

# AX 111-D, M / AX 115-D, M senseca

## Precision analog 4-wire Pt100 immersion probe



- Ergonomic handle with high operating temperature up to 120 °C
- Interchangeable with good accuracy
- Fast
- Pt100 platinum sensor for 4-wire reference instruments (e.g. PRO 115)
- Robust for many years of professional use
- Easy to clean
- Water-protected according to IP67

### DESCRIPTION

The AX 111 are precision analog Pt100 temperature probes based on thin film sensor technology.

The AX 115 are analog immersion probes incorporating wire wound Pt100 sensors for highest precision demands.

The probes are designed for use in gases and liquids

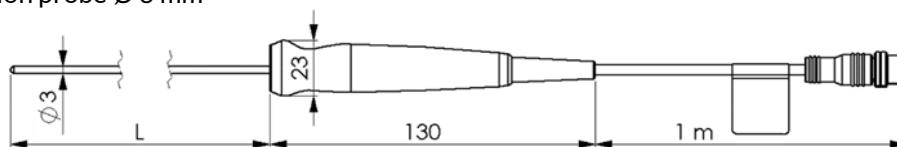
Stem material is corrosion and temperature resistant stainless steel, which is suitable for continuous food contact. Bendable versions are optionally available (mineral-insulated/sheathed element).

The cable is optionally terminated with M12 male connector, Mini-DIN or loose ends.

The probes can optionally be supplied with ISO 9001 or DAkkS-/ACCREDIA accredited calibration ISO/IEC 17025 when combined with a suitable display instrument (e.g. PRO 111 / PRO 115 Pt 100 thermometer).

Two variants of probe tip / probe stem are available:

Immersion probe  $\varnothing$  3 mm



Tip with rigid -D3/-DH3 stem



Tip with bendable mineral insulated -M3 stem

Numerous configuration options enable a customized selection to suit your technical challenge and your budget, please refer to the standard articles below.

## TECHNICAL SPECIFICATION

Measuring element	AX 111-xx	Pt100, <b>thin film sensor</b>
	AX 115-xx	Pt100, <b>wire-wound sensor</b>
Construction	AX 11x-D3 / -DH3	Rigid probe stem Ø3 mm
	AX 11x-M3	mineral insulated *) Ø 3 mm
Accuracy	Tolerance classes B, A, AA, 1/10 B Attention: Note the scope of applicability of the classes **)	
Measuring range ***)	AX 111-D3	-50...+250 °C, available classes: B, A or AA, thin film, rigid stem
	AX 115-D3	-50...+250 °C, class 1/10 B wire-wound, rigid stem
	AX 111-DH3	-50...+400 °C, class B, thin film, rigid stem
	AX 115-DH3	-100...+400 °C, class A, wire wound, rigid stem
	AX 111-M3	-200...+600 °C, class B thin film, mineral insulated, bendable
	AX 115-M3	-50...+250 °C, class 1/10 B, wire wound, mineral insulated, bendable
Response time (T <sub>90</sub> )	- D3 water 0.4 m/s < 2 s, air 2 m/s approx. 40 s - DH3 water 0.4 m/s < 10 s, air 2 m/s approx. 40 s - M3 water: 0.4 m/s < 5 s air 2 m/s approx. 60 s	
Output	Pt100 4-wire	
Connection options	- M12 4-pole male A-coded, - Mini-DIN 4 pole (for GMH 37xx) - loose ends	
Dimensions	Stem: Ø3 mm, L = 150/300 mm (other lengths on request) Cable: Ø4 mm, L = 1, 2 or 5 m	
Weight	110 g approx. with 1 m cable	
Materials	Stem: AISI 316, Handle: Polyamide (PA6-GF30, max. 120°C), optionally molded, for permanent underwater use (-WD, PVC cable only) Cable: PVC (permanently up to +80 °C / short-term 2 hours per session up to +105 °C)	
Protection degree	IP67, with option "Waterproof molded handle" for continuous operation under water	
Applications	Immersion, insertion	

\*) Mineral-insulated temperature probes are filled with ceramic powder inside the sensor tube, thus achieving a higher temperature resistance, and the probes can be bent within certain limits (except the first 4 cm from the tip).

\*\*) following **tolerance classes** of platinum resistors are standardized according/aligning to IEC 751 and EN 60751:

Tolerance class	Norm	limiting deviation in °Kelvin	wire wound	thin film
B	IEC 751 / EN 60751	$\pm (0,30 + 0,00500 \bullet  \text{temperature} )$	-196 to +600 °C	-50 to +500 °C
A	IEC 751 / EN 60751	$\pm (0,15 + 0,00200 \bullet  \text{temperature} )$	-100 to +450 °C	-30 to +300 °C
AA (= 1/3 B)	IEC 751 / EN 60751	$\pm (0,10 + 0,00167 \bullet  \text{temperature} )$	-50 to +250 °C	0 to +150 °C
1/10 B	none	$\pm (0,03 + 0,00050 \bullet  \text{temperature} )$	-50 to 100 °C	

Depending on the class, the limiting deviation is only valid within the named limited range.

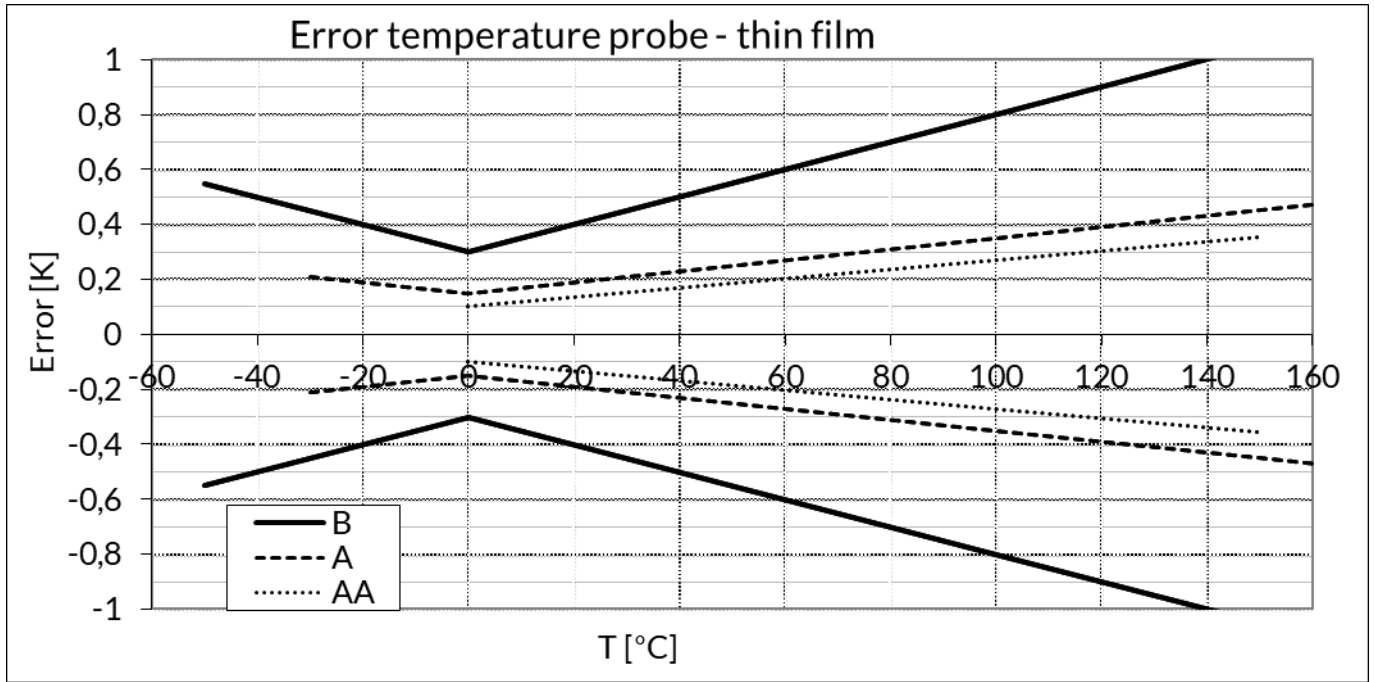
Higher deviations are to be expected outside the limited range of validity.

Ageing and vibration can lead to drift, which further reduces accuracy.

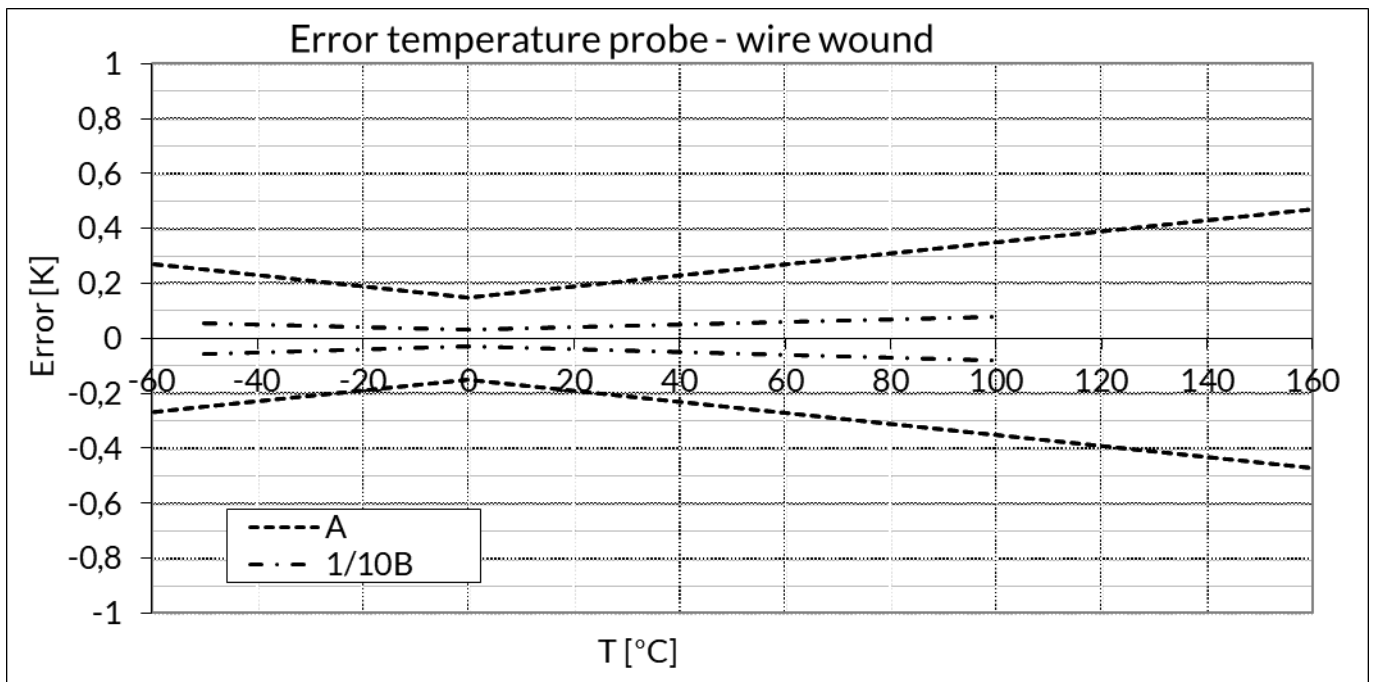
\*\*\*) The final measuring range depends on the design of the sensor (mineral insulated or not) and the sensor type (wire-wound/thin film). Repeatedly falling significantly below/exceeding the validity range can have negative effects on sensor accuracy.

The measuring range must not be exceeded under any circumstances, otherwise in the worst case the sensor may be destroyed or at least the accuracy reduced.

Error band of Pt100 thin film resistors



Error band of Pt100 wire wound resistors



## ORDERING CODE

AX11 1. - 2. - 3. - 4. - 5. - 6. - 7.

1.	Measuring element & construction	
	1-D	4 wire, thin film sensor, up to 250 °C, rigid stem, fast
	1-DH	4 wire, thin film sensor, up to 400 °C, rigid stem
	5-D	4 wire, wire wound sensor, rigid stem, fast
	5-DH	4 wire, wire wound sensor, up to 400 °C, rigid stem
	1-M	4 wire, thin film sensor mineral insulated stem
	5-M	4 wire, wire-wound sensor mineral insulated stem
2.	Stem diameter	
	3	Ø3 mm
3.	Accuracy	
	B	Class B
	A	Class A
	AA	Class AA
	01B	1/10 class B
4.	Stem length	
	-150	150 mm
	-300	300 mm
	-XXX	other length on request
5.	Cable length and material	
	-L01-P	1 m PVC cable, -20 ... +105 °C
	-L02-P	2 m PVC cable, -20 ... +105 °C
	-L05-P	5 m PVC cable, -20 ... +105 °C
	-L01.2SK	Spiral cable stretchable to 1.2 m
6.	Connection	
	-M12	M12 connector, 4-pin (e.g. PRO 11X)
	-MD	Mini-DIN plug, 4 wire (GMH 37xx)
	-LE	Loose ends with wire end ferrules, 4-wire
7.	Option	
	-WD	Waterproof molded handle for permanent under water use

## STANDARD ARTICLES

AX 111-D3-B-150-L01-P-M12	<b>fast and economic:</b> Pt100 immersion probe, -50 ... +250 °C, thin film class B, Ø3 x 150 mm, PVC cable 1 m, M12	<b>Art no. 486727</b>
AX111-D3-AA-150-L01-P-M12	<b>fast and accurate:</b> Pt100 immersion probe, -50 ... +250 °C, thin film class AA, Ø3 x 150 mm, PVC cable 1 m, M12	<b>Art no. 487377</b>
AX 111-DH3-B-300-L01-P-M12	<b>high temp. and economic:</b> Pt100 immersion probe, -50 ... +400 °C, thin film class B, Ø3 x 300 mm, PVC cable 1 m, M12	<b>Art no. 488996</b>
AX 115-DH3-A-300-L01-P-M12	<b>high temp., accurate:</b> Pt100 immersion probe, -100 ... +400 °C, wire wound class A, Ø3 x 300 mm, PVC cable 1 m, M12	<b>Art no. 489003</b>
AX115-D3-01B-150-L01-P-M12	<b>fast &amp; best accuracy</b> Pt100 immersion probe, -50 ... +250 °C, wire-wound class 1/10B, Ø3 x 150 mm, PVC cable 1 m, M12	<b>Art no. 488826</b>
AX 111-M3-B-300- L01-P-M12	<b>highest temp., bendable</b> Pt100 immersion probe, -200 ... +600 °C, min. insulated, thin film class B, Ø3 x 300 mm, cable length 1 m, M12	<b>Art no. 486728</b>
AX 115-M3-01B-300- L01-P-M12	<b>accurate, bendable</b> Pt100 immersion probe, -50 ... +250 °C, min. insulated, wire wound 1/10 class B, Ø3 x 300 mm, cable length 1 m, M12	<b>Art no. 486730</b>

Extract from portfolio, others on request

## SUITABLE INSTRUMENTS

PRO 111	High precision thermometer for Pt100 4 wire probes, M12 socket 4-pole, graphic display. Supplied in carton box, with 4 x AA alkaline batteries, QuickStart, test-protocol	<b>Art no. 486650</b>
PRO 115	High precision thermometer for Pt100 4 wire probes, M12 socket 4-pole, graphic display. Supplied with 4 x AA alkaline batteries, QuickStart, test-protocol, USB cable. Free Software ProXware downloadable from Senseca website	<b>Art no. 486651</b>