Quick Installation Guide
00825-0100-4738, Rev BA
October 2009

Rosemount 3095FB MultiVariable™ Transmitter with MODBUS® Protocol

Product Discontinued

MODBUS®

ROSEMOUNT®

www.rosemount.com

EMERSON™
Process Management

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN USA 55317
T (US) (800) 999-9307, F (952) 949-7001
T (Intnl) (952) 906-8888

Emerson Process Management Asia Pacific Private Limited
1 Pandan Crescent
Singapore 128461
T (65) 6777 8211, F (65) 6777 0947/(65) 6777 0743

Emerson Process Management GmbH & Co. OHG
Argelsrieder Feld 3
82234 Wessling
Germany
T 49 (8153) 9390, F49 (8153) 939172

Beijing Rosemount Far East Instrument Co., Limited
No. 6 North Street,
Hepingli, Dong Cheng District
Beijing 100013, China
T (86) (10) 6428 2233, F (86) (10) 6422 8586

⚠ IMPORTANT NOTICE

This installation guide provides basic guidelines for the Rosemount 3095FB MultiVariable Transmitter with MODBUS Protocol (reference manual document number 00809-0100-4738). It does not provide instructions for configuration, diagnostics, maintenance, service, or troubleshooting. Refer to the appropriate reference manual for more instruction. These manuals are also available electronically on www.rosemount.com.

⚠ WARNING

Explosions could result in death or serious injury:

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices.

- Before connecting communications in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- In an Explosion-Proof/Flame-Proof installation, do not remove the transmitter covers when power is applied to the unit.

Process leaks may cause harm or result in death.

- To avoid process leaks, only use the o-ring designed to seal with the corresponding flange adapter.

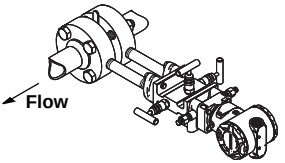
Electrical shock can result in death or serious injury.

- Avoid contact with the leads and the terminals. High voltage that may be present on leads can cause electrical shock.

STEP 1: MOUNT THE TRANSMITTER

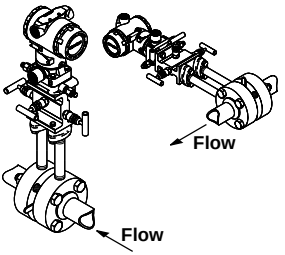
Liquid Flow Applications

1. Place taps to the side of the line.
2. Mount beside or below the taps.
3. Mount the transmitter so that the drain/vent valves are oriented upward.



Gas Flow Applications

1. Place taps in the top or side of the line.
2. Mount beside or above the taps.



Steam Flow Applications

1. Place taps to the side of the line.
2. Mount beside or below the taps.
3. Fill impulse lines with water.

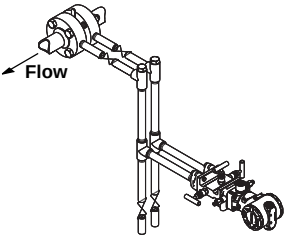
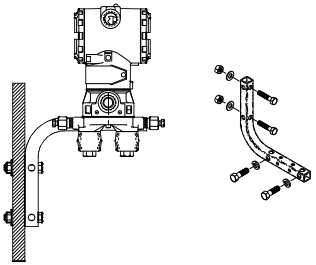
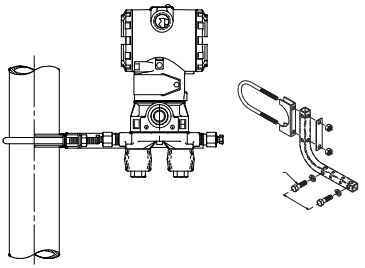


Figure 1. Using a Mounting Bracket

Panel Mount(1) | **Pipe Mount**





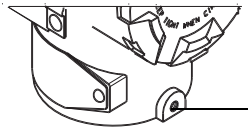
(1) Panel bolts are customer supplied.

STEP 2: CONSIDER HOUSING ROTATION

Consider Housing Rotation

To improve field access or to better view the optional LCD display:

1. Loosen the housing rotation set screw.
2. Rotate the housing clockwise to the desired position – up to 180° from its original position. Over rotating will damage the transmitter.
3. If the desired position is attained, tighten the housing rotation set screw.
4. If the desired position cannot be reached because the housing will not rotate further, rotate the housing counterclockwise until in the desired position is attained (up to 180° from its original position).
5. Tighten the housing rotation set screw.



Field Installation

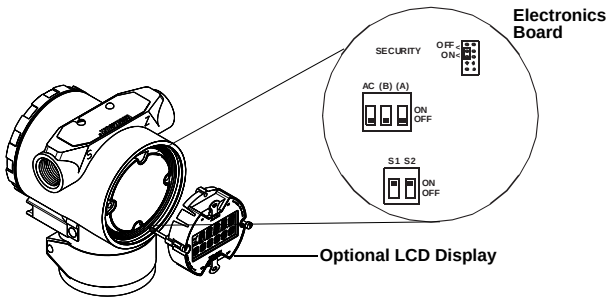
1. Mount the transmitter
   a. Install the flange or flange/adapter bolt finger-tight.
   b. Torque bolts to initial torque value using a cross pattern (see Table 1). When installing to a mounting bracket, torque bolts to 125 in./lb (169 N/m)

   Table 1. Torque Cross Pattern

Bolt Material	Initial Value	Final Value
Carbon Steel (CS)	300 in./lb (34 N/m)	650 in./lb (73 N/m)
Stainless Steel (SST)	150 in./lb (17 N/m)	300 in./lb (34 N/m)

2. If security jumpers are not installed, the transmitter will operate normally with the default security *off*. Verify baud rate. Default baud rate is 9600 with switch S1 and S2 in *on* position. Verify AC termination, pull down (B), and pull up (A) switches; default is in the *off* position.

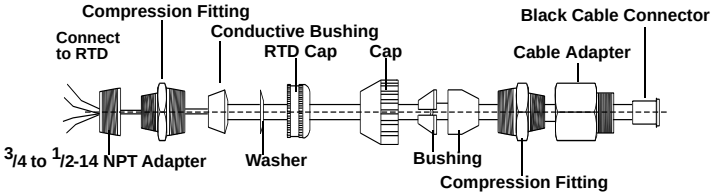
Figure 2. Transmitter Electronics Board and Optional LCD Display



STEP 2 CONTINUED...

3. Connect the transmitter to the process.
4. Install the RTD Cable Assembly (optional). All RTD 3095 Cable Assemblies use the 3095 RTD Cable Connector. Identify the cable type being installed and follow the steps below.
   - Installing an Armored Shielded RTD Cable (See Figure 3)
     a. Fully engage the black cable connector to the 3095 RTD connector.
     b. Tighten the cable adapter until metal contacts metal.
     c. Install the compression fitting.
     d. Tighten the cap onto the compression fitting.

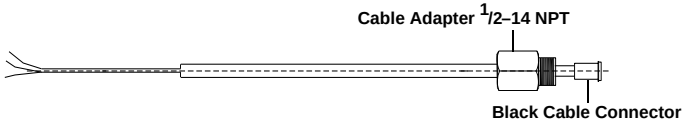
Figure 3. Armored Shielded RTD Cable



STEP 2 CONTINUED...

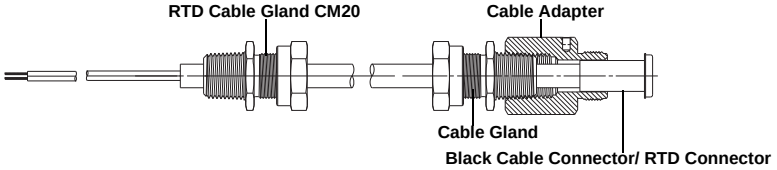
- Installing a Shielded 3095 RTD Cable (See Figure 4)
  Note: Shielded cable is intended for use in a conduit.
  a. Fully engage the black cable connector to the 3095 RTD Connector.
  b. Tighten the cable adapter until metal contacts metal.

Figure 4. Shielded RTD Cable



- Installing a ATEX/IECEx Flameproof 3095 RTD Cable (See Figure 5)
  a. Fully engage the black cable connector to the 3095 RTD Connector.
  b. Tighten the cable adapter and cable gland until metal contacts metal.

Figure 5. ATEX/IECEx Flameproof RTD Cable



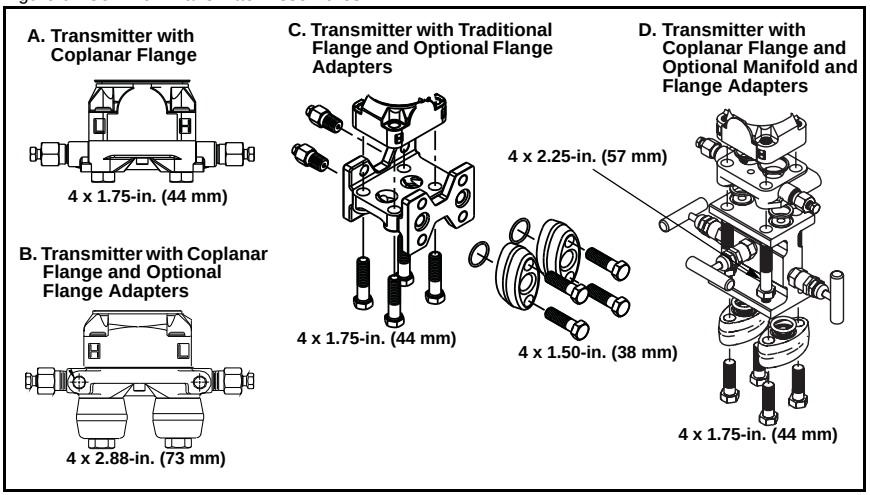
5. Check all process connections for leaks.
6. Connect the appropriate wiring (see Step 5). Ground the transmitter according to national and local electrical codes. Install field wiring grounding (optional).

STEP 2 CONTINUED...

Bolting Considerations

If the transmitter installation requires assembly of the process flanges, manifolds, or flange adapters, follow these assembly guidelines to ensure a tight seal for optimal performance characteristics of the transmitters. Use only bolts supplied with the transmitter or sold by Emerson as spare parts. Figure 6 illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 6. Common Transmitter Assemblies



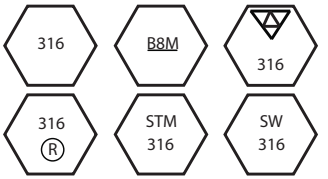
Bolts are typically carbon steel or stainless steel. Confirm the material by viewing the markings on the head of the bolt and referencing Figure 7. If bolt material is not shown in Figure 7, contact the local Emerson Process Management representative for more information.

Use the following bolt installation procedure:

1. Carbon steel bolts do not require lubrication and the stainless steel bolts are coated with a lubricant to ease installation. However, no additional lubricant should be applied when installing either type of bolt.
2. Finger-tighten the bolts.
3. Torque the bolts to the initial torque value using a crossing pattern. See Figure 7 for initial torque value.
4. Torque the bolts to the final torque value using the same crossing pattern. See Figure 7 for final torque value.
5. Verify that the flange bolts are protruding through the isolator plate before applying pressure.

STEP 2 CONTINUED...

Figure 7. Torque values for the flange and flange adapter bolts

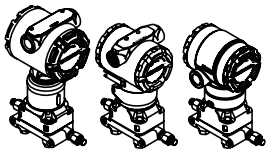
Bolt Material	Head Markings	Initial Torque	Final Torque
Carbon Steel (CS)		300 in.-lbs.	650 in.-lbs.
Stainless Steel (SST)		150 in.-lbs.	300 in.-lbs.

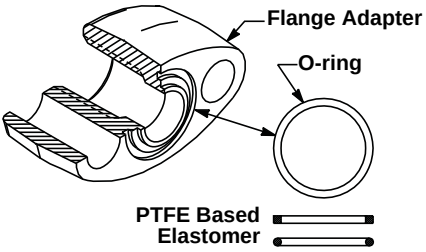
O-rings with Flange Adapters

⚠ WARNING

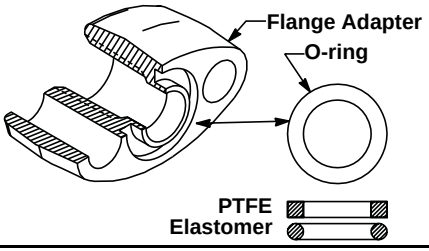
Failure to install proper flange adapter O-rings may cause process leaks, which can result in death or serious injury. The two flange adapters are distinguished by unique O-ring grooves. Only use the O-ring that is designed for its specific flange adapter, as shown below.

Rosemount 3051S / 3051 / 2051 / 3095





Rosemount 1151



⚠ Whenever the flanges or adapters are removed, visually inspect the o-rings. Replace them if there are any signs of damage, such as nicks or cuts. If the o-rings are replaced, re-torque the flange bolts and alignment screws after installation to compensate for seating of the PTFE o-ring.

STEP 3: CONNECT THE WIRING AND POWER UP

Use the following steps to wire the transmitter:

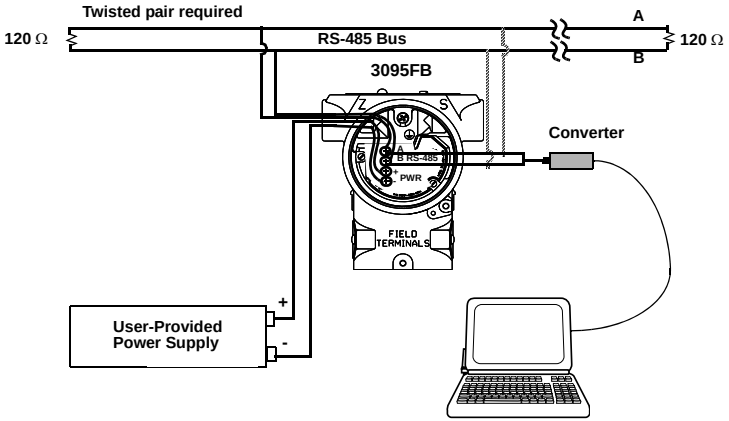
1. Remove the housing cover on the side marked FIELD TERMINALS.
2. Connect the lead from the positive power supply terminal to the "+" terminal (PWR/COMM) and the lead from the negative power supply terminal to the "–" terminal.
3. Connect the transmitter to the RS-485 bus:
   Connect the A lead to the "A" terminal.
   Connect the B lead to the "B" terminal.

NOTE
Improper field wiring connections may damage the 3095FB. Do not connect power wiring to the RS-485 terminals. Twisted pairs should be used for best results. Twisted pair is required for RS-485 bus wiring. Runs under 1000 ft (305 m) should be AWG 22 or larger. Runs from 1000 to 4000 feet (305 to 1219 m) should be AWG 20 or larger. Wiring should not exceed AWG 16.

4. Plug and seal unused conduit connections.
5. Install wiring with a drip loop. Arrange the drip loop so the bottom is lower than the conduit connections and the transmitter housing.

Figure 8 shows wiring connections necessary to power a 3095 and enable communications. The 3095FB requires a power supply between 7.5 - 30 Vdc. RS-485 signal wiring requires 2-wire half duplex RS-485 Modbus with 8 data bits, one stop bit, and no parity.

Figure 8. Transmitter Wiring Diagram



NOTE
Installation of the transient protection terminal block does not provide transient protection unless the 3095 case is properly grounded. The converter cables may be connected directly to the RS-485 bus or the transmitter terminals. Be sure to observe proper polarity.

STEP 4: VERIFY CONFIGURATION

To verify configuration, the user must first be connected to the Rosemount 3095FB using the Rosemount FB user interface software.

3095FB User Interface Software Packages

- Part Number 03095-5130-0003: Windows User Interface Software–Single PC License, Converter, and Cable.
- Part Number 03095-5125-0004: Windows User Interface Software–Single PC License.
- Part Number 03095-5125-0005: Windows User Interface Software– Site License.
- Part Number 03095-5106-0002: RS-485 Converter and Cable.

Verify Tag Information

1. Click **Transmitter** on the taskbar.
2. Click **Device Info...** from the drop-down menu.
3. Verify tag information.
4. Click **OK** to exit.

Verify Damping

1. Click **Transmitter** on the taskbar.
2. Click **Damping...** from the drop-down menu.
3. Verify damping settings for DP, SP, and PT.
4. Click **OK** to exit.

Verify Units of Measure

1. Click **Transmitter** on the taskbar.
2. Click on **Units...** from the drop-down menu.
3. Verify units of measure for DP, SP, and PT.
4. Click **OK** to exit.

Verify Sensor Range

1. Click **Transmitter** on the taskbar.
2. Click on **Sensor Limits...** from the drop-down menu.
3. Verify sensor limits.
4. Click **Cancel** to exit.

STEP 5: TRIM THE TRANSMITTER

NOTE
Transmitters are shipped from Emerson Process Management, Rosemount Division fully calibrated per request or by the factory default of full scale.

Zero Offset Trim

A zero trim is a single-point adjustment used for compensating mounting position effects. When performing a zero trim, ensure the low side block valve is closed, the equalize valve is open, the high side block valve is open, and all wet legs are filled to the correct level.

If zero offset is less than 3% of true zero, follow the user interface software instructions below.

Trim DP Offset (Zero)

1. Click **Maintenance**, **Sensor Trim** on the taskbar.
2. Click **DP** option.
3. click **Offset Trim** option.
4. Enter the offset trim point to trim DP Offset (Zero)
5. Click **Trim** to complete the sensor trim

Trim SP Offset (Zero) (AP, GP)

1. When performing a offset or zero SP trim, ensure the low side block valve is closed, the equalize valve is open, and the high side block valve is closed. Then, open vent to atmosphere.
2. Click **Maintenance**, **Sensor Trim** on the taskbar.
3. Click **SP** option.
4. click **Offset Trim** option.
5. If using GP type sensor, enter zero.
   If using AP type sensor, do not zero. Instead, enter an Offset value based on a barometric pressure reading.

NOTE
For Absolute Pressure (AP) Sensor: If open to atmosphere, reading should be at atmospheric pressure (roughly 12 - 15 psi (0.8 – 1.0 bar), *not* zero. Use a barometer that is four times as accurate as the Rosemount 3095 AP sensor.

6. Click **Trim** to complete the sensor trim.
7. Once the offset or zero SP trim is complete, verify that vent is closed, the high side block valve is open, close the equalize valve tightly, then open the low side block valve.

PRODUCT CERTIFICATIONS

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)

3095F_2/3,4/D Flow Transmitters

— QS Certificate of Assessment - EC No. PED-H-100 Module H Conformity Assessment

All other 3095_ Transmitters/Level Controller

— Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold

— Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (2004/108/EC)

3095F Flow Transmitters - EN 61326-1:1997 - A1, A2, and A3

Ordinary Location Certification for Factory Mutual

As standard, the Rosemount 3095FB transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Hazardous Locations Certifications

North American Certifications

FM Approvals

A Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/III, Division 1, Groups E, F, and G, hazardous locations. Factory Sealed. Provides non-incendive RTD connections for Class I, Division 2, Groups A, B, C, and D. Install per Rosemount drawing 03095-1025. Enclosure Type 4X.

Canadian Standards Association (CSA)

C Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II/III, Division 1, Groups E, F, and G, hazardous locations. CSA enclosure Type 4X. Factory Sealed. Provides a non-incendive RTD Connection for Class I, Division 2, Groups A, B, C, and D. Suitable for use in Class I, Division 2, Groups A, B, C, and D. Install in accordance with Rosemount Drawing 03095-1024. Single Seal.

European Certifications

H **ATEX Flameproof**
Certificate Number: KEMA02ATEX2320X Ⓔx II 1/2 G
Ex d IIC T5 (-50°C ≤ T_{amb} ≤ 80°C)
T6 (-50°C ≤ T_{amb} ≤ 65°C)
V_{max} = 55V dc
CE 1180
Special Conditions for Safe Use (x):
The device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

P **ATEX Dust**
Certificate Number: KEMA02ATEX2321 Ⓔx II 1 D T90°C
Ambient Temp (-50°C ≤ T_{amb} ≤ 80°C**)**
V = 55 Vdc MAX
I = 23 mA MAX
IP66
CE 1180

IECEx Certifications

7 **IECEx Flameproof**
Certificate Number: IECEx KEM 06.0018
Zone 0/1 Ex d IIC T6 (-20°C ≤ T_a ≤ 65°C)
Zone 0/1 Ex d IIC T5 (-20°C ≤ T_a ≤ 80°C)
V_{max} = 55 Vdc
I_{max} = 23 mAdc

8 **IECEx Dust**
Certificate Number: IECEx KEM 06.0018
Ex tD A22 T90°C
IP66

ROSEMOUNT

EC Declaration of Conformity

No: RMD 1000 Rev. H

We,

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317-6985

declare under our sole responsibility that the product,

Model 3095 Transmitters & Level Controller

manufactured by,

Rosemount Inc.		
12001 Technology Drive	*and*	**8200 Market Boulevard**
Eden Prairie, MN 55344-3695		**Chanhassen, MN 55317-9687**
USA		**USA**

to which this declaration relates, is in conformity with the provisions of the European Community Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Community notified body certification, as shown in the attached schedule.

January 22, 2009
(date of issue)

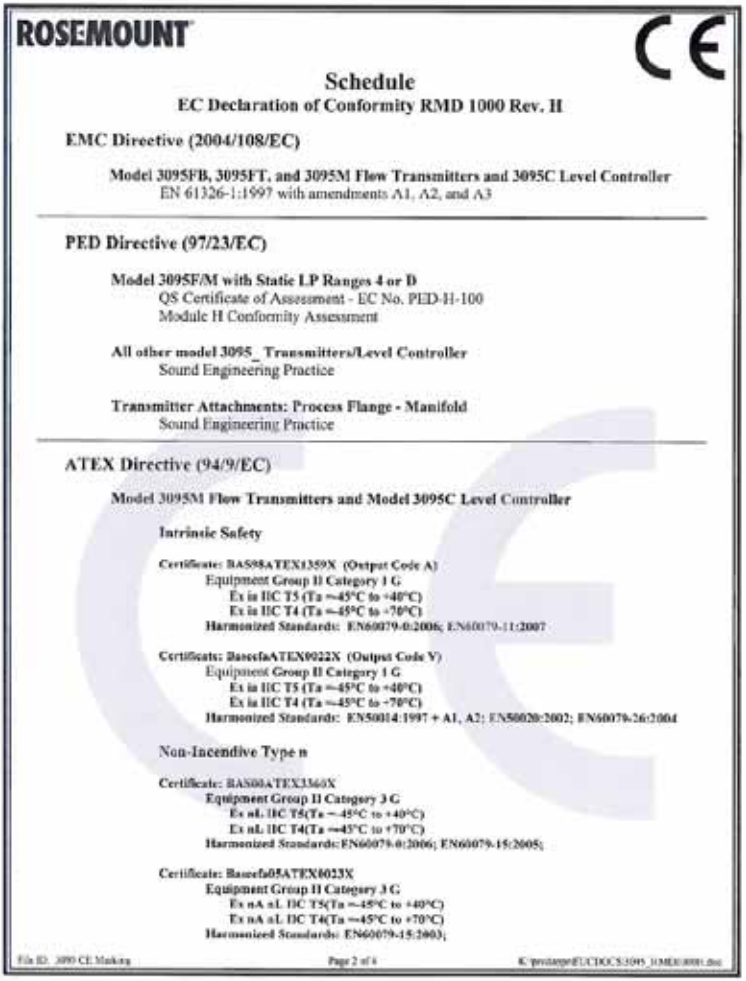
(signature)

Larrell De Jong
(name)

Manager Global Quality
(function name)

EMERSON.
Process Management

File ID: 3095 CE Marking Page 1 of 4 K:\prodapp\EUCDOCS\3095_RMD1000H.doc



ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RMD 1000 Rev. H

EMC Directive (2004/108/EC)

Model 3095FB, 3095FT, and 3095M Flow Transmitters and 3095C Level Controller
EN 61326-1:1997 with amendments A1, A2, and A3

PED Directive (97/23/EC)

Model 3095F/M with Static LP Ranges 4 or D
QS Certificate of Assessment - EC No. PED-H-100
Module H Conformity Assessment

All other model 3095_ Transmitters/Level Controller
Sound Engineering Practice

Transmitter Attachments: Process Flange - Manifold
Sound Engineering Practice

ATEX Directive (94/9/EC)

Model 3095M Flow Transmitters and Model 3095C Level Controller

Intrinsic Safety

Certificate: BAS98ATEX1359X (Output Code A)
Equipment Group II Category 1 G
Ex ia IIC T5 (Ta =-45°C to +40°C)
Ex ia IIC T4 (Ta =-45°C to +70°C)
Harmonized Standards: EN60079-0:2006; EN60079-11:2007

Certificate: BaseefaATEX0022X (Output Code V)
Equipment Group II Category 1 G
Ex ia IIC T5 (Ta =-45°C to +40°C)
Ex ia IIC T4 (Ta =-45°C to +70°C)
Harmonized Standards: EN50014:1997 + A1, A2; EN50020:2002; EN60079-26:2004

Non-Incendive Type n

Certificate: BAS00ATEX3360X
Equipment Group II Category 3 G
Ex nL IIC T5(Ta =-45°C to +40°C)
Ex nL IIC T4(Ta =-45°C to +70°C)
Harmonized Standards: EN60079-0:2006; EN60079-15:2005;

Certificate: Baseefa05ATEX0023X
Equipment Group II Category 3 G
Ex nA nL IIC T5(Ta =-45°C to +40°C)
Ex nA nL IIC T4(Ta =-45°C to +70°C)
Harmonized Standards: EN60079-15:2003;

File ID: 3095 CE Marking Page 2 of 4 K:\prototype\EUDOCS\3095_10MED0001.doc

ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RMD 1000 Rev. H

Model 3095F/M Flow Transmitters and Model 3095C Level Controller

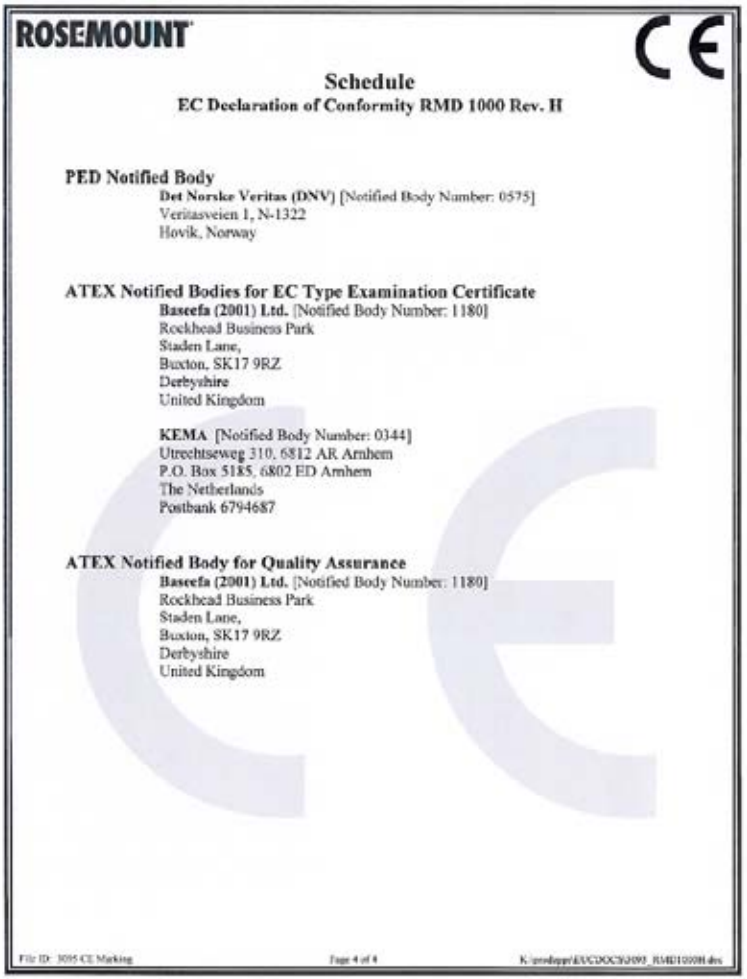
Flameproof

Certificate: KEMA00ATEX2320X
Equipment Group II Category 1/2 G
Ex d IIC T6 (-20°C ≤ Ta ≤ +60°C)
Harmonized Standards: EN60079-0:2006; EN60079-1:2007

Dust

Certificate: KEMA00ATEX2121
Equipment Group II Category 1 D "tD" T90°C
Standards: EN61241-0:2006 and EN61241-1:2004 with EN50014-1997 and EN50281-1-1:1998.

File ID: 3095 CE Mark.rtg Page 1 of 4 K:\prodappr\EU\CDOCS\3095_RMD1000H.doc



ROSEMOUNT

CE

Schedule

EC Declaration of Conformity RMD 1000 Rev. H

PED Notified Body

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

ATEX Notified Bodies for EC Type Examination Certificate

Baseefa (2001) Ltd. [Notified Body Number: 1180]
Rockhead Business Park
Staden Lane,
Buxton, SK17 9RZ
Derbyshire
United Kingdom

KEMA [Notified Body Number: 0344]
Utrechtseweg 310, 6812 AR Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
Postbank 6794687

ATEX Notified Body for Quality Assurance

Baseefa (2001) Ltd. [Notified Body Number: 1180]
Rockhead Business Park
Staden Lane,
Buxton, SK17 9RZ
Derbyshire
United Kingdom

File ID: 3095 CE Marking Page 4 of 4 K:\prodappr\EUCDOC\3095_RMD1000H.doc