CoolPoint ™

Installation and Operation Manual

Vortex Shedding Flow/Temperature Transmitters

Series:

CT6, CT8, CT12 and CT16

CoolPoint™ with Rotatable Enclosure

Effective with products having serial number 090100001 and greater

UNIVERSAL FLOW MONITORS, INC.
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UNIVERSAL FLOW MONITORS, INC.

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INDUSTRIAL DYNAMICS CO   800-940-0453   WWW.INDUSTRIALDYNAMICS.COM
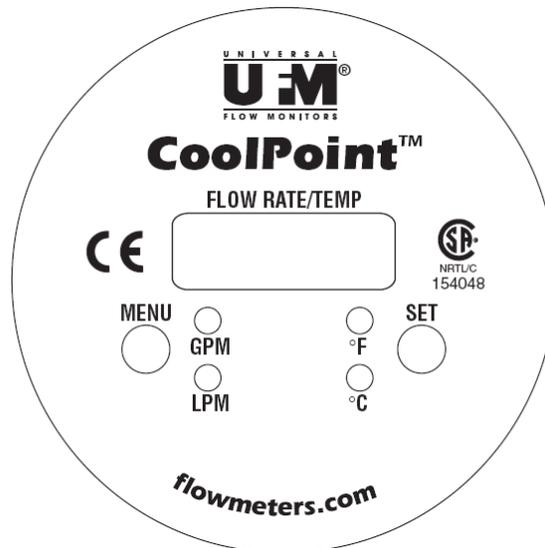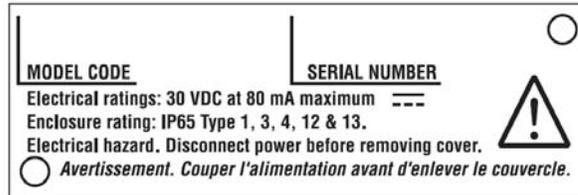
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USING THIS MANUAL

In order to use this manual, you will need the model code that can be found on the nameplate of the flowmeter, as shown on the example below (see MODEL CODES). The Model Code allows you to determine minimum and maximum flow capabilities, as well as pressure drop for various sizes.

MODEL CODE   SERIAL NUMBER

Electrical ratings: 30 VDC at 80 mA maximum ⎓
Enclosure rating: IP65 Type 1, 3, 4, 12 & 13.
Electrical hazard. Disconnect power before removing cover.
Avertissement. Couper l'alimentation avant d'enlever le couvercle.

UNIVERSAL
UiM®
FLOW MONITORS

CoolPoint™

FLOW RATE/TEMP

CE

CSA.
NRTL/C
154048

MENU   SET

GPM   °F

LPM   °C

flowmeters.com

QUICKSTART

PIPING

Install in pipe making sure to orient IN port to flow supply.

10 pipe diameters distance is required upstream and 5 down for best accuracy.

Use proportional spacing if this much space is not available.

50 pipe diameters are required upstream as distance from a valve.

No use of Teflon tape please. (See detailed piping instructions.)

Attach pin connector/cable assembly to unit. (See detailed wiring instructions.)

CONFIGURATION OF METER

Description	Digital Display	GPM LED	LPM LED	Deg F LED	Deg C LED
At powerup display shows 888 to verify all digits working. Default selections for units of measure is GPM and Fahrenheit	8.8.8	X		X	
Next , firmware revision. Number shown is an example.	4.64Ct	X		X	
Run mode achieved.	0.00	X		X	
SET button toggles between GPM and LPM.		X	X		
MENU button toggles between temperature in F and C			X	X	

INDUSTRIAL DYNAMICS CO   800-940-0453   WWW.INDUSTRIALDYNAMICS.COM

SETTING UP ALARMS

Description	Digital Display	GPM LED	LPM LED	Deg F LED	Deg C LED
Units can be configured to have alarms or pulse output					
Press MENU to toggle between flow and temperature. Put in FLOW mode		X	X		
Press and hold MENU	FLo				
Then the display will show either PUL for pulse out	PUL				
Or ALA if in Alarm mode	ALA				
Chose ALA by pressing the SET button until ALA is shown	ALA				
Value shown in LED digital display is the set point. Initially this is 0	0.0				
Press MENU to incrementally change the set point. Only feasible settings are shown. Hold down for faster changes.	16				
To have no alarm (disabled) leave setting at Zero.	00.0				
Storing the selected number in memory is done with the SET button. Press it once. Example: setting at 5 GPM.	5 SET	X			
The next selection is for Normally opened or normally closed. This means that in normal flow conditions the alarm circuit is open (no)	no				
Or it is closed	nc				
Use MENU button to select. Example shown is nc	nc				
Use SET button to save this setting	Set				

SETTING UP PULSE OUTPUT FOR FLOW

Description	Digital Display	GPM LED	LPM LED	Deg F LED	Deg C LED
Units can be configured to have alarms or pulse output					
Press MENU to toggle between flow and temperature. Put in FLOW mode		X	X		
Press and hold MENU	FLo				
Then the display will show either PUL for pulse out or ALA for alarm mode	PUL				
Make sure it says PUL	PUL				
Press SET and now the meter will put off 100 pulses per minute for 3/6 to 1 ½ inch units and 25 pulses per minute for2 inch units.	Set				

CONFIGURING TEMPERATURE ALARM

Description	Digital Display	GPM LED	LPM LED	Deg F LED	Deg C LED
Press MENU to toggle from flow display to temperature display				X	X
Press and hold MENU					
Display shows "t"	t				
Followed by "AL"	AL				
Release MENU button. Value shown is the alarm set point.	45				
Use MENU button to adjust the set point by pressing it repeatedly or continuously.	180				
Press SET to save the value. Set to Zero to disable alarm	Set				
Alarm is normally opened or normally closed as set in the flow alarm setting procedure.					

GENERAL SPECIFICATIONS

Maximum Operating Pressure: 300 PSIG (20.4 Bar) for CT6, CT12 and CT16

Minimum Operating Pressure: 10 PSI of back pressure is required for the formation of vortices.

Maximum Operating Temperature: 210 °F (99 °C),

Minimum Operating Temperature: 35 °F (2 °C) fluid and ambient

Maximum Flow: Meters may occasionally be over-ranged up to 125% of capacity without damaging the meter.

Note: Output is clamped at 21mA (6.3% over-range) but the display will indicate up to 125% F.S.

Capacities: 3/4" = 25 GPM (95 LPM)

1" = 50 GPM (190 LPM)

1 1/2" = 100 GPM (380 LPM)

2" = 200 GPM (750 LPM)

Turndown Ratio: 10:1 standard.

Process Connections: Female NPT for 2 inch pipe sizes and below. This would include CT 6-16.

Wetted Parts: Brass, PVDF and Viton®. 316 Stainless Steel optional for all sizes up to 2″ (CT6, CT8, CT12 and CT16)

Display: 3-digit LED for CT6, CT8, CT12 and CT16

Digit height = 0.3"

Enclosure Rating: Type 1, 3, 4, 12, 13, IP65

Power: 10 - 30 VDC @ 80 mA

⚠ Caution: The unit shall be supplied by a SELV (separated extra-low voltage) source in accordance with CSA Standard C22.2 No.1010.1-92 Annex H.

Environmental conditions: This device has been designed for use in Installation Category I, pollution degree 4, at altitudes up to 2000 meters

(6560 ft.), either indoors or outdoors as defined in CSA Standard C22.2 No.1010.1-92.

Viton® is a registered trademark for DuPont Performance Elastomers.

TEMPERATURE READINGS

Accuracy:	± 2° F
Analog Output:	4-20 mA; 4 mA= 35 °F (0 °C), 20 mA = 210 °F (100 °C)
Response Time:	1.5 seconds to 63% of step change
Repeatability:	± 0.25% of actual temperature
Alarm Output:	High temperature, solid-state relay, rated to 125 mA @ 30 VDC, up to 150 °F [50 mA @ 30 VDC between 150-210 °F (65-99 °C)]
	Alarm Deadband = 2% of full-scale
	Alarm State = same as selected for flow alarm
Electrical Connection:	8-pin micro DC male connector (CT models), pigtail leads or junction box
Cabling:	8-pin female shielded cable to be used with micro connector
Electrical Service:	General Purpose
Electrical Classification:	Non-hazardous Type 1, 2, 3, 4 (equal to IP 65), 12, and 13
Power Requirements:	24 VDC (10-30 VDC) @ 80 mA
Cabling:	Male DC micro pin connector standard, pigtails or conduit box optional.

FLOWMETER READINGS

Accuracy:	±2% of full-scale
Analog Output:	4-20 mA proportional to flow
Response Time:	450 ms
Repeatability:	± 0.25% of actual flow
Solid State Relay:	Standard units have a solid state relay in addition to the transmitted flow rate output and it is field selectable to either be a pulse output or a flow alarm.

Alarm Output: Optically-isolated solid-state relay, rated to 125 mA @ 30 VDC, up to 150 °F [50 mA @ 30 VDC between 150-210 °F (65-99 °C)]
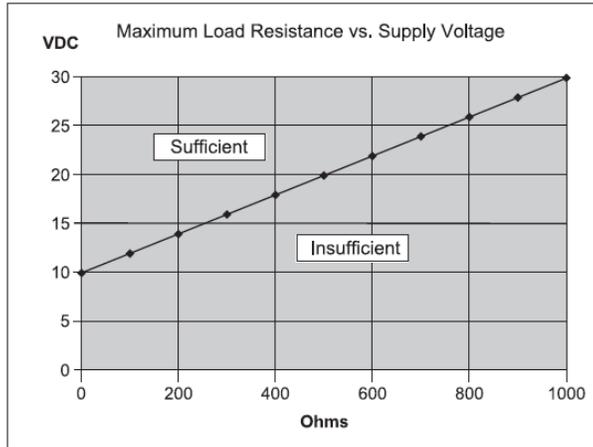
Alarm Deadband = 5% of full-scale for all sizes above ½"

Alarm State = NO or NC above setpoint (selectable)

Pulse Output: The pulse output always indicates flow in GPM. It is driven by the internal solid-state relay with a 10K pull-up resistor to supply voltage (30 VDC maximum pulse amplitude, pulse width = 3 msec). Note: pulse output represents instantaneous flow rate, not an averaged (filtered) value which can result in jitter if no external filter is applied.
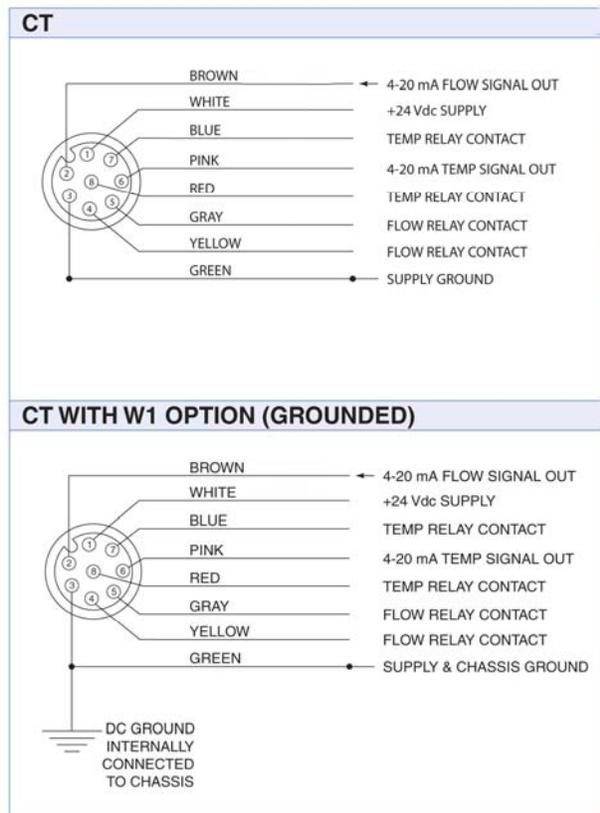
The totalizer resolution and the corresponding flow rate pulse output depend on the full-scale setting of the flowmeter, as follows:

CT071910

WIRING

PIN CONNECTOR PINOUTS

CT

Color	Signal
BROWN	4-20 mA FLOW SIGNAL OUT
WHITE	+24 Vdc SUPPLY
BLUE	TEMP RELAY CONTACT
PINK	4-20 mA TEMP SIGNAL OUT
RED	TEMP RELAY CONTACT
GRAY	FLOW RELAY CONTACT
YELLOW	FLOW RELAY CONTACT
GREEN	SUPPLY GROUND

CT WITH W1 OPTION (GROUNDED)

Color	Signal
BROWN	4-20 mA FLOW SIGNAL OUT
WHITE	+24 Vdc SUPPLY
BLUE	TEMP RELAY CONTACT
PINK	4-20 mA TEMP SIGNAL OUT
RED	TEMP RELAY CONTACT
GRAY	FLOW RELAY CONTACT
YELLOW	FLOW RELAY CONTACT
GREEN	SUPPLY & CHASSIS GROUND

DC GROUND INTERNALLY CONNECTED TO CHASSIS

The flowmeters are inline and utilize the vortex shedding principle. The fluid strikes a bluff body, generating vortices (eddies) that move downstream. The vortices alternate from one side of the bluff body to the other. A piezoelectric sensor housed in a sensor tube directly downstream of the bluff senses the pressure zones created by the vortices. The sensor generates a frequency directly proportional to the vortices (flow). The pulses are then amplified by the circuit board and converted to a 4-20 mA output, which is also linear with flow. Flow is displayed on the LEDs in either GPM or LPM. Selection of the preferred units of measure is made by using the **SET** pushbutton. A solid-state relay can also be set for a low-flow alarm, typically from 15% to 90% of full-scale flow. The relay can be configured to be either NC (normally-closed) or NO (normally-open), or for a pulse output.

 The CoolPoint® flowmeters in this manual combine temperature measurement with flow-measurement . An internal temperature sensor, housed in a small thermo well downstream of the flow sensor, measures the liquid temperature. Temperature can be displayed in either degrees Fahrenheit or Celsius, and is selected by using the **SET** pushbutton. There is an independent 4-20 mA output proportional to temperature and an independent solid-state relay that can be configured as a high temperature alarm. The relay state (NC or NO) is the same as that selected for flow alarm. The user can select either flow or temperature to be displayed on the LEDs by using the **MENU** pushbutton.

APPLICATIONS

CoolPoint can be used on low viscosity, clean or dirty water-like liquids that are compatible with brass, PVDF and Viton. Metered fluids should not include long fibers or a significant level of abrasive solids. Should abrasive wear occur over time, bluffs as well as the sensors are replaceable. Typical applications include cooling loops using water, 50% solutions of glycol, and water-soluble machine coolant (up to 10%). These applications are found in most process industries, including rubber, steel, fabrication, manufacturing, refining, paper, chemical, food, petrochemical and power. They cannot be used on gases (including air), or on flammable liquids.

Note: If used outside the parameters specified in this manual, the proper operation of the flowmeter cannot be guaranteed.

Cleaning: These meters do not require any special cleaning of the external surfaces. If cleaning is deemed necessary, strong solvents, detergents, or chemicals should not be used. A damp cloth may be used to wipe off dirt or debris.

INSTALLATION

For best results, the meters may be installed in any position as long as proper piping installation requirements are observed. This includes sufficient support of adjacent piping to minimize the system's inherent vibration. Unions of the same pipe size and full port isolation ball valves may be installed for ease of removal and servicing of equipment, if necessary. Meters should be placed in horizontal, slightly ascending runs or vertical runs to prevent trapped air from accumulating in the meter. Furthermore, the meters should not be placed at the highest point in the piping. The piping system should be filled slowly to prevent water hammer from damaging the flow sensor. Please note that reverse flow can also damage the flow sensor.

In order to achieve the stated accuracy, a straight pipe run of 10 pipe-diameters (minimum) is required upstream of the meter, as well as 5 pipe-diameters downstream. Isolation ball valves, when used, should be in the full open position. Throttling valves should always be placed downstream of the meter. A minimum straight run of 50 pipe-diameters is required between an upstream valve and the flowmeter.

If Teflon® tape or pipe sealant is used, the user must ensure that no loose parts become wrapped around the bluff or the flow sensor when flow starts.

Use of diaphragm or piston pumps affects the meter's performance unless they are installed with a properly sized pulsation dampener and pressure control. The piping system must create some backpressure on the meter to allow vortex formation and to prevent cavitation, especially at full flow. Minimum required backpressure is 10 PSIG at maximum flow and at 70 °F (21 °C). Higher backpressures are required at elevated temperatures and occasional surges to 125% of maximum flow.

In rare situations, the user may notice an intermittent flow display that drops off while the flow is held steady. In this case, please contact UFM to discuss the backpressure requirements.

FACTORY DEFAULT SETTINGS

Flow Units: GPM

Set Point: 00.0.   NO/NC is set to NC.

Temperature Units: °F

FLOW SET POINT RANGES AVAILABLE BY SIZE

Meter Size	Setpoint Min.		Setpoint Max.		Hysteresis	
	GPM	LPM	GPM	LPM	GPM	LPM
¼″	0.40	1.5	3.00	12.0	0.10	0.4
¾″	3.0	11	22.5	85	1.2	5
1″	7.5	30	45.0	170	2.5	9
1 ½″	15	56	90	341	5	18
2″	30	113	180	682	10	37

PULSE OUTPUT DETAILS AND CHARACTERISTICS

Pulse Output:

There is an output pulse proportional to flow "rate" as well. The pulse output always indicates flow in GPM. It is driven by an internal solid-state relay with a 10K pull-up resistor to supply voltage (pulse width = 3 msec). It should be noted that the pulse output represents instantaneous flow rate, not an averaged value. Therefore, flow jitter may be present when an external rate indicator is used, unless the indicator is capable of filtering or signal averaging.

The totalizer resolution and the corresponding flow rate pulse output depend on the full-scale setting of the flowmeter, as follows:

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Port Size	Full-scale flow (GPM)	Pulse Output (Per Gallon)
¾"	25.0	100
1"	50.0	100
1 ½"	100	100
2"	200	25

TEMPERATURE ALARM RANGES

Meter Size	Setpoint Min.		Setpoint Max.		Hysteresis	
	°F	°C	°F	°C	°F	°C
All CT Models	35	1	200	93	4	2

Table 3. Temperature Alarm Range

Note: Temperature alarm is activated when temperature >= setpoint. After temperature alarm is activated, it can only be cleared when temperature < setpoint - hysteresis . The term "activated" means that the relay contact is closed when "no" is selected (Steps 10 and 11, under Configuring the Flow Alarm), or opened when "nc" is selected.

MODEL CODES

Flow maximum GPM (LPM)	Pipe size in inches	Model code	Material	Thread options available	Connector or conduit box options available	Special options
4 (15)	3/4	**CT6F1**	**-M1***=Brass	**T1***=NPT	**C1***=Pin connector	
6 (23)	3/4	**CT6F9**	**-M2**=316 Stainless Steel	**T2**=BSPT	**C2**=Pig tails	**W1**=20:1extended turndown**
12 (45)	3/4	**CT6F2**		**T3**=BSPP	**C3**=Conduit box, terminal strip	**E20**=High temp (150-210° F)
25 (95)	3/4	**CT6**				
50 (190)	1	**CT8**				
100 (380)	1 1/2	**CT12**				
200 (750)	2	**CT16**				

** Not available on CT6-F1
** Needs grounding
** Turndown is 20:1 standard temp.

* Indicates default selection. If no selection is made, this option is assumed.

Example: CT6 is the same as CT6-M1T1C1.

PRESSURE DROP CHARTS

PRESSURE DROP CHARTS
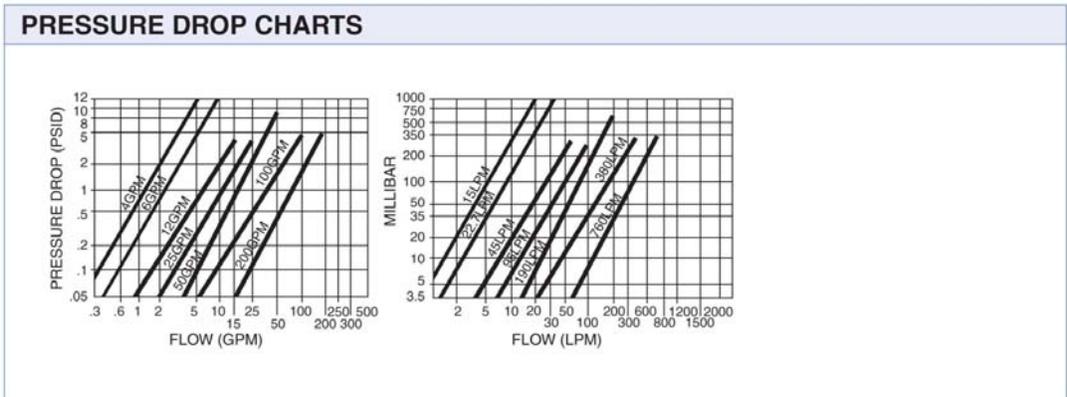
CABLING

ACCESSORY CABLES AVAILABLE FOR PIN CONNECTOR METERS

Series	Description	Length in Meters	Part Number
CT	8 pin female	2 5 10	6242-2M 6242-5M 6242-10M

DIMENSIONS

INSTALLATION DRAWING – BASIC METERS
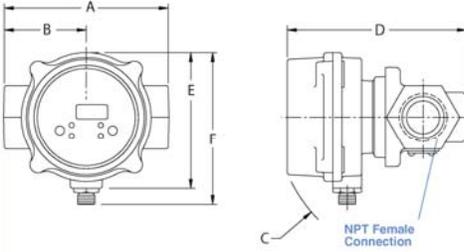
Size	A	B	C	D	E	F
CP6, CP6-F1D2, CP6-F9D2, CP6-F2D2, CP8, CT6, CT6-F1, CT6-F9, CT6-F2 and CT8	4.50 [113mm]	2.25 [57mm]	4.04 [103mm]	4.92 [125mm]	3.75 [95mm]	4.19 [113mm]
CP12,CT12 CT16 & CP16	6.75 [171mm]	3.37 [86mm]	4.71 [120mm]	6.14 [156mm]	3.75 [95mm]	4.19 [106mm]

NPT Female Connection

INSTALLATION DRAWING – METERS WITH OPTIONAL JUNCTION BOX
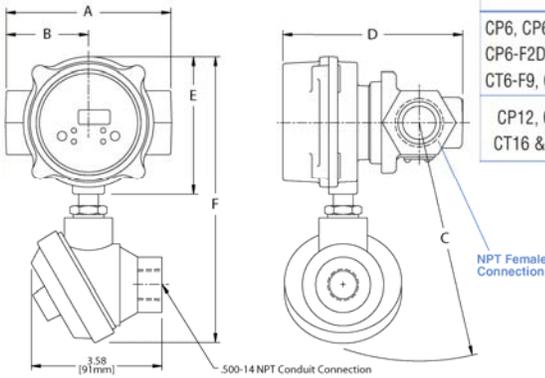
Size	A	B	C	D	E	F
CP6, CP6-F1D2, CP6-F9D2, CP6-F2D2, CP8, CT6, CT6-F1, CT6-F9, CT6-F2 and CT8	4.50 [114mm]	2.25 [57mm]	6.52 [166mm]	4.92 [125mm]	3.75 [95mm]	7.79 [198mm]
CP12, CT 12 CT16 & CP16	6.75 [171mm]	3.37 [86mm]	6.87 [175mm]	6.14 [156mm]	3.75 [95mm]	7.79 [198mm]

NPT Female Connection

3.58 [91mm]

.500-14 NPT Conduit Connection

Please read the following UFM policy information carefully. By following the guidelines outlined below you will assist in providing a timely evaluation and response regarding the status of your flow meter. UFM evaluates all AUTHORIZED RETURNED MATERIALS in a timely manner and will promptly provide notification regarding the status of the related materials and/or a written quotation indicating the total charges and description of the necessary repairs.

1   All returns must have a RMA form completed by the customer.

2   Any meter returned that was previously in service must have the OSHA requirements completed and a MSDS included where applicable.

3   An RMA number will only be issued when UFM has received a copy of the completed RMA form and any applicable MSDS.

4   A "Return Goods" shipping label (located in the back of the Instruction Manual) must be used for returning materials to UFM.

5   Returned goods must be shipped prepaid or they will be rejected.

REPAIRABLE MATERIAL

Written or verbal authorization to proceed with the repair under an assigned Purchase Order, must be received within 30 days of repair quotation. If the unit(s) are repaired, the $90.00 evaluation charge will be applied to the quoted repair costs. If no repairs are authorized within this 30 day period, the customer will be billed $90.00 plus shipping charges and the materials will be returned to the customer.

NON-REPAIRABLE MATERIAL

If materials are found not repairable, a written notice that the material is not repairable will be provided to the customer by UFM. If no disposition to scrap or return the material is received from the customer within 30 days, unrepairable material will be scrapped and the customer will be billed the $90.00 evaluation charge. If a UFM replacement unit is purchased within 30 days of non-repairable condition notice, the $90.00 evaluation fee will be waived. The return of non-repairable materials may be ordered by customer Purchase Order providing for shipping and handling charges.

RETURN FOR RESTOCK All goods returned for restock adjustment **must** be:

A. New and unused.

B. **Returned to the factory within ONE YEAR of date of original shipment.**

C. Returned through the distributor where the goods were originally purchased. This material will also be subject to an evaluation charge of $90.00.

CT071310

The customer will be advised of the restocking adjustment for all restockable goods. Upon acceptance of the restocking adjustment, by the customer, the $90.00 evaluation fee will be waived and a credit issued by UFM. The customer will be advised of any **non-restockable** goods and will be charged the $90.00 evaluation fee plus any shipping charges if returned to the customer.

If no disposition is received by UFM within 30 days, the goods will be scrapped and the $90.00 evaluation fee will be billed.

WARRANTY RETURNS

Warranty returns must be shipped prepaid to UFM. UFM will review the goods and advise the customer of the evaluation and validity of the warranty claim. Valid warranty claims will be repaired or replaced at no charge. No evaluation fee will be charged for repairs made under warranty. Return shipping costs will be prepaid by UFM. Should UFM determine the returned material is not defective under the provisions of UFM's standard warranty, the customer will be advised of needed repairs and associated costs. All materials returned for warranty repair that are determined to not have a valid warranty claim will be subject to the "**Repairable Material**" policy outlined above.

INDUSTRIAL DYNAMICS CO   800-940-0453   WWW.INDUSTRIALDYNAMICS.COM

RMA FORM

UNIVERSAL UFM FLOW MONITORS **ROCON LLC**

RETURN MATERIAL AUTHORIZATION
E-MAIL: ufm@flowmeters.com
1755 E. Nine Mile Rd., Hazel Park MI 48030
PH: (248) 542-9635
Fax: (248) 398-4274

IMPORTANT: *This form must be filled out completely and faxed to the Repair Department prior to issuing a RMA # (UFM) / NRA # (ROCON)*

Customer: _____

Contact Name: _____
Phone # _____
FAX # _____
E-mail: _____

Product Information   Qty: _____
Model Code: _____

S/N: _____
Sales Order: _____

Are before (as found) and after readings required?
_____ Yes   _____ No

Reason for return: (Please be detailed as possible. **Lack of Information may increase labor charges.**)

Mechanical	**Electronics**
☐ Leaks	☐ No signal
☐ Sticks	☐ Inaccurate signal
☐ Calibration Off	☐ No Display
☐ Switch does not work	☐ Other (describe below)
☐ Other (describe below)	

Details:
_____
_____
_____

Note: *There will be a minimum evaluation charge of $90.00 for all units returned (excluding units covered under warranty). Units WILL NOT be accepted without a valid Return Material Authorization Number (RMA#). A Material Safety Data Sheet on the process fluid must be received, when applicable, prior to the RMA# being issued.*

* OSHA Requirements: (to be filled out by customer) **NO EXCEPTIONS!!**

Process Fluid: _____
Meter must be flushed to remove all process fluids.

I hereby certify that the material being returned has been properly flushed and cleaned of all hazardous materials and does not require any special handling.

Print or Type Name _____   Signature: _____

Title _____   Date: _____

Distributor Information   ***INTERNAL USE ONLY***

Company Name _____
Contact Name _____
PO # _____
Phone # _____ FAX # _____

 # _____
Authorized by _____
Date _____

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