d IIC) and must be suitable for operating temperatures of up to 105°C . When using pipe entries, the associated sealing equipment must be fitted directly at the housing.

The cable entries and openings not used must be sealed tight with suitable components.

The rotation of the display is only allowed during installation and in a non explosive environment! Before rotating the local display make sure that the device has been powered off for at least 5 minutes.

The display version of S453 can be rotated 270° in both directions. For this purpose the nut at the top of the shaft has to be opened fully, then pull up the metal casing and rotate it to the desired direction. It can be rotated in 90° steps in both directions. A metal pin locks the position. When the desired position is achieved, press down the metal casing onto the shaft so that the metal pin can insert into the position hole. Tighten up the nut.

2.2 Temperature Range

The minimum temperature for fluid is -30°C and for ambient is -40°C .

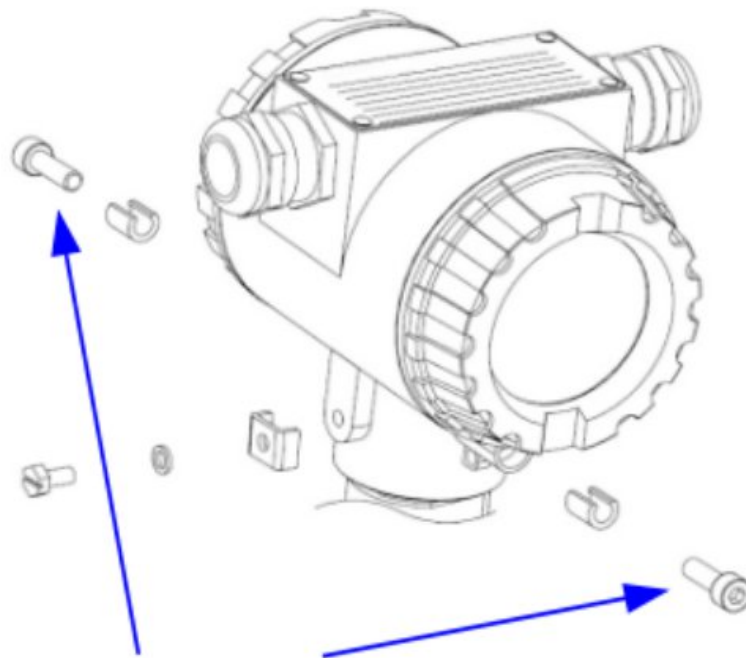
2.3 Potential Equalization

For the safety of the operation in the explosive environment the potential equalization is very important. The device has a screw terminal outside the enclosure to connect the earth signal.

The device can also be integrated to the equalization through the pipeline as long the earth connection is conform to regulations.

2.4 Front and Back Cover Security Seal

The front and back cover of the instrument are secured with a screw separately to avoid the opening of the covers by unauthorized persons. Please ensure that both security screws are tighten up after finishing the installation!



Security screws at back and front covers

2.5 Cable Entries

The cable glands/entries must be secured to prevent working loose and the seals have to be installed immediately adjacent to the casing.

Ensure that the cable entries and cable glands are leak-tight!

The cables used must be manufactured in a way that the build-up of electrostatic charges are avoided!

Only following cable glands and blind plug from Hummel are allowed to be used and can be ordered at SUTO:

	Hummel	Description	Thread size	Cable entry
	Order No.			
Gland	1.622.2000.51	HSK-M-Ex-d / Metr.	M20 x 1.5	7 - 12 mm
Blind plug	1.877.2000.50	V-Ms-Ex-d / Metr.	M20 x 1.5	

Cable outer diameter must be between 7.0 ... 12 mm!

2.6 Fuse

The power supply for the flow meter needs to have a fuse with following specification:

Voltage 16 to 30 VDC, fuse 0.5 A slow blow (according to IEC 127)

3 Examination Certificate, Certificates of Conformity

The system meets the fundamental health and safety requirements for the design and construction of devices and protective systems intended for use in potentially explosive atmospheres in accordance with appendix II of directive 94/9/EC.

4 Name Plate

4.1 IECEx

○ S453 Ex IECEx	SUTO ITEC (China) Co., Ltd. No. 1001 Zhongshanyuan Rd., Nanshan, Shenzhen, PRC		 www.suto-itec.com
Item number	: S695 4530	IECEx NEP 23.0035X	
Serial number	: XXXX XXXX	Ex db ib IIC T4 Gb	
Supply	: 16 ... 30 VDC, 5 W	Ex ib tb IIIC T135°C Db IP65	
Pmed	: 0 ... 4.0 MPa(g)	 	
Tmed	: -30 ... +90°C (T4)		
Tamb	: -40 ... +55°C		
Caution! - Please read instruction manual before working on device. - The device should be opened in a non-explosive atmosphere. - Potential electrostatic charging hazard.			

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Item number	: S695 4530	IECEx NEP 23.0035X	
Serial number	: XXXX XXXX	Ex db ib IIC T4 Gb	
Supply	: 16 ... 30 VDC, 5 W	Ex ib tb IIIC T135°C Db IP65	
Pmed	: 0 ... 1.6 MPa(g)	 	
Tmed	: -30 ... +90°C (T4)		
Tamb	: -40 ... +55°C		
Caution! - Please read instruction manual before working on device. - The device should be opened in a non-explosive atmosphere. - Potential electrostatic charging hazard.			

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	Item number : S695 4511 Serial number : XXXX XXXX Supply : 16 ... 30 VDC, 5 W Pmed : 0 ... 1.6 MPa(g) Tmed : -30 ... +90°C (T4) Tamb : -40 ... +55°C	IECEX NEP 23.0035X Ex db ib IIC T4 Gb Ex ib tb IIIC T135°C Db IP65 FC CE		
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	Item number : S695 4510 Serial number : XXXX XXXX Supply : 16 ... 30 VDC, 5 W Pmed : 0 ... 1.6 MPa(g) Tmed : -30 ... +90°C (T4) Tamb : -40 ... +55°C	IECEX NEP 23.0035X Ex db ib IIC T4 Gb Ex ib tb IIIC T135°C Db IP65 FC CE		
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4.2 ATEX

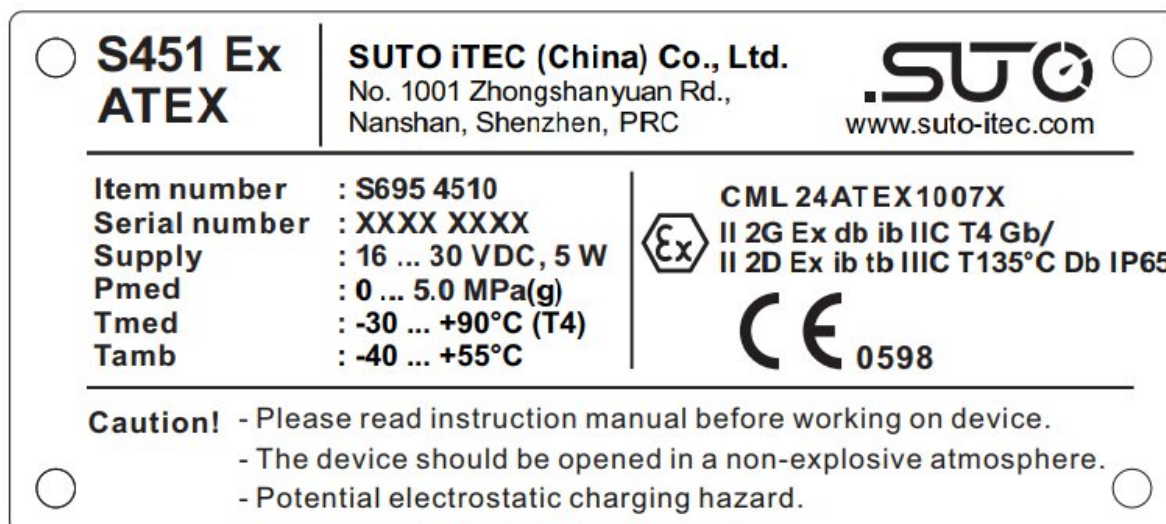
○ S453 Ex ATEX	SUTO ITEC (China) Co., Ltd. No. 1001 Zhongshanyuan Rd., Nanshan, Shenzhen, PRC		SUTO www.suto-itec.com
Item number	: S695 4530	CML 24ATEX1007X	
Serial number	: XXXX XXXX		
Supply	: 16 ... 30 VDC, 5 W	CE 0598	
Pmed	: 0 ... 4.0 MPa(g)		
Tmed	: -30 ... +90°C (T4)		
Tamb	: -40 ... +55°C		
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Item number	: S695 4530	CML 24ATEX1007X	
Serial number	: XXXX XXXX		
Supply	: 16 ... 30 VDC, 5 W	CE 0598	
Pmed	: 0 ... 1.6 MPa(g)		
Tmed	: -30 ... +90°C (T4)		
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Item number : S695 4511 Serial number : XXXX XXXX Supply : 16 ... 30 VDC, 5 W Pmed : 0 ... 1.6 MPa(g) Tmed : -30 ... +90°C (T4) Tamb : -40 ... +55°C		 CML 24ATEX1007X II 2G Ex db ib IIC T4 Gb/ II 2D Ex ib tb IIIC T135°C Db IP65  0598		
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See Appendix - Name Plate Size for the size information of name plates. Each name plate is in the same size.

5 Intrinsic Safety Ratings and Parameters

Electrical parameters supply and signal circuit in type of protection intrinsic safety Ex ib IIC:

- Um: 30V DC
- Max Input power: 5 W
- Max available short circuit current: 1.5 A

6 Other Technical Information

Since this manual only contains ex-relevant information please refer to the instruction manual of S451 and S453 for technical data and further information.

7 Used Standards

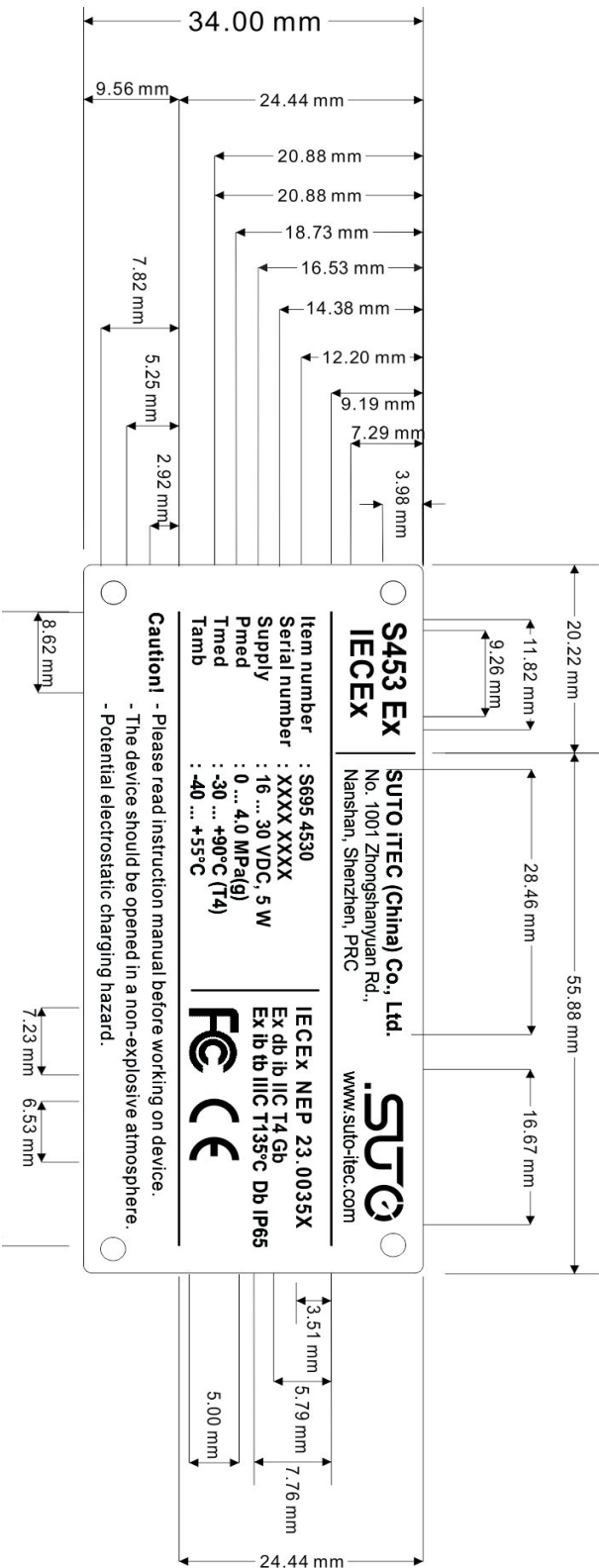
ATEX:

EN IEC 60079-0:2018
 EN 60079-1:2014
 EN 60079-11:2012
 EN 60079-31:2022

IECEx:

IEC 60079-0:2017
 IEC 60079-1:2014
 IEC 60079-11:2011
 IEC 60079-31:2022

8 Appendix - Name Plate Size



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