

ACC-17B

*Mag Coil Flow Rate Preamplifier
Frequency to Pulse Conditioner*

USER'S MANUAL



**HP-274
August 2004**

HOFFER
Flow Controls

Perfecting Measurement™

107 Kitty Hawk Lane • P.O. Box 2145 • Elizabeth City, NC 27909
1-800-628-4584 • (252) 331-1997 • Fax (252) 331-2886
www.hofferflow.com email: info@hofferflow.com

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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HOFFER FLOW CONTROLS' policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering. The information contained in this document is subject to change without notice.

RETURN REQUESTS/INQUIRIES

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 been 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.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HFC SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE RESULTING, DIRECTLY OR INDIRECTLY, FROM THE USE OF LOSS OF USE OF THE GOODS. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, THIS EXCLUSION FROM LIABILITY EMBRACES THE PURCHASER'S EXPENSES FOR DOWNTIME, DAMAGES FOR WHICH THE PURCHASER MAY BE LIABLE TO OTHER PERSONS, DAMAGES TO PROPERTY, AND INJURY TO OR DEATH OF ANY PERSON. HFC NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OR USE OF HFC'S GOODS, AND THERE ARE NO AGREEMENTS OR WARRANTIES COLLATERAL TO OR AFFECTING THE AGREEMENT. *PURCHASER'S SOLE AND EXCLUSIVE REMEDY IS THE REPAIR AND/OR REPLACEMENT OF NONCONFORMING GOODS AS PROVIDED IN THE PRECEDING PARAGRAPHS. HFC SHALL NOT BE LIABLE FOR ANY OTHER DAMAGES WHATSOEVER INCLUDING INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.*

Disclaimer:

Specifications are subject to change without notice.
Some pages are left intentionally blank.

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SECTION I

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 milli volt 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

MODEL ACC17B-(A)-(B)-(C)-(D)

PULSE OUTPUT

INPUT POWER

OPTIONAL FEATURE

ENCLOSURE STYLE

PULSE OUTPUT

MODEL ACC17B-(A)-()-()-()

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-()-(B)-()-()

OPTION (B)

- (A) 115 VAC 50/60 HZ +/-10%
- (B) 220 VAC 50/60 HZ +/-10%
- (D) 15-35 VDC

OPTIONAL FEATURE

MODEL ACC17B-()-()-(C)-()

OPTION (C)

- (PS) PULSE SCALING DIVIDE BY 2, 4, 8, 16, 32, 64, 128, 256

ENCLOSURE STYLE

MODEL ACC17B-()-()-()-(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.

DWG NO. ACC17B-401 SH 1 REV C

ZONE	REV	DESCRIPTION	DATE	APP
A		REVISED AND REDRAWN.	920921	J.D
B		DRAWING NO WAS ACC17B-401.	951109	J.D
C		DESIGNING NO. WAS 700-0098	951011	J.D

SERVICING PROCEDURES

- TD-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.

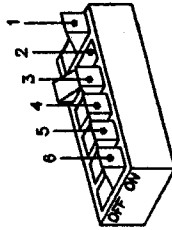
REPLACING FUSE

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



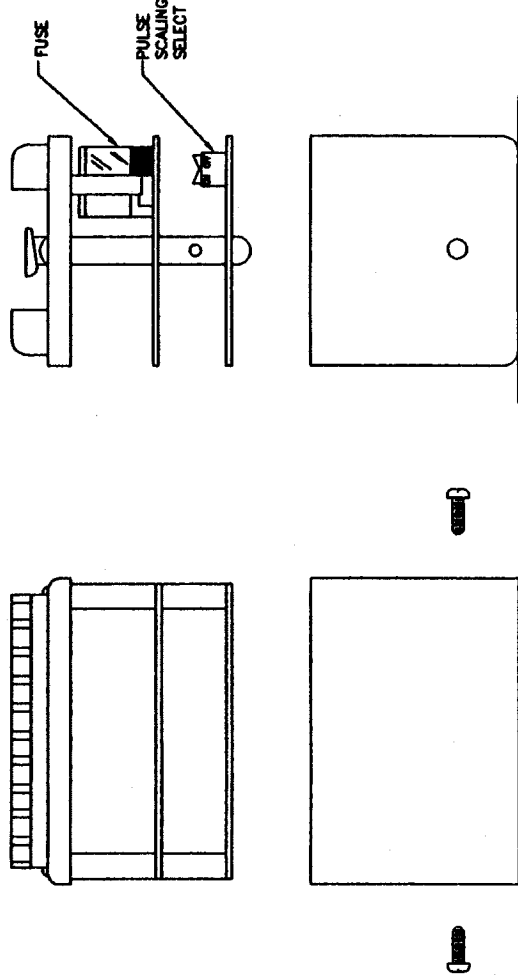
SWITCH 2 IS SHOWN DEPRESSED FOR ILLUSTRATION ONLY
NOTE: SELECT ONE SWITCH ONLY. ALL OTHER SWITCHES MUST BE OFF.

TABLE 1

PULSE SCALING SWITCH	DIVIDE BY
1	+2
2	+4
3	+8
4	+16
5	+32
6	+84, +128, +256

* CONSULT FACTORY FOR JUMPER SELECTION.

SUBASSEMBLY DETAIL



H OFFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC

CONTROLS AND ADJUSTMENTS

DATE: C 33321
DWG NO: ACC17B-401
REV: C

SCALE: N/A
SHEET: 1 OF 1

CONTRACT/FR	DATE
DRWIN J.DEFEO	
ORER	
ON H.COYALL	
PROJ ENG K.HOFFER	

MATERIAL	QUANTITY	UNIT
FRESH		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. DIMENSIONS IN PARENTHESES SHALL BE THE SIZE OF STANDARD MATERIALS.

CONTRACTUAL PROPERTY OF OFFER FLOW CONTROLS, INC. (MFC) NOT TO BE DISCLOSED TO OTHERS. REPRODUCED OR USED FOR ANY OTHER PURPOSE EXCEPT AS AUTHORIZED IN WRITING BY COMPLETELY BE LIMITED TO ORIGINAL INTENT AND PURPOSE FOR WHICH INT.

PLACE DIMENSIONS IN PARENTHESES FOR ANGULAR

NEUT ASBY USED ON APPLICATION

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 recommendation 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, solinoids, 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 up stream and 5 pipe diameters downstream are required. Where this optimum line configuration can not be implemented, it is advisable to install a flow straightner 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 contaminates 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:

$$\text{Min. Back Pressure} = 1.25 \times \text{Vapor Pressure} + 2X \text{ Pressure Drop}$$

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 past 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.

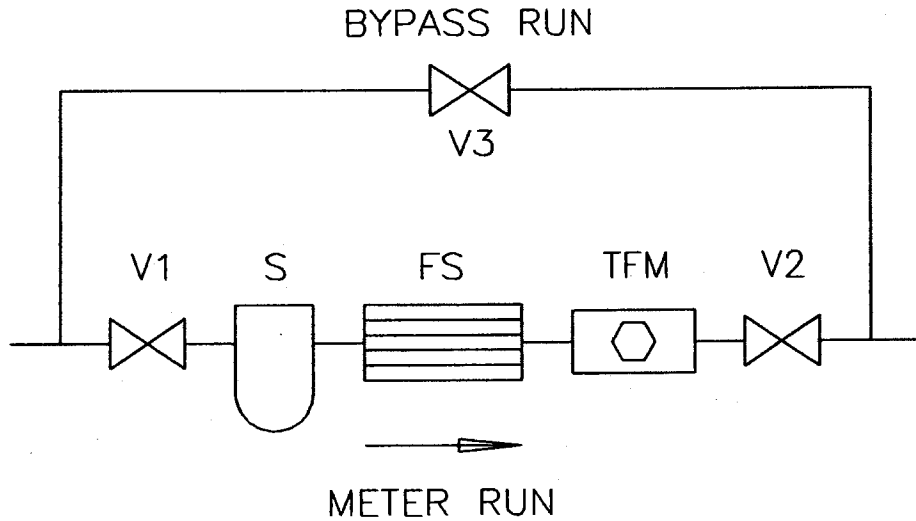
Connect pulse output. Several output pulse waveforms are available factory equipped. Wire to appropriate terminal for waveform desired and specified. Use same precaution as described for the flowmeter input signal.

NOTES:

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.

REVISIONS

REV	DESCRIPTION	DATE	APP
A	REDRAWN	1-31-92	
B	ADDED NOTE 2, CHG'D MESH SIZE	3-17-92	
C	DRAWING NO. WAS INSTL-104.	950907	JR



METER SIZE	MESH SIZE
MF SERIES	100
1/4" - 1/2"	100
5/8" - 1 1/4"	70
1 1/2" - 3"	40
4" - 12"	24

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

REPLACES INSTL-104

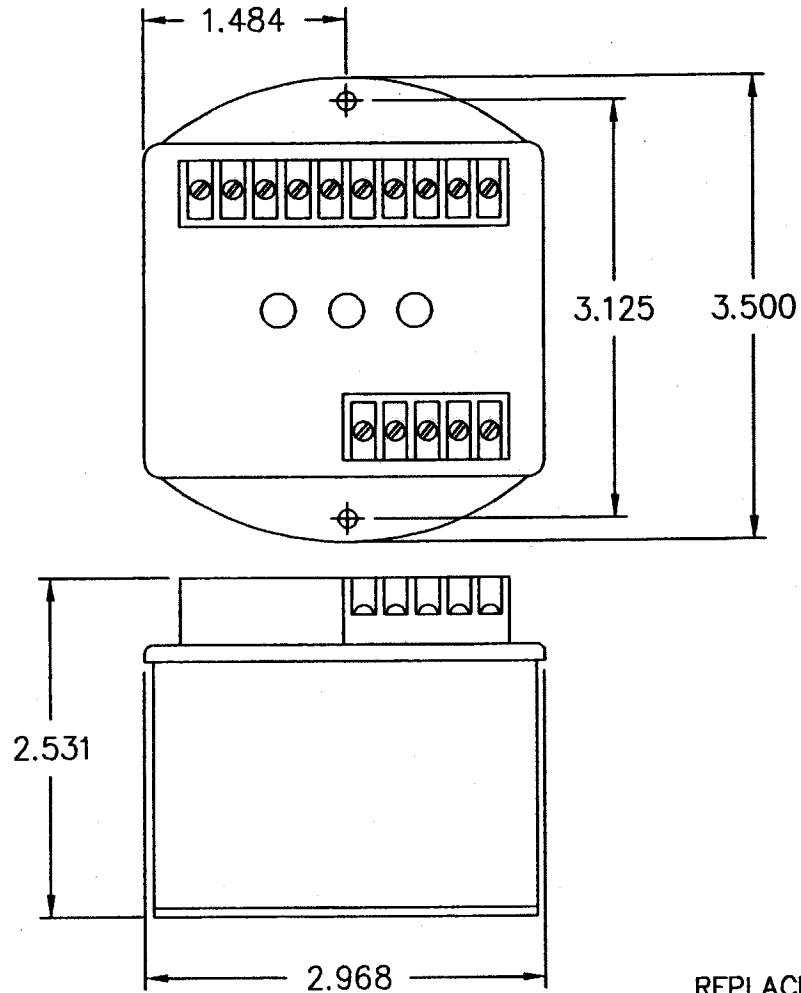
		MATERIAL	DRAWN DW	DATE 1-31-92	H HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909			
			CHECK JD	1-31-92				
			QA H. COVELL	1-31-92				
		FINISH	PROJ ENG KRH	1-31-92				
					TITLE TYPICAL TURBINE INSTALLATION			
NEXT ASSY	USED ON	CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS: 2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°		SIZE A	CAGE CODE 33321	DWG NO 500-0194	REV C
APPLICATION				SCALE NONE	SHEET 1	OF 1		

NOTES:


1. UNIT MAY BE INSTALLED IN EXPLOSION PROOF ENCLOSURE.

REVISIONS

REV	DESCRIPTION	DATE	APP
A	REVISED AND REDRAWN. (CS)	920921	JD
B	DRAWING NO. WAS ACCXX-401.	950830	JD



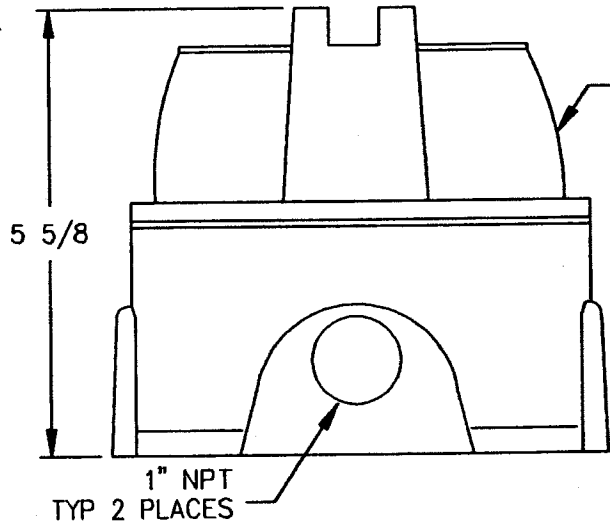
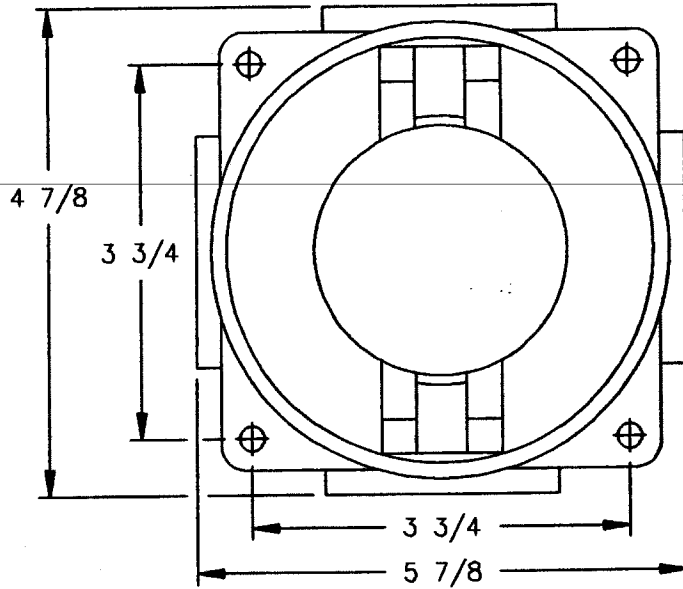
REPLACES ACCXX-401

		MATERIAL	CONTRACT/JN		 H OFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909			
			DRAWN J.F.	DATE 9/82				
			CHECK R.S.	11/82				
		FINISH	QA					
			PROJ ENG		TITLE CASE OUTLINE, ACC STYLE-2 CASE			
		CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS: 2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°		SIZE A	FSCM NO 33321	DWG NO 500-0173	REV B
NEXT ASSY	USED ON					SCALE NONE	SHEET 1 OF 1	
APPLICATION								

NOTES:

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

REVISIONS			
REV	DESCRIPTION	DATE	APP



		MATERIAL	DRAWN <i>Sweet</i> DATE <i>9/10/83</i>
			CHECK
			PROJ ENG <i>A</i> <i>9/18/83</i>
		FINISH	
NEXT ASSY	USED ON	CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS. REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS: 2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°
APPLICATION			

H OFFER FLOW CONTROLS, INC.
 ELIZABETH CITY, NC 27909

TITLE
 ENCLOSURE,
 EXPLOSION PROOF-
 STYLE 4H

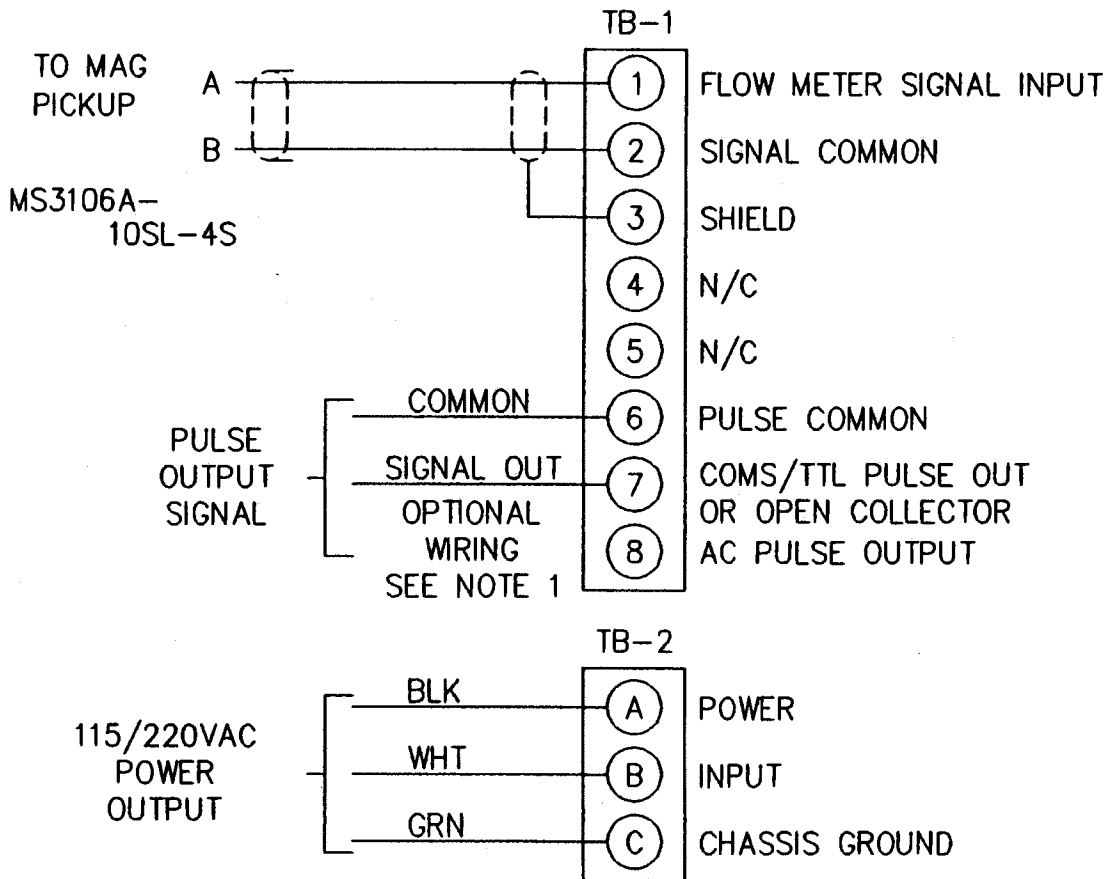
SIZE	FSCM NO	DWG NO	REV
A	33321	500-0020	-
SCALE		SHEET 1 OF 1	
NONE			


NOTES:

1. WIRE TO 7 OR 8 DEPENDING ON TYPE OF OUTPUT WAVEFORM DESIRED AND SPECIFIED.

REVISIONS

REV	DESCRIPTION	DATE	APP
A	REVISED AND REDRAWN (CS)	920918	JD
B	DWG NO. WAS ACC17B-701. (CS)	951109	JD
C	DWG NO. WAS 700-0101 (CS)	961011	ED

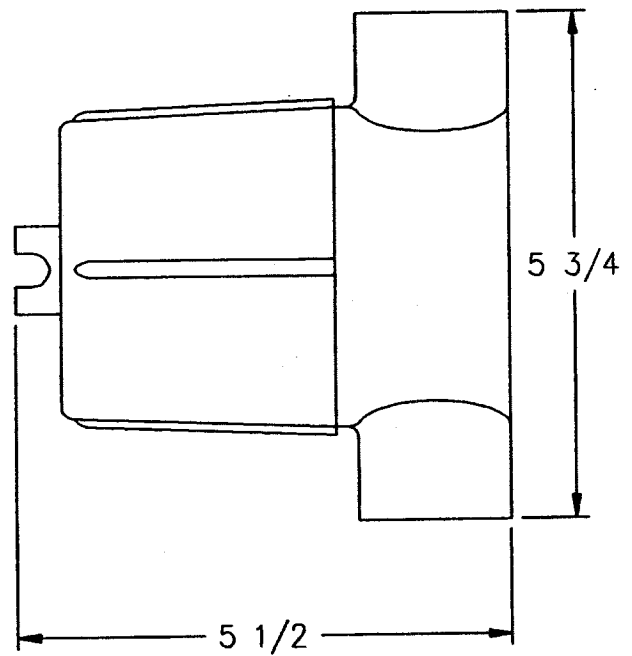
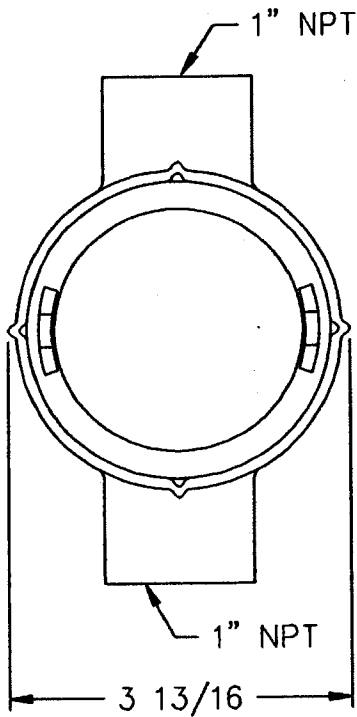


		MATERIAL	CONTRACT/JN		 HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909
			DRAWN	DATE	
			RS	11/82	
			CHECK	11/82	
			PB		
		FINISH	QA	11/82	
			JD		
			PROJ ENG	11/82	
			KH		
		CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS:		TITLE WIRING, INSTALLATION- ACC17B (AC)
NEXT ASSY	USED ON		2 PLACE DECIMAL ±.01	3 PLACE DECIMAL ±.005	
APPLICATION		ANGULAR ±1/2"	SIZE FSCM NO DWG NO REV A 33321 ACC17B-701 C		
		SCALE NONE		SHEET 1 OF 1	

NOTES:

- ENCLOSURE MEETS:
CLASS I, GROUP C & D
CLASS II, GROUP E, F & G
NEMA 7 & 9
- USED WHEN SIGNAL CONDITIONER IS
ENCLOSED, MOUNTED OR REMOTE.

REVISIONS			
REV	DESCRIPTION	DATE	APP



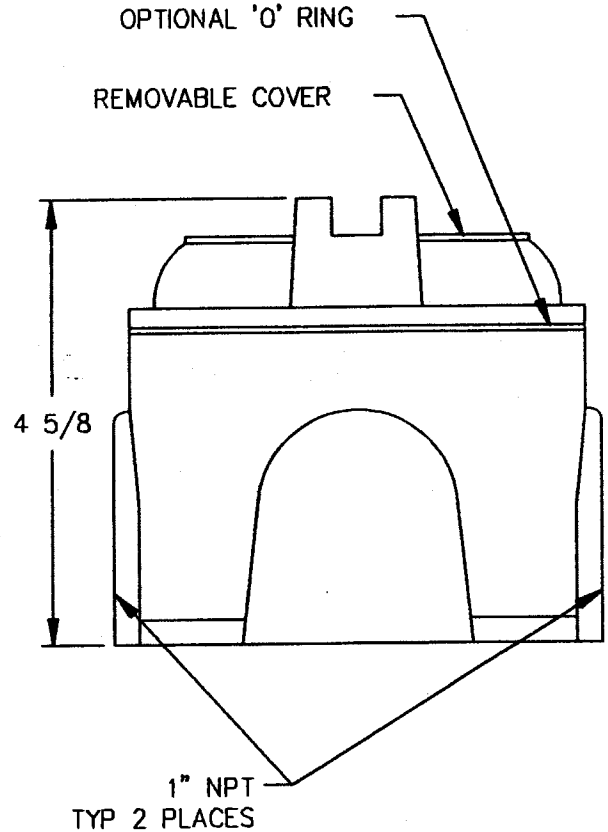
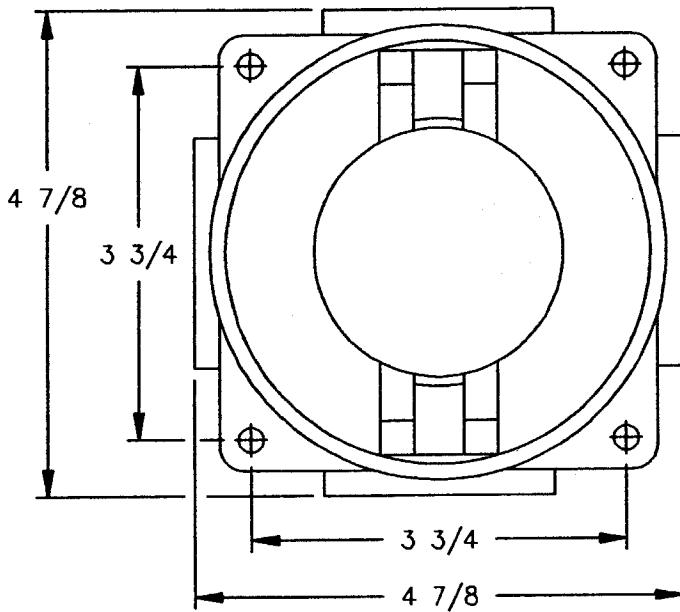
		MATERIAL	DRAWN <i>Sweet</i>	DATE <i>9/10/83</i>	H HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909
			CHECK		
			PROJ ENG <i>JA</i>	<i>9/10/83</i>	TITLE ENCLOSURE, EXPLOSION PROOF- STYLE 3
		FINISH			
		CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS:		SIZE CAGE CODE DWG NO REV A 33321 500-0018 -
NEXT ASSY	USED ON		2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°		
APPLICATION			SCALE NONE		SHEET 1 OF 1

NOTES:

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

REVISIONS

REV	DESCRIPTION	DATE	APP



		MATERIAL	DRAWN <i>Swat</i>	DATE 9/4/83	H HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909			
			CHECK					
		FINISH	PROJ ENGR <i>JA</i>	7/1/83	TITLE			
					ENCLOSURE, EXPLOSION PROOF- STYLE 4			
NEXT ASSY	USED ON	CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS:		SIZE	FSCM NO	DWG NO	REV
APPLICATION			2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°	A	33321	500-0021	-	
			SCALE	NONE	SHEET 1 OF 1			

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

÷ N	SWITCH POSITION
2	1
4	2
8	3
16	4
32	5
64*	
128*	6
256*	

*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.

SECTION IV

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.

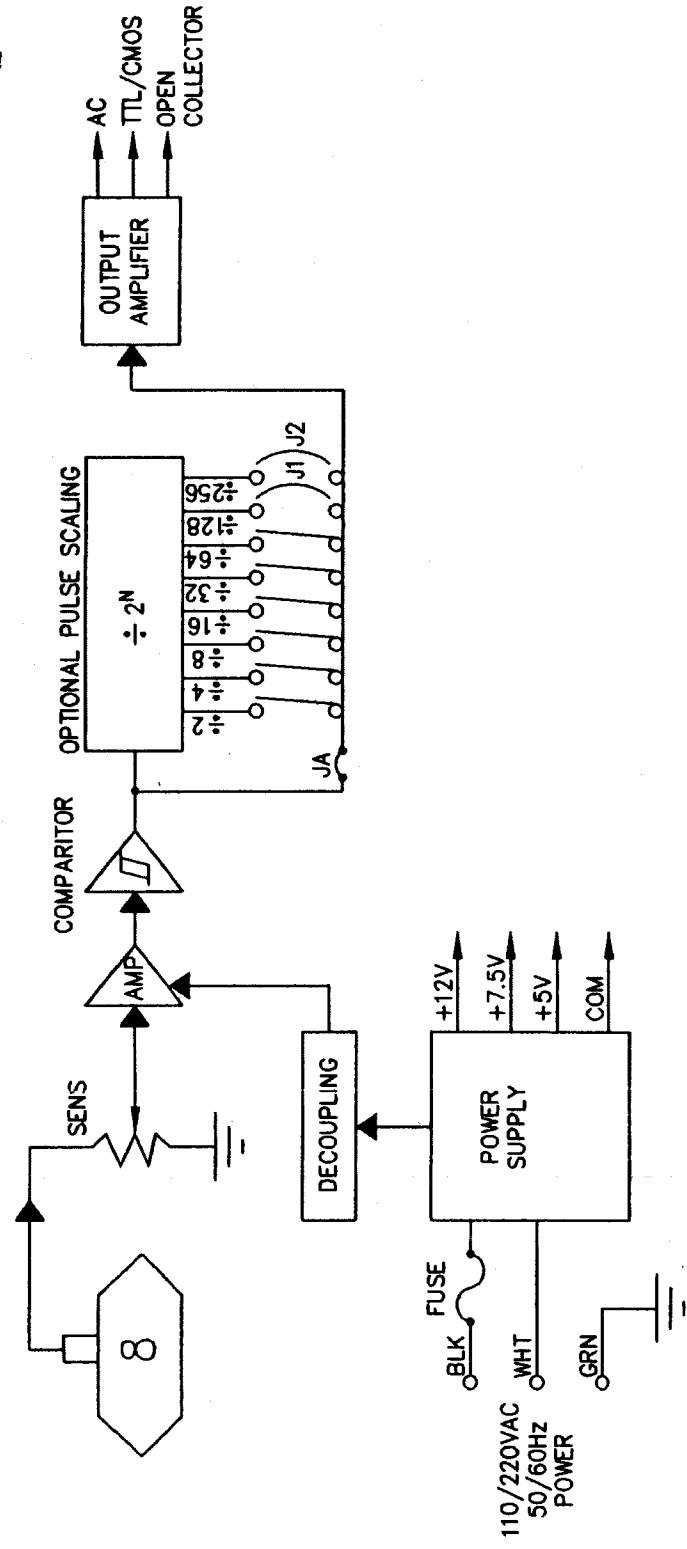
The pulse output amplifier may be configured to provide one of the following:

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.

REVISIONS

REV	DESCRIPTION	DATE	APP
A	REVISED AND REDRAWN. (CS)	920921	JD
B	DWG NO. WAS ACC17B-601 (CS)	951109	JD
C	DWG NO. WAS 700-0099 (CS)	961011	JD



MATERIAL		CONTRACT/JN	
		DRAWN	J.D.
		DATE	2/19/81
		CHECK	J.DEFEO
		DATE	2/19/81
		PROJ ENG	K.HOFFER
		DATE	2/19/81
FINISH		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES, TOLERANCES OTHER THAN THE SIZE OF RAW MATERIAL SHALL BE HELD AS FOLLOWS:	
		2 PLACE DECIMAL	±.01
		3 PLACE DECIMAL	±.005
		FRACTIONAL	±1/64
		ANGULAR	+1/2°
APPLICATION		CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LEVIT.	
NEXT ASSY	USED ON	SIZE	FSCM NO
		A 33321	ACC17B-601
		SCALE	NONE
		DWG NO	ACC17B-601
		REV	C
		SHEET	1 OF 1



HOFFER FLOW CONTROLS, INC.
ELIZABETH CITY, NC 27909

TITLE
BLOCK DIAGRAM-
ACC17B (AC POWER)

SECTION V

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 inoperative, 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 WARRANTEED 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.

OBSERVED CONDITION

A. NO PULSE OUTPUT

PROBLEM/CORRECTIVE ACTION

1. Inspect terminal strip wiring for conformity to the installation instructions and for acceptable workmanship.
2. Verify fuse is good with an ohm meter. See dwg. ACC-17B-401.
3. Determine if flowmeter rotor is fouled.
4. Defective pickup coil. Replace.
5. Defective cable. Replace.
6. Sensitivity potentiometer turned fully clockwise - unit will not function properly.
7. Defective ACC17B. Repair or replace.
8. Power supply failure.

OBSERVED CONDITION

PROBLEM/CORRECTIVE ACTION

B. PULSING OUTPUT WITH NO FLOW

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.

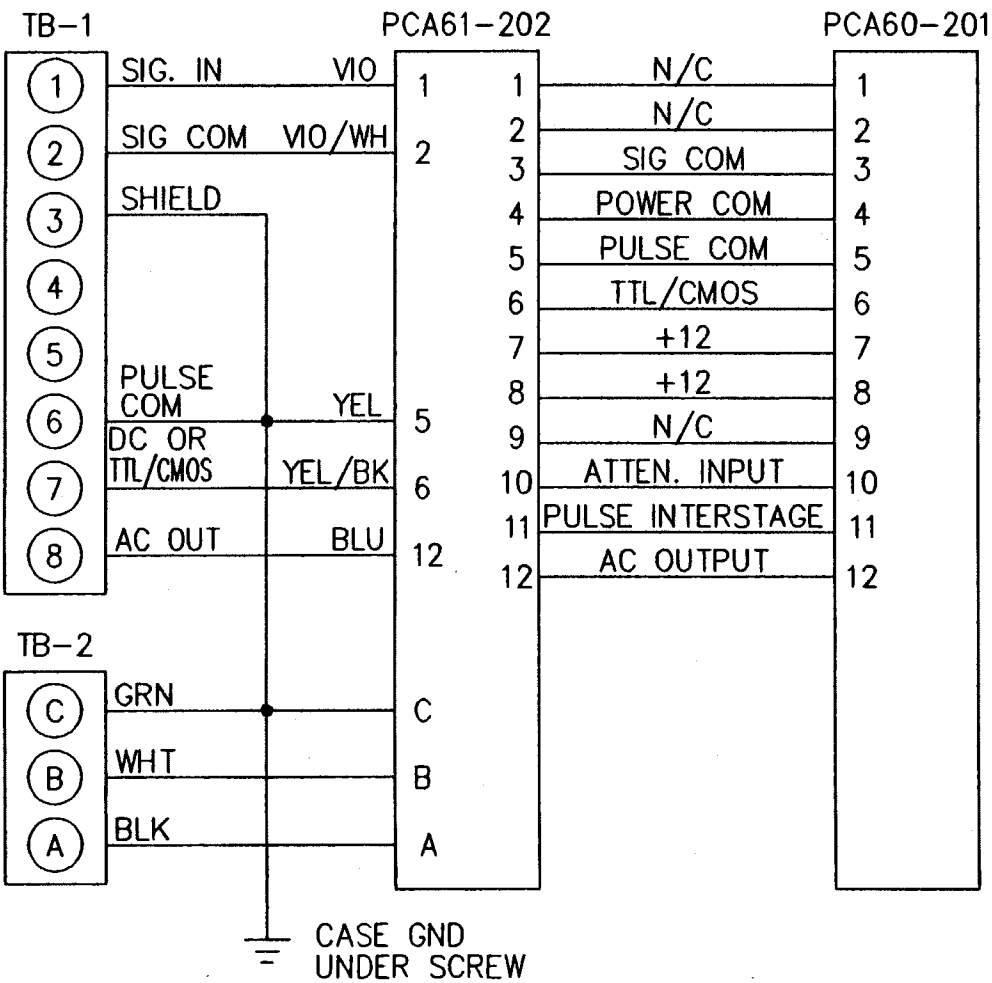
NOTE - REFER TO FLOWMETER USER'S MANUAL FOR REPAIR INSTRUCTIONS FOR THE TURBINE FLOWMETER.

MODEL ACC-17B SIGNAL CONDITIONER
TABLE -1 RECOMMENDED SPARE PARTS LIST

PART NUMBER	DESCRIPTION	QTY.
1/20 AMP	FUSE, POWER SUPPLY	1 BOX
ACC-17B-XX	CONDITIONER	1
PC-XX-XX	COIL	1

NOTE - ADDITIONAL SPARE PARTS MAY BE RECOMMENDED FOR THE TURBINE FLOWMETER. SEE USER'S MANUAL FOR TURBINE FLOWMETER FOR DETAILS.

REVISIONS			
REV	DESCRIPTION	DATE	APP
A	SHIELD TIED TO COMMON	12/82	
B	REVISED AND REDRAWN (CS)	920918	JD
C	DRAWING NO. WAS ACC17B-301	951109	JD
D	DRAWING NO. WAS 700-0096	961011	<i>JD</i>

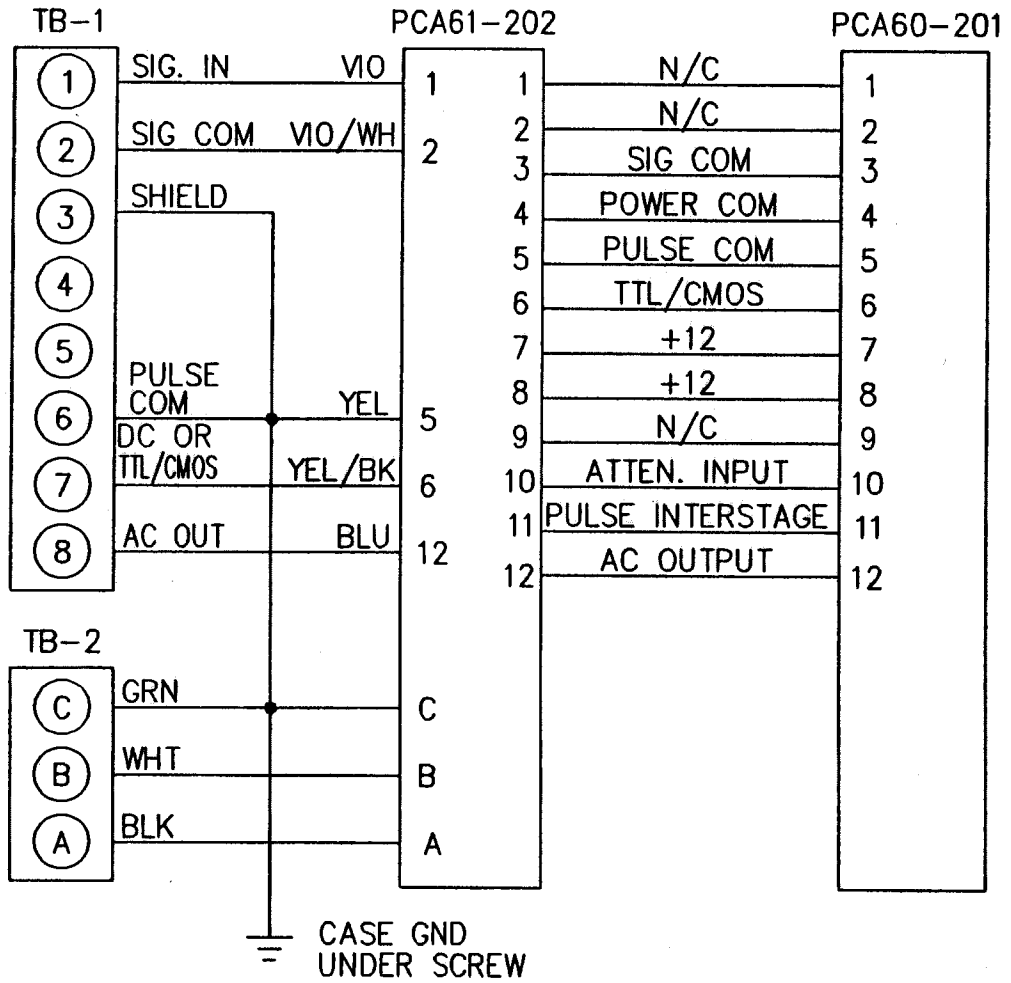


115VAC/220VAC
POWER
INPUT
±10%

		MATERIAL	CONTRACT/JN		H HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909		
			DRAWN JD	DATE 11/82			
			CHECK		TITLE WIRING, INTERNAL CASE- ACC17B (AC)		
		FINISH	QA				
			PROJ ENG KH	11/82			
NEXT ASSY	USED ON	CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS: 2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°			
APPLICATION				SIZE A	FSCM NO 33321	DWG NO ACC17B-301	REV D
				SCALE NONE	SHEET 1 OF 1		

REVISIONS


REV	DESCRIPTION	DATE	APP
A	SHIELD TIED TO COMMON	12/82	
B	REVISED AND REDRAWN (CS)	920918	JD
C	DRAWING NO WAS ACC17B-302	951109	JD
D	DRAWING NO WAS 700-0097	961011	ES



POWER INPUT
15-35VDC

CHASSIS
V-
V+

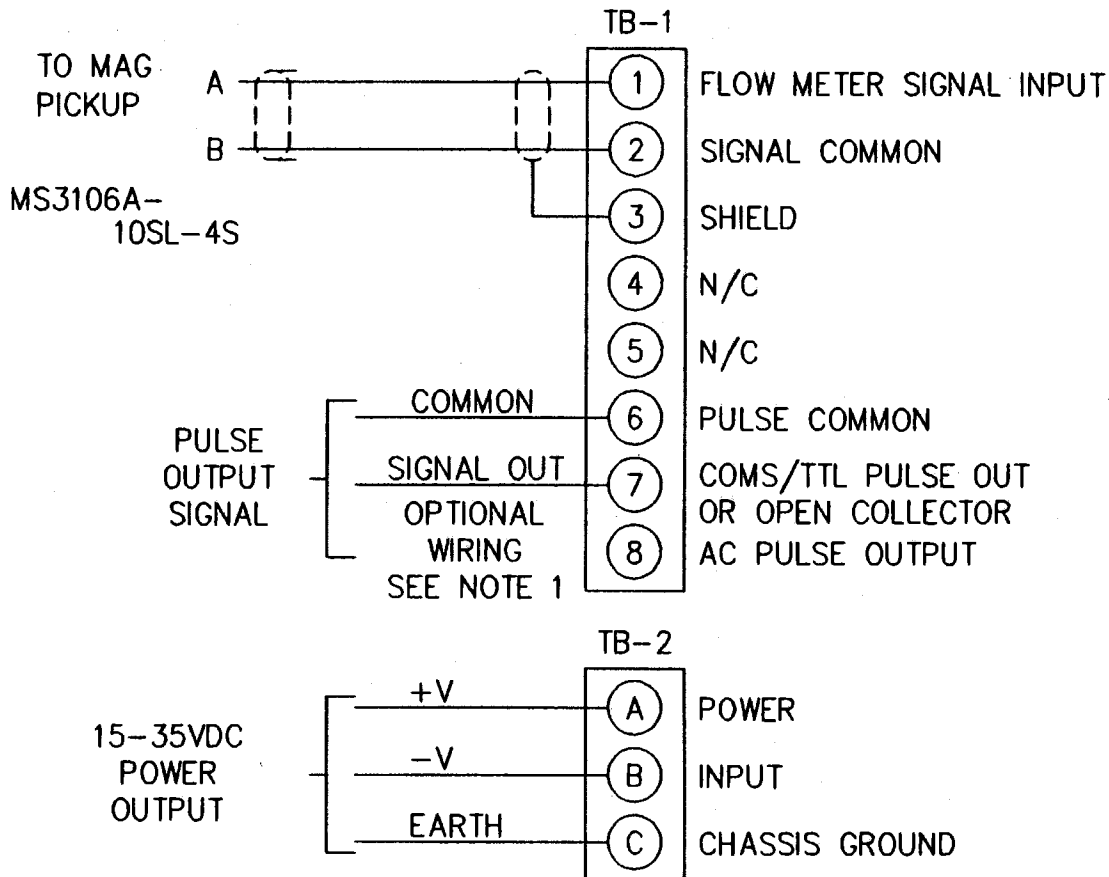
CASE GND
UNDER SCREW

		MATERIAL	CONTRACT/JN		 HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909
			DRAWN JD	DATE 11/82	
			CHECK		
		FINISH	QA		
			PROJ ENG KH	11/82	TITLE WIRING, INTERNAL CASE- ACC17B DC POWER
NEXT ASSY	USED ON	CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC. (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS: 2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°		SIZE A FSCM NO 33321 SCALE NONE
APPLICATION			DWG NO ACC17B-302 REV D	SHEET 1 OF 1	

NOTES:

1. WIRE TO 7 OR 8 DEPENDING ON TYPE OF OUTPUT WAVEFORM DESIRED AND SPECIFIED.

REVISIONS			
REV	DESCRIPTION	DATE	APP
A	REVISED AND REDRAWN (CS)	920918	JD
B	DWG NO. WAS ACC17B-702. (CS)	951109	JD
C	DWG NO. WAS 700-0102 (CS)	961011	<i>JD</i>



		MATERIAL	CONTRACT/JN		H HOFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909
			DRAWN RS	DATE 11/82	
			CHECK PB	11/82	
		FINISH	QA JD	11/82	
			PROJ ENG KH	11/82	TITLE
			CONFIDENTIAL PROPERTY OF HOFFER FLOW CONTROLS, INC (HFC) NOT TO BE DISCLOSED TO OTHERS, REPRODUCED, OR USED FOR ANY OTHER PURPOSE, EXCEPT AS AUTHORIZED IN WRITING BY HFC. MUST BE RETURNED ON DEMAND, ON COMPLETION OF ORDER OR OTHER PURPOSE FOR WHICH LENT.		INSTALLATION WIRING, ACC17B-DC POWER
NEXT ASSY	USED ON		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS: 2 PLACE DECIMAL ±.01 3 PLACE DECIMAL ±.005 FRACTIONAL ±1/64 ANGULAR ±1/2°		SIZE A 33321 ACC17B-702 C
APPLICATION					SCALE NONE SHEET 1 OF 1

