Safety Instructions
Soliphant M
FTM50, FTM51, FTM52

Ex d or Ex de IIC T6 Ga/Gb, Gb (FTM50)
Ex d or Ex de [ia Ga] IIC T6 Ga/Gb, Gb (FTM51/52)
Ex ta IIIC T80°C T_{500} 130°C Da (FTM50/51)
Ex ta [ia Da] IIIC T80°C T_{500} 130°C Da (FTM52)
Ex ta/tb IIIC T90°C Da/Db (FTM50/51)
Ex ta/tb [ia Da] IIIC T90°C Da/Db (FTM52)

IECEx DEK 13.0088X

Document: XA00633F-A
Safety instructions for electrical apparatus for explosion-hazardous areas

Endress+Hauser
People for Process Automation

Soliphant M
FTM50, FTM51, FTM52

english

Associated Documentation

This document is an integral part of the following Operating Instructions:
KA00229F/00, KA00230F/00

The Operating Instructions which are supplied and correspond to the device type apply.

Supplementary Documentation

Explosion-protection brochure:
CP00021Z/11

Designation

Explanation of the labelling and type of protection can be found in the explosion protection brochure.

Designation according to IECEx Equipment protection level (EPL)

Ga/Gb
Gb

Designation of explosion protection

FTM50 **Ex d IIC T6...T2 Ga/Gb**
Ex d IIC T6...T3/T2 Gb
Ex de IIC T6...T2 Ga/Gb
Ex de IIC T6...T3/T2 Gb

FTM51 **Ex d [ia Ga] IIC T6...T2 Ga/Gb**
Ex d [ia Ga] IIC T6...T3/T2 Gb
Ex de [ia Ga] IIC T6...T2 Ga/Gb
Ex de [ia Ga] IIC T6...T3/T2 Gb

FTM52 **Ex d [ia Ga] IIC T6 Ga/Gb**
Ex d [ia Ga] IIC T6 Gb
Ex de [ia Ga] IIC T6 Ga/Gb
Ex de [ia Ga] IIC T6 Gb

Designation according to IECEx Equipment protection level (EPL)

Da
Da/Db

Designation of explosion protection

FTM50 **Ex ta IIIC T80°C T_{500} 130°C Da**
Ex ta/tb IIIC T90°C Da/Db

FTM51 **Ex ta IIIC T80°C T_{500} 130°C Da**
Ex ta/tb IIIC T90°C Da/Db

FTM52 **Ex ta [ia Da] IIIC T80°C T_{500} 130°C Da**
Ex ta/tb [ia Da] IIIC T90°C Da/Db

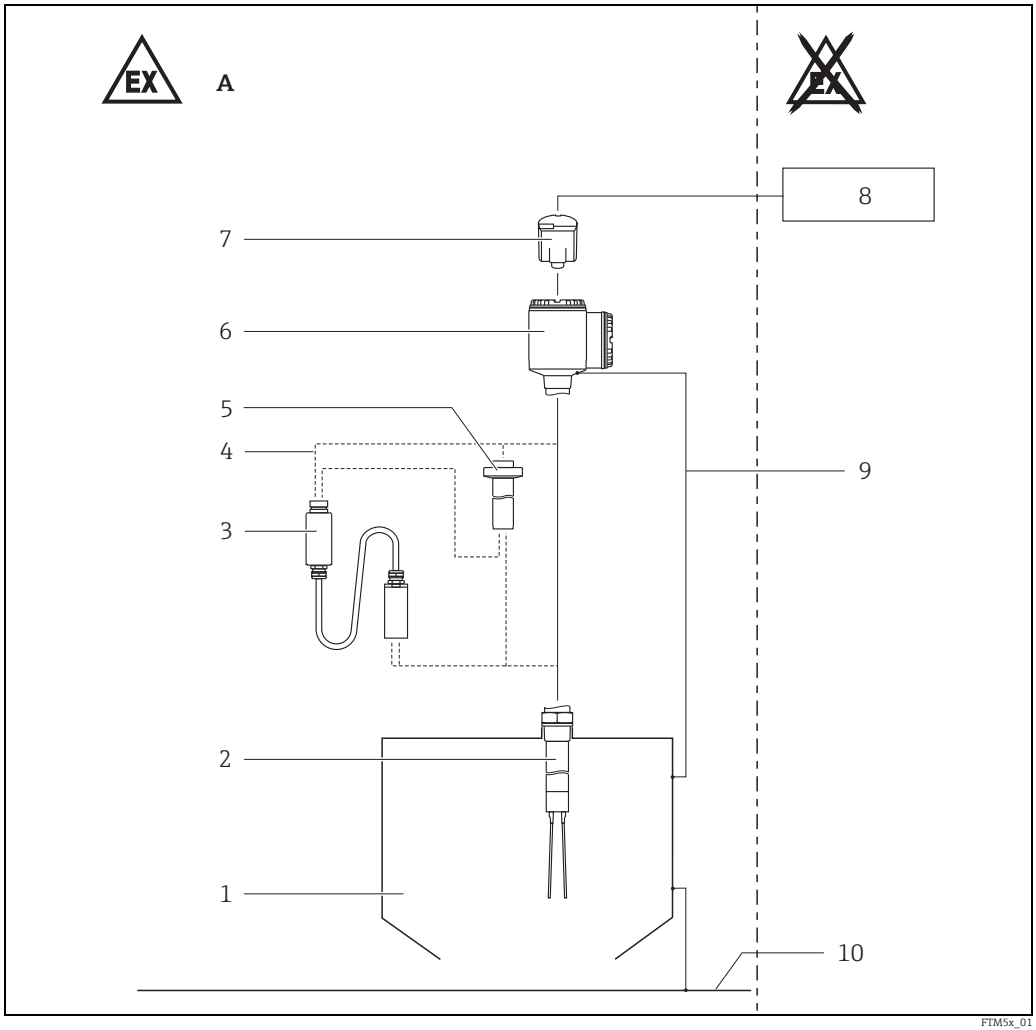
Applied standards

IEC 60079-0 :2011
IEC 60079-1 :2007
IEC 60079-7 :2006
IEC 60079-11 :2011
IEC 60079-26 :2006
IEC 60079-31 :2008

Safety instructions: General

- Do not open the connection or electronics compartments under voltage in an explosive atmosphere.
- Waiting time before opening the electronics compartment after switching off the power supply: 17 min.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. housing, sensor element, special varnishing , attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)

Safety instructions: Installation



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A *Zone 1, Zone 20, Zone 21*

1 *Tank, hazardous area Zone 0, Zone 1, Zone 20*
2 *Version:*
- *FTM50*
- *FTM51*
- *FTM52*

3 *Separate installation (optional)*
4 *[Ex ia] circuit*
5 *Temperature spacer (optional at 150 °C)*
6 *Housing:*
- *F13, Aluminium (Ex d only)*
- *F27, Stainless steel (Ex d only)*
- *T13, Aluminium (Ex d, Ex de) with separate connection compartment*

7 *Electronic insert:*
- *FEM51*
- *FEM52*
- *FEM54*
- *FEM55*

8 *Supply unit*
9 *Potential equalization*
10 *Local potential equalization*

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations (e.g. IEC 60079-14).
- Pay attention to the maximum process conditions according to the manufacturer's Operating Instructions. At high medium temperatures: note flange pressure load capacity as a factor of temperature.
- Connect the device using suitable cable and wire entries* or using piping systems of protection type "Pressure-tight Enclosure (Ex d)". *For selection criteria refer to IEC 60079.
- To maintain the ingress protection IP66/67 of the housing, install the housing cover and cable glands correctly. Close unused entry glands with approved (Ex d) sealing plugs.
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Support extension tube of Soliphant M FTM51 if a dynamic load is expected.
- Install the device to exclude impact and friction sparks on the aluminium housing.
- Only install the devices in media for which the wetted materials have sufficient durability; e.g. process connection seal (→ Technical Information TI00392F).
- Use a process connection seal that meets the materials compatibility and temperature requirements.
- When connecting the cables, ensure there is adequate strain relief at place of installation.
- Protect the connecting cable between the separate housing and the level sensor from tension and friction (e.g. due to electrostatic charge from medium flow).

Safety instructions: Zone 0/1

- No danger of ignition arises from the sensor parts of Soliphant M FTM50 and FTM51 approved for Zone 0 if they are operated under non-atmospheric pressures and temperatures.
  Permissible medium temperatures for operation in accordance with manufacturer's specifications: dependent on ambient temperature; → 🖹 5, "Temperature tables".
- Permissible pressures for operation in accordance with manufacturer's specifications: pe = −1 bar...+25 bar, dependent on process connection; → manufacturer's Operating Instructions.

Temperature tables

Compact version

FTM50	Type of protection	Ambient temperature: Housing	Process temperature
	Ex d IIC T6...T2 Ga/Gb, Gb Ex de IIC T6...T2 Ga/Gb, Gb	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C	−50 °C ≤ Tp ≤ +230 °C −50 °C ≤ Tp ≤ +280 °C
	Ex d IIC T6...T3 Gb Ex de IIC T6...T3 Gb	FEM54: −50 °C ≤ Ta ≤ +60 °C	−50 °C ≤ Tp ≤ +150 °C
	Ex ta IIIC T80°C T_{500} 130°C Da*1 Ex ta/tb IIIC T90°C Da/Db*2		

FTM51	Type of protection	Ambient temperature: Housing	Process temperature
	Ex d [ia Ga] IIC T6...T2 Ga/Gb, Gb Ex de [ia Ga] IIC T6...T2 Ga/Gb, Gb	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C	−50 °C ≤ Tp ≤ +230 °C −50 °C ≤ Tp ≤ +280 °C
	Ex d [ia Ga] IIC T6...T3 Gb Ex de [ia Ga] IIC T6...T3 Gb	FEM54: −50 °C ≤ Ta ≤ +60 °C	−50 °C ≤ Tp ≤ +150 °C
	Ex ta IIIC T80°C T_{500} 130°C Da*1 Ex ta/tb IIIC T90°C Da/Db*2		

FTM52	Type of protection	Ambient temperature: Housing	Process temperature
	Ex d [ia Ga] IIC T6 Ga/Gb, Gb Ex de [ia Ga] IIC T6 Ga/Gb, Gb	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C	−50 °C ≤ Tp ≤ + 80 °C
	Ex ta [ia Da] IIIC T80°C T_{500} 130°C Da*1 Ex ta/tb [ia Da] IIIC T90°C Da/Db*2	FEM54: −50 °C ≤ Ta ≤ +60 °C	

*1 FEM55
*2 FEM51/52/54/55

Version with separate housing

FTM50, FTM51	Type of protection	Ambient temperature: Housing	Process temperature
Housing	Ex d [ia Ga] IIC T6 Gb Ex d [ia Da] IIC T6 Gb Ex de [ia Ga] IIC T6 Gb Ex de [ia Da] IIC T6 Gb	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C FEM54: −50 °C ≤ Ta ≤ +60 °C	−50 °C ≤ Tp ≤ +150 °C
Sensor	Ex ia IIC T6...T2 Ga/Gb Ex ia IIC T6...T3 Gb	−50 °C ≤ Ta ≤ +120 °C	−50 °C ≤ Tp ≤ +230 °C −50 °C ≤ Tp ≤ +280 °C
Housing	Ex ta [ia IIC Ga] IIIC T80°C T_{500} 130°C Da*[1] Ex ta [ia Da] IIIC T80°C T_{500} 130°C Da*[1]	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C FEM54: −50 °C ≤ Ta ≤ +60 °C	−50 °C ≤ Tp ≤ +150 °C
Sensor	Ex ia IIIC T*°C +10K Da	−50 °C ≤ Ta ≤ +120 °C	

FTM52	Type of protection	Ambient temperature: Housing	Process temperature
Housing	Ex d [ia Ga] IIC T6 Gb Ex d [ia Da] IIC T6 Gb Ex de [ia Ga] IIC T6 Gb Ex de [ia Da] IIC T6 Gb	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C FEM54: −50 °C ≤ Ta ≤ +60 °C	−50 °C ≤ Tp ≤ + 80 °C
Sensor	Ex ia IIC T6...T2 Ga/Gb Ex ia IIC T6...T3 Gb	−50 °C ≤ Ta ≤ + 80 °C	
Housing	Ex ta [ia IIC Ga] IIIC T80°C T_{500} 130°C Da*[1] Ex ta [ia Da] IIIC T80°C T_{500} 130°C Da*[1]	FEM51/52/55: −50 °C ≤ Ta ≤ +70 °C FEM54: −50 °C ≤ Ta ≤ +60 °C	
Sensor	Ex ia IIIC T*°C +10K Da	−50 °C ≤ Ta ≤ + 80 °C	

*[1] FEM55
* depending on process temperature

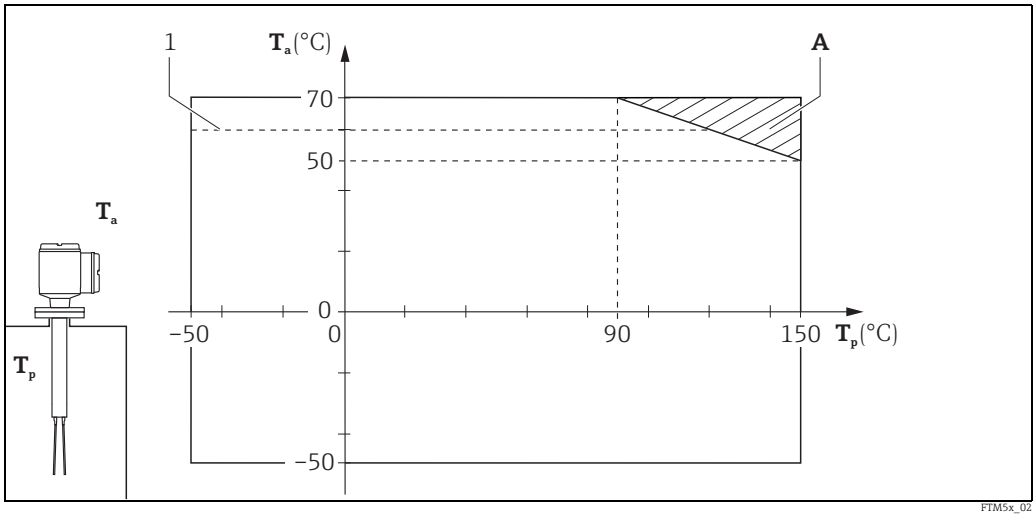
Assignment of the ambient and process temperatures to the temperature classes:

FTM50, FTM51 / version	Temperature class	Fluid temperature Tp (process), (sensor)	Ambient temperature Ta (ambient), (electronics)
150 °C, 230 °C, 280 °C	T6	−50 °C... + 85 °C	−50 °C...+ 70 °C
150 °C, 230 °C, 280 °C	T5	−50 °C... +100 °C	→ temperature graph
150 °C, 230 °C, 280 °C	T4	−50 °C... +135 °C	
150 °C 230 °C, 280 °C	T3 T3	−50 °C... +150 °C −50 °C... +200 °C	
230 °C, 280 °C	T2	−50 °C... +230 °C/+280 °C	

FTM52 / version	Temperature class	Fluid temperature Tp (process), (sensor)	Ambient temperature Ta (ambient), (electronics)
80 °C	T6	−40 °C... + 80 °C	−50 °C...+ 70 °C

Compact version

FTM50, FTM51



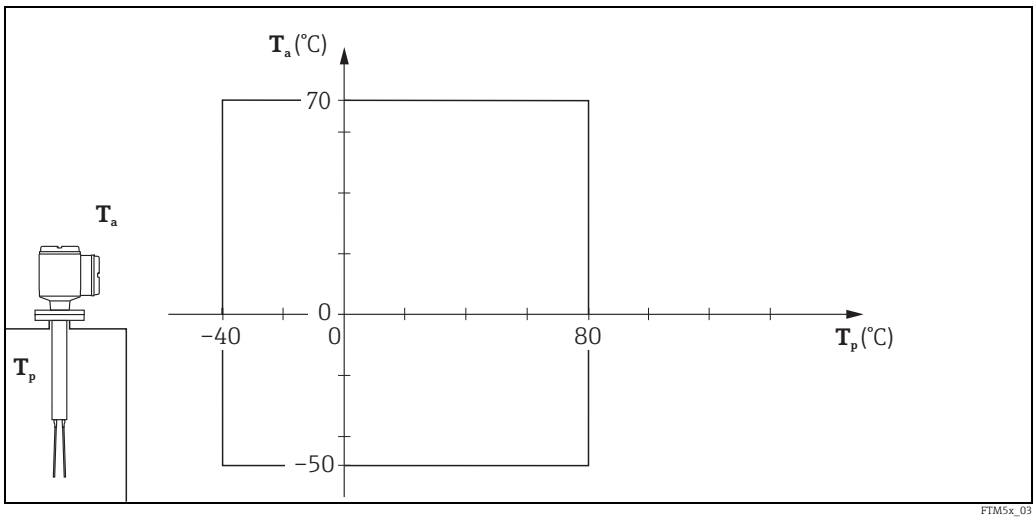
2

T_a *Ambient temperature*
T_p *Process temperature*

A *Additional temperature range for sensors with temperature spacer*

1 *T_a for FEM54: −50...+60 °C*

FTM52

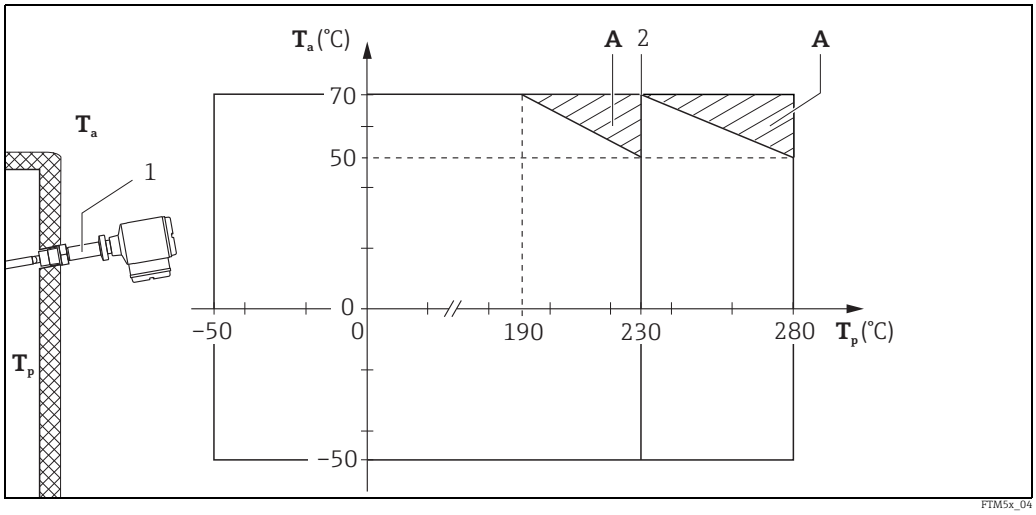


3

T_a *Ambient temperature*
T_p *Process temperature*

High temperature version

only FTM50, FTM51



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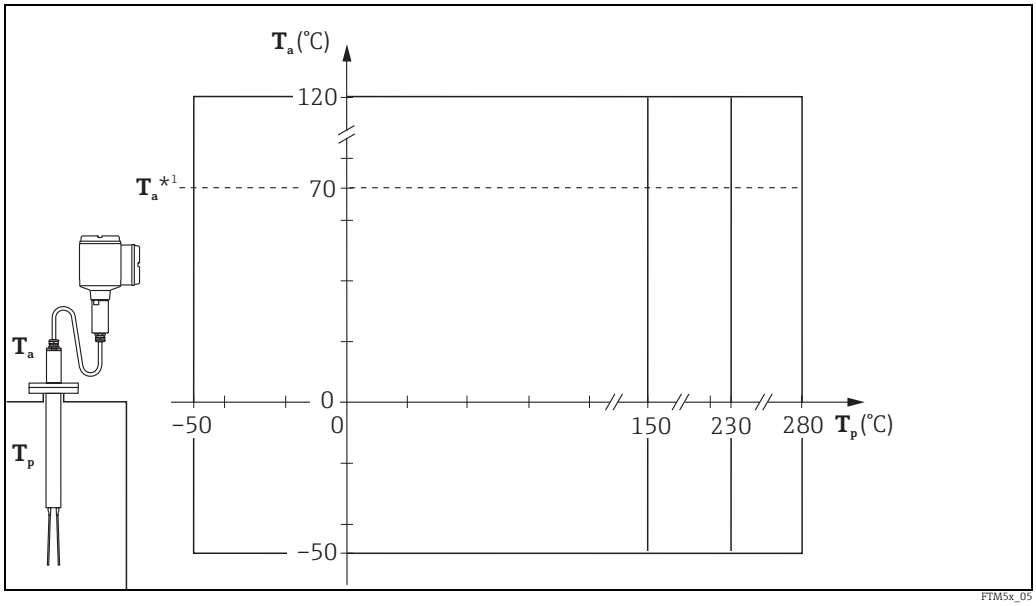
T_a *Ambient temperature*
T_p *Process temperature*

A *Additionally utilizable temperature range when using the temperature spacer outside the insulation*

1 *Temperature spacer outside the insulation*
2 *Antistick coating possible up to max. 230 °C*

Version with separate housing

FTM50, FTM51



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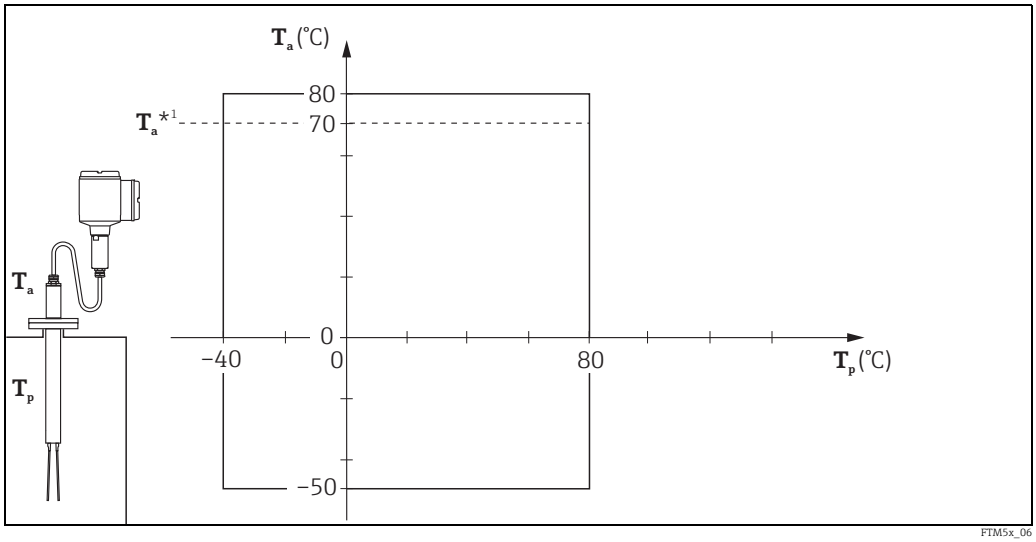
T_a *Ambient temperature*
T_p *Process temperature*

1 T_a at housing: Restriction to 70 °C

FTM52



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T_a *Ambient temperature*
T_p *Process temperature*

1 T_a at housing: Restriction to 70 °C

Connection data

Electronic insert	Power supply	Relay circuit
FEM51	19...253 V AC	--
FEM52	10... 55 V DC	--
FEM54	19...253 V AC	253 V AC / 6 A (Ex de version: 4 A) 1500 VA / cos φ = 1 750 VA / cos φ > 0.7
	19... 55 V DC	30 V DC / 4 A 125 V DC / 0.2 A
FEM55	11... 36 V DC	--

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