Deutscher Akkreditierungs Rat

DAP-PL-3856.99

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CERTIFICATE

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH

Manufacturer:	SICK Maihak GmbH
Measuring System:	FLOWSIC100
Components:	Gas velocity
Test Report:	936/21206702/B, 2008-02-28

The measurement system fulfils
the requirements of
QAL 1
according to EN 14181 and EN ISO 14956.

Köln, 2008-06-20

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The company is accredited to DIN EN ISO/IEC 17025.

attached: 2 page(s)

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EN ISO 14956 and EN 15267-3 calculation for QAL1 in EN 14181

Manufacturer data

Manufacturer	Sick Maihak GmbH
Measurement System	Gas velocity measurement system 1
Name	Flowsic100
Serial Number	SN 07118724
Measuring Principle	Ultrasound

TÜV Data

Approval Report	936/21206702/B
Date	07.11.2007
Editor	Kerpa

Measurement Component Gas velocity 20 m/s

Calculation of the combined standard uncertainty

Test Value		$\Delta X_{\max,\ j}$	$u(\Delta X_{\max,j}) = \frac{\Delta X}{\sqrt{3}}$	$u(\Delta X_{\max,j})^2$
Lack of fit	u_L	-0,54 m/s	-0,31 m/s	0,097
Biggest interference (positiv or negativ)	u_I	0,00 m/s	0,00 m/s	0,000
Span shift in the field test	$u_{d,s}$	0,08 m/s	0,05 m/s	0,002
Zero shift in the field test	$u_{d,z}$	0,08 m/s	0,05 m/s	0,002
Sensitivity to ambient temperature	u_t	0,04 m/s	0,02 m/s	0,000
Dependence on supply voltage	u_{sv}	-0,05 m/s	-0,03 m/s	0,001
Repeatability at span	u_s	0,08 m/s	0,05 m/s	0,002
Field reproducibility	u_D	0,06 m/s	0,04 m/s	0,001
Combined standard uncertainty (u_C)	u_c	$u_c = \sqrt{\Sigma(u_{\max,j})^2}$		0,326
Total expanded uncertainty	(u_c * k)	$U_c = u_c * 1,96$		0,640
Relative total expanded uncertainty		Uc in % of the limit 20 m/s		3,2
Requirement		Uc in % of the limit 20 m/s		7,5

Result: Requirements keep to QAL 1 of EN 14181

Attention: For this component no requirements in the EC-directives 2001/80/EG und 2000/76/EG are given.

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EN ISO 14956 and EN 15267-3 calculation for QAL 1 in EN 14181

Manufacturer data

Manufacturer	Sick Maihak GmbH
Measurement System	Gas velocity measurement system 2
Name	Flowsic100
Serial Number	SN 07118726
Measuring Principle	Ultrasound

TÜV Data

Approval Report	936/21206702/B
Date	07.11.2007
Editor	Kerpa

Measurement Component gas velocity 20 m/s

Calculation of the combined standard uncertainty

Test Value		$\Delta X_{\max,j}$	$u(\Delta X_{\max,j}) = \frac{\Delta X}{\sqrt{3}}$	$u(\Delta X_{\max,j})^2$
Lack of fit	u_L	-0,66 m/s	-0,38 m/s	0,145
Biggest interference (positiv or negativ)	u_I	0,00 m/s	0,00 m/s	0,000
Span shift in the field test	$u_{d,s}$	0,04 m/s	0,02 m/s	0,001
Zero shift in the field test	$u_{d,z}$	0,02 m/s	0,01 m/s	0,000
Sensitivity to ambient temperature	u_t	0,02 m/s	0,01 m/s	0,000
Dependence on supply voltage	u_{sv}	-0,02 m/s	-0,01 m/s	0,000
Repeatability at span	u_s	0,02 m/s	0,01 m/s	0,000
Field reproducibility	u_D	0,06 m/s	0,04 m/s	0,001
Combined standard uncertainty (u_C)	u_c	$u_c = \sqrt{\Sigma(u_{\max,j})^2}$		0,384
Total expanded uncertainty	(u_c * k	$U_c = u_c * 1{,}96$		0,753
Relative total expanded uncertainty		Uc in % of the limit 20 m/s		3,8
Requirement		Uc in % of the limit 20 m/s		7,5

Result: Requirements keep to QAL 1 of EN 14181

Attention: For this component no requirements in the EC-directives 2001/80/EG und 2000/76/EG are given.