

**BI-UMB**  
**Revision 05**  
**January 2010**

# ***Model UMB Pulser***

**Installation and Operation Manual**



**BRODIE**  
International<sup>TM</sup>  
Engineering the Future



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# **1.0 Read Me First**

## **Notice**

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## **Essential Instructions General**

Brodie Meter Co., LLC designs, manufactures and tests its products to meet many international standards. As the instruments are sophisticated technical products they must be installed, used and maintained properly to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and incorporated into onsite safety programs where possible.

Read all instructions prior to installing, operating or servicing the product. If the instruction manual is not the correct one, telephone +1 912 489 0200. Retain the instruction manual for future reference.

If you do not understand any of the instructions, contact your local Brodie representative for clarification.

Follow all warnings, cautions and instructions marked on or supplied with the product. It is the end users responsibility to operate the instrument within the specifications as defined within the instruction manual or marked on the instruments name plates.

Install the equipment as specified in the installation instructions of the appropriate manual and in accordance to local and national codes.

To ensure proper performance, use qualified personnel to install, operate, program and maintain the product.

Some types of equipment contain Carbon Steel, Cast Iron and/or Aluminium wetted parts, these instruments are not for use on water service.

It is the end users responsibility to assess the surface temperature of the device when it is in service, and if required take the necessary precautions to avoid personnel injury or damage to other equipment.

When replacement parts are required, ensure that qualified people use replacement parts specified by the manufacturer. Unauthorised parts and procedures can affect the products performance and place the safe operation of the process at risk. Look alike substitution may result in explosion, fire, electrical hazards, improper operation or personnel injury.

Use of this equipment for any other purpose than it is intended for may result in property damage and/or serious personal injury or death.

## **Essential Instructions for Electrical Equipment Including the European Union (Directive 2004/108/EC and 2004/22/EC)**

This unit contains Electrostatic sensitive circuit boards. Electrostatic safety precautions should be taken to prevent damage.

When connecting wiring, it is good practice to use shielded cable. The shield should be connected to earth at the read out or control systems end of the cable; the other end of the shield should not be connected. This wiring practice is mandatory in order to comply with the requirements for electromagnetic compatibility as per the EMC directive 2004/108/EC and MID 2004/22/EC of the council of the European Union

It is the end users responsibility to ensure that all protective covers are in place to prevent electrical shock and/or personnel injury.

## **Essential Instruction When Equipments Is To Be Used In Hazardous Locations, Including the European Union (Directive 94/9/EC)**

Any Hazardous area approval applies to equipment without cable glands. When mounting the flameproof enclosure in a hazardous area only cable glands / conduit seals certified to meet or exceed the rating of the equipment should be used, refer to the type approval documentation for further details. It is the end users responsibility to ensure this happens.

Cable glands and cable must be suitable for the operating temperature of the device under its rated conditions, this is especially important is the device has an operating temperature above 70°C (158°F)

The meter has been provided with an approved sealing device in one of the cable entries, the other entry has been closed with a plastic cap plug. It is the end users responsibility to remove the cap plug and replace it with a suitable cable gland or conduit seal before the equipment is put into service.

It is the end users responsibility to ensure when the instrument is located in a hazardous area that all Cable glands and conduit seals must be installed in accordance with the local codes and regulations.

It is the end users responsibility to ensure that before opening an electronic enclosure in a flammable atmosphere; all the electrical circuits must be interrupted.

If replacement of the screws which secure the sensor housing, the UMB cover of the electronic register and its cover are required, they must be replaced with either factory direct parts or M6-1 x 16 (6g) mm hex socket head screws of equal length. The screws must be made from stainless steel grade A1-70 or A2-70 and be torqued to a value of 55 in lbs upon installation, its is the end users responsibility to ensure this happens.

It is the end users responsibility to assess the maximum surface temperature of the device and the equipment the device is attached to and located next to as this may exceed the temperature ratings of the device itself. If this happens, additional safety precautions will need to be implemented by the end user.

Flame proof housings contain Aluminium; although the composition of these enclosures is carefully maintained to prevent any risk of an ignition source it is the end users responsibility to ensure that the housing is not struck by rusty tools or objects.

If the equipment is to be installed in an area where dust deposits and build up are to be expected, a maintenance plan should be arranged to include regular removal of the dust build up. This will prevent the dusts forming a possible source of ignition.

The power supply requirements for this product are specified with in the operating and maintenance manual, it is the end users responsibility to operate the product with in these specified limits.

The instrument contains surfaces that constitute flames paths, these surfaces should not contain any mars or scratches, and if any are present the factory or the local representative should be contacted immediately to obtain a new housing as the safety of the enclosure may be impaired. It is the end users responsibility to inspect these surfaces every time the enclosure is opened.

When flanged flame paths are re assembled the gap between them should be less than 0.0015" (0.038 mm) such that a ½" (12.5mm) wide feeler 0.0015" (0.038mm) gauge will not enter the gap more than 1/8" (3mm). It is the end users responsibility to ensure this happens each time the enclosure is reassembled.

## 2.0 Receipt of Shipment

When the instrument is received, inspect the outside of the packing case for any damage that may have occurred during shipment.

**Any damage incurred during shipment is the carrier's responsibility and is not part of the factory warranty. If the packing case is damaged notify the carrier immediately and follow their claim procedures.**

If the packaging is undamaged locate the envelope containing the packing list, this will generally be on the outside of the box. Carefully remove all the contents from the packaging checking for any damage, Check the items off against the packing list for correct parts and quantities. If any items are incorrect or damage please contact your sales representative immediately, quoting the sales order reference number.

## 3.0 Return Shipment

If any item is returned to the factory, a returned material report (RMR) will need to be completed, The RMR forms can be obtained from the local sales representative or the Brodie Meter Co., LLC product service department.

If an instrument has been used with process fluid, then in addition to the RMR a decontamination statement will also be required..

A decontamination form is included in section 13 of this manual.

**Note:** When an instrument is being removed from service it must be thoroughly drained and any hazardous substances neutralised. Care must be taken to ensure any substance removed from the instrument is disposed of in accordance to the local regulations, Placing the instrument on its inlet flange will aid drainage.

The process connections should be sealed to prevent any residual substances leaking from the meter during shipment. The type of seal will depend on the mode of transport, the local carrier should be contacted for details.

Any item should be securely packed, the larger instruments should be mounted on wooden pallets or skids for shipment, The exterior of pallet mounted items should be protected but suitable means, such as a solid wooden crate.

When packaging the instrument for return to the factory, make two copies of the RMR and decontamination statement, place one copy inside the packaging and one copy on the outside of the packaging,

Any equipment returned to the factory with out the correct documentation will be returned to the sender at their own expense.

Return shipping address:

Brodie International  
Product Service Department  
19267 Hwy. 301 North  
Statesboro, GA 30461  
Phone: 001.912.489.0200  
Fax: 001.912.489.0294  
service@brodieintl.com

## **4.0 Storage**

Brodie International instruments are precision devices and should be handled and stored with care.

The inlet and outlet covers should remain in the instrument until the unit is ready for installation.

If extended storage is required it is recommend that the instrument be placed in an environmentally controlled warehouse, if this is not possible the instrument should be stored in a water proof lined wooden box, desiccant packs should be taped to the inside of the instrument end connections before they are sealed to reduce the effect of humidity, depending on the storage time is may also be preferable to use a compatible corrosion inhibitor. Care should be taken to remove any storage protection items before installing the instrument.

If an instrument is removed from service for an extended period of time it should be flushed with an appropriate corrosion inhibitor before being place in long term storage as mentioned above.

## **5.0 Introduction**

### **Description**

The Brodie UMB Pulser, is a device that can be fitted to a mechanical flow meter to provide an electrical output signal proportional to the volume measured. It is designed to replace old fashioned mechanical stack up assemblies so to adapt the flow meters to modern day control systems and electronic instrumentation that required pulsed input signals.

Two UMB pulser configurations are available both feature explosion proof / weather proof housing, there is the high resolution Model 0360 optical pulser and the low resolution model 0355.

### **Principle of Operation**

#### **0355 UMB Pulser**

The 0355 UMB pulser configuration includes a magnetic wheel, sensor and connector board. When the magnetic wheel is rotated by the metering device, the sensor detects the movement and generates pulses. These pulses are transmitted to the connector board where the connection is made to the customers receiving device. The pulses are generated without the application an external power supply.

#### **0360 UMB Pulser**

The 0360 UMB pulser includes an optical encoder, code wheel, detectors and preamplifier board. As the code wheel rotates, it interrupts a light beam transmitted from a light emitting diode in the optical detector. Signal processing circuitry receives this signal and produces two primary, high resolution channels and an index channel. The two primary channels, A and B, are 90 electrical degrees out of phase. Channels A and B may be combined to double the output. All configurations give one pulse per revolution on the index channel. The output is a user selectable square wave or open collector.

## 6.0 Specifications

### Temperatures Limits

Ambient: -40 to 140 Deg F, -40 to 60 Deg C  
Operating: -40 to 167 Deg F, -40 to 75 Deg C

### Materials of Construction

Housing: Aluminium: Grade A356

### Electrical Details

0355 Puler:

Outputs: Pulse type  
Amplitude: +/- 2V per pulse  
Pulse width: 20 microseconds approx  
Pulses per revolution: 10

Max transmission distance: 20 ft (6.1m) using  
Belden 88442 cable or equivalent

0360 Pulser:

Preamplifier

Supply voltage: 9 to 28 VDC, 130 mA Max  
Outputs (Jumper Selectable)

Square wave: (See Figure 1)  
0 to 5 KHz  
5 V or supply voltage less 5% powered pulse  
(Jumper Selectable):  
Loading: 1k ohm internal pull up

Open Collector

Max voltage: 30 VDC  
Max current: 125 mA  
Max power: 0.5 W  
Duty Cycle: 50/50 +/- 20%  
Pulses per revolution: 100 or 500

Max transmission distance: Belden 8762 (2  
conductor), Belden 8772 (3 Conductor)  
shielded 20 gauge wire or equivalent up to  
500 ft (152 m) Belden 8760 (2 conductor),  
Belden 8770 (3 Conductor) shielded 18 gauge  
wire or equivalent from 500 to 3000 ft (152 –  
914 m)

## 7.0 UMB Pulser Approvals

### Environmental

Type 4 (When Installed Vertically)  
IP 65

### Electromagnetic Emissions & Immunity

CE European Union (EN 61326)  
FCC 47 CFR Part 15  
ICES-003 Issue 4

### Hazardous Area Approvals

Temp Ambient: -40 to 60°C, -40 to 140°F  
CSA (United States and Canada)  
Class 1, Division 1, Groups C & D  
Certificate: 2212487 221162

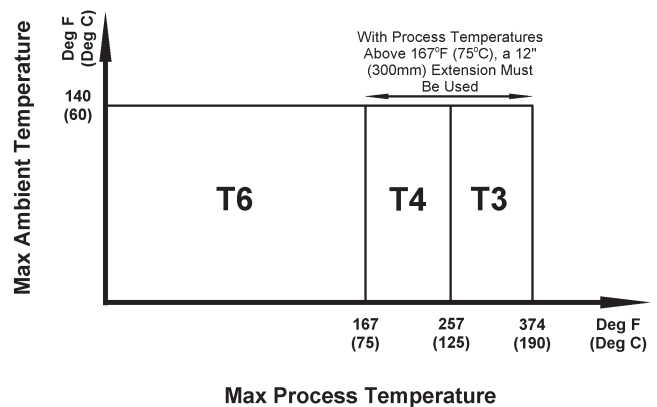
ATEX for European Union

CE 0359  II 2 G Ex d IIB T6...T3  
Certificate: ITS07ATEX15663X

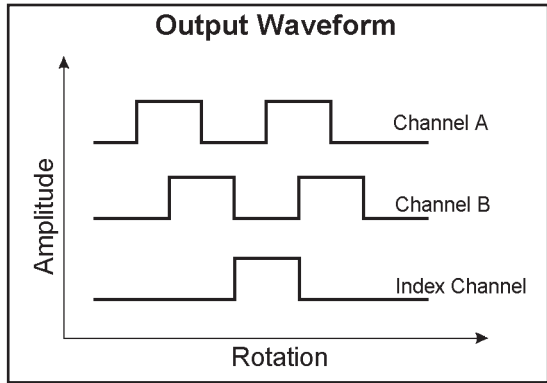
IEC Ex Scheme

IEC Ex d IIB T6...T3 Gb  
Certificate: IEC Ex ITS 08.0020X

### Chart 1: Hazardous Area Temperature Classification Chart (T Chart)

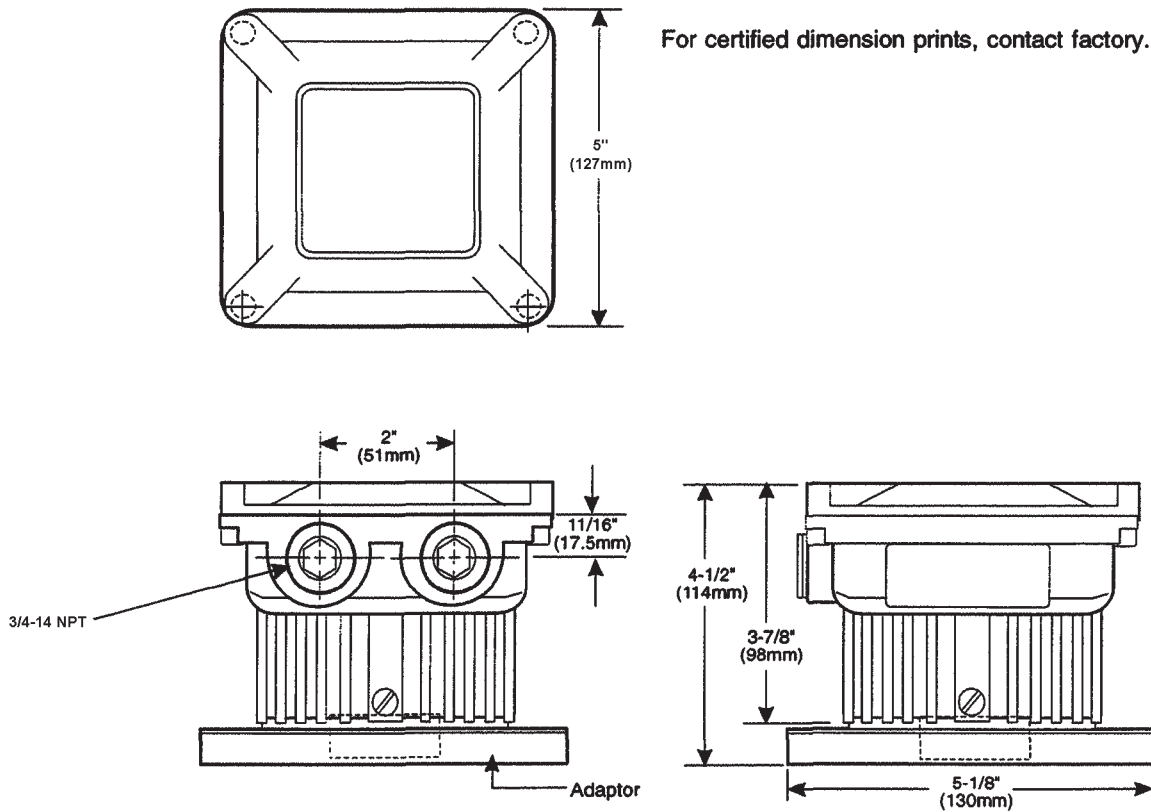


**Figure 1: Optical Pulser Preamp Output** **Table 1: Shipping Weights and Volume**



	Weight	Dimensions
0355	6 lbs.	13" x 11" x 9"
0360	(2.7 kg)	(320 x 280 x 230mm)

**Figure 2: Dimensions**



## 8.0 Installation

### Field Conversion

The first consideration to be made when changing the meter from mechanical to electrical output is the establishment of a K factor. One of two methods may be employed.

1. The procedure of choice is to replace the existing mechanical stack / accessories with the UMB pulser and prove the meter using currently accepted practices.
2. An alternative method for determining K-factor is to determine the meter factor using existing mechanical accessories.

### K-Factor Calculation Using Existing Mechanical Accessories

#### A. Determining meter output

The output of the measuring unit must be known before the K-factor can be calculated. If not known, the meter output may be determined by the following method:

1. Remove the complete stack (above any adjustor) for the meter and reassemble this on its own
2. With the stack in the vertical position rotate the input shaft counter clockwise. This is accomplished using a tool adequate for turning (For Brodie meters a tool is included in the retro fit kit)
3. Rotate the input shaft until all backlash is removed and the counter begins to rotate.
4. Reset or record the beginning counter reading.
5. Proceed to rotate the input shaft one complete revolution.
6. Subtract the beginning counter reading from the ending reading. This is the approximate meter output per revolution and should be in engineering units (1 gallon per revolution, 10 gallons per revolution, 10 liters per revolution etc )
7. The K-factor is determined by dividing the output of the UMB pulser (10, 100 , 200, 500 or 1000 ) by the result of A.6 above.

#### Example:

- a: the meter output is found to be 10 gallons per revolution of the output shaft.
- b: divide the UMB pulser output (10, 100, 200,

500 or 1000) pulses per revolution by 10 gallons per revolution.

- c. The result will be the K-factor

### B: K-factor Determination, Adjustor Correction (Brodie Type Adjustor Devices Only)

After determining the meter output, a correction factor for the adjustor must be applied if the adjustor is to remain on the meter.

1. Remove the adjustor cover to expose the adjustment shafts.
2. Determine the adjustment setting by counting the slots (including that occupied by the locking key) on the fine and coarse adjustment shafts.
3. Using the conversion Table 2 for the model 4200 adjustor or Table 3 for the model 4000 adjustor determine the output correction factor for flow meter
4. Multiply the proper correction factor by the meter output. This will be the actual meter output per revolution of the output shaft.
5. The K-factor is determined by dividing the output of the UMB pulser (10, 100, 200, 500 or 1000 pulses per revolution) by the result of B.4 above.

#### Example:

- a: The meter output is found to be 10 gallons per revolution of the output shaft
- b: The adjustment setting for the Model 4200 adjustor is 1 coarse (1C) and 2 fine (2F).
- c: from Table 3 the correction factor is  $1C/2F = 0.98805$
- d: Multiply 10 gallons per revolution by 0.98805 which yields 9.8805
- e. Of the four outputs available we will use 100 pulses per revolution for this example: Divide the output of the UMB pulser, 100 PPR by 9.8805 (the corrected meter output)
- f. This gives a K-factor for the meter of 10.1209 pulser per gallon.

### Mounting the UMB Pulser to the Meter

Two adapter plates are available for meter mounting, the Brodie Oval/ER and the BiRotor/ Cyclone Counter base plate adaptor. On BiRotor/

**Table 2: Model 4200 Adjustor Conversion**

**Table 3: Model 4000 Adjustor Conversion**

Table 2: Model 4200 Adjustor Conversion

Fine Adjustment		11	10	9	8	7	6	5	4	3	2	1
Course Adjustment	11	1.05000	1.04945	1.04890	1.04835	1.04780	1.04725	1.04670	1.04615	1.04560	1.04505	1.04450
	10	1.04430	1.04375	1.04320	1.04265	1.04210	1.04155	1.04100	1.04045	1.03990	1.03935	1.03880
	9	1.03860	1.03805	1.03750	1.03675	1.03640	1.03585	1.03530	1.03475	1.03420	1.03365	1.03310
	8	1.03290	1.03235	1.03180	1.03125	1.03070	1.03015	1.02960	1.02905	1.02850	1.02795	1.02740
	7	1.02720	1.02665	1.02610	1.02555	1.02500	1.02445	1.02390	1.02335	1.02280	1.02225	1.02170
	6	1.02150	1.02075	1.02040	1.01985	1.01930	1.01875	1.01820	1.01765	1.01710	1.01655	1.01600
	5	1.01580	1.01525	1.01470	1.01415	1.01360	1.01305	1.01250	1.01195	1.01140	1.01085	1.01030
	4	1.01010	1.00755	1.00900	1.00845	1.00790	1.00735	1.00680	1.00625	1.00570	1.00515	1.00460
	3	1.00440	1.00365	1.00330	1.00275	1.00220	1.00165	1.00110	1.00055	1.00000	0.99945	0.99870
	2	0.99870	0.99815	0.99760	0.99725	0.99650	0.99595	0.99540	0.99485	0.99430	0.99375	0.99320
	1	0.99300	0.99245	0.99190	0.99135	0.99080	0.99025	0.98970	0.98915	0.98860	0.98805	0.98750

Table 3: Model 4000 Adjustor Conversion

Fine Adjustment		11	10	9	8	7	6	5	4	3	2	1
Course Adjustment	11	1.04320	1.04268	1.04215	1.04156	1.04100	1.04043	1.03987	1.03931	1.03875	1.03818	1.03762
	10	1.03700	1.03643	1.03587	1.03531	1.03475	1.03418	1.03362	1.03306	1.03250	1.03193	1.03137
	9	1.03075	1.03018	1.02962	1.02906	1.02850	1.02793	1.02737	1.02681	1.02625	1.02568	1.02512
	8	1.02450	1.02393	1.02337	1.02281	1.02225	1.02168	1.02112	1.02056	1.02000	1.01943	1.01887
	7	1.01825	1.01768	1.01712	1.01656	1.01600	1.01543	1.01487	1.01431	1.01375	1.01318	1.01262
	6	1.01200	1.01143	1.01087	1.01031	1.00975	1.00918	1.00862	j 1.00806	1.00750	1.00693	1.00637
	5	1.00575	1.00518	1.00462	1.00406	1.00350	1.00293	1.00237	1.00181	1.00125	1.00068	1.00012
	4	0.99950	0.99893	0.99837	0.99781	0.99725	0.99668	0.99612	0.99556	0.99500	0.99443	0.99387
	3	0.99325	0.99268	0.99212	0.99156	0.99100	0.99043	0.98987	0.98931	0.98875	0.98818	0.98762
	2	0.98700	0.98643	0.98587	0.98531	0.98475	0.98418	0.98362	0.98306	0.98250	0.98193	0.98137
	1	0.98075	0.98018	0.97962	0.97906	0.97850	0.97793	0.97737	0.97681	0.97625	0.97568	0.97512

Cyclone applications above 150°F (66°C) a counter base plate extension will also be required.

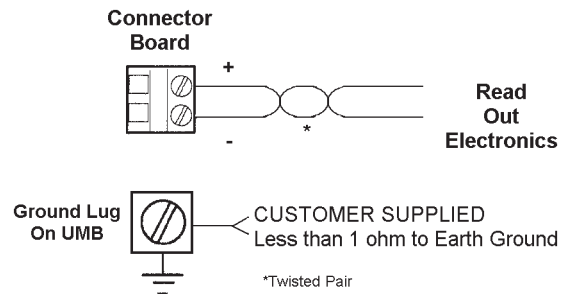
“Caution: the UMB pulser must be installed in a vertical position to maintain its NEMA 4X capability”

- 1a. For Oval gear meter: Beginning at the uppermost accessory, remove the mechanical stack up including the adjuster if equipped and not to be used, do not remove the 90° gear box.
- 1b. For meters other than Oval gear meters: Remove the mechanical stack down to the counter base plate, including the adjuster if equipped and not to be used.
2. Attach the adapter plate to the counter base plate, gear box or adjuster of the meter using the four screws provided.
3. Position the UMB over the adapter plate and lower into place. The meter output shaft must align properly with the UMB shaft and coupling to assure proper operation.
4. Secure the UMB in the desired position using three retaining screws located at the base of the UMB.

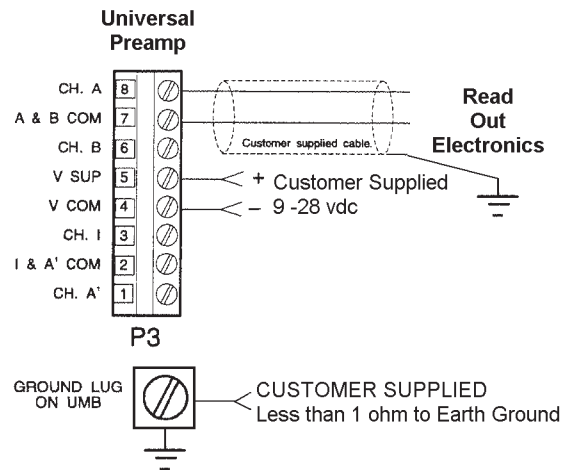
## Electrical Connection

Connections the instrument wiring, refer to diagram Figures 3 and 4.

**Figure 3: 0355 Pulser**



**Figure 4: 0360 Pulser**



## Attachment to Additional Accessories

If the instrument is being used with additional accessories, the instructions for these accessories should be read and understood before continuing with the installation. The output signals from the preamplifier (Model 0360 only) can be altered to interface with most electronic accessories, this is accomplished by the use of jumpers on the circuit board, Table 4 shows their configurations.

### Output Channel Designations

A= Output 1: (100, 500) pulses per revolution, depending on model.

B= Output 2: (100, 500) pulses per revolution, depending on model. Output 2 is 90 electrical degrees out of phase to output 1.

I= Index pulse: 1 pulse per revolution.

A= Duplicate of output 1 (Channel A).

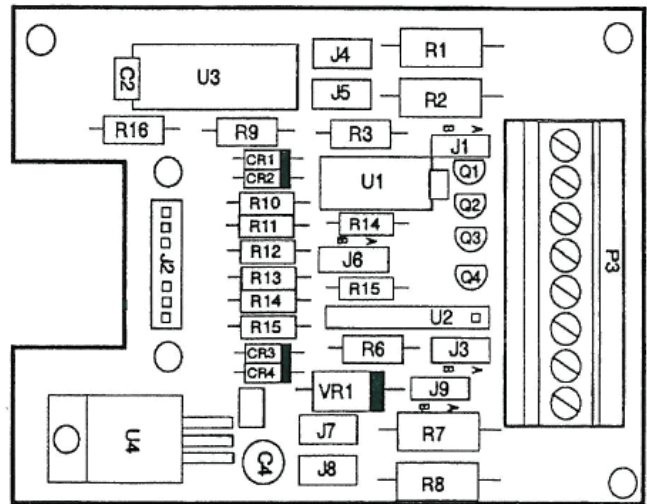
Note: A and B can be combined to double output 1 to (200, 1000) depending on model. this output if selected is available on Channel A.

**Table 4**

Jumper	Required Output		
	5 VDC	9 - 28 VDC	Open Collector
1	B*	B*	B*
2	N/A	N/A	N/A
3	B	B	B
4	IN	IN	OUT
5	IN	IN	OUT
6	B	B	B
7	IN	IN	OUT
8	IN	IN	OUT
9	B	A	OUT

\*Place J1 in position 'A' for pulse doubling

**Figure 5: Preamp Board Connectors**



## Integral BERT Electronic Register

If the instrument has been supplied with an integral electronic register, the internal connection wiring will already be in place. For additional functions and wiring possibilities please refer to the BERT's instruction manual. X-BERT.

## 9.0 Maintenance

### General

No routine maintenance, cleaning or lubricating is required on the UMB. In the event of pulse failure of interruption of signal reference Section 10. Trouble shooting

### Connector Board/Preamplifier Removal and Installation

#### A. Removal

1. Disconnect the main power to the UMB pulser.
2. Using a 5mm hex wrench, remove screws and UMB cover or associated electronics.
3. Remove the terminal connections to the preamp.
4. Remove retaining screws from the board and carefully lift the board out.

#### B. Installation

1. Place the board in the UMB housing.
2. Replace and tighten screws to secure the board.
3. Connect wiring to the terminal connections as outlined in this manual.
4. Reattach the UMB lid or associated equipment, ensure that all torque and gap requirements are maintained especially for hazardous area applications. Reference essential instructions.

## 10.0 Troubleshooting

This information has been provided as an aid to basic trouble shooting. Disassembly procedure have been outlined in Section 9 of this manual. If the UMB is found to be in need of repair it is recommended the user contact the nearest Brodie International Service office or representative. It is important that servicing be performed by trained and qualified service personnel.

### Conditions

#### A: Meter output is turning, but no pulse output is present.

Probable Causes:

1. Improper electrical connection
2. Insufficient voltage to the preamplifier board (if fitted)
3. Improper or broken alignment between meter output and UMB coupling.
4. Power failure (0360 only) / damaged board

Corrective actions:

1. Ensure the proper wiring connections have been made.
2. Supply sufficient voltage to the preamplifier board, see specifications Section 6.
3. Replace UMB coupling.
4. Ensure power supply is functioning or replace board.

#### B: Condition: Erratic or non uniform pulse signal.

Probable cause:

1. Improper electrical connection
2. Insufficient or fluctuating voltage to the preamplifier board (if fitted)
3. Improper ground or shielding of connection cable grounded at both ends.
4. Power failure (0360 only) / damaged board

Corrective actions:

1. Ensure the proper wiring connections have been made
2. Supply sufficient voltage to the preamplifier board, see specifications Section 6
3. Replace and / or connect wiring cable to proper ground.
4. Ensure power supply is functioning or replace board as required.

# 11.0 Parts List

Figure 6: 0355 UMB Pulser

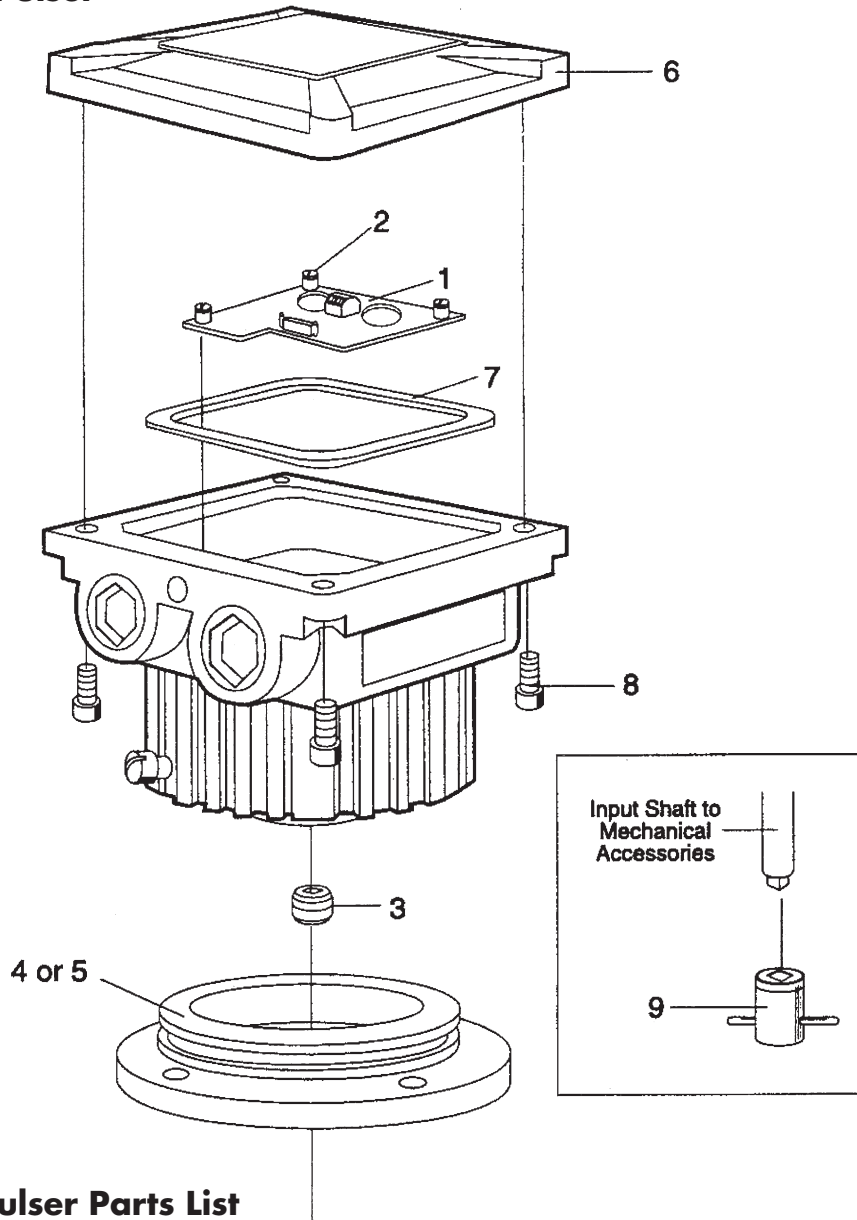
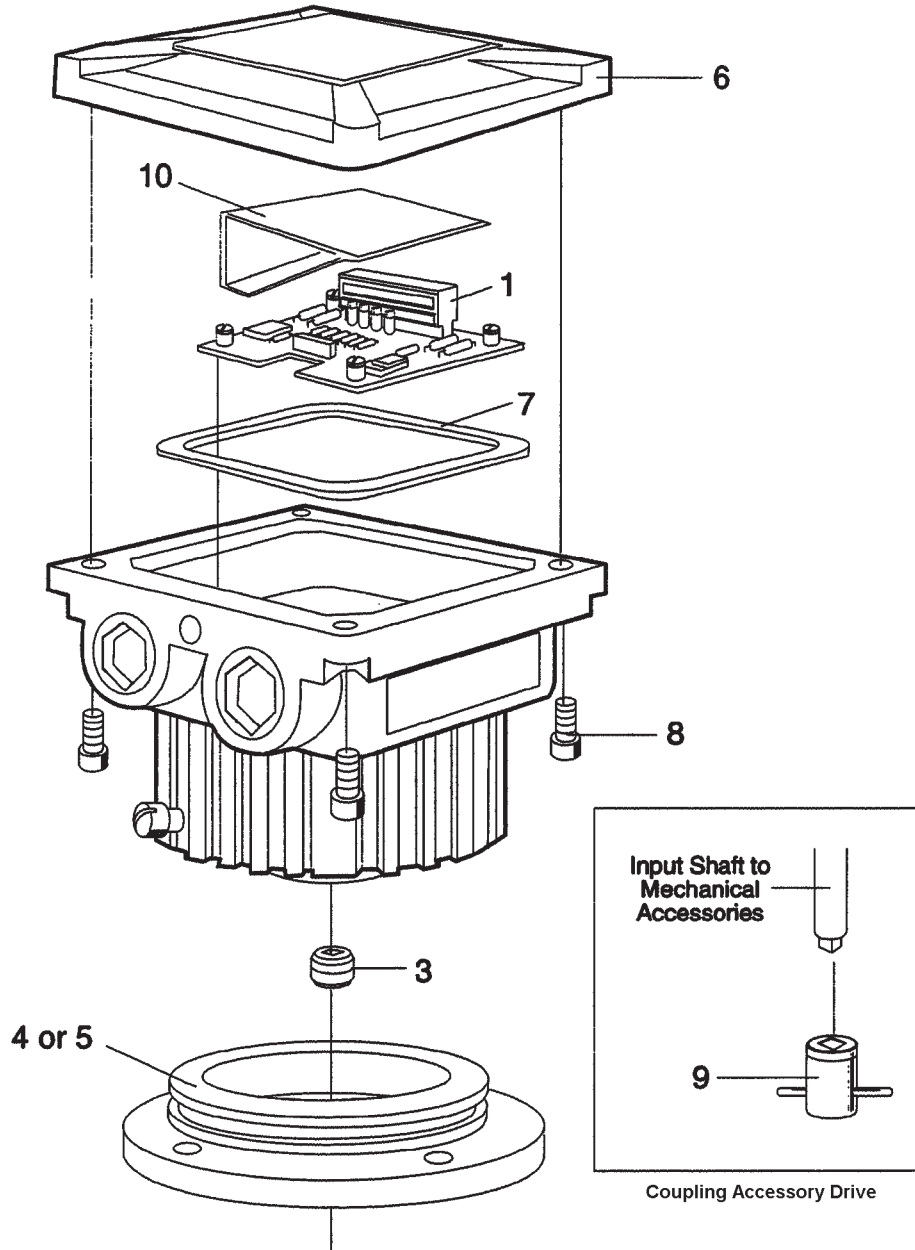


Table 6: 0355 UMB Pulser Parts List

Item	Description	Part Number
1	Connector Board Assembly	CS-097Y-384-AAA
2	Connector Board Screws	150623-019
3*	Coupling	W4125
4	Accessory Adaptor Plate	CB-013Z-267-FB%
5	BiRotor/Cyclone/Counter Base Plate Adaptor	CB-013Z-268-FB%
6	UMB Cover	CC-219Z-633-EBG
7*	Gasket	CA-375Z-259-XXA
8*	Cover Screws	151496M
9	Coupling Accessory Drive	159798

\* Denotes Recommended Spare Parts

**Figure 7: 0360 UMB Pulser**



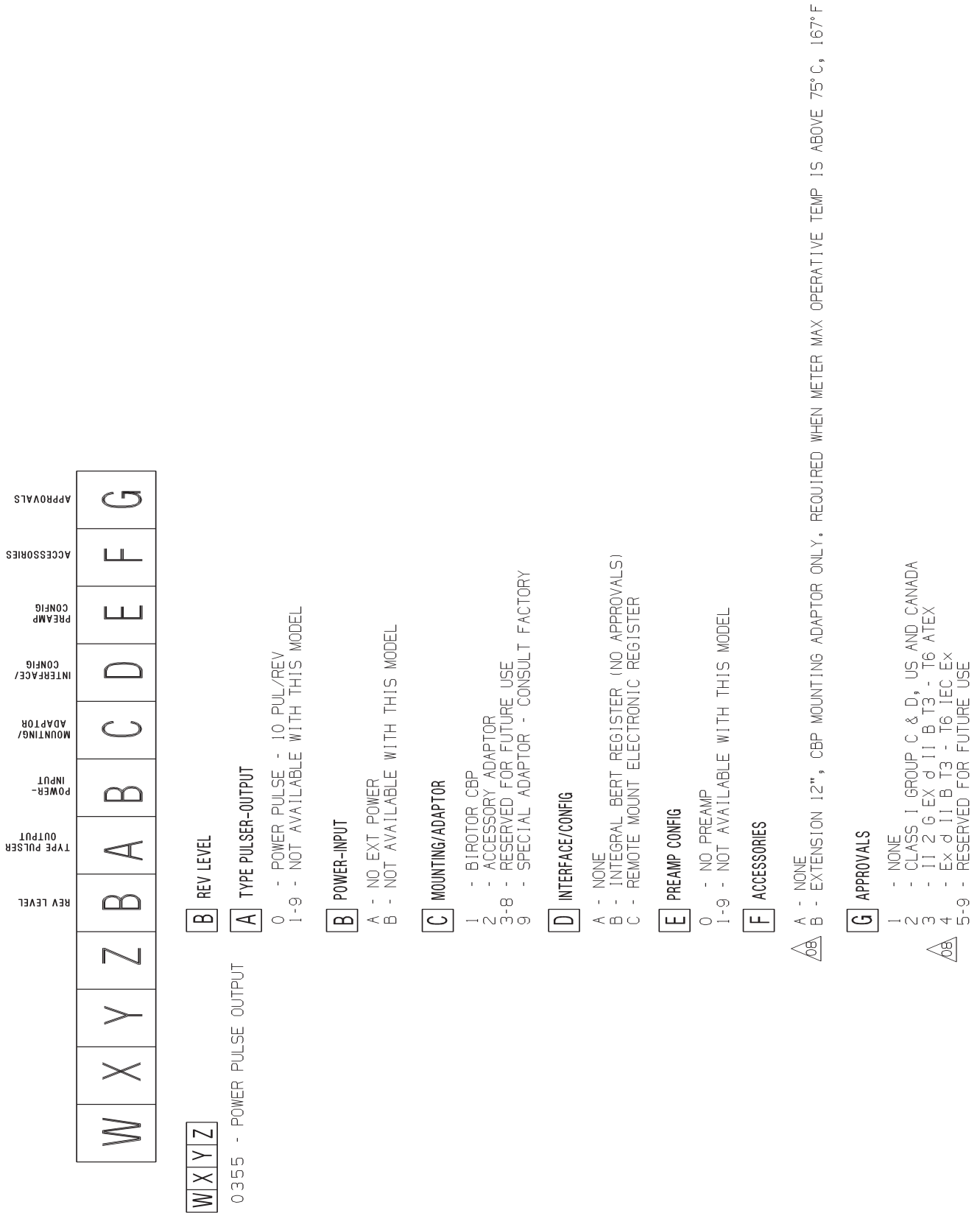
**Table 7: 0360 UMB Pulser Parts List**

Item	Description	Part Number
1*	Preamplifier Board Assembly	CS-097Y-383-AAA
3*	Coupling	W4125
4	Accessory Adaptor Plate	CB-013Z-267-FB%
5	BiRotor/Cyclone/Counter Base Plate Adaptor	CB-013Z-268-FB%
6	UMB Cover	CC-219Z-633-EBG
7*	Gasket	CA-375Z-259-XXA
8*	Cover Screws	151496M
9	Coupling Accessory Drive	159798
10	Instruction Card	CB-502Y-133-MXZ

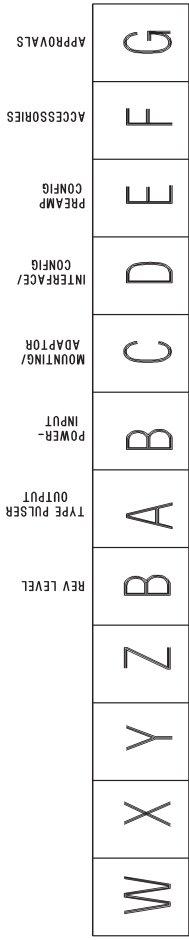
\* Denotes Recommended Spare Parts

# 12.0 Model Code

Figure 8: 0355 UMB Pulser Model Code



**Figure 8: 0360 UMB Pulser Model Code**



**W X Y Z**

0360 - OPTICAL OUTPUT

**B** REV LEVEL

**A** TYPE PULSER-OUTPUT

- 0 - NOT AVAILABLE WITH THIS MODEL
- 1 - OPTICAL - 100 LINE CODE WHEEL
- 100/100 PUL/REV (CHANNEL A & B)
- 2 - OPTICAL - 500 LINE CODE WHEEL
- 500/500 PUL/REV (CHANNEL A & B)
- 3-8 - RESERVED FOR FUTURE USE
- 9 - SPECIAL

**B** POWER-INPUT

- A - NOT AVAILABLE WITH THIS MODEL
- B - 9 - 28 VDC

**C** MOUNTING/ADAPTOR

- 1 - BIROTOR CBP
- 2 - ACCESSORY ADAPTOR
- 3-8 - RESERVED FOR FUTURE USE
- 9 - SPECIAL ADAPTOR - CONSULT FACTORY

**D** INTERFACE/CONFIG

- A - NONE
- B - INTEGRAL BERT REGISTER (NO APPROVALS)
- C - REMOTE MOUNT ELECTRONIC REGISTER

**E** PREAMP CONFIG

- 0 - NOT AVAILABLE WITH THIS MODEL
- 1 - 5 V FIXED PULSE DUAL CHANNEL
- 2 - SUPPLY VOLTAGE PULSE DUAL CHANNEL
- 3 - OPEN COLLECTOR PULSE DUAL CHANNEL
- 4 - RESERVED
- 5 - 5 V FIXED SINGLE CHANNEL (PULSE RATE DOUBLED)
- 6 - SUPPLY VOLTAGE SINGLE CHANNEL (PULSE RATE IS DOUBLED)
- 7 - OPEN COLLECTOR SINGLE CHANNEL (PULSE RATE IS DOUBLED)
- 8 - RESERVED
- 9 - SPECIAL: CONSULT FACTORY

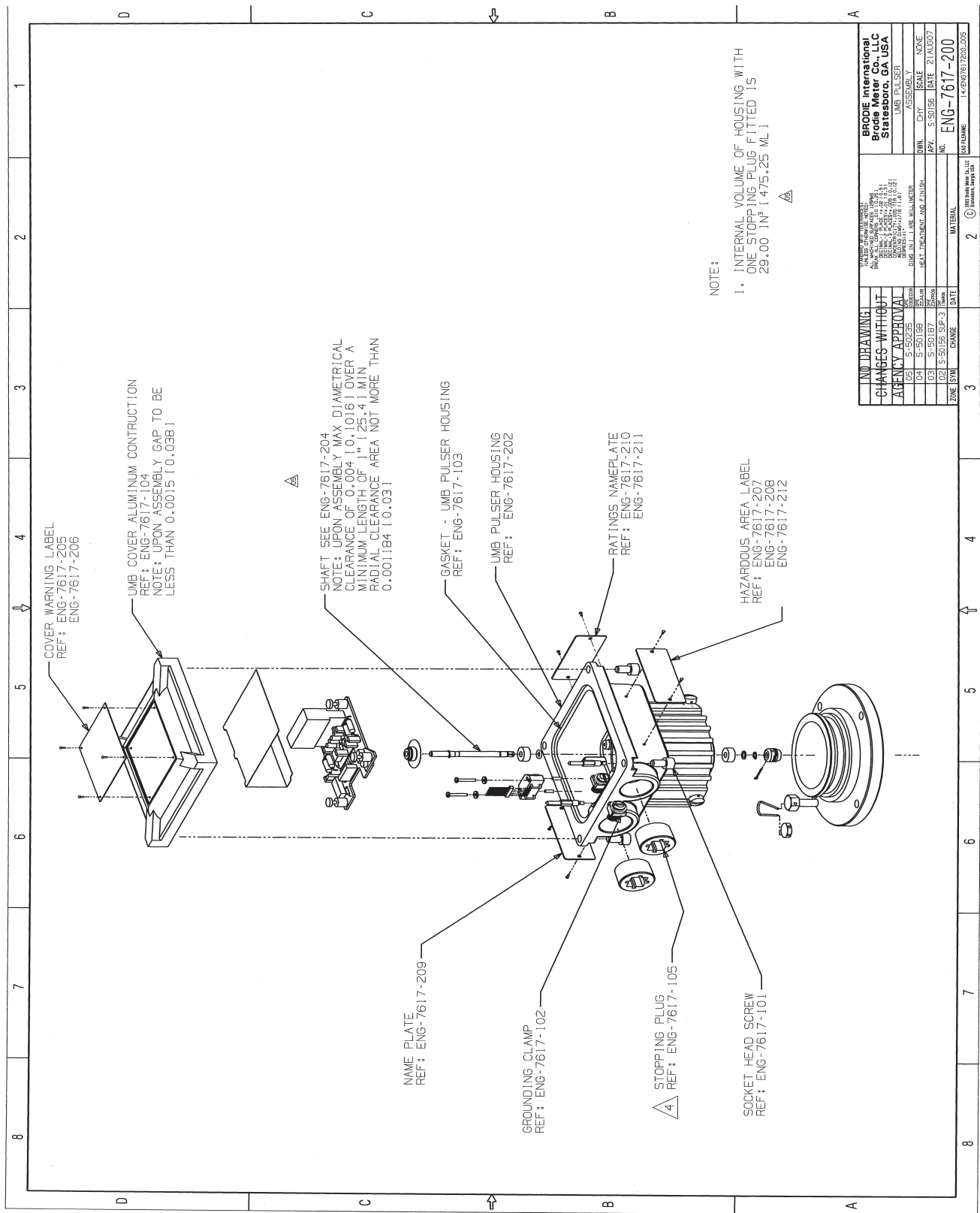
**F** ACCESSORIES

- A - NONE
- B - EXTENSION 12", CBP MOUNTING ADAPTOR ONLY. REQUIRED WHEN METER MAX OPERATIVE TEMP IS ABOVE 75°C, 167°F

**G** APPROVALS

- 1 - NONE
- 2 - CLASS I GROUP C & D, US AND CANADA
- 3 - I I 2 G EX d I I B T3 - T6 ATEX
- 4 - Exd I I B T3 - T6 IEC Ex
- 5-9 - RESERVED FOR FUTURE USE

# 13.0 Approval Drawing



NO DRAWING CHANGES WITHOUT AGENCY APPROVAL	DATE	BY	DESCRIPTION
01	5-50198	SP/SLD	UMB PULSER ASSEMBLY
02	5-50187	SP/SLD	HEAT TREATMENT AND FINISH
03	5-50187	SP/SLD	REWORK
02	5-50156	SP-3	REWORK
ZONE SYM	CHANGE	DATE	
2			

<b>BRDIE International</b> 14750 Highway 101 Statesboro, GA USA	UMB PULSER ASSEMBLY
DWG. CHY SCALE NONE APPL. 5-50156 DATE 21 AUG 07	NO. ENG-7617-200
14750 Highway 101 Statesboro, GA USA	14750 Highway 101 Statesboro, GA USA

# **14.0 Warranty Claim Procedures**

## **1. Limited Warranty:**

Subject to the limitations contained in Section 2 herein and except as otherwise expressly provided herein, Brodie International, a Brodie Meter Co., LLC Company ("Brodie") warrants that the firmware will execute the programming instructions provided by Brodie, and that the Goods-manufactured or Services provided by "Brodie" will be free from defects in materials or workmanship under normal use and care until the expiration of the applicable warranty period. Goods are warranted for twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by "Brodie", whichever period expires first. Consumables and Services are warranted for a period of 90 days from the date of shipment or completion of the Services. Products purchased by "Brodie" from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. Buyer agrees that "Brodie" has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products. If Buyer discovers any warranty defects and notifies "Brodie" thereof in writing during the applicable warranty period, "Brodie" shall, at its option, promptly correct any errors that are found by "Brodie" in the firmware or Services, or repair or replace F. O. B. point of manufacture that portion of the Goods or firmware found by "Brodie" to be defective, or refund the purchase price of the defective portion of the Goods/Services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources, unsuitable environmental conditions, accident, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of "Brodie" are not covered by this limited warranty, and shall be at Buyer's expense. "Brodie" shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by an authorized "Brodie" representative. All costs of dismantling, reinstallation and freight and the time and expenses of "Brodie's" personnel for site travel and diagnosis under this warranty clause shall be borne by Buyer unless accepted in writing by "Brodie". Goods repaired and parts replaced during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Brodie and can be amended only in a writing signed by an authorized representative of "Brodie". Except as otherwise expressly provided in the Agreement, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICES. It is understood that - corrosion or erosion of materials is not covered by our guarantee.

## **2. Limitation Of Remedy And Liability:**

Brodie International, a Brodie Meter Co., LLC Company ("Brodie") Shall Not Be Liable For Damages Caused By Delay In Performance. The Sole And Exclusive Remedy For Breach Of Warranty Hereunder Shall Be Limited To Repair, Correction, Replacement Or Refund Of Purchase Price Under The Limited Warranty Clause In Section 1 Herein. In No Event, Regardless Of The Form Of The Claim Or Cause Of Action (Whether Based In Contract, Infringement, Negligence, Strict Liability, Other Tort Or Otherwise), Shall "Brodie's" Liability To Buyer And/Or Its Customers Exceed The Price To Buyer Of The Specific Goods Manufactured Or Services Provided By Brodie Giving Rise To The Claim Or Cause Of Action. Buyer Agrees That In No Event Shall Brodie's Liability To Buyer And/Or Its Customers Extend To Include Incidental, Consequential Or Punitive Damages. The Term "Consequential Damages" Shall Include, But Not Be Limited To, Loss Of Anticipated Profits, Loss Of Use, Loss Of Revenue And Cost Of Capital.

## Decontamination Statement

RMA Number: \_\_\_\_\_

Item Being Returned: \_\_\_\_\_

List all chemicals and process fluids and gasses that have come in contact with the equipment including cleaning agents. Attach additional pages of information if necessary. A Material Safety Data Sheet (MSDS) is required if non-food grade products have been used with the item being returned.

Information Required	Product 1	Product 2
Chemical Name		
Health and Safety Hazards		
Precautions, First Aid		

I hereby certify the equipment being returned has been cleaned and decontaminated in accordance with good industrial practices and in compliance with OSHA and DOT regulations. This equipment poses no health or safety risks due to contamination.

Signature: \_\_\_\_\_

Name (Please Print): \_\_\_\_\_

Title: \_\_\_\_\_

Company Name: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

Reason for Return: \_\_\_\_\_

### Reminder:

All items being returned must be packaged separately. This decontamination statement and the MSDS sheet(s) must be placed on the outside of the shipping container.



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