

Coriolis mass flowmeter
and transmitter



TM
TME
TMU
UMC3

Installation Notes for hazardous locations



Please read the instructions carefully and store them in a safe place

CONTENTS

INTRODUCTION	3
I. Shipping and storage; product inspection	3
II. Warranty	3
III. Application domain of the operating manual	3
IV. Measures to be taken before sending your device to the manufacturer for repair.....	3
 1. STEPS PRIOR TO OPERATION.....	4
1.1 Installation, mounting, commissioning and maintenance	4
1.2 Hazard warnings.....	4
1.2.1 Danger.....	4
1.2.2 Warning	4
1.2.3 Caution	5
1.2.4 Note	5
1.3 Proper use of the device.....	5
 2. IDENTIFICATION	5
2.1 Version / date.....	5
 3. GENERAL INFORMATION ABOUT EXPLOSION PROTECTION	6
 4. CORIOLIS MASS FLOWMETERS	7
4.1 Description of the TM, TME and TMU sensors	7
4.1.1 Device identification.....	7
4.1.1.1 TM/TME/TMU rating plate.....	7
4.1.2 Mounting.....	8
4.1.2.1 Thermally insulated sensor	8
4.1.2.2 Heating the sensor	8
4.1.2.3 Connecting a remote mount transmitter.....	8
4.2 Description of the UMC3 transmitter	9
4.2.1 Device identification.....	9
4.2.2 Transmitter type of protection.....	10
4.2.3 Connecting cables	10
4.2.4 Terminal compartment.....	10
4.2.4.1 Equipotential bonding.....	10
4.3 Control unit type BE2.....	11
4.3.1 Connecting the transmitter when the device is put into operation	11
4.3.2 Configuration procedure	12
4.4 Parameters	13
4.4.1 Conditions for safe operation	13
4.5 Control Drawings	13
 5. CERTIFICATES	13

Introduction

I. Shipping and storage; product inspection

The device is to be safeguarded against dampness, dirt, impact and damage.

Product inspection

Upon receipt of the product, check the contents of the box and the product particulars against the information on the delivery slip and order form so as to ensure that all ordered components have been supplied. Notify us of any shipping damage immediately upon receipt of the product. Any damage claim received at a later time will not be honored.

II. Warranty

Your flowmeter was manufactured in accordance with the highest quality standards and was thoroughly tested prior to shipment. However, in the event any problem arises with your device, we will be happy to resolve the problem for you as quickly as possible under the terms of the warranty which can be found in the terms and conditions of delivery. Your warranty will only be honored if the device was installed and operated in accordance with the instructions for your device. Any mounting, commissioning and/or maintenance work is to be carried out by qualified and authorized technicians only.

III. Application domain of the operating manual

The present instructions apply to explosion-proof Coriolis TM/TME and TMU flowmeters that are operated in conjunction with the UMC3 transmitter. These instructions are supplementary operating manual for non-explosion proof Coriolis flowmeters. If you do not have a copy of the latter instructions, please request one from Heinrichs Messtechnik GmbH or download the instructions from our website.

The instructions herein pertain primarily to explosion proof Coriolis flowmeters. The technical data in the mounting and operating instructions for non-explosion proof Coriolis flowmeters still apply insofar as the present instructions do not replace them or exclude their application.

IV. Measures to be taken before sending your device to the manufacturer for repair

It is important that you do the following before shipping your flowmeter to Heinrichs Messtechnik GmbH for repair:

- Enclose a description of the problem with your device. Describe in as much detail as possible the application and the physical and chemical properties of the fluid.
- Remove any residues from the device and be sure to clean the seal grooves and recesses thoroughly. This is particularly important if the fluid is corrosive, toxic, carcinogenic, radioactive or otherwise hazardous.

The operator is liable for any substance removal or personal damage costs arising from inadequate cleaning of a device that is sent for repair.

1. Steps prior to operation



Prior to installation and operation, it is essential that the operator familiarizes himself with all of the instructions and information contained in the manual for non-explosion proof Coriolis flowmeters as well as the present instructions. If any part of either manual is missing, contact Heinrichs Messtechnik GmbH to request a new manual. These manuals can also be downloaded from our website.

The UMC3 transmitter described herein is only to be used to measure mass and volume flow, as well as liquid and gas density and temperature, in conjunction with a Heinrichs Messtechnik GmbH TM, TME or TMU sensor.

1.1 Installation, mounting, commissioning and maintenance

Installation, mounting, commissioning and maintenance are to be performed by a technician trained to work with explosion-proof devices, or by a Heinrichs Messtechnik service technician.



Warning

Any maintenance or repair that could compromise the explosion-proof capabilities of the device in a potentially explosive atmosphere is to be carried out by an authorized Heinrichs Messtechnik GmbH service center or under the supervision of an expert in explosion proof devices.

Heinrichs Messtechnik GmbH accepts no liability for any loss or damage of any kind arising from improper operation of any product, improper handling or use of any replacement part, or from external electrical or mechanical effects, overvoltage or lightning. Any such improper operation, use or handling shall automatically invalidate the warranty for the product concerned.

In the event a problem arises with your device, please contact us at one of the following numbers to arrange to have your device repaired:

Phone: +49 221 49708-0

Fax: +49 221 49708-178

Contact our customer service department if your device needs repair or if you need assistance in diagnosing a problem with your device.

1.2 Hazard warnings

The purpose of the hazard warnings listed below is to ensure that device operators and maintenance personnel are not injured and that the flowmeter and any devices connected to it are not damaged.

The safety advisories and hazard warnings in the present document that aim to avoid placing operators and maintenance personnel at risk and to avoid material damage are prioritized using the terms listed below, which are defined as follows in regard to the instructions herein and the advisories pertaining to the device itself.

1.2.1 Danger

means that failure to take the prescribed precautions **will result** in death, severe bodily injury, or substantial material damage.

1.2.2 Warning

means that failure to take the prescribed precautions **could result** in death, severe bodily injury, or substantial material damage.

1.2.3 Caution

means that the accompanying text contains important information about the product, handling the product or about a section of the documentation that is of particular importance.

1.2.4 Note

means that the accompanying text contains important information about the product, handling the product or about a section of the documentation that is of particular importance.

1.3 Proper use of the device



Warning

The operator is responsible for ensuring that the material used in the sensor and transmitter housing is suitable and that such material meets the requirements for the fluid being used and the ambient site conditions. The manufacturer accepts no responsibility in regard to such material and housing.



Warning

In order for the device to perform correctly and safely, it must be shipped, stored, set up, mounted operated and maintained properly.

2. Identification

Manufacturer Heinrichs Messtechnik GmbH
 Robert-Perthel-Straße 9
 D-50739 Köln
 Phone: +49 221 49708-0
 Fax: +49 221 49708-178
 Internet: <http://www.heinrichs-mt.com>
 E-mail: info@heinrichs-mt.com

Product type Mass flowmeter for liquid and gaseous products

Product name Sensor type TM/TME/TMU
 Transmitter type UMC3, suitable for TM, TME and TMU Coriolis mass flowmeters

2.1 Version / date

Version: UMC3-FM-EX_BA_01_ENG
dated December 15, 2007

3. General information about explosion protection

Hazardous Location Coding System - NEC 500 Class I / II / III, Division 1 / 2 (Standard No. 3610)

Example designation		IS	I	1	CD	T6	CD06100	FISCO
Type of Protection								
XP	Explosionproof							
IS	Intrinsically Safe Apparatus							
AIS	Associated Apparatus with Intrinsically Safe Connections							
AN1	Associated Nonincendive Field Wiring Circuit							
PX,PY,PZ	Pressurized							
APX,APY,APZ	Associated Pressurization Systems/Components							
NI	Nonincendive apparatus and nonincendive field wiring apparatus							
DIP	Dust-Ignitionproof							
SP	Special Protection							
Permitted Class								
Class	Definition							
I	Class I Hazardous Location is one in which flammable <i>gases or vapors</i> may be present in the air in sufficient quantities to be explosive or ignitable.							
II	Class II Locations are those areas made hazardous by the presence of combustible <i>dust</i> .							
III	Class III hazardous locations, according to the NEC, are areas where there are easily-ignitable <i>fibers or flyings</i> present, due to the types of materials being handled, stored, or processed.							
Permitted Division								
Division	Definition							
1	Flammable Materials Present Normally or Intermittently							
2	Flammable materials Present Abnormally							
Group								
Examples: Gases, vapours and dusts								
A	Acetylene, Hydrogen, carbon bisulphide							
B	hydrogen							
C	City gas, ethylene, isoprene							
D	Propane							
E	Metal dusts							
F	Carbon dusts							
G	Flour, starch, grain, combustible plastic or chemical dust							
Temperature classes								
Temperature class	Maximum surface temperature							
T1	450 °C	842 °F						
T2	300 °C	572 °F						
T3	200 °C	392 °F						
T4	135 °C	275 °F						
T5	100 °C	212 °F						
T6	85 °C	185 °F						
Control Documentation								
When critical details for the installation are specified in a control drawing, instruction manual, installation diagram, etc. – the document number will be specified.								
Entity								
Intrinsically Safe apparatus Approved under the Entity concept shows the word "Entity" and may include the entity parameters in the Listing.								

Example for hazardous (Classified) Location

Class I, Division 1 locations are those in which hazardous concentrations of flammable gases or vapors exist continuously, intermittently or periodically under normal operating conditions. Electrical equipment for use in such locations may be “explosionproof,” “intrinsically safe,” “purged” or otherwise protected to meet the intent of Articles 500 of the National Electrical Code®.

Class I, Division 2 locations are those in which hazardous concentrations of flammable gases or vapors exist only under abnormal conditions of operation. As such, equipment and associated wiring which are incapable of releasing sufficient electrical and thermal energy to ignite flammable gases or vapors under “normal” operation and environmental conditions are safe to use in Class I, Division 2 locations.

4. Coriolis mass flowmeters

4.1 Description of the TM, TME and TMU sensors

The TM* sensor is an “Intrinsic safety” type of protection device that is outfitted with the following four independent potential-free circuits:

- Excitation circuit
- Sensor circuit 1
- Sensor circuit 2
- Temperature sensor circuit (PT1000)

If the transmitter is mounted externally, it should be connected to the sensor using a Heinrichs Messtechnik cable that is specially designed for this purpose. Although the appearance of the standard and explosion-proof transmitters is identical and their rating plates contain the same information, **under no circumstances should a standard (non-explosion proof) transmitter be connected to an explosion-proof sensor!**

4.1.1 Device identification

The rating plates on Heinrichs Messtechnik flowmeters that are suitable for use in potentially explosive atmospheres are labeled accordingly. Since the sensor and transmitter have different ratings, each device has its own rating plate.

4.1.1.1 TM/TME/TMU rating plate

Example: TMU for process temperatures ranging from - 40 °C to 260 °C.

○ Heinrichs Messtechnik Robert-Perthel-Str. 9 D 50739 Köln / Germany	TAG-NO. 4711		○
	TYPE TMU		
Ex CE 0123 0036 DMT 01 ATEX E 149 X II 1/2 G EEx ia IIC T6-T2	SER. NO. 123 456		
	MODEL CODE TMU-S050-246R-A00-EA-1-0		
	CONNECTION 2" 150 lbs RF ANSI B16.5		
	WETTED PARTS 1.4571 / 1.4404		
	MF-DATE 12-2006		
	LOWER RANGE 80 000 kg/h		
	UPPER RANGE 20 000 kg/h		
	TEMP. PROCESS -40°C to 260°C		
	TEMP. AMBIENT -40°C to 100°C		
	PS TUBE 40 bar		
	PT TUBE 60 bar	DATE 12-2006	
	PN BODY 0 bar	PED = 1G	
○ EXCITER CIRCUIT TYP: EC1 CABLE FITTINGS 1/2" NPT	C= 4567		○

4.1.2 Mounting

The mounting instructions for the standard sensor also apply to the explosion-proof sensor.

4.1.2.1 Thermally insulated sensor

The explosion-proof sensor can be outfitted with thermal insulation in potentially explosive atmospheres as well. However, the insulation should only cover half of the support tube on which the junction box or integrated transmitter is mounted.

4.1.2.2 Heating the sensor

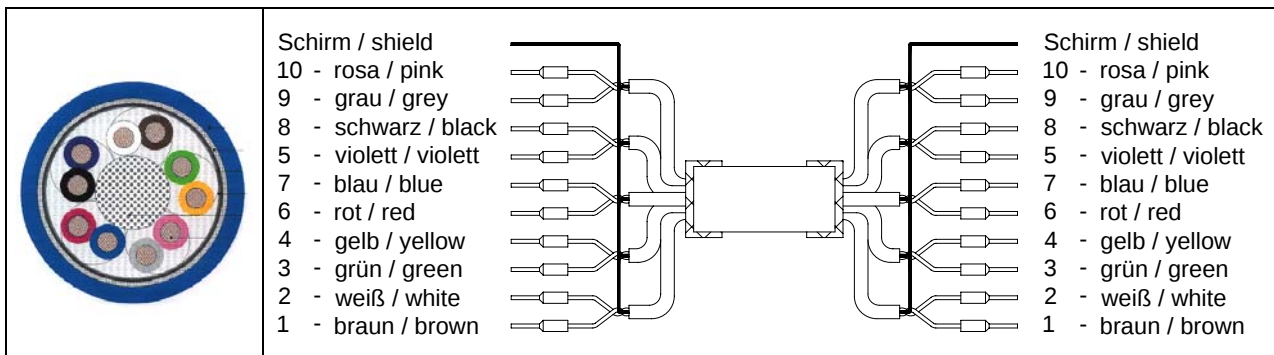
The sensor can be heated from the outside in order to avoid crystallization in the flow tube. Any heating technique or device can be used. The electrical heating device that is used must be suitable for use in a potentially explosive atmosphere.

It is the operator's responsibility to ensure that the heating temperature does not exceed the maximum allowable temperature for the fluid and/or the maximum allowable temperature range for the potentially explosive atmosphere in which the device is being operated.

The maximum allowable temperature range for the fluid is indicated on the flowmeter rating plate.

4.1.2.3 Connecting a remote mount transmitter

A dedicated cable **SLI2Y (SP) CY 5 x 2 x 0.5 mm² [blue]** is to be used for the electrical connection between sensor and remote mount transmitter. This cable, which is available from Heinrichs Messtechnik, has five twisted pairs, each of which has a foil shield and filler cord. The filler cords are installed on the "shield" terminal in both the sensor and transmitter are themselves shielded by tinned copper wire mesh. This external cable shield is connected to the housing via a dedicated EMC cable fitting, thus ensuring optimal noise immunity.



Applicable guidelines pertaining to the interconnection of intrinsically safe circuits must also be observed.

The following maximum values apply to the cable mentioned above:

$C_L = 100 \text{ pF/m}$ wire to wire $L_L = 0.7 \text{ mH/km}$ wire to wire
 $C_L = 170 \text{ pF/m}$ wire to shield $L_L = 0.5 \text{ mH/km}$ wire to shield



Warning

If a connecting cable other than the Heinrichs Messtechnik cable is used, the intrinsic safety of the cable is to be validated using the cable's nominal values

4.2 Description of the UMC3 transmitter

When used in conjunction with the sensor, the **UMC3** transmitter measures the mass flow of liquids and gases in tubes. The transmitter can be mounted on the sensor and programmed using a built-in or standalone BE2 control unit, thus allowing for a high degree of adaptability to user requirements. Although the basic device settings are factory-configured, the settings pertaining to measurement data output and evaluation are user definable.

4.2.1 Device identification

Terminal compartment: "Flameproof enclosure" type of protection


 Heinrichs Messtechnik
 D 50739 Köln/Germany

Typ / type	UMC3
MF-date	11-2006
Mat.-No.	XXXXXXXXXXXX
Modelcode	UMC3-C11A31
Ser.-No.	XXX XXX
supply	90 - 265V AC 50-60Hz / DC 7,5VA

Control unit type BE2
 Plug in only certificated HEINRICHS transmitter.

  0123	BVS 05 ATEX E 021 X EEx d [ia] IIC/IIB T6-T3 II (1)2G
---	---

 APPROVED	CL I, DIV 1 GPS ABCD, T*
--	-----------------------------

Entity Control Drawing No CD06100

 APPROVED	CL I, DIV 1 GPS CD, T*
--	---------------------------

Entity Control Drawing No CD06101

"WARNING - DO NOT OPEN UNDER LOAD OR WHEN AN
 EXPLOSIVE ATMOSPHERE MAY BE PRESENT"
 "WARNING - SEAL AT THE WALL OF THE ENCLOSURE"

1/2" NPT		cable fittings
----------	---	----------------

4.2.2 Transmitter type of protection

The transmitter is accommodated in a housing that is divided by a partition into an electronics compartment and a terminal compartment with the “Flameproof enclosure” type of protection.

The signal outputs can be realized either as “Intrinsic safety” type of protection (“i”).

The electrical and thermal parameters are represented in the "control Drawings" in appendix A.

4.2.3 Connecting cables

The connecting cables for auxiliary power, signal outputs and sensor circuits must adhere to the national requirements.



Note

- The connecting cables are to be installed in such a way that they are protected against mechanical damage and unduly high temperatures.
- The external diameters of the connecting cables must be compatible with the thickness range of the cable fittings and rubber seals used.
- The cables and cable fittings used must be compatible with the type of protection of the junction box being used.
- The dummy plugs used for unused cable glands must be compliant with the type of protection of the housing being used.
- It must be ensured that the cable fitting gaskets are correctly seated.

4.2.4 Terminal compartment

The electrical connections for all electrical circuits are realized in the transmitter terminal compartment, which in all cases accommodates both intrinsically safe and non-intrinsically safe circuits.

The terminals are covered by the IP 30 ingress protection control unit.

The compartment screw-down cover should be removed only for very brief periods for purposes of configuring the transmitter. When the cover is removed, care should be taken to ensure that no dampness enters the enclosure and that no explosion capable atmosphere is available.

Connecting can be installed in one of the two following ways:

- They can be brought through approved flameproof cable glands.
- They can be brought through conduits that are specially designed and approved for this purpose. In this case, the stopping boxes must be installed close to the housing.

4.2.4.1 Equipotential bonding

When the sensor is mounted externally (remote mount configuration), equipotential bonding between the sensor and transmitter is to be realized. Terminals are provided on the outside of the sensor and transmitter for this purpose.

4.3 Control unit type BE2

In as much as the standard transmitter terminals are covered by the BE2 control unit with IP 30 ingress protection, the cover of the terminal compartment can be opened while the device is running (also in a potentially explosive atmosphere). This allows for modification of the transmitter configuration while the device is in operation.

The following precautions are to be taken in this regard:



Warning

- The compartment screw-down cover should be removed only for very brief periods for purposes of configuring the transmitter. When the cover is removed, care should be taken to ensure that no dampness enters the enclosure.
- Under no circumstances should the cover of a “d” type of protection terminal compartment be opened in the presence of an explosive mixture of gases or liquids.

Various configurations with the same family of transmitters can be realized using a BE control unit. The BE2 control unit is outfitted with a pluggable connecting cable. If no on-site notification is required, a BE control unit can be used to configure various transmitters.

In order for a transmitter without a built-in BE2 control unit to be opened while it is running (energized), the terminals must be covered using a dedicated cover plate, which is outfitted with a plug for connecting the BE control unit. The circuit for operating the BE2 control unit of the explosion-proof version has the “Intrinsic safety” type of protection (“i”) and can therefore be activated and deactivated in a potentially explosive atmosphere.

4.3.1 Connecting the transmitter when the device is put into operation

Unscrew the terminal compartment cover and then unscrew and remove the cover plate for the terminals. The cover plate screws are not removable (to prevent them from being misplaced). The cable on the underside of the cover plate, which is plugged into the socket for an integrated BE2 control unit, can be unplugged if necessary.

After connecting the power supply and signal cables, plug the cable on the underside of the cover plate back into the original BE2 socket. Then reinstall the cover plate and terminal compartment cover.

4.3.2 Configuration procedure

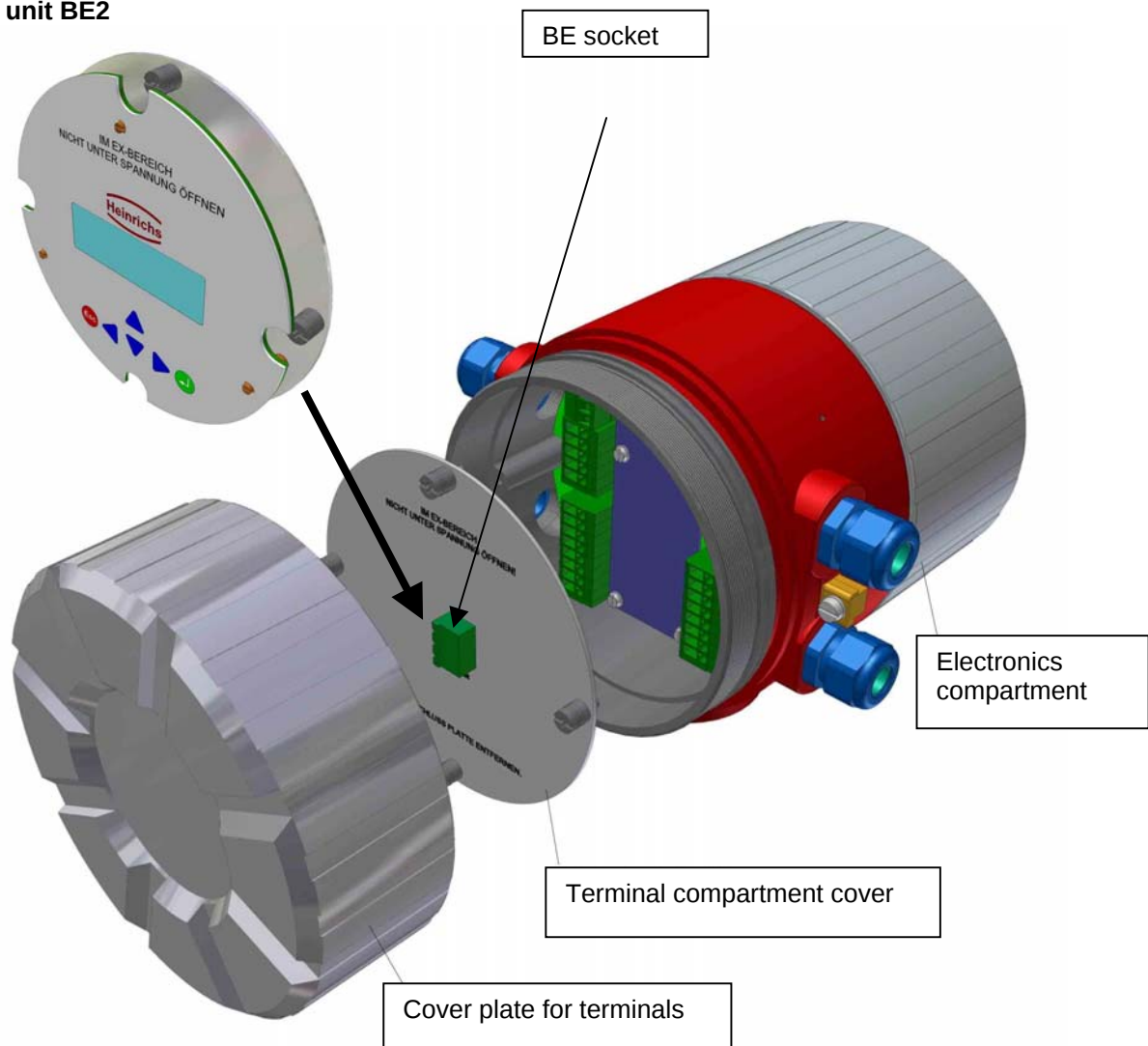
Unscrew the terminal compartment cover, which will expose the cover plate and the BE2 socket on it. Plug the BE2 connecting cable into this socket. After being plugged in, the BE2 control unit will be initialized automatically and the following information will be displayed:

- BE model number and software version
- Transmitter connected (e.g. UMC3)
- The most recent date on which settings were defined under “Display mode during startup.”

The transmitter can now be configured in accordance with the instructions in the operating manual.

After the configuration procedure has been completed, unplug the connector and carefully screw the cover back on.

Control unit BE2



4.4 Parameters

The electrical and thermal parameters for the different models are represented in the enclosed "control Drawings" no. CD06100 and CD06101.

Control Drawing:

A drawing provided by the manufacturer of the intrinsically safe or associated apparatus that details the allowed interconnections between the intrinsically safe and associated apparatus.

4.4.1 Conditions for safe operation

- When the transmitter is connected using cable glands that are approved for this purpose, the stopping boxes must also be installed close to the housing.
- Control unit BE2 can be used at ambient temperatures ranging from - 20 °C to + 60 °C.

4.5 Control Drawings

See appendix A

5. Certificates

See appendix B

Unclassified Location

Line (L, N, E)
AC 90-230 V (Um=265V) or
AC 24 V (Um=30V) or
DC 19-36 V (Um=36V)

The unclassified location equipment connected to the associated apparatus intrinsically safe barriers or galvanic isolators and to the Transmitter shall not use or generate more than 250Vrms or 250Vdc.

One single channel or one channel of a dual channel barrier or galvanic isolator with entity parameters complying with the following requirements:
Voc or Vt equal or less than Vmax
Poc or Pt equal or less than Pmax
La equal or less than Lcable + Li
Ca equal or less than Ccable + Ci

The associated intrinsically safe barriers or galvanic isolators must be FM Approved and the manufacturers installation drawings shall be followed when installing this equipment.

Installations shall be in accordance with the National Electrical Code ANSI/NFPA 70

Heinrichs Messtechnik GmbH
Robert-Perthel-Straße 9
D-57399 Köln

CONTROL DRAWING NO. CD06100
Page 1 of 2
Model UMC3 with TM/TME/TMU
Coriolis mass flow meter
Class I, Division 1, Groups A, B, C and D
Application - US

Approved by: FM Date: 10/25/2006
DWG No.: CD06100-1 Rev.: 0

Hazardous (Classified) Location

Class I, Division 1, Groups A, B, C and D

Coriolis measuring systems with integral mounted transmitter

Type
Transmitters
UMC3-A****
UMC3-B****
Sensors
TM-***-*****-***1-**-**
TM-***-*****-***2-**-**
Sensors
TME-***-*****-***1-**-**
TME-***-*****-***2-**-**
Sensors
TMU-***-***-***-***-A****-*
TMU-***-***-***-***-B****-*

Model	Spacer	Process temperature (°C)	Max. ambient temperature (°C)	Temperature class
TM/TME/TMU	without	45	113	T6
TM/TME/TMU	without	60	140	T5
TM/TME/TMU	without	100	212	T4
TM/TME/TMU	100 mm	120	248	T4
TM/TME/TMU	100 mm	150	302	T3

INTRINSICALLY SAFE OUTPUTS / INPUT

Signal Outputs / Input	Terminal Number	GROUP A&B (or IIC)				GROUP C&D (or IIB)			
		Voc or Uo (V)	Isc or Io (mA)	Po (mW)	Ca or Co (nF)	La or Lo (mH)	Ca or Co (µF)	La or Lo (mH)	
Current outputs (0/4-20mA)	11 (-), 12 (+)	19.2	84	400	230	5	1.53	19.8	
Binary input	13 (-), 14 (+)	30	15	113	64.8	160	0.559	560	
Profibus RS 485-IS control unit model BE2	35, 36	4.1	59	61					
Binary output 1	16 (-), 17 (+)	19.5	130	563	232	2	1.482	9	
Binary output 2	19 (-), 20 (+)								
Binary output 3	33 (-), 34 (+)								
Profibus PA (FISCO-model)	39, 40								

Hazardous (Classified) Location

Class I, Division 1, Groups A, B, C and D

Unclassified Location

Coriolis measuring systems with remote mounted transmitter

Transmitter Type
UMC3-C-****
UMC3-D-****
UMC3-E-****
UMC3-F-****

Ambient temperature (°C)	(°F)
-20 to +60	-4 to +140

INTRINSICALLY SAFE sensor circuits (The output characteristic curves are linear)

	Terminal Number	Voc or Uo (V)	Isc or Io (mA)	Po (mW)	Ca or Co (nF)	La or Lo (mH)	GROUP A&B (or IIC)	GROUP C&D (or IIB)
Temperature sensor circuit	5 up to 8	19.5	6.4	31	225	870	1475	1000
Positions sensors	1 - 2 and 3 - 4	19.5	25	128	154	58	1404	210
Exciter circuit	9 and 10	19.5	90	400	240	5	1490	18

	Signal Outputs / Input	Terminal Number	Voc or Uo (V)	Isc or Io (mA)	Po (mW)	Ca or Co (nF)	La or Lo (mH)	GROUP A&B (or IIC)	GROUP C&D (or IIB)
Current outputs (0/4-20mA)		11 (-), 12 (+) 13 (-), 14 (+)	19.2	84	400	230	5	1.53	19.8
Binary input	Profibus	21 (-), 22 (+)	30	15	113	64.8	160	0.559	560
Profibus RS 485-IS control unit model BE2		35, 36	4.1	59	61				
			19.5	130	563	232	2	1.482	9
Binary output 1		16 (-), 17 (+)	Vmax or Vi (V)	Imax or Ii (mA)	Pi (W)	Ci (nF)	Li (mH)		
Binary output 2		19 (-), 20 (+)	30	200	3	20	0.2		
Binary output 3		33 (-), 34 (+)							
Profibus PA (FISCO-model)		39, 40				1.2	negligible		

Line (L, N, E)
AC 90-230 V (Um=265V) or
AC 24 V (Um=30V) or
DC 19-36 V (Um=36V)

The unclassified location equipment connected to the associated apparatus intrinsically safe barriers or galvanic isolators and to the Transmitter shall not use or generate more than 250Vrms or 250Vdc.

One single channel or one channel of a dual channel barrier or galvanic isolator with entity parameters complying with the following requirements:
Voc or Vi equal or less than Vmax
Isc or Ii equal or less than Imax
Po equal or less than Pmax
La equal or less than Lcable + Li
Ca equal or less than Ccable + Ci

The associated intrinsically safe barriers or galvanic isolators must be FM Approved and the manufacturers installation drawings shall be followed when installing this equipment.

See ANSI/ISA RP12.06.01 Installations of Intrinsically Safe Systems for Hazardous (Classified) Locations for guidance on the installation of intrinsically safe apparatus and systems.

Heinrichs Messtechnik GmbH
Robert-Pertel-Straße 9
D-5739 Köln

CONTROL DRAWING NO. CD06100
Page 2 of 2

Model UMC3 with TM/TME/TMU
Coriolis mass flow meter
(remote mounted transmitter)
Class I, Division 1, Groups A, B, C and D
Application - US

Approved by: FM Date: 10/25/2006
DWG. No.: CD06100-2 Rev.: 0

Sensors Types

TM-***,*****-***3-***	TMU-***,*****-***C-***
TM-***,*****-***4-***	TMU-***,*****-***D-***
TM-***,*****-***5-***	TMU-***,*****-***E-***
TM-***,*****-***6-***	TMU-***,*****-***F-***
TM-***,*****-***7-***	TMU-***,*****-***G-***
TM-***,*****-***8-***	TMU-***,*****-***H-***
	TMU-***,*****-***J-***
TME-***,*****-***6-***	TMU-***,*****-***K-***
TME-***,*****-***7-***	TMU-***,*****-***L-***
	TMU-***,*****-***M-***

INTRINSICALLY SAFE sensor circuits

	Terminal Number	Vmax or Vi (V)	Imax or Ii (mA)	Pi (W)	Ci (nF)	Li (mH)	L/R Ratio mH/Ω
Temperature sensor circuit	5 up to 8	30	100	0.333	negligible	negligible	
sensor circuits	1 - 2 and 3 - 4	30	50	0.375	negligible	≤ 14	0.17
Exciter circuit model EC1	9 and 10	30	90	0.4	negligible	4.5	0.15
Exciter circuit model EC2	9 and 10	30	150	1			

With plug connection

Model	Spacer	Process temperature (°C)	Ambient temperature (°C)	Tem perature class
TM/TME/TMU	without	60	-40 to +60	T5
TM/TME/TMU	60 mm	100	-40 to +60	T4
TM/TME/TMU	160 mm	120	-40 to +60	T4
TM/TME/TMU	160 mm	180	-40 to +60	T3
TM/TMU	260 mm	260	-40 to +60	T2

With connector housing for remote mounted transmitter

Model	Spacer	Process temperature (°C)	Ambient temperature (°C)	Tem perature class
TM/TME/TMU	without	45	-40 to +45	T6
TM/TME/TMU	without	60	-40 to +60	T5
TM/TME/TMU	without	100	-40 to +60	T4
TM/TME/TMU	100 mm	120	-40 to +60	T4
TM/TME/TMU	100 mm	180	-40 to +60	T3
TM/TMU	200 mm	260	-40 to +60	T2

Unclassified Location

Line (L, N, E)
AC 90-230 V (Um=265V) or
AC 24 V (Um=30V) or
DC 19-36 V (Um=36V)

The unclassified location equipment connected to the associated apparatus intrinsically safe barriers or galvanic isolators and to the Transmitter shall not use or generate more than 250Vrms or 250Vdc.

One single channel or one channel of a dual channel barrier or galvanic isolator with entity parameters complying with the following requirements:
Voc or Vt equal or less than Vmax
Isc or It equal or less than Imax
Po equal or less than Pmax
La equal or less than Lcable + Li
Ca equal or less than Ccable + Ci

The associated intrinsically safe barriers or galvanic isolators must be listed for use in Canada and the manufacturers installation drawings shall be followed when installing this equipment.

Installations shall be in accordance with the Canadian Electrical Code CSA C22.1

Hazardous (Classified) Location

Class I, Division 1, Groups C and D

Coriolis measuring systems with integral mounted transmitter

Type
Transmitters
UMC3-A*****
UMC3-B*****
Sensors
TM-***-*****-***1-**-*
TM-***-*****-***2-**-*
Sensors
TME-***-*****1-**-*
TME-***-*****2-**-*
Sensors
TMU-***-*****-***-A***-*
TMU-***-*****-***-B***-*

Model	Spacer	Process temperature (°C)	Max. ambient temperature (°C)	Temperature class
TM/TME/TMU	without	45	113	T6
TM/TME/TMU	without	60	140	T5
TM/TME/TMU	without	100	212	T4
TM/TME/TMU	100 mm	120	248	T4
TM/TME/TMU	100 mm	150	302	T3

Signal Outputs / Input	Terminal Number	INTRINSICALLY SAFE OUTPUTS / INPUT					GROUP C&D (or IIB)	
		Voc or Uo (V)	Isc or Io (mA)	Po (mW)	Ca or Co (µF)	La or Lo (mH)		
Current outputs (0/4-20mA)	11 (-), 12 (+) 13 (-), 14 (+) 21 (-), 22 (+)	19.2 30	84 15	400 113	1.53 0.559	19.8 560		
Profibus RS 485-IS control unit model BE2	35, 36	4.1	59	61				
		19.5	130	563	1.482	9		
Binary output 1	16 (-), 17 (+)							
Binary output 2	19 (-), 20 (+)							
Binary output 3	33 (-), 34 (+)							
Profibus PA (FISCO-model)	39, 40							

Heinrichs Messtechnik GmbH
Robert-Perthel-Straße 9
D-57399 Köln

CONTROL DRAWING NO. CD06101
Page 1 von 2

Model UMC3 with TM/TME/TMU
Coriolis mass flow meter
Class I, Division 1, Groups C and D
Application - Canada

Approved by: FM
Date: 10/25/2006
DWG. No.: CD06101-1
Rev.: 0



Member of the FM Global Group

FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: 781 762 4300 F: 781 762 9375 www.fmglobal.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

UMC3-abcd31 Coriolis Mass Flow Transmitter Integral Mount
XP-AIS/ I / I / ABCD / T*: CD06100

a = Mounting, A or B
b = Display/Interface Board 0, 1 or 2
c = Power Supply 1 or 2
d = Outputs A, B, C, D or E
* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs TM, TMU or TME Coriolis Mass Flow Sensors

TM – ab-cd-efgh-A-j-k Coriolis Mass Flow Meter Integral Mount
IS / I / I / ABCD / T*: CD06100

a = Wetted materials S, H, or T
b = Meter Line Size, when a = S: 01, 04, 07, 10, 13, 19, 25, 34, 40, 49, 55 or XX;
when a = H: 22, 25, 34, 40, 49, 55 or XX;
when a = T: 23, 28, 37, 43, 46 54 or XX
c = Process connection 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 105E, 109N, 109E, 116N, 121N, 121E, 131N, 131E, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 241R, 202R, 202F, 222F, 242R, 203R, 203F, 243R, 205R, 245R, 206R, 206F, 246R, 208R, 208F, 248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 226F or XXXX
d = Overall length 0000 or XXXX
e = Containment Options A, E, F, R, K, S, W or X
f = Heating/cooling 0, 1, 2, 3, 4, 5 or X
g = Flow direction U, O, L or R
h = Transmitter Interface 1 or 2
j = Certificate 0, 1, 2, B or C
k = Accessory 0 or X
* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Transmitter



Member of the FM Global Group

TME – Sabcd-A-f-g Coriolis Mass Flow Meter Integral Mount

IS / I / 1 / ABCD / T*: CD06100

a = Range Process Connections 13-101C, 13-101N, 13-201R, 13-221R, 16-101C, 16-101N, 16-201R, 16-221R, 25-105C, 25-105N, 25-202R, 31-105C, 31-105N, 31-202R, 34-109C, 34-109N, 34-203R, 34-223R, 40-109C, 40-109N, 40-203R, 40-223R, 49-121C, 49-121N, 49-206R, 49-226R, 55-131C, 55-131N, 55-208R, 55-228R, 58-131C, 58-131N, 58-208R, or 58-228R

b = Heating/cooling 0, 1, 2 or 3

c = Flow direction U, O, L or R

d = Transmitter Interface 1 or 2

f = Certificate 0, 1, 2, B or C

g = Supplementary Equipment 0 or X

* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Transmitter

TMU- ab-c-def-gA-ij-k Coriolis Mass Flow Meter Integral Mount

IS / I / 1 / ABCD / T*: CD06100

a = Wetted Materials S or H

b = Meter Line Size 008, 010, 015, 025, 040, 050, 080, 100, 150, 200, 250 or 300

c = Process connection 6010, 6030, 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 109N, 116N, 117N, 121N, 131N, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 226R, 241R, 202R, 242R, 203R, 243R, 205R, 245R, 206R, 246R, 208R, 248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 225R, 226C, 246C or XXXX

d = Containment Options A, B or X

e = Heating/cooling 0 A or B

f = Connection for the heating 0, A, B, C, D, E, F, G, H or X

g = Transmitter interface A or B

i = Calibration mass flow 1, 2, 3 or X

j = Calibration density 0, 1, 2 or X

k = Accessory 0 or X

* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Transmitter

UMC3-abcd31 Coriolis Mass Flow Transmitter Remote Mount

XP-AIS/ I / 1 / ABCD / T*: CD06100

a = Mounting C, D, E or F

b = Display/Interface Board 0, 1 or 2

c = Power Supply 1 or 2

d = Outputs A, B, C, D or E

* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs TM, TMU or TME Coriolis Mass Flow Sensors

TM – ab-cd-efgh-A-j-k Coriolis Mass Flow Meter Remote Mount

IS / I / 1 / ABCD / T*: CD06100

a = Wetted materials S, H, or T

b = Meter Line Size, when a = S: 01, 04, 07, 10, 13, 19, 25, 34, 40, 49, 55 or XX
when a = H: 22, 25, 34, 40, 49, 55 or XX;
when a = T: 23, 28, 37, 43, 46, 54 or XX:

c = Process connection 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 105E, 109N, 109E, 116N, 121N, 121E, 131N, 131E, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 241R, 202R, 202F, 222F, 242R, 203R, 203F, 243R, 205R, 245R, 206R, 206F, 246R, 208R, 208F, 248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 226F or XXXX

d = Overall length 0000 or XXXX

e = Containment Options A, E, F, R, K, S, W or X

f = Heating/cooling 0, 1, 2, 3, 4, 5 or X

g = Flow direction U, O, L or R

h = Transmitter Interface 3, 4, 5, 6, 7 or 8

j = Certificate 0, 1, 2, B or C

k = Accessory 0 or X

* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Remote Transmitter

TME – Sabcd-A-e-f Coriolis Mass Flow Meter Remote Mount

IS / I / 1 / ABCD / T*: CD06100

a = Range Process/Connections 13-101C, 13-101N, 13-201R, 13-221R, 16-101C, 16-101N, 16-201R, 16-221R, 25-105C, 25-105N, 25-202R, 31-105C, 31-105N, 31-202R, 34-109C, 34-109N, 34-203R, 34-223R, 40-109C, 40-109N, 40-203R, 40-223R, 49-121C, 49-121N, 49-206R, 49-226R, 55-131C, 55-131N, 55-208R, 55-228R, 58-131C, 58-131N, 58-208R, 58-228R

b = Heating/cooling 0, 1, 2 or 3

c = Flow direction U, O, L or R

d = Transmitter Interface 3, 4, 6 or 7

e = Certificate 0, 1, 2 B or C

f = Accessory 0 or X

* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Remote Transmitter

TMU- ab-c-def-gA-ij-k Coriolis Mass Flow Meter Remote Mount

IS / I / 1 / ABCD / T*: CD06100

a = Wetted Materials S or H

b = Meter Line Size 008, 010, 015, 025, 040, 050, 080, 100, 150, 200, 250 or 300

c = Process connection 6010, 6030, 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 109N, 116N, 117N, 121N, 131N, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 226R, 241R, 202R, 242R, 203R, 243R, 205R, 245R, 206R, 246R, 208R, 248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 225R, 226C, 246C or XXXX

d = Containment Options A, B or X

e = Heating/cooling 0 or A

f = Connection for the heating 0, A, B, C, D, E, F, G, H or X

g = Transmitter interface C, D, E, F, G, H, J, K, L or M

i = Calibration mass flow 1, 2, 3 or X

j = Calibration density 0, 1, 2 or X

k = Accessory 0 or X

* See drawing: CD06100

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Remote Transmitter

Equipment Ratings:

UMC3 – Explosionproof for Class I, Division 1, Groups A, B, C and D Hazardous (Classified) Locations with intrinsically safe outputs for connection to Class I Division 1 Groups A, B, C and D Hazardous Apparatus.

TM, TME and TMU – Intrinsically Safe for use in Class I, Division 1, Groups A, B, C and D Hazardous (Classified) Locations.

FM Approved for:

Heinrichs Messtechnik GmbH
Köln, Germany D-50739



This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3610	1999
Class 3615	2006
Class 3810	2005

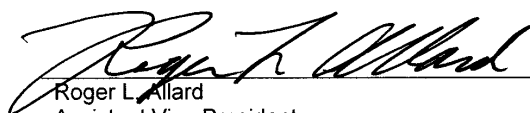
Original Project ID: 3023373

Approval Granted: December 7, 2006

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
020107	21 JUNE 2007		

FM Approvals LLC


Roger L. Allard
Assistant Vice President

21 JUNE 2007
Date



Member of the FM Global Group

FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: 781 762 4300 F: 781 762 9375 www.fmglobal.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

UMC3-abcd31 Coriolis Mass Flow Transmitter Integral Mount
XP-AIS/ / / 1 / CD / T*: CD06101

a = Mounting, A or B
b = Display/Interface Board 0, 1 or 2
c = Power Supply 1 or 2
d = Outputs A, B, C, D or E
* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs TM, TMU or TME Coriolis Mass Flow Sensors

TM – ab-cd-efgh-A-j-k Coriolis Mass Flow Meter Integral Mount
IS / / / 1 / ABCD / T*: CD06101

a = Wetted materials S, H, or T
b = Meter Line Size, when a = S: 01, 04, 07, 10, 13, 19, 25, 34, 40, 49, 55 or XX;
when a = H: 22, 25, 34, 40, 49, 55 or XX;
when a = T: 23, 28, 37, 43, 46, 54 or XX
c = Process connection 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C,
155C, 156C, 162C, 169C, 175C, 101N, 105N, 109N, 109E, 116N, 121N, 121E, 131N,
131E, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 241R,
202R, 202F, 222F, 242R, 203R, 203F, 243R, 205R, 245R, 206R, 206F, 246R, 208R, 208F,
248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R,
235R, 255R, 216R, 236R, 256R, 217R, 226F or XXXX
d = Overall length 0000 or XXXX
e = Containment Options A, E, F, R, K, S, W or X
f = Heating/cooling 0, 1, 2, 3, 4, 5 or X
g = Flow direction U, O, L or R
h = Transmitter Interface 1 or 2
j = Certificate 0, 1, 2, B or C
k = Accessory 0 or X
* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Transmitter

TME – Sabcd-A-f-g Coriolis Mass Flow Meter Integral Mount
IS / / / 1 / ABCD / T*: CD06101

a = Range Process Connections 13-101C, 13-101N, 13-201R, 13-221R, 16-101C, 16-101N,

16-201R, 16-221R, 25-105C, 25-105N, 25-202R, 31-105C, 31-105N, 31-202R, 34-109C, 34-109N, 34-203R, 34-223R, 40-109C, 40-109N, 40-203R, 40-223R, 49-121C, 49-121N, 49-206R, 49-226R, 55-131C, 55-131N, 55-208R, 55-228R, 58-131C, 58-131N, 58-208R or 58-228R

b = Heating/cooling 0, 1, 2 or 3

c = Flow direction U, O, L or R

d = Transmitter Interface 1 or 2

f = Certificate 0, 1, 2, B or C

g = Supplementary Equipment 0 or X

* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Transmitter

TMU- ab-c-def-gA-ij-k Coriolis Mass Flow Meter Integral Mount

IS / I / 1 / ABCD / T*: CD06101

a = Wetted Materials S or H

b = Meter Line Size 008, 010, 015, 025, 040, 050, 080, 100, 150, 200, 250 or 300

c = Process connection 6010, 6030, 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 109N, 116N, 117N, 121N, 131N, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 226R, 241R, 202R, 242R, 203R, 243R, 205R, 245R, 206R, 246R, 208R, 248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 225R, 226C, 246C or XXXX

d = Containment Options A, B or X

e = Heating/cooling 0, A or B

f = Connection for the heating 0, A, B, C, D, E, F, G, H or X

g = Transmitter interface A or B

i = Calibration mass flow 1, 2, 3 or X

j = Calibration density 0, 1, 2 or X

k = Accessory 0 or X

* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Transmitter

UMC3-abcd31 Coriolis Mass Flow Transmitter Remote Mount

XP-AIS/ I / 1 / CD / T*: CD06101

a = Mounting C, D, E or F

b = Display/Interface Board 0, 1, or 2

c = Power Supply 1 or 2

d = Outputs A, B, C, D or E

* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs TM, TMU or TME Coriolis Mass Flow Sensors

TM- ab-cd-efgh-A-j-k Coriolis Mass Flow Remote Mount

IS / I / 1 / ABCD / T*: CD06101

a = Wetted materials S, H, or T

b = Meter Line Size, when a = S: 01, 04, 07, 10, 13, 19, 25, 34, 40, 49, 55 or XX
when a = H: 22, 25, 34, 40, 49, 55 or XX;
when a = T: 23, 28, 37, 43, 46, 54 or XX:

c = Process connection 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 105E, 109N, 119E, 116N, 121N, 121E, 131N, 131E, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 241R, 202R, 202F, 222F, 242R, 203R, 203F, 243R, 205R, 245R, 206R, 206F, 246R, 208R, 208F,



248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 226F or XXXX

d = Overall length 0000 or XXXX

e = Containment Options A, E, F, R, K, S, W or X

f = Heating/cooling 0, 1, 2, 3, 4, 5 or X

g = Flow direction U, O, L or R

h = Transmitter Interface 3, 4, 5, 6, 7 or 8

j = Certificate 0, 1, 2, B or C

k = Accessory 0 or X

* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Remote Transmitter

TME – Sabcd-A-e-f Coriolis Mass Flow Remote Mount

IS / I / 1 / ABCD / T*: CD06101

a = Range Process/Connections 13-101C, 13-101N, 13-201R, 13-221R, 16-101C, 16-101N, 16-201R, 16-221R, 25-105C, 25-105N, 25-202R, 31-105C, 31-105N, 31-202R, 34-109C, 34-109N, 34-203R, 34-223R, 40-109C, 40-109N, 40-203R, 40-223R, 49-121C, 49-121N, 49-206R, 49-226R, 55-131C, 55-131N, 55-208R, 55-228R, 58-131C, 58-131N, 58-208R, 58-228R

b = Heating/cooling 0, 1 2 or 3

c = Flow direction U, O, L or R

d = Transmitter Interface 3, 4, 6 or 7

e = Certificate 0, 1, 2 B or C

f = Accessory 0 or X

* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Remote Transmitter

TMU- ab-c-def-gA-ij-k Coriolis Mass Flow Remote Mount

IS / I / 1 / ABCD / T*: CD06101

a = Wetted Materials S or H

b = Meter Line Size 008, 010, 015, 025, 040, 050, 080, 100, 150, 200, 250 or 300

c = Process connection 6010, 6030, 101C, 105C, 109C, 117C, 121C, 131C, 135C, 140C, 145C, 150C, 155C, 156C, 162C, 169C, 175C, 101N, 105N, 109N, 116N, 117N, 121N, 131N, 135N, 140N, 145N, 150N, 155N, 156N, 162N, 169N, 175N, 6010, 6030, 201R, 226R, 241R, 202R, 242R, 203R, 243R, 205R, 245R, 206R, 246R, 208R, 248R, 210R, 230R, 250R, 212R, 232R, 252R, 213R, 233R, 253R, 214R, 234R, 254R, 215R, 235R, 255R, 216R, 236R, 256R, 217R, 225R, 226C, 246C or XXXX

d = Containment Options A, B or X

e = Heating/cooling 0 or A

f = Connection for the heating 0, A, B, C, D, E, F, G, H or X

g = Transmitter interface C, D, E, F, G, H, J, K, L or M

i = Calibration mass flow 1, 2, 3 or X

j = Calibration density 0, 1, 2 or X

k = Accessory 0 or X

* See drawing: CD06101

Special condition of Use

1. When used with Heinrichs UMC3 Coriolis Mass Flow Remote Transmitter

Equipment Ratings:

UMC3 – Explosionproof for Class I Division 1 Groups C and D Hazardous Locations with intrinsically safe outputs for connection to Class I Division 1 Groups A, B, C and D Hazardous Apparatus.

TM, TME and TMU – Intrinsically Safe for use in Class I Division 1 Groups A, B, C and D Hazardous Locations.

FM Approved for:

Heinrichs Messtechnik GmbH
Köln, Germany D-50739

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

CSA C22.2 No. 0.4	1982
CSA C22.2 No. 0.5	1982
CSA C22.2 No. 30	1988
CSA C22.2 No. 94	1991
CSA C22.2 No. 142	1990
CSA C22.2 No. 157	1992

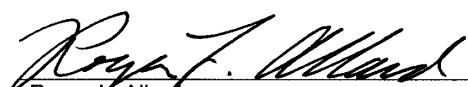
Original Project ID: 3023373C

Approval Granted: December 7, 2006

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
020107	21 JUNE 2007		

FM Approvals LLC


Roger L. Allard
Assistant Vice President

21 JUNE 2007
Date