ACC-17B
Mag Coil Flow Rate Preamplifier
Frequency to Pulse Conditioner

USER’S MANUAL

HP-274
August 2004
Notice

HOFFER FLOW CONTROLS, INC. MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

This manual has been provided as an aid in installing, connecting, calibrating, operating, and servicing this unit. Every precaution for accuracy has been taken in the preparation of this manual; however, HOFFER FLOW CONTROLS, INC. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that may result from the use of products in accordance with information contained in the manual.

HOFFER FLOW CONTROLS’ policy is to provide a user manual for each item supplied. Therefore, all applicable user manuals should be examined before attempting to install or otherwise connect a number of related subsystems.

During installation, care must be taken to select the correct interconnecting wiring drawing. The choice of an incorrect connection drawing may result in damage to the system and/or one of the components.

Please review the complete model of each item to be connected and locate the appropriate manual(s) and/or drawing(s). Identify all model numbers exactly before making any connections. A number of options and accessories may be added to the main instrument, which are not shown on the basic user wiring. Consult the appropriate option or accessory user manual before connecting it to the system. In many cases, a system wiring drawing is available and may be requested from HOFFER FLOW CONTROLS.

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Direct all warranty and repair requests/inquiries to the Hoffer Flow Controls Customer Service Department, telephone number (252) 331-1997 or 1-800-628-4584. BEFORE RETURNING ANY PRODUCT(S) TO HOFFER FLOW CONTROLS, PURCHASER MUST OBTAIN A RETURNED MATERIAL AUTHORIZATION (RMA) NUMBER FROM HOFFER FLOW CONTROLS’ CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned RMA number should then be marked on the outside of the return package and on any correspondence.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting HOFFER FLOW CONTROLS:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS OR CALIBRATIONS, consult HOFFER FLOW CONTROLS for current repair/calibration charges. Have the following information available BEFORE contacting HOFFER FLOW CONTROLS:

1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.
LIMITED WARRANTY

HOFFER FLOW CONTROLS, INC. ("HFC") warrants HFC’s products ("goods") described in the specifications incorporated in this manual to be free from defects in material and workmanship under normal use and service, but only if such goods have been properly selected for the service intended, properly installed and properly operated and maintained. This warranty shall extend for a period of (1) year from the date of delivery to the original purchaser (or eighteen (18) months if the delivery to the original purchaser occurred outside the continental United States). This warranty is extended only to the original purchaser ("Purchaser"). Purchaser’s sole and exclusive remedy is the repair and/or replacement of nonconforming goods as provided in the following paragraphs.

In the event Purchaser believes the goods are defective, the goods must be returned to HFC, transportation prepaid by Purchaser, within twelve (12) months after delivery of goods (or eighteen (18) months for goods delivered outside the continental United States) for inspection by HFC. If HFC’s inspection determines that the workmanship or materials are defective, the goods will be either repaired or replaced, at HFC’s sole determination, free of additional charge, and the goods will be returned, transportation paid by HFC, using the lowest cost transportation available.

Prior to returning the goods to HFC, Purchaser must obtain a Returned Material Authorization (RMA) Number from HFC’s Customer Service Department within 30 days after discovery of a purported breach of warranty, but no later than the warranty period; otherwise, such claims shall be deemed waived. See the Return Requests/Inquiries Section of this manual.

If HFC’s inspection reveals the goods are free of defects in material and workmanship or such inspection reveals the goods were improperly used, improperly installed, and/or improperly selected for service intended, HFC will notify the purchaser in writing and will deliver the goods back to purchaser upon (i) receipt of Purchaser’s written instructions and (ii) the cost of transportation. If Purchaser does not respond within 30 days after notice from HFC, the goods will be disposed of in HFC’s discretion.

HFC does not warrant these goods to meet the requirements of any safety code of any state, municipality, or any other jurisdiction, and purchaser assumes all risk and liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

This warranty shall not apply to any HFC goods or parts thereof, which have bee repaired outside HFC’s factory or altered in any way, or have been subject to misuse, negligence, or accident, or have not been operated in accordance with HFC’s printed instructions or have been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such goods.

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Disclaimer:
Specifications are subject to change without notice.
Some pages are left intentionally blank.
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ACC-17B SIGNAL CONDITIONER

GENERAL DESCRIPTION

The Model ACC-17B is a preamplifier with wave shaping that allows convenient interfacing between the turbine flowmeter and digital electronics.

The output signal has a square pulse wave form. Outputs are provided to suit most users requirements. Summation of the pulsing signal relates directly to the total flow throughput. The frequency of the signal relates directly to the flow rate or the velocity.

The input signal conditioning circuitry is designed to accept the low level flowmeter signal while providing rejection of unwanted noise and spurious signal. A signal threshold control is provided which allows the user to set the input sensitivity above the ambient noise level, thereby eliminating any false signal on the output.

Several output pulse configurations are provided which offer flexibility in the interface required by the host system. The output is available in the form of a CMOS/TTL compatible pulse or in the form of an open collector. Pulse scaling is optionally available to reduce output pulse rate where required.

SPECIFICATIONS

**INPUT**

- Input protected, RF and bandpass filtered, adjustable trigger level
- Input Impedance - 40 kilo ohm (nominal)
- Trigger Sensitivity - 10 millivolt RMS (minimum) 10 Hz to 1000 Hz
- Over voltage - 120 volts RMS absolute (maximum)
- Compatible with magnetic pick-offs
SPECIFICATIONS (Cont'd)

PULSE OUTPUT CHARACTERISTICS

TTL/CMOS COMPATIBLE OPTION
LOGIC 1 2.4V at - .800mA
LOGIC 0 0.4V maximum at 100mA

OPEN COLLECTOR OPTION
TYPE VMOS 2N 6660
V Max. (Abs.) 60 V DC
I Max. (Abs.) 100mA

AC OPTION
5Vp-p Square Wave

PULSE SCALING CAPABILITY
(Optional)

±2, ±4, ±8, ±16, ±32, ±64, ±128
and ±256

POWER REQUIREMENTS
(Optional)

115/220 VAC 50/60Hz
15-35V DC

TEMPERATURE

0° to 70°C Standard

ENCLOSURE OPTIONS

Standard enclosure Style -2 Case
(See outline drawing)
Explosion Proof Enclosure
Explosion Proof Enclosure with "O" Ring Seal
NEMA -4 Enclosure

CONTROLS AND ADJUSTMENTS

FUSE

A circuit protection device
located inside of case.

SENS.

A multiple turn control used to
set the threshold sensitivity
level above the ambient noise
pickup.

SCALING FACTOR

A dual in line (DIP) switch
located on the PCA-60 board
which is used to set the pulse
scaling divide factor to ±2, 4,
8, 16, 32, 64, 128 and 256.
ORDERING INFORMATION

PULSE OUTPUT
MODEL ACC17B-(A)-(B)-(C)-(D)
OPTION (A)
(1) OPEN COLLECTOR
(2) TTL/CMOS
(3) AC 5 VOLT P/P SQUARE WAVE
(5) 0-10 V SQUARE WAVE

INPUT POWER
MODEL ACC17B-(A)-(B)-(C)-(D)
OPTION (B)
(A) 115 VAC 50/60 HZ +/-10%
(B) 220 VAC 50/60 HZ +/-10%
(D) 15-35 VDC

OPTIONAL FEATURE
MODEL ACC17B-(A)-(B)-(C)-(D)
OPTION (C)
(PS) PULSE SCALING DIVIDE BY 2, 4, 8, 16, 32, 64, 128, 256

ENCLOSURE STYLE
MODEL ACC17B-(A)-(B)-(C)-(D)
OPTION (D)
(2) STYLE 2 CASE, GENERAL PURPOSE
(4/O) STYLE 4 CASE, EXPLOSION-PROOF WITH WATER TIGHT ‘O’ RING
MEETS CLASS I, GROUP C, D (ADALET CASE) (XJS WITH FLAT COVER)
STOCK #200-0698
CLASS II, GROUPS E, F & G
CLASS III

NOTE: INSERT (X) IN MODEL NUMBER FOR EVERY OPTION NOT SPECIFIED.
SERVICING PROCEDURES

TO - REMOVE COVER/PRINTED CIRCUIT-SUBASSEMBLY:
1. TURN POWER TO ACC17B OFF.
2. REMOVE TWO MACHINE SCREWS FROM SIDES OF CASE
3. LIFT COVER/PRINTED CARD ASSEMBLY OUT.

REPLACING FUSE
1. REMOVE COVER/PRINTED CIRCUIT SUBASSEMBLY
2. LOCATE FUSE ON SUBASSEMBLY
3. PULL FUSE FROM SOCKET USING FINGERS
   (PLIERS ARE NOT RECOMMENDED)
4. INSTALL NEW FUSE
5. REASSEMBLE INTO LOWER CASE

PULSE SCALING SELECTION (OPTIONAL)
1. REMOVE COVER/PRINTED CIRCUIT SUBASSEMBLY
2. TURN 'ON' DESIRED DIVIDE BY POSITION USING A BALL POINT PEN OR SIMILAR OBJECT.
   SEE PULSE SCALING DETAIL
3. REASSEMBLE INTO LOWER CASE

PULSE SCALING DETAIL

SWITCH 2 IS SHOWN DEPRESSED FOR ILLUSTRATION ONLY
NOTE: SELECT ONE SWITCH ONLY. ALL OTHER SWITCHES MUST BE OFF.

TABLE 1

<table>
<thead>
<tr>
<th>PULSE SCALING</th>
<th>DIVIDE BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>+4</td>
</tr>
<tr>
<td>4</td>
<td>+8</td>
</tr>
<tr>
<td>5</td>
<td>+16</td>
</tr>
<tr>
<td>6</td>
<td>+32</td>
</tr>
<tr>
<td>+64, +128, +256</td>
<td></td>
</tr>
</tbody>
</table>

* CONSULT FACTORY FOR JUMPER SELECTION.

SUBASSEMBLY DETAIL
SECTION II
FLOWMETER INSTALLATION

GENERAL

Proper application of the turbine flowmeter requires a suitable piping installation in order to achieve accurate and reliable operation.

The piping configuration immediately preceding and following the flowmeter is termed the meter run. Refer to the manufacturer's outline and installation instructions when installing the flowmeter and meter run.

RELATIVE - The performance of the turbine flowmeter is affected by fluid swirl and non-uniform velocity profiles. The following recommendations will reduce such flow irregularities.

It is advisable not to locate the meter run immediately downstream of pumps, partially opened valves, bends or other similar piping configurations. In addition, the area surrounding the flowmeter should be free of sources of electrical noise such as motors, solenoids, transformers and power lines which may be coupled to the pickoff device.

The metering section should not be subjected to excessive vibration or shock. Such a condition may result in an mechanically induced output signal from the pickoff device.

METER RUN - In general, the meter run should be chosen to have the same inner diameter as the meter bore. A minimum of 10 pipe diameters of straight pipe upstream and 5 pipe diameters downstream are required. Where this optimum line configuration can not be implemented, it is advisable to install a flow straightener properly positioned upstream of the flowmeter. Orientation is not a critical factor, however, horizontal is a preferred orientation.

BYPASS RUN - A properly sized bypass run with suitable blocking valves may be equipped where an interruption in fluid flow for turbine meters servicing can not be tolerated.

STRAINER - A strainer, filter and/or air eliminator is recommended to reduce the potential of fouling or damage. See table for recommended mesh size.

On initial startup of a line, it is advisable to install a spool piece purging the line to eliminate damaging the flowmeter, due to flux, tape, solder, welds or other contamination carried along by the fluid stream.
CAVITATION - Cavitation causes measurement inaccuracies in turbine flowmeters and should be avoided by suitable line and operating configurations.

Whenever the pressure within a pipeline instantaneously falls below the equilibrium vapor pressure of the fluid, a portion of the fluid vaporizes and forms bubbles in the pipe line. This is termed cavitation. Cavitation is eliminated by maintaining adequate back pressure on the flowmeter. A downstream valve that provides the necessary back pressure is one means for preventing cavitation in the metering run. Control valves should be located downstream, if possible. Some installations may also make use of a vapor eliminator upstream of the flowmeter.

The minimum required back pressure may be estimated using the following equation:

\[
\text{Min: Back Pressure} = 1.25 \times \text{Vapor Pressure} + 2 \times \text{Pressure Drop}
\]
INSTALLATION WIRING LAYOUT FOR INTERCONNECTIONS

In considering the interconnections between the flowmeter and the flow measurement system some attention must be given to anticipated noise sources and to the coupling of these noise sources to the interconnecting wiring.

Noise signals may be coupled inductively or capacitively into the wiring between the flowmeter and the electronic measuring systems. In general, utilizing a shielded, twisted pair for the interconnection greatly reduces this coupling. The shield should be grounded on one end of the cable only. In general, grounding only on the electronic measuring system is best.

However, even with proper interconnecting cabling cross talk with other signal lines or power lines may still occur and should be avoided. Physical isolation in the manner in which the wiring is run reduces the chance of potential problems.

It is common to transmit the low level output signal from the flowmeter several hundred feet through a shielded, twisted pair instrument cable. Where a noisy environment is suspect, it is recommended that a pre-amplifier be installed on or near the flowmeter to assure the preservation of flow information from the flowmeter to the electronic measuring system. Suitable accessory models are available from manufacturer.
INSTALLATION OF ACC-17B

The Model ACC-17B should be placed in a convenient location which maintains access to the unit should repairs or readjustment be required.

Refer to outline and installation drawing for the appropriate case type to be installed. Drill appropriate mounting holes as required.

Refer to wiring installation drawing for appropriate terminals for interconnections. Connections to the terminal block should be carefully dressed to avoid having bare wires extend pass the screw clamp on the terminal block. This is particularly important for units mounted within the explosion proof enclosure. Wires should be neatly dressed near bottom of enclosure to assure wiring will not become fouled when cover is installed.

Connect two conductor shielded cable from flowmeter. Connect shield to ACC-17B only.

Line power connection should be made through a circuit breaker so that power can be turned off while servicing accessory model.

Connect pulse output. Several output pulse waveforms are available factory equipped. Wire to appropriate terminal for waveform desired and specified. Use same precaution as described for the flowmeter input signal.
1. FACTORY RECOMMENDS 10" PIPE DIA. UPSTREAM AND 5 PIPE DIA. DOWNSTREAM OF SAME SIZE PIPE AS FLOWMETER. A FLOW STRAIGHTENER IS RECOMMENDED IF THIS IS NOT POSSIBLE OR FOR CUSTODY TRANSFER APPLICATIONS.

**TABLE:**

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>MESH SIZE</th>
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<tr>
<td>MF SERIES</td>
<td>100</td>
</tr>
<tr>
<td>1/4&quot; - 1/2&quot;</td>
<td>100</td>
</tr>
<tr>
<td>5/8&quot; - 1 1/4&quot;</td>
<td>70</td>
</tr>
<tr>
<td>1 1/2&quot; - 3&quot;</td>
<td>40</td>
</tr>
<tr>
<td>4&quot; - 12&quot;</td>
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**Revisions:**

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<td>REDRAWN</td>
<td>1-31-92</td>
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<tr>
<td>B</td>
<td>ADDED NOTE 2, CHG'D MESH SIZE</td>
<td>3-17-92</td>
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<tr>
<td>C</td>
<td>DRAWING NO. WAS INSTL-104.</td>
<td>950907</td>
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**Diagram:**

- BYPASS RUN
- V3
- V1, S, FS, TFM, V2
- METER RUN
- V1, V2 BLOCKING VALVE
- S STRAINER
- FS FLOW STRAIGHTENER
- TFM TURBINE FLOWMETER
- V3 BYPASS VALVE

**Title:**

TYPICAL TURBINE INSTALLATION

**Company:**

HOFFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC 27909

**Drawing Details:**

- DRAWN: 1-31-92
- CHECK: JD 1-31-92
- QA: H.COVELL 1-31-92
- PROJ ENG: KRH 1-31-92
- TITLE: TYPICAL TURBINE INSTALLATION
- SIZE: A
- CAGE CODE: 3321
- DWG NO: 500-0194
- REV: C
- SCALE: NONE
- SHEET: 1 OF 1

**Notes:**

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- 2 PLACE DECIMAL ±.01
- 3 PLACE DECIMAL ±.005
- FRACTIONAL ±1/64
- ANGULAR ±1/2°
1. UNIT MAY BE INSTALLED IN EXPLOSION PROOF ENCLOSURE.
1. WIRE TO 7 OR 8 DEPENDING ON TYPE OF OUTPUT WAVEFORM DESIRED AND SPECIFIED.

TO MAG PICKUP

MS3106A-10SL-4S

PULSE OUTPUT SIGNAL

COMMON

FLOW METER SIGNAL INPUT

SIGNAL COMMON

SHIELD

N/C

N/C

PULSE COMMON

COMS/TTL PULSE OUT OR OPEN COLLECTOR

AC PULSE OUTPUT

115/220VAC POWER OUTPUT

BLK

WHT

GRN

TB-1

TB-2

POWER

INPUT

CHASSIS GROUND

MATERIAL

CONTRACT/INV

DRAWN

RS

11/82

CHECK

PB

11/82

QA

JD

11/82

PROJ ENG

KH

11/82

HOFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC 27909

WIRING, INSTALLATION—ACC17B (AC)

SIZE

FSCM NO

DWG NO

REV

A33321

ACC17B-701

C

SCALE

NONE

SHEET 1 OF 1

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1 PLACE DECIMAL ±0.01

2 PLACE DECIMAL ±0.005

3 PLACE DECIMAL ±1/64

FRACTIONAL ±1/2

UNLESS OTHERWISE SPECIFIED TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS:
NOTES:

1. ENCLOSURE MEETS:
   CLASS I, GROUP C & D
   CLASS II, GROUP E, F & G
   NEMA 7 & 9

2. USED WHEN SIGNAL CONDITIONER IS ENCLOSED, MOUNTED OR REMOTE.
**NOTES:**

ENCLOSURE MEETS:

CLASS I, GROUPS C & D
CLASS II, GROUPS E, F & G
NEMA 7 & 9

---

**REVISIONS**

<table>
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<th>DESCRIPTION</th>
<th>DATE</th>
<th>APP</th>
</tr>
</thead>
</table>

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**OPTIONAL 'O' RING**

**REMovable COVER**

---

**ENCLOSE, EXPLOSION PROOF—STYLE 4**

**HOFER FLOW CONTROLS, INC.**
**ELIZABETH CITY, NC 27909**

**SIZE**

<table>
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**MATERIAL**

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---

**UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS:**

- 2 PLACE DECIMAL ±0.01
- 3 PLACE DECIMAL ±0.005
- FRACTIONAL ±1/64
- ANGULAR ±1/22

---

**NEXT ASSY USED ON APPLICATION**

<table>
<thead>
<tr>
<th>SHEET</th>
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<tbody>
<tr>
<td>1 OF 1</td>
</tr>
</tbody>
</table>
SECTION III
CALIBRATION

No calibration is required with the ACC-17B. However, SENS control should be properly adjusted during startup, as described in Section IV.

FOR PULSE SCALING OPTION

1. An optional DIP switch is located on the PCA-60 printed circuit card. See Table A to determine required switch position and set into switch, as shown on drawing ACC-17B-401 for required divide by N.

2. For a required divide by 64, 128, or 256, switch position 6 must be jumpered as shown on drawing ACC-17B-401.

3. The required divide factor may be determined by the maximum pulse rate limitation of the host system. Note that the significance given to each pulse increases as larger divide factors are utilized.

TABLE - A

<table>
<thead>
<tr>
<th>+ N</th>
<th>SWITCH POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
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<tr>
<td>4</td>
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<td>32</td>
<td>5</td>
</tr>
<tr>
<td>64*</td>
<td>6</td>
</tr>
<tr>
<td>128*</td>
<td></td>
</tr>
<tr>
<td>256*</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: FOR DIVIDE BY 64, 128 OR 256, SWITCH POSITION 6 IS JUMPERED TO APPROPRIATE LOCATION ON PCA-60 PRINTED CIRCUIT BOARD. CONTACT ENGINEERING DEPARTMENT FOR DETAILS IF A CHANGE IN FACTORY WIRED DIVIDE (POSITION 6) IS SOUGHT.
ACC-17B FREQUENCY/VOLTAGE FLOW CONVERTER SUBSYSTEM

INITIAL STARTUP

Perform any purging of piping with spool piece in place. Once completed, install the flowmeter and connect cabling to pickup coil. If false counting action occurs, turn sensitivity control clockwise.

OPERATION

The pulse output commences with flow through the flowmeter.

PRINCIPLE OF OPERATION

A simplified block diagram of the ACC-17B Signal Conditioner Subsystem is given on drawing ACC-17B-601. Key functional blocks, as well as, information flow are designated. The basic operation of the system is as follows.

The frequency signal from the turbine flowmeter is connected to the ACC-17B with a twisted pair shielded cable. The signal enters through the SENSITIVITY control which is used to reject unwanted noise by raising the trigger threshold above the background noise present.

The low level flowmeter signal is then passed through a signal conditioning chain where it is amplified and shaped into a train of digital pulses whose frequency is related to the volume flow rate.

POWER SUPPLY

The Power Supply provides for operating bias voltage for all internal circuitry.

The pulse output amplifier may be configured to provide one of the following:

1. High level AC square wave (capacitively coupled)
2. Open collector transistor
3. TTL/CMOS compatible square pulse of 5 volt amplitude

An optional divide by N may be equipped if pulse scaling is required.
MAINTENANCE, GENERAL

Hoffer Flow Controls Flow Measurement Systems are constructed to give a long service life in the targeted measuring field and service environment. However, problems do occur from time to time and the following points should be considered for preventive maintenance and repairs.

The bearing type used in the flowmeter was chosen to give compromise between long life, chemical resistance, ease of maintenance and performance. A preventive maintenance schedule should be established to determine the amount of wear which has occurred since last over haul. See users manual for flowmeter for further instructions.

A spare Parts List has been provided which, at the discretion of the user, may be user stocked. Consult with the manufacturer if an abridged spare parts list is sought. The recommended spare parts list may be found following this section and in the users manual for the flowmeter.

In case the flow measurement system malfunctions or becomes in-operative, a trouble shooting procedure is enclosed.

Factory consultation is available to assist in diagnosing problems. In addition, factory repair parts and service are available for individuals who wish to utilize this service.

A complete set of schematic diagrams for all printed cards is available from Hoffer Flow Controls for users who wish their own personnel to service the measuring system.

NOTE:

- ALL PRINTED CIRCUIT CARDS ARE WARRANTED FOR ONE YEAR AFTER DATE OF SALE.
- ALL PRINTED CIRCUIT CARDS MAY BE FACTORY REPAIRED AT A NOMINAL FEE FOR PARTS AND LABOR AFTER WARRANTEE PERIOD.
TROUBLE SHOOTING AND MAINTENANCE

INTRODUCTION

In case of an inoperable or malfunctioning system the following procedures can be used to isolate the faulty wiring, printed circuit boards and/or alternate causes. The majority of repairs can be made in the field thereby reducing the time a unit is out of service.

A recommended spare parts list is given immediately following the trouble shooting portion of this manual. The necessary documentation is contained within this manual with the exception of the calibration data sheet for the turbine flowmeter. This calibration is supplied separately.

Factory consultation is available to assist in diagnosing problems. Note that in some cases factory repairs can be performed more easily than can be accomplished in the field.

Failure conditions are listed and the possible corrective actions given to eliminate the observed problem.

GENERAL INSPECTION TO DETERMINE IF UNIT IS OPERATING PROPERLY

Proper operation of the ACC-17B can be assumed when with power applied to the unit, the pulse output produces a pulse train of the desired amplitude and flow through the flow transducer occurs.

<table>
<thead>
<tr>
<th>OBSERVED CONDITION</th>
<th>PROBLEM/CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. NO PULSE OUTPUT</td>
<td>1. Inspect terminal strip wiring for confirmity to the installation instructions and for acceptable workmanship.</td>
</tr>
<tr>
<td></td>
<td>2. Verify fuse is good with an ohm meter. See dwg. ACC-17B-401.</td>
</tr>
<tr>
<td></td>
<td>3. Determine if flowmeter rotor is fouled.</td>
</tr>
<tr>
<td></td>
<td>5. Defective cable. Replace.</td>
</tr>
<tr>
<td></td>
<td>6. Sensitivity potentiometer turned fully clockwise - unit will not function properly.</td>
</tr>
<tr>
<td></td>
<td>7. Defective ACC17B. Repair or replace.</td>
</tr>
</tbody>
</table>
B. PULSING OUTPUT WITH NO FLOW

PROBLEM/CORRECTIVE ACTION

1. Noise pickup present on input. Turn sensitivity control counter clockwise until false counting ceases.
2. Power supply voltage low.
3. Defective pickup coil. Replace.
4. Defective signal cable. Replace.
5. Defective ACC-17B. Repair or replace.

NOTE - REFER TO FLOWMETER USER'S MANUAL FOR REPAIR INSTRUCTIONS FOR THE TURBINE FLOWMETER.
### MODEL ACC-17B SIGNAL CONDITIONER

**TABLE -1 RECOMMENDED SPARE PARTS LIST**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/20 AMP</td>
<td>FUSE, POWER SUPPLY</td>
<td>1 BOX</td>
</tr>
<tr>
<td>ACC-17B-XX</td>
<td>CONDITIONER</td>
<td>1</td>
</tr>
<tr>
<td>PC-XX-XX</td>
<td>COIL</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTE** - ADDITIONAL SPARE PARTS MAY BE RECOMMENDED FOR THE TURBINE FLOWMETER. SEE USER'S MANUAL FOR TURBINE FLOWMETER FOR DETAILS.
1. Wire to 7 or 8 depending on type of output waveform desired and specified.

TO MAG PICKUP

MS3106A-10SL-4S

FLOW METER SIGNAL INPUT
1
FLOW METER SIGNAL INPUT
2
SIGNAL COMMON
3
SHIELD
4
N/C
5
N/C
6
PULSE COMMON
7
COMS/TTL PULSE OUT OR OPEN COLLECTOR
8
AC PULSE OUTPUT

PULSE OUTPUT SIGNAL

COMMON
SIGNAL OUT
OPTIONAL WIRING SEE NOTE 1

+V
POWER

-V
INPUT

EARTH
CHASSIS GROUND

15-35VDC POWER OUTPUT

REVISIONS

<table>
<thead>
<tr>
<th>REV</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APP</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>REvised AND REDRAWn (CS)</td>
<td>920918</td>
<td>JD</td>
</tr>
<tr>
<td>B</td>
<td>DWG NO. WAS ACC17B-702. (CS)</td>
<td>951109</td>
<td>JD</td>
</tr>
<tr>
<td>C</td>
<td>DWG NO. WAS 700-0102 (CS)</td>
<td>961011</td>
<td>C</td>
</tr>
</tbody>
</table>