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6724 Joy Road



Data Sheet 404393

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JUMO MAERA S29 SW

Titanium or stainless steel level probe

Applications

Level and level measurements

- In tank and storage systems
- · Of clarification, settling and rainwater retention basis
- · In sewage lifting and pumping stations
- · In splash water containers for swimming pools
- · In a ballast water tank for ship building

Special features

- Measuring ranges from 100 mbar relative pressure and 600 mbar absolute pressure are available
- · Explosion protection according to ATEX
- Shipbuilding approval according to DNV (titanium)
- · Highly resistant to chemical (titanium)
- · Proven piezoresistive silicon sensor

Description

The JUMO MAERA S29 SW level probe is used for the continuous hydrostatic level measurement in ventilated tanks. Measuring is carried out unaffected by electrical medium features or any foam formation.

Approvals are needed for particular ship building requirements (exclusively titanium) and explosion protection.

The level probe can be readily used in depths from as low as 1 mWS. The titanium version has been designed for application in liquids with media containing chlorides. These may be found in ship building, swimming pools, or water and sewage water management.

The cost-optimized level probe made of titanium or stainless steel with a front-flush membrane offers an alterative in highly viscous media. The screwable protective cap protects the membrane

The level probe is equipped with a reverse-polarity protection mechanism, which prevents incorrect polarity during startup.

Another benefit to the measuring system is the extensive range of accessories for an optimum design.

Further information on our level probes from the JUMO MAERA series can be found in the brochure "Limit Level Measurement and Level Measurement" in the documentation.

Customer benefits

- · Improved plant availability
- Standardized signal processing
- · Resistant to climate due to improved moisture and vibration protection
- Measurements in very harsh and highly viscous media thanks to the front-flush membrane
- · Prevention of build up of resistance
- A complete solution for measurement points thanks to the extensive range of accessories
- Reverse-polarity protection mechanism



Titanium Stainless steel

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Approvals

	Designation	ATEX
(£x)	Testing agency	Eurofins Electrosuisse Product Testing AG
	Certificate no.	SEV 17 ATEX 0136 X
	Inspection basis	EN 60079-0, EN 60079-11
	Valid for	Type 404393/362, Type 404393/662
	Designation	UKEX
	Testing agency	Bureau Veritas
	Certificate no.	EPS 22 UKEX 1 087 X
	Inspection basis	EN IEC 60079-0, EN 60079-11
	Valid for	Type 404393//085
TEGE	Designation	IECEx
IECEX	Testing agency	Eurofins Electrosuisse Product Testing AG
	Certificate no.	IECEx SEV 20.0010X
	Inspection basis	IEC 60079-0, IEC 60079-11
	Valid for	Type 404393/362, Type 404393/662
LINE AND	Designation	DNV
(DNV)	Testing agency	DNV
DNV,COM/AF	Certificate no.	TAA00001TH
	Inspection basis	DNV GL CG-0339
	Valid for	Type 404393/062, Type 404393/662
EH[Ex	Designation	EAC Ex ^a
LIILLX	Testing agency	ProfiTest/ПрофиТест
	Certificate no.	RU C-DE.HB07.B.00659/22
	Inspection basis	Standard TR TS 012/2011
	Valid for	Type 404393/363/240, Type 404393/662/240

a Russian documentation available upon request.

For the special conditions for use, observe the examination certificate, which is available for download on the Internet on the respective product page.

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Technical data

General Information

Reference conditions	According to DIN 16086 and DIN 61298
Measuring principle	Piezoresistive sensor with separating membrane
Pressure transfer medium	Synthetic oil
Admissible load changes	> 10 million, 0 % to 100 % measuring range
Mounting position	Vertical/hanging from the cable

Input

Measuring range and accuracy

Measuring range	Accuracy a	t	Long-term	Overload	Burst
	20 °C ^b	10 to 50 °C ^c	stability ^a	capacity	pressure
	% MSP ^d	% MSP	% MSP		
			per year		
0 to 1 mH2O	1.2	1.9	≤ 0.4	3	4
0 to 1.6 mH2O	0.8	1.8		4.8	6.4
0 to 2.5 mH2O	0.8	1.7	≤ 0.3	7.5	10
0 to 4 mH2O	0.7	1.7		12	16
0 to 6 mH2O	0.7	1.6	≤ 0.2	18	24
0 to 10 mH2O	0.6	1.3		30	40
0 to 100 mbar relative pressure	1.2	1.9	≤ 0.4	0.3	0.4
0 to 160 mbar relative pressure	0.8	1.8		0.48	0.64
0 to 250 mbar relative pressure	0.8	1.7	≤ 0.3	0.75	1
0 to 400 mbar relative pressure	0.7	1.7		1.2	1.6
0 to 600 mbar relative/absolute pressure	0.7	1.6	≤ 0.2	1.8	2.4
0 to 1 bar relative/absolute pressure	0.6	1.3		3	4
0 to 1.6 bar relative/absolute pressure	0.5	1.3		4.8	6.4
0 to 2.5 bar relative/absolute pressure	0.5	1.2		7.5	10
0 to 4 bar sealed gauge/absolute pressure	0.5	1.2		12	16
0 to 6 bar sealed gauge/absolute pressure	0.5	1.2		18	24
0 to 10 bar sealed gauge/absolute pressure	0.5	1		30	40

a Reference conditions EN 61298-1

Output

Analog output	
Current	
Output 405	4 to 20 mA, 2-wire
Step response t ₉₀	2 ms
Burden	
Current	
4 to 20 mA, 2-wire	$R_L \le (U_B-16 \text{ V}) \div 0.022 \text{ A} (\Omega)$

b Includes: linearity, hysteresis, repeatability, deviation from measuring range start (offset), and measuring range end

^c Includes: linearity, hysteresis, repeatability, deviation from measuring range start (offset) and measuring range end, thermal influences on measuring range start (offset), and measuring span

d MSP = measuring span

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Electrical data

Voltage Supply U _B	The voltage peaks must not exceed the specified voltage supply values!
For basic type extension 000	DC 16 to 28 V (nominal 24 V)
For basic type extension 062	DC 21 to 24 V (nominal 24 V)
For basic type extension 362	DC 16 to 28 V (nominal 24 V)
For basic type extension 662	DC 21 to 24 V (nominal 24 V)
Reverse voltage protection	Yes
Max. current consumption	23 mA
Electrical circuit	SELV
Requirement	The device must be equipped with an electrical circuit that meets the requirements of EN 61010-1 with regard to "Limited-energy circuits".

Mechanical features

Ensure the medium durability of the material!

	Titanium	Stainless steel	Stainless steel with mounted protective cage
Material			
Protective cap	PVC	PVC	-
Process connection	Titanium grade 2	Stainless steel 316 L	Stainless steel 316 L
Measuring membranes	Titanium grade 2	Stainless steel 316 L	Stainless steel 316 L
Case	Titanium grade 2	Stainless steel 316 L	Stainless steel 316 L
Shrink tubing	Polyolefin	-	-
Mass (without cable)	109 g	200 g	1700 g (max. freely suspended cable 100 m)
Diameter	27 mm	27 mm	95 mm

Cable

	6-core, shielded cable with integrated pressure compensation hose, AWG 24 with ferrules	3-core, remote cable with integrated pressure compensation hose, AWG 24 with ferrules				
Material						
Outer sheath	FEP	PUR				
Compensation hose	PA	PA				
Color	Black	Black				
Outer diameter	Approx. 8.4 mm	Approx. 7.5 mm				
Conductor cross section	0.25 mm ²	0.25 mm ²				
Bending radius						
Moving	min. 140 mm	min. 75 mm				
Fixed	min. 70 mm	min. 37.5 mm				
Tensile force	4000 N	880 N				
Mass	≈ 90 g/m	Approx. 60 g/m				
Admissible temperatures	-10 to +70 °C	-10 to +70 °C				
UV resistance	Yes, according to DIN ISO 4892-2	Yes, according to DIN ISO 4892-2				

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Environmental influences

Reference conditions	DIN 16086, DIN 61298							
Admissible temperatures								
Medium	-10 to +60 °C The level probe must not freeze in the medium! A restriction may be required depending on the medium.							
	Ignition protection type Gb							
	Temperature class	Ambient temperature T _A						
	T4	-40 to +85 °C						
	T5	-40 to +70 °C						
	T6 -40 to +55 °C							
	Ignition protection type Db							
	Temperature class	Ambient temperature T _A						
	T100 °C	-40 to +85 °C						
	T85 °C	-40 to +70 °C						
	T70 °C	-40 to +55 °C						
Storage	-25 to +70 °C, dry	-25 to +70 °C, dry						
Electromagnetic Compatibility (EC)	DIN EN 61326-2-3:2022	DIN EN 61326-2-3:2022						
Interference emission	Class B ^a							
Interference immunity	Industrial requirements							
Protection type	IP68, DIN EN 60529							
Measuring principle	Piezoresistive sensor with separati	ng membrane						
Pressure transfer medium	Synthetic oil	Synthetic oil						
Admissible load changes	> 10 million, 0 to 100 % measuring	range						
Mounting position	Vertical/hanging from the cable							

The product is suitable for industrial use as well as for housholds and small businesses.

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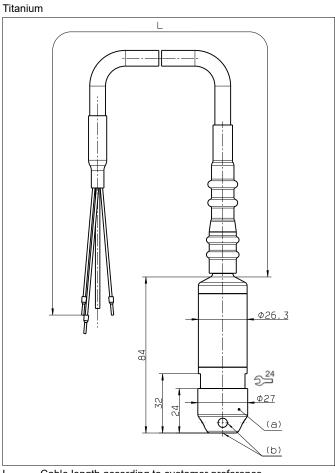
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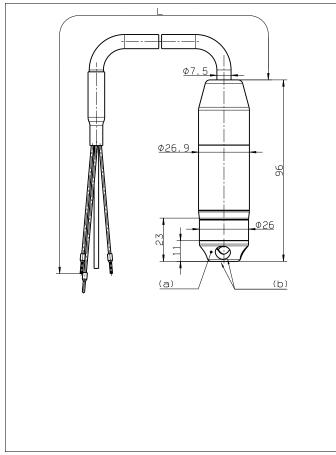
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Dimensions



- Cable length according to customer preference
- (a) Protective cap
- (b) 5 bore holes for every Ø 5 mm

Stainless steel



- Cable length according to customer preference
- (a) Protective cap
- (b) 5 bore holes for every Ø 5 mm

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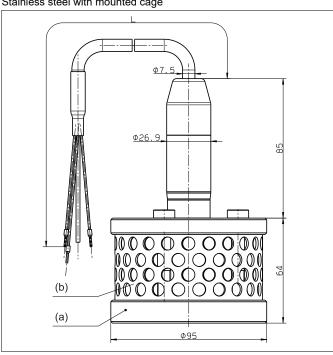
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Data Sheet 404393

Stainless steel with mounted cage



- Cable length according to customer preference L
- (a) Protective cage
- (b) Perforated metal grid Ø 8 mm

The stainless steel version with mounted protective cage is designed for difficult level measurements where sludge, turbulence or currents may be present (e.g. pumping stations, wastewater lifting stations).

The additional weight reduces effects on the output signal with strongly moving media.

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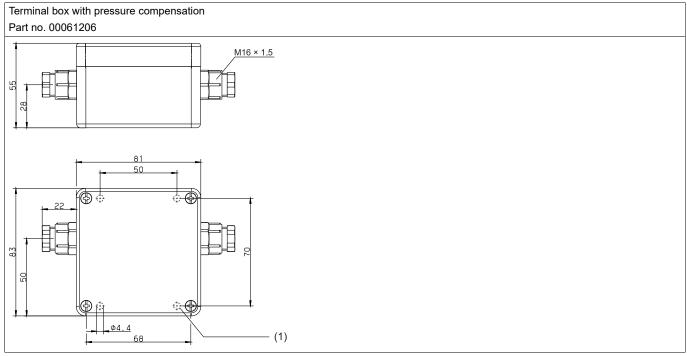
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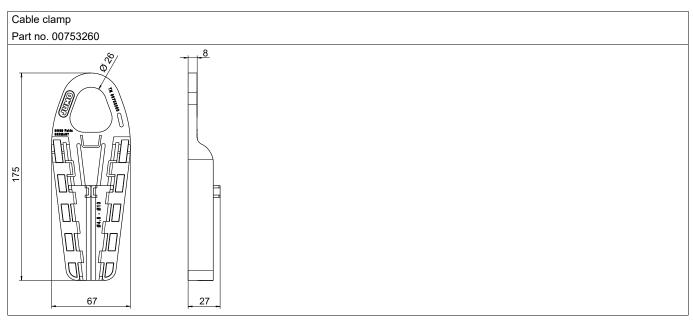


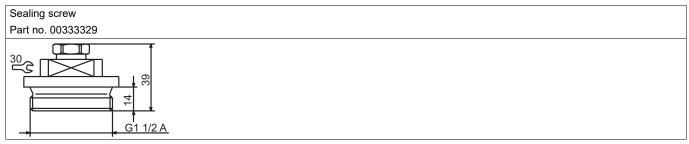
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Accessories



Fastening hole (1)





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Connection diagram

The connection diagram in the data sheet provides information on product selection.

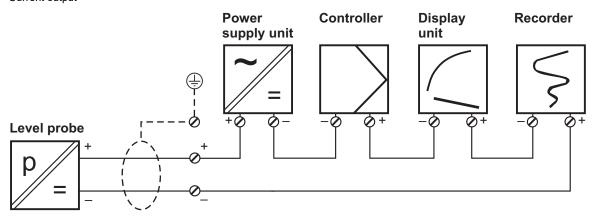
For the electrical connection, only use the installation instructions or the operating manual.

Connection		Terminal assignment						
Cable		FEP PUR (electrical connection 25) (electrical connection 16						
4 to 20 mA, 2-wire		'	'					
Rated voltage supply DC 24 V	U _B /S+ ^a	White	White					
	0 V/S-	Gray	Brown					
Shielding	11		,					
Caution: Ground the device!		Black	Black					
Ground all connected devices (such as pumps and valves) to the same potential!								

The voltage peaks must not exceed or fall below the specified voltage supply values!

Connection example

Current output



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Order details

(1)	Basic type
	JUMO MAERA S29 SW – Level probe made of titanium or stainless steel
(2)	Basic type extension
	None
	Shipbuilding approval (only available in titanium version)
	Explosion protection
	Shipbuilding approval and explosion protection, intrinsically safe, Ex i (only available in titanium version)
(3)	Input
	0 to 1.6 mH2O
	0 to 2.5 mH2O
	0 to 4 mH2O
	0 to 6 mH2O
	0 to 10 mH2O
	0 to 100 mbar relative pressure
	0 to 160 mbar relative pressure
	0 to 250 mbar relative pressure
	0 to 400 mbar relative pressure
	0 to 600 mbar relative pressure
	0 to 1 bar relative pressure
	0 bar to 1.6 bar relative pressure
	0 to 2.5 bar relative pressure
	0 to 4 bar sealed gauge
	0 to 6 bar sealed gauge
	0 to 10 bar sealed gauge
	0 bar to 0.6 bar absolute pressure
	0 to 1 bar absolute pressure
	0 to 1.6 bar absolute pressure
	0 to 2.5 bar absolute pressure
	0 to 4 bar absolute pressure
	0 to 6 bar absolute pressure
	0 to 10 bar absolute pressure
	Special measuring range for sealed gauge
	Special measuring range for absolute pressure ^a
	Special measuring range for relative pressure ^a
(4)	Output
	4 to 20 mA, 2-wire
(5)	Process connection
	Mounted protection cage Ø 95 mm ^b
	Front-flush process connection with protective cap
(6)	Process connection material
	CrNi (stainless steel) (only available with PUR cable)
	Ti (titanium) (only available with FEP cable)
(7)	Electrical connection
	Cable shielded, fixed, PUR, black, UV-resistant (only available in stainless steel version)
	Cable shielded, fixed, FEP, black, UV-resistant (only available in titanium version)
(8)	Connecting cable length ^c
	2 m
	5 m
	10 m
	(4) (5) (6)

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020		20 m
030		30 m
040		40 m
050		50 m
060		60 m
070		70 m
080		80 m
090		90 m
100		100 m
	(9)	Extra codes
000		None
085		UKEX approval
240		EAC Ex approval

The special measuring range is specified in plain text.

Other cable length available on request.

	(1)	_	(2)	_	(3)		(4)		(5)		(6)		(7)		(8)		(9)
Order code		/		-		-		-		-		-		-		1	
Order example	404393	/	000	_	417	-	405	-	770	-	60	-	25	-	005	/	000

Stock versions

Order code	Part no.
404393/000-414-405-770-60-25-005/000	00640023
404393/000-417-405-770-60-25-005/000	00640030
404393/000-424-405-770-60-25-010/000	00644175

Only available in conjunction with process connection material 20.

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Accessories

The accessories are not checked according to DNV requirements.

Item	Description	Part no.
Terminal box with pressure compensation element	The terminal case, is used for secure installation of the level probe cable. The end of the pressure compensation tube is always protected from deposits and condensation (IP65). The remaining distribution can be performed with a standard cable without a pressure equalization hose. The terminal case should be mounted as close as possible to the medium surface while still outside the medium to ensure the system is implemented cost-effectively and in the best possible way.	00061206
Cable clamp	The cable clamp holds the probe in the liquid at a defined depth and provides strain relief. Use of the cable clamp ensures that the cable is not deformed in an unacceptable manner. The cable clamp is compatible with all JUMO level probes. The clamping range is 4.8 mm to 10 mm. The maximum tensile strength is 390 N. The cable clamp is made of UV-resistant, corrosion-free and fiberglass-reinforced polyamide. The central elongated holes are provided for optional, application-dependent fixing of the cable to prevent the clamping jaws from sliding upwards. The side elongated hole is provided for fixing additional cable length.	00753260
Sealing screw	For closed containers or water wells with a well head, the cable should be guided through and fastened by a sealing screw. The sealing screw is made up of a G 1 1/2" thread and is used to route the cable.	00333329
Pressure compensation filter for cable	The pressure compensation filter is a breathable filter that ensures aeration and exhaust-air ventilation without moisture penetrating. It is fitted at the end of the special cable.	00382632
Ex-i supply/input isolating amplifier	The Ex-i repeater power supply / input isolating amplifier is designed for operating intrinsically safe transmitters (Ex-i) and mA current sources installed in potentially explosive (Ex) areas. Two-wire transmitters are supplied with energy and analog 0/4 to 20 mA measured values are transmitted from the Ex-area to the non-Ex-area. The output of the module can be operated actively or passively. Further technical data and the relevant safety requirements are available in the operating manual B 707530.0.	00577948