

ROSEMOUNT INC.
ANNUBAR FLOWMETER SERIES
CALCULATION DATA SHEET

GENERAL DATA

Customer:
 Project:
 S. O. No:
 P. O. No:
 Calc. Date:
 Model No: 285G060CCSP1S17
 Tag No: BTG 6170

PRODUCT DESCRIPTION

Product Type:	Pak-Lok	Instrument Valve:	Not Applicable
Sensor Size:	1	Valve Material:	Not Applicable
Wetted Material:	316 Stainless Steel	Line Size:	6 Inch (150mm)
Mounting Conn. Type:		Pipe Sch.:	40
Mounting Conn. Material:	316 Stainless Steel	Pipe Orientation:	n/a
Electronics Mounting:	Remote-Mount NPT Connections	Flange Type:	n/a
Max. Allow. Pressure@Temp.:	17,360,998 bar-g	70 C	
Design Pressure/Temperature:	0,07 bar-g	70 C	Max. Allow. Temp.: 148,89 C

INPUT DATA

Fluid Type:	Gas		
Fluid Description:	AIR		
Pipe I.D.(Span):	154,050	mm	Wall: 7,110 mm
Pressure:	0,07	bar-g	Base Pressure: 101,325 kPa-a
Temperature at Flow:	50,00	C	Base Temperature: 0,00 C
Absolute Viscosity:	0,01962	cP	
Isentropic Exponent:	1,40048		
Compressibility at Flow:	0,999727		Base Compressibility: 0,999365
Density at Flow:	1,16754	kg/m3	Base Density: 0,080686 lb/ft3
Flow Rates			
Minimum:	500	Nm3/hr	
Normal:	1000	Nm3/hr	
Maximum:	2000	Nm3/hr	
Full Scale:	2000	Nm3/hr	

CALCULATED DATA

(Calculation Performed at Normal Conditions. DP in inH2O@68F)

DP at Min Flow:	12,104 mmH2O@68F	Flow Coefficient:	0,5785
DP at Normal Flow:	48,450 mmH2O@68F		
DP at Max Flow:	194,334 mmH2O@68F	Rod Reynolds Number (Normal):	14694
DP at Full Scale Flow:	194,334 mmH2O@68F	Pipe Reynolds Number (Full Scale):	302254
Structural Limit (DP):	6350,000 mmH2O@68F	Gas Expansion Factor:	0,9982
Structural Limit (Flow):	11448,3285 Nm3/hr	Permanent Pressure Loss:	
Minimum Accurate Flow:	442,3574 Nm3/hr	at Normal Flow:	5,998 mmH2O@68F
Resonant Frequency:	629,20 Hz	at Maximum Flow:	24,058 mmH2O@68F
Wake Frequency:	219,949893 Hz	Velocity at Max Flow:	32,962 m/sec
Blockage:	0,124		

WARNINGS

NOTES

This report is provided according to the terms and conditions of the Instrument Toolkit(TM) End-Use Customer License Agreement.
 Version: 3.0 (Build129B)

Printed On:

31-lug-06

MELINDO LE CAVAL
 Rosario Hs.

ROSEMOUNT INC.
ANNUBAR FLOWMETER SERIES
CALCULATION DATA SHEET

GENERAL DATA

Customer:
 Project:
 S. O. No:
 P. O. No:
 Calc. Date:
 Model No: 285G020CCSP1S17
 Tag No: BTG 6170*

PRODUCT DESCRIPTION

Product Type:	Pak-Lok	Instrument Valve:	Not Applicable
Sensor Size:	1	Valve Material:	Not Applicable
Wetted Material:	316 Stainless Steel	Line Size:	2 Inch (50mm)
Mounting Conn.Type:		Pipe Sch.:	40
Mounting Conn. Material:	316 Stainless Steel	Pipe Orientation:	n/a
Electronics Mounting:	Remote-Mount NPT Connections	Flange Type:	n/a
Max. Allow. Pressure@Temp.:	17,360,998 bar-g	70 C	
Design Pressure/Temperature:	0,07 bar-g	70 C	Max. Allow. Temp.: 148,89 C

INPUT DATA

Fluid Type:	Gas		
Fluid Description:	AIR		
Pipe I.D.(Span):	52,500	mm	Wall: 3,910 mm
Pressure:	0,07	bar-g	Base Pressure: 101,325 kPa-a
Temperature at Flow:	50,00	C	Base Temperature: 0,00 C
Absolute Viscosity:	0,01962	cP	
Isentropic Exponent:	1,40048		
Compressibility at Flow:	0,999727		Base Compressibility: 0,999365
Density at Flow:	1,16754	kg/m3	Base Density: 0,080686 lb/ft3
Flow Rates			
Minimum:	60	Nm3/hr	
Normal:	100	Nm3/hr	
Maximum:	200	Nm3/hr	
Full Scale:	200	Nm3/hr	

CALCULATED DATA

(Calculation Performed at Normal Conditions. DP in inH2O@68F)

DP at Min Flow:	25,072 mmH2O@68F	Flow Coefficient:	0,4153
DP at Normal Flow:	69,659 mmH2O@68F		
DP at Max Flow:	278,879 mmH2O@68F	Rod Reynolds Number (Normal):	12652
DP at Full Scale Flow:	278,879 mmH2O@68F	Pipe Reynolds Number (Full Scale):	88690
Structural Limit (DP):	6350,000 mmH2O@68F	Gas Expansion Factor:	0,9994
Structural Limit (Flow):	954,772147 Nm3/hr	Permanent Pressure Loss:	
Minimum Accurate Flow:	51,3770 Nm3/hr	at Normal Flow:	25,304 mmH2O@68F
Resonant Frequency:	2614,80 Hz	at Maximum Flow:	101,304 mmH2O@68F
Wake Frequency:	189,377576 Hz	Velocity at Max Flow:	28,380 m/sec
Blockage:	0,363		

WARNINGS

NOTES

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 Version: 3.0 (Build129B)

Printed On:

31-lug-06



EC-Declaration of Conformity

We
ABB SACE SpA
Via Statale 113
22016 Lenno (Como) Italy

Declare that the :

2600T Series Electronic Transmitter

are in conformity with the Council Directive 94/9/EC of 23 March 1994
and is constructed in accordance with the following standards:

EN 50014+A1+A2 (1997)
EN 50018 (2002)
EN 50284 (1999)
EN 50281-1-1 (1998)

EC- Type Examination Certificate : CESI 02 ATEX 027

Notified Body entrusted with the surveillance

Name : CESI

Identification number : 0722

Address : Via Rubattino 54, 20134 Milano Italy

Lenno 16/01/03

Ex Certification Manager
Business Unit Instrumentation
Walter Volo

Research and Development Manager
Business Unit Instrumentation
Andrea Moroni

ABB SACE S.p.A.

Instrumentation

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Osazucco (CO)
Sesto S. Giovanni (MI)
Capitale Sociale: € 60.000.000 i.v.
Partita IVA/Id. n°: IT 00257710731
Registro delle Imprese di Milano e
Codice Fiscale 0109948 015 1
R.E.A. Milano: 1066547

CESI

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iscrizione C.C.I.A.A. 00783560150
Registro Imprese di Milano
Società per Azioni
N. P.R.A. 429222
P.I. IT00763560150

ALEX

CESI

Schema di certificazione

Il CESI è stato autorizzato
dal governo italiano ad
operare come organismo di
certificazione per prodotti
e sistemi destinati a essere
usati in strutture
proteggibili in caso di
incendio
con D.M. 12/10/83, D.M.
12/9/1980, D.M. 20/7/1986
e D.M. 27/6/2000

CERTIFICATE



EC-TYPE EXAMINATION CERTIFICATE

Equipment or Protective System intended for use
in potentially explosive atmospheres
Directive 94/9/EC

[3] EC-Type Examination Certificate number:

CESI 02 ATEX 027

[4] Equipment: Electronic pressure transmitters series 2600T

[5] Manufacturer: ABB Instrumentation spa

[6] Address: Via Statale 113, Lenno (Como - Italy)

[7] This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to..

[8] CESI, notified body n. 0722 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report n. EX-A2/011987.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014: 1997 + A1...A2 EN 50018: 2000 EN 50284:1999 EN 50281-1-1:1999

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EC-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

[12] The marking of the equipment or protective system shall include the following:

II 1/2 GD EEx d IIC T6 IP 67 T85 °C

This certificate may only be reproduced in its entirety and without any change, schedule included.

Date April 26th, 2002 translation issued on April 26th, 2002

Prepared
Mirko Balaz

Balaz

Approved
Ulisse Colombo

CESI

CENTRO ELETTROTECNICO SPERIMENTALE ITALIANO
Business Unit Certificazioni

51 Responsabili

Ulisse Colombo

8.4 Certificados

Informe del TÜV para medir gases inflamables EG1 - KAR Gr01 X



Test Certificate
BB-EG1- KAR Gr01X

Containment System of
Gas analyser Type ULTRAMAT 23

Bau und
Betrieb

Certificate Holder	Siemens AG A&D PI 2 CA D-76181 Karlsruhe Germany	Region Baden-Württemberg Niederlassung Karlsruhe TÜV Bayern Hessen Sachsen Südwest e.V.
Test unit	Gas analyser ULTRAMAT 23 Manufacturer Siemens	Durmersheimer Str. 145 D-76189 Karlsruhe Phone (07 21) 57 06-2 51 Telefax (07 21) 57 06-2 89 www.tuev-sued.de
Test Basis	EN 50016 and EN 60079 -14 (current revisions); ExRL; Guidelines for explosion protection of BG Chemie (BGR 104)	Karlsruhe, September 15, 2003 BB-EG1-KAR/Greß Test Certificate ULTRAMAT 23
Scope of the Test	Evaluation of the tightness of the containment system without external purging in non explosive areas	This document consists of 2 pages
Documents	- Technical Description of the ULTRAMAT 23; - leakage test of the containment system; - calculations; - technical manual; - Decay of He and CO₂ concentration in the housing with no moving ambient air	
Date of examination	August 27, 2003	
Test Results	see page 2	

Certified

K.-D. Greß
K.-D. Greß



Analizador Fijo De Metano
ROSARIO NARTE III

Page 2 of 2

Test Certificate ULTRAMAT 23



1. Results

1.1 Containment System

The following gases or gas mixtures are allowed to be measured with the containment system (gas path) of ULTRAMAT 23:

- non flammable gas/air mixtures or
- flammable gas/air mixtures but the gas concentration is always below the lower explosion limit (LEL) or
- gas mixtures according to definition of zone 2 (rarely flammable gas mixtures) or
- gas mixtures according to definition of zone 1 (occasionally flammable gas mixtures).

1.2 Purging of housing

The 19" rack housing of the ULTRAMAT 23 does not need to be purged as

- the released amount of gases from the containment can be regarded as limited and
- the gas exchange rate of the housing is sufficiently high enough, so that
- any enrichment of the released gases above the LEL is not possible.

2. Special conditions

Connection of flammable gases or gas mixtures above the LEL is only allowed when the containment system of the analyser is equipped with pipes.

Connection of occasionally flammable gas mixtures is only allowed when a flame barrier is used.

Maximum temperature class for the analyser type ULTRAMAT 23 is T4.

If the 19" rack housing is mounted in a rack a sufficient air exchange with the ambient must be guaranteed.

For closed cabinets sufficient purging with protective gas is absolutely necessary. Flow rate depends on free internal volume of the cabinet and has to be chosen in accordance with the requirements of BGR 104 or other respective international standards.

To guarantee continuous tightness of the containment system a leakage test must be performed regularly according to the specifications in the manual. The user is responsible for the frequency of this test; however, potentially negative effects of the sample gases to the containment system must be taken into account.

3. Other

Detailed explanations to this test report and certificate BB-EG1/KAR Gr01X are available on request.

Karlsruhe, September 15, 2003

BB-EG1-KAR/Greß

