Certificate of Compliance

Certificate: 70138578 **Master Contract:** 220495

Project: 80061032 **Date Issued:** March 29, 2021

Issued to: **RHEONIK Messtechnik GmbH**
Rudolf Diesel Strasse 5
Odelzhausen, 85235
GERMANY

Attention: **Kay Stegmann**

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only

C US

Issued by: Braxton Chong

PRODUCTS

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations
CLASS 2258 84 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to U.S. Standards

Class I, Division 1, Groups A, B, C and D T6…T1
Ex ia IIC T6…T1 Ga
Class I, Zone 0, AEx ia IIC T6…T1 Ga

The Coriolis mass flow meter RHM* in combination with a separate certified transmitter is used for flow measurement (fluid / gas). The flow meter contains oscillating tubes, coils, temperature sensors, diodes and either a connection box with terminals or a fixed cable (maximum cable length 10 m). The device is intrinsically safe when installed per Appendix A, Ex-Safety Instructions in the Manual. The RHM are designed for measuring fluids and gases at high pressure. All units are certified according to ASME B31.1 and ASME B31.3. The maximum allowable pressure is specified for each type according to ASME and indicated on the nameplate.

Model Designation

MaaaTTPPCCCMMFFCC-OO-EE

Maaa Meter type
M#5* = RHM015
M02* = RHM02
M03* = RHM03
M04* = RHM04
M06* = RHM06
M08* = RHM08
M10* = RHM10
M12* = RHM12
M15* = RHM15
M20* = RHM20
M30* = RHM30
M40* = RHM40
M60* = RHM60
M80* = RHM80
M100 = RHM100
*= F, G, L, S, or W, depending on torsion bar type (Not Ex relevant)

TT Medium Temperature range
N* -50°C to +120°C, * = 0…Z, indicating specific limits within that range
E* -196°C to +210°C, * = 0…Z, indicating specific limits within that range
H* -20°C to +400°C, * = 0…Z, indicating specific limits within that range

PPCCCMMFF
Mechanical features (pressure range, mechanical construction, material, flange type).
These features are not relevant for the certification for hazardous areas.
The features are relevant for determining the maximum operating pressure according to ASME B31.3.
The resulting maximum operating pressure is indicated on the nameplate.

CC Connection type and electrical properties
JC = aluminum connection box, Pt100
JM = aluminum connection box, Pt1000
SC = stainless steel connection box, Pt100
SM = stainless steel connection box, Pt1000

TM = fixed cable, up to 10m, Pt100 or Pt1000 1)

OO OO = 01 to ZZ except H1: Options not relevant for Ex protection

EE Hazardous Area Certification
C0 = Division 1 and Zone 0
Marked: Class I, Division 1, Group A, B, C, and D T6…T1
Ex ia IIC T6…T1 Ga
Class I, Division 1, AEx ia IIC T6…T1 Ga

Restrictions:

1) Temperature code N*: with limiting diodes, all types
2) Temperature code E*: without limiting diodes, only RHM015 to RHM04

Explanation: Drive coils for RHM06 through RHM100 are molded

Entity Parameters

The drive circuit shall be connected to a linear source with Ci and Li negligible.

RHM standard versions:

Circuit name	Terminals	Vmax, Ui (V)	Imax, Ii (mA)	Pmax, Pi (mW)	Li (mH)	Ci (nF)
Drive circuit	1-2	9.3	144	335	1.5	< 10
Temperature sense	3-4, 5-4	7.4	58	107	< 0.1	< 10
Pickup circuit	6-7, 9-8	7.4	29	54	4.5	< 10

Temperature Code

The classification into a temperature code depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following tables. These values may be restricted by the used materials, see manual.

Temperature Ranges N*

The mass flow sensors with temperature ranges N* cover different temperature ranges in the total range from -50°C to +120°C.

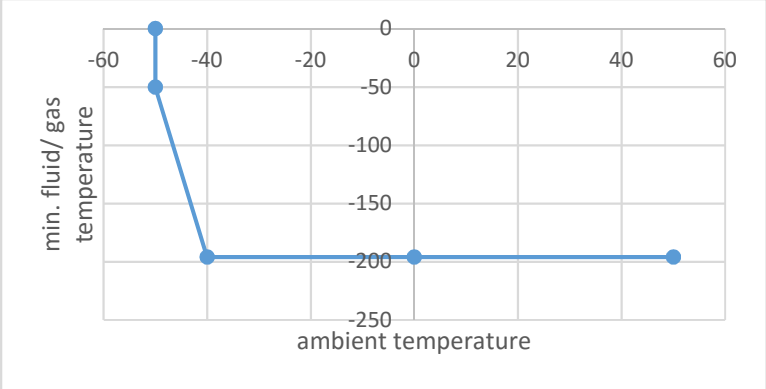
Temperature code	T6	T5	T4	T3	T2	T1
Min. temperature	-50°C	-50°C	-50°C	-50°C	-50°C	-50°C
Max. ambient temperature	65°C	80°C	80°C	80°C	80°C	80°C
Max. fluid/gas temperature	65°C	80°C	115°C	120°C	120°C	120°C

Temperature Ranges E*

The mass flow sensors with temperature ranges E* cover different temperature ranges in the total range from -196°C to +210°C.

Temperature code	T6	T5	T4	T3	T2	T1
Min. ambient temperature	-50°C*	-50°C*	-50°C*	-50°C*	-50°C*	-50°C*
Min. flow temperature	-196°C*	-196°C*	-196°C*	-196°C*	-196°C*	-196°C*
Max. ambient temperature	65°C	80°C	80°C	80°C	80°C	80°C
Max. fluid/gas temperature	65°C	80°C	115°C	180°C	210°C	210°C

*) At ambient temperature below -40°C the minimum flow temperature rises linearly from -196°C at -40°C ambient temperature to -50°C at -50°C ambient temperature, see graph below.



Derating of minimum fluid/gas temperature for low ambient temperatures.

Temperature Ranges H*

Temperature code	T6	T5	T4	T3	T2	T1
Min. temperature	-	-	-20°C	-20°C	-20°C	-20°C
Max. ambient temperature	-	-	80°C	80°C	80°C	80°C
Max. fluid/gas temperature	-	-	105°C	170°C	270°C	400°C

Class I, Division 1, Groups C and D T6…T1
Ex ia IIB Ga T6…T1
Class I, Zone 0, AEx ia IIB Ga T6…T1

The Coriolis mass flow meter RHM* in combination with a separate certified transmitter is used for flow measurement (fluid / gas). The flow meter contains oscillating tubes, coils, temperature sensors, diodes and either a connection box with terminals or a fixed cable (maximum cable length 10 m). The device is intrinsically safe when installed per Appendix A, Ex-Safety Instructions in the Manual. The RHM are designed for measuring fluids and gases at high pressure. All units are certified according to ASME B31.1 and ASME B31.3. The maximum allowable pressure is specified for each type according to ASME and indicated on the nameplate.

Model Designation

MaaaTTPPCCCMMFFCC-OO-EE

Maaa Meter type
M#5* = RHM015
M02* = RHM02
M03* = RHM03
M04* = RHM04
M06* = RHM06
M08* = RHM08
M10* = RHM10
M12* = RHM12
M15* = RHM15
M20* = RHM20
M30* = RHM30
M40* = RHM40
M60* = RHM60
M80* = RHM80
M100 = RHM100
*= F, G, L, S, or W, depending on torsion bar type (Not Ex relevant)

TT Medium Temperature range
N* -50°C to +120°C, * = 0…Z, indicating specific limits within that range
E* -196°C to +210°C, * = 0…Z, indicating specific limits within that range
H* -20°C to +400°C, * = 0…Z, indicating specific limits within that range

PPCCCMMFF
Mechanical features (pressure range, mechanical construction, material, flange type).
These features are not relevant for the certification for hazardous areas.
The features are relevant for determining the maximum operating pressure according to ASME B31.3.
The resulting maximum operating pressure is indicated on the nameplate.

CC Connection type and electrical properties
JC = aluminum connection box, Pt100
JM = aluminum connection box, Pt1000

SC = stainless steel connection box, Pt100
SM = stainless steel connection box, Pt1000
TM= fixed cable, up to 10m, without suppressor diodes, Pt100 or Pt1000 2)

OO OO = 01 to ZZ except H1: Options not relevant for Ex protection

EE Hazardous Area Certification
CB = Class I, Zone 0, Div. 1, Group C, D

Explanation: Some drive coils need not to be molded

Restrictions:
1) Temperature code N*: with limiting diodes, all types
2) Temperature code E*: without limiting diodes, only RHM015 to RHM20

Entity Parameters

The drive circuit shall be connected to a linear source with Ci and Li negligible.

RHM standard versions:

Circuit name	Terminals	Vmax, Ui (V)	Imax, Ii (mA)	Pmax, Pi (mW)	Li (mH)	Ci (nF)
Drive circuit	1-2	9.3	140	326	7.2	< 10
Temperature sense	3-4, 5-4	7.4	58	107	< 0.1	< 10
Pickup circuit	6-7, 9-8	7.4	29	54	4.5	< 10

Temperature Code

The classification into a temperature code depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following tables. These values may be restricted by the used materials, see manual.

Temperature Ranges N*

The mass flow sensors with temperature ranges N* cover different temperature ranges in the total range from -50°C to +120°C.

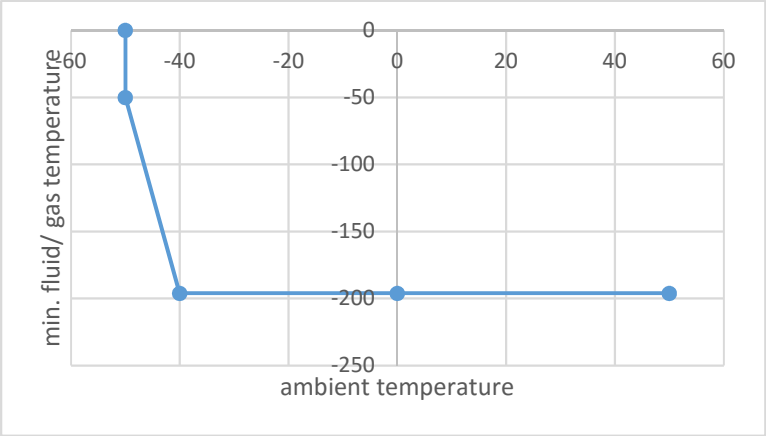
Temperature code	T6	T5	T4	T3	T2	T1
Min. temperature	-50°C	-50°C	-50°C	-50°C	-50°C	-50°C
Max. ambient temperature	65°C	80°C	80°C	80°C	80°C	80°C
Max. fluid/gas temperature	65°C	80°C	115°C	120°C	120°C	120°C

Temperature Ranges E*

The mass flow sensors with temperature ranges E* cover different temperature ranges in the total range from -196°C to +210°C.

Temperature code	T6	T5	T4	T3	T2	T1
Min. ambient temperature	-50°C*	-50°C*	-50°C*	-50°C*	-50°C*	-50°C*
Min. flow temperature	-196°C*	-196°C*	-196°C*	-196°C*	-196°C*	-196°C*
Max. ambient temperature	65°C	80°C	80°C	80°C	80°C	80°C
Max. fluid/gas temperature	65°C	80°C	115°C	180°C	210°C	210°C

*) At ambient temperature below -40°C the minimum flow temperature rises linearly from -196°C at -40°C ambient temperature to -50°C at -50°C ambient temperature, see graph below.



Derating of minimum fluid/gas temperature for low ambient temperatures.

Temperature Ranges H*

Temperature class	T6	T5	T4	T3	T2	T1
Min. temperature	-	-	-20°C	-20°C	-20°C	-20°C
Max. ambient temperature	-	-	80°C	80°C	80°C	80°C
Max. fluid/gas temperature	-	-	105°C	170°C	270°C	400°C

Notes:

1. The above model is fixed connection, Pollution Degree 3, Installation Category I.
2. Mode of operation: Continuous.
3. Environmental Conditions: Extended, Indoor and outdoor use, -20 °C to +80 °C or -50 °C to +80 °C depending on the model, altitude up to 3000 m, RH% of 0-100%.

PRODUCTS

CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations
CLASS 2258 83 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations

Ex nA IIC T6…T1 Gc
Class I, Zone 2, AEx nA IIC T6…T1 Gc

The Coriolis mass flow meter RHM* in combination with a separate certified transmitter is used for flow measurement (fluid / gas). The flow meter contains oscillating tubes, coils, temperature sensors, diodes and either a connection box with terminals or a fixed cable (maximum cable length 10 m). The device is intrinsically safe when installed per Appendix A, Ex-Safety Instructions in the Manual. The RHM are designed for measuring fluids and gases at high pressure. All units are certified according to ASME B31.1 and ASME B31.3. The maximum allowable pressure is specified for each type according to ASME and indicated on the nameplate.

Model Designation

MaaaTTPPCCCMMFFCC-OO-EE

Maaa Meter type
M#5* = RHM015
M02* = RHM02
M03* = RHM03
M04* = RHM04
M06* = RHM06
M08* = RHM08
M10* = RHM10
M12* = RHM12
M15* = RHM15
M20* = RHM20
M30* = RHM30
M40* = RHM40

*= F, G, L, S, or W depending on torsion bar type (Not Ex relevant)

TT Medium Temperature range
N* -50°C to +120°C, * = 0…Z, indicating specific limits within that range
E* -196°C to +210°C, * = 0…Z, indicating specific limits within that range

PPCCCMMFF
Mechanical features (pressure range, mechanical construction, material, flange type).
These features are not relevant for the certification for hazardous areas.
The features are relevant for determining the maximum operating pressure according to ASME B31.3.
The resulting maximum operating pressure is indicated on the nameplate.

CC Connection type and electrical properties
C5 = connection box prepared for mounting RHE45
JC = aluminum connection box, Pt100
JM = aluminum connection box, Pt1000
SC = stainless steel connection box, Pt100
SM = stainless steel connection box, Pt1000
TM = fixed cable, up to 10m, Pt100 or Pt1000

OO OO = 01 to ZZ except H1: Options not relevant for Ex protection

EE Hazardous Area Certification
C2 = CSA for Div 2 / Zone 2, Group A, B, C, D
CN = CSA for Div 2 / Zone 2, Group C and D

Parameters:

Nominal voltage: 7 V
Nominal current: 150 mA

Temperature Code

The classification into a temperature code depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following tables. These values may be restricted by the used materials, see manual.

Temperature Ranges N

Temperature code	T6	T5	T4	T3	T2	T1
Min. temperature	-50°C	-50°C	-50°C	-50°C	-50°C	-50°C
Max. ambient temperature	65°C	80°C	80°C	80°C	80°C	80°C
Medium temperature	65°C	80°C	115°C	120°C	120°C	120°C

Temperature Ranges E

Temperature code	T6	T5	T4	T3	T2	T1
Min. temperature	-50°C	-50°C	-50°C	-50°C	-50°C	-50°C
Max. ambient temperature	65°C	80°C	80°C	80°C	80°C	80°C
Medium temperature	65°C	80°C	115°C	120°C	120°C	120°C

Notes:

1. The above model is fixed connection, Pollution Degree 3, Installation Category I.
2. Mode of operation: Continuous.
3. Environmental Conditions: Extended, -20 °C to +80 °C or -50 °C to +80 °C depending on the model, altitude up to 3000 m, RH% of 0-100%.

Certificate: 70138578 **Master Contract:** 220495
Project: 80061032 **Date Issued:** March 29, 2021

Conditions of Acceptability:

1. The device must be supplied by a Class 2 or Limited Energy Source in accordance with CSA 61010-1-12/ISA 61010-1 3rd Edition.
2. Wiring to or from this device, which enters or leaves the device enclosure, must utilize wiring methods suitable for Intrinsically Safe devices for Class I, Division 1 Hazardous Locations, as stated in CEC and NEC, and as appropriate for the installation.
3. Field wiring of different intrinsically safe circuits shall be separated from each other by at least 0.25 mm thick insulation used on each conductor.
4. Applicable to models with painted enclosure - Under certain extreme conditions, the painting may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions can cause build-up of electrostatic charge on such surfaces. In addition, the enclosure shall only be cleaned with a damp cloth.
5. Applicable to models with enclosure made of Aluminum - In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation and use.
6. End-user shall ensure the device is properly connected to Earth upon installation.
7. Only for sensors with temperature ranges above 210 °C (temperature code H*) or below -50 °C (e.g. temperature code E3): Along to the intrinsically safe circuit potential equalization should be provided because in case of a fault the intrinsically safe circuit has to be regarded as connected to the metal housing.

APPLICABLE REQUIREMENTS

CAN/CSA C22.2 No. 61010-1-12	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements - Third Edition
CAN/CSA-C22.2 No. 60079-0:15	Explosive Atmospheres - Part 0: Equipment - General requirements
CAN/CSA-C22.2 No. 60079-11:14	Explosive Atmospheres – Part 11: Equipment protection by intrinsic safety "i"
CAN/CSA-C22.2 No. 60079-15:16	Explosive Atmospheres – Part 15: Equipment protection by type of protection "n"
ANSI/ISA-61010-1 3rd Edition	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements - Third Edition
ANSI/UL 60079-0:13	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
ANSI/UL 60079-11:13	Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety “i”
ANSI/UL 60079-15:13	Explosive Atmospheres – Part 15: Equipment protection by type of protection "n"