

CHECK WIRING HARNESS BEFORE INSTALLATION

TAS 1000

INSTALLATION PROCEDURES

DOCUMENT 1000-402 REV. J

DATE: JULY 20, 2021

PLEASE READ INSTRUCTIONS
COMPLETELY
BEFORE PROCEEDING
WITH INSTALLATION

The logo for Insight Instrument Corp. features the word "Insight" in a bold, blue, sans-serif font. The letters are stylized with horizontal lines extending from the top and bottom of each letter, giving it a digital or technical appearance. The word "Instrument Corp." is written in a smaller, plain blue font directly below "Insight".

Instrument Corp.

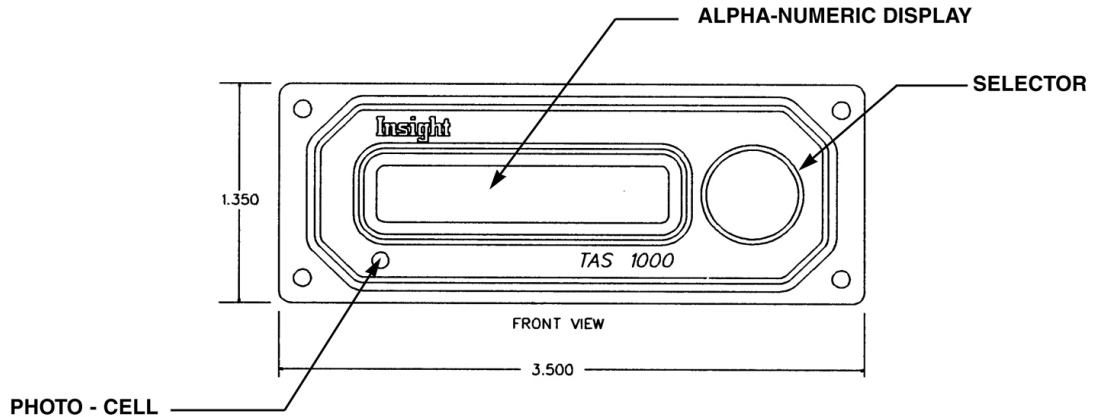
Box 122
Fort Erie
Ontario
L2A 5M6

Table of Contents

1.	PLANNING THE INSTALLATION	2
1.1	TAS SYSTEM INSTALLATION OPTIONS	2
2.	HARDWARE INSTALLATION	3
2.0	INSTALL TAS WIRING	3
2.1	INSTALLING THE TAS 1000 AIR DATA COMPUTER	3
2.2	INSTALLING THE WINDICATOR	3
2.3	CONNECTING POWER AND GROUND	3
2.4	INSTALLING THE OAT (Outside Air Temperature) SENSOR	3
2.5	INSTALLING THE EXPANSION MODULE	3
2.6	INSTALLING THE FUEL FLOW SENSOR(S)	3
2.7	CONNECTING TO A HEADING SYSTEM	4
2.8	CONNECTING TO AN ALTIMETER	4
2.9	CONNECTING TO A GPS	4
3.0	CONNECTING TO A PITOT/STATIC SYSTEM	4
4.0	TAS DEALER MODE SETUP	4
4.1	SINGLE/TWIN ENGINE	5
4.2	FUEL UNITS	5
4.3	FUEL TYPE	5
4.4	SYNCHRO	5
4.5	BAROMETER SETTING CALIBRATION 31	6
4.6	BAROMETER SETTING CALIBRATION 28	6
4.7	MFO (Maximum Fuel Onboard)	7
4.8	FUEL FLOW CALIBRATION (KL for left engine/single engine)	7
4.9	FUEL FLOW CALIBRATION (KL for right engine/single engine)	7
4.10	AWB (Alert Warning Band)	7
4.11	TAS RS-232 TRANSMIT FORMATS	7,8
4.12	EXIT DEALER MODE	9
5.0	INSTRUCTIONS FOR GARMIN 400/500 SERIES SOFTWARE SETUP	9
5.1	FINAL ACCEPTANCE TEST	9
5.2	FLIGHT CHECK	9
5.3	TAS SERVICE	10
5.4	TAS-1000 Data Sources	11
	INSTALLATION DRAWINGS	12-30

PLANNING THE INSTALLATION

The TAS 1000 Air Data System interconnects with several existing aircraft systems. Full implementation requires connection with: Electrical system, Pitot/Static system, OAT probe, slaved heading system, fuel flow sensors, altimeter, and GPS.



Note that the TAS 1000 contains an ambient light sensor for automatic brightness control and so requires no connection to aircraft lighting bus. Read all installation instructions and examine the aircraft to determine existing aircraft equipment.

1.1 TAS SYSTEM INSTALLATION OPTIONS

OPTIONS	REQUIREMENTS	RESULTS
FUEL FLOW		
A. INSIGHTS FUEL FLOW SENSOR	CONNECT TAS TO INSIGHT FUEL FLOW SENSOR	TAS WILL PROVIDE FUEL DATA
B. AC SINEWAVE FUEL FLOW SENSOR	CONNECT TAS TO EXISITING AC SINEWAVE FUEL FLOW SENSOR AND INSTRUMENT	TAS WILL PROVIDE FUEL DATA AS BACK-UP TO EXISTING INSTRUMENT
C. FLOWSCAN 201B AND EXISTING INSTRUMENT	CONNECT TAS TO EXISITING 201B FUEL FLOW SENSOR AND INSTRUMENT	TAS WILL PROVIDE FUEL DATA AS BACK-UP TO EXISTING INSTRUMENT
D. FLOWSCAN 201B ONLY	CONNECT TAS TO EXISITING 201B FUEL FLOW SENSOR ONLY	TAS WILL PROVIDE FUEL DATA
E. TF 500 FUEL SENSOR	CONNECT TF500 FUEL INPUTS AS SHOWN	TF500 WILL PROVIDE FUEL FUNCTIONS TO A GPS
F. NONE	CONNECT TAS FUEL FLOW INPUTS TO GROUND	NO FUEL FUNCTIONS AVAILABLE
COMPASS		
A. NO COMPASS SYSTEM	IF NO HEADING SOURCE IS AVAILABLE CONNECT TAS AS SHOWN	PILOT MUST ENTER HEADING CHANGES ON TAS
B. SYNCHRO (SLAVED DG/HSI)	WIRE TAS SYNCHRO INPUTS TO AIRCRAFT X, Y, Z AND 400 HZ REF.	TAS WILL UTILIZE HEADING FROM COMPASS.
C STEPPER (KING HSI)	CONNECT TAS SA, SC INPUTS TO HSI OUTPUTS AS SHOWN.	AS ABOVE, BUT PILOT WILL PERIODICALLY CHECK AND RESET TAS HEADING.
BARO SETTINGS		
A. BARO-OUTPUT ALTIMETER	CONNECT ALTIMETER BARO-OUTPUT TO TAS INPUT PINS. (400 HZ REF. REQUIRED)	TAS WILL ACQUIRE BARO-SETTING FROM THE ALTIMETER
B. NONE	CONNECT TAS BARO INPUT PINS TO GROUND	PILOT MUST SET BARO ON TAS

2. HARDWARE INSTALLATION

2.0 INSTALL TAS WIRING

Install all wiring in accordance with AC 43.13-1B Chapter 11 Section 8, 11-96, 11-97, 11-98, 11-100, 11-104, 11-105, 11-106, and 11-107.

2.1 INSTALLING THE TAS 1000 AIR DATA COMPUTER

Select a suitable panel location for the TAS 1000. Avoid locations subject to direct sunlight. Check for accessibility to the pitot/static and all other required systems.

Use existing or create a panel hole in accordance with Insight Drawing #1000-304 (PANEL CUT-OUT). Mount TAS 1000 using four supplied screws (or similar).

2.2 INSTALLING THE WINDICATOR

The Insight Windicator displays the TAS 1000's real-time wind aloft data in graphical format. It may be mounted in any convenient location. Mount the Windicator in accordance with Insight Drawing #1000-305 (WINDICATOR MOUNTING DIAGRAM). Terminate in accordance with Insight Drawing #1000-301 Page 1 (TAS 1000 INSTALLATION SCHEMATIC).

2.3 CONNECTING POWER AND GROUND

Using Insight supplied connector and installer supplied circuit-breaker connect to aircraft avionics bus in accordance with Insight Drawing #1000-301 Page 1.

2.4 INSTALLING THE OAT (Outside Air Temperature) SENSOR

Select a suitable location on the exterior of the aircraft for the OAT sensor. Choose a location on the aircraft avoiding vents, exhaust, or any feature that may interfere with sensing ambient air temperature. Insight recommends mounting the probe in the engine induction air inlet near the engine induction air filter. Probes located there will read well as soon as the engine is started.

Mount the sensor in accordance with Insight Drawing #1000-302 (OAT MOUNTING DIAGRAM). Terminate the OAT cable in accordance with Insight Drawing #1000-301 Page 1.

2.5 INSTALLING THE EXPANSION MODULE (Altitude Encoder & Over-speed Indicator)

Select a suitable location for the EXPANSION MODULE. Choose a location inside the aircraft avoiding radio transmitters, antennas or any feature that may induce RF noise within the EXPANSION MODULE. Avoid installation in places that may become extremely hot during operation. Mount the sensor in accordance with Insight Drawing #1000-302 (EXPANSION MODULE MOUNTING DIAGRAM). Terminate the EXPANSION MODULE cable in accordance with Insight Drawing #1000-301 Page 4.

2.6 INSTALLING THE FUEL FLOW SENSOR(S)

Aircraft without existing FF sensors should have one Insight supplied sensor installed per engine. Existing compatible FF sensors may be connected directly to the TAS 1000. Contact Insight regarding compatibility. Refer to AC 43.13-1B, Chapter 8 Section 2, 8-30, 8-31, 8-37, 8-38.

Insight manufactures a variety of FF sensors for injected and carbureted engines. See drawing 1000-303 (Rev. E or Rev. F) for sensor details and part numbers. Use drawing Rev. E for P/N 1000-004 sensors, and use drawing Rev. F for P/N 1000-004A sensors.

Install new sensors in accordance with Insight Drawing #1000-303 (FUEL FLOW/TF SENSOR MOUNTING DIAGRAM). Use Insight Drawing #1000-301 page 3 to cable and terminate Fuel Flow Sensor #1000-004 or 1000-004A. .

For installations with Insight G-Series GEM instruments (Models G2, G3 or G4) utilizing Insight FF sensors, wire according to Option C on Insight Drawing 1000-301 page 3. Insight FF sensors do not require external pull-up resistors. Refer to G-Series Installation Manual for additional detail.

NOTE: TF500 Sensors are to be connected to a GPS and operate independently from TAS 1000 system. Use Insight Drawing #1000-816 to cable and terminate TF500 Sensor #1000-006.

2.7 CONNECTING TO A HEADING SYSTEM (synchro system preferred)

TAS 1000 should be connected to either a slaved synchro compass system OR a digital stepper heading system (KCS-55). Autopilot outputs are usually not compatible. Aircraft not equipped with slaved heading systems will require the pilot to manually input heading data to the TAS 1000. Refer to Insight Drawing #1000-301 Page 1 for termination.

2.8 CONNECTING TO AN ALTIMETER (Baro setting)

TAS 1000 may be connected to an altimeter to automatically receive barometer-correction (altimeter setting).

Aircraft not equipped with barometer-setting output altimeters will require the pilot to manually input altimeter setting to the TAS 1000.

Terminate in accordance with Insight Drawing #1000-301 Page 1. Note that a 400Hz AC signal is required.

Note that if connection is made to an altimeter, the TAS 1000 barometer setting MUST be calibrated using the TAS 1000 DEALER MODE.

2.9 CONNECTING TO A GPS

TAS 1000 should be connected to a GPS. See the DEALER MODE section for compatible GPS models. Cable and terminate in accordance with Insight Drawing #1000-301 Page 1. Note that the serial protocol configuration is required using the TAS 1000 DEALER MODE.

3.0 CONNECTING TO A PITOT/STATIC SYSTEM

Connect the TAS 1000 to a PITOT/STATIC system using the Insight supplied air fitting or equivalent. Installer must supply approved tubing. Refer to AC 43.13-1B Chapter 12 Sections 1, 12-1, 12-2, Section 2, 12-8, 12-9, 12-19, 12-20, Section 4, 12-51.

Make all connections to provide for moisture drainage. Aircraft equipped with Primary-Secondary Pitot/Static systems should have the TAS 1000 connected to the Secondary system. Perform a leak check prior to flight tests.

4.0 TAS DEALER MODE SET-UP

DEALER MODE allows access to the following configuration items:

Single/Twin Engine

Fuel Units - Pounds/Gallons/Liters

Aviation gasoline - yes or no

Synchro – Synchro or HSI input

Baro 31 - Baro-pot input calibration 31 inches of Hg

Baro 28 - Baro-pot input calibration 28 inches of Hg

M.F.O. - Maximum fuel on board (gallons)

KL - Single or left engine (pulses/gallon AC mode)

KR - Right engine K factor (pulses/gallon AC mode)

A.W.B. - Altitude Alert warning band (feet)

RSOUT - RS - 232 output mode C, D, F, Z or G

EXIT

Start the TAS 1000 in DEALER MODE by pushing and holding the selector while applying power. The TAS 1000 will initially show "CONFIG", continue holding the selector for approximately 20 seconds or until the TAS 1000 shows "DEALER", then release selector.

4.1 Single/Twin Engine

The TAS 1000 default will show "SINGLE N". For twin-engine aircraft push the selector to accept the default and advance the display to the next item. For single engine aircraft, turn the selector to show "SINGLE Y". Push the selector to accept this selection, and advance the display to the next configuration item.

4.2 Fuel Units

The TAS 1000 allows you to select between gallons or pounds. To select a measurement unit, turn the selector to show "FUEL GAL OR FUEL LB". Push to accept and proceed to next item.

4.3 Fuel Type (aviation gasoline or jet fuel)

default NO

For piston engine(s), select yes.

For turboprop and jet engine(s), select no.

4.4 SYNCHRO (YES or NO)

default YES

If connected to a synchro compass select yes.

For all others select no.

4.5 Barometer Setting Calibration 31 inches of Hg

default NO

The TAS 1000 Barometer Setting (Altitude Setting) must be calibrated if the TAS 1000 is connected to an altimeter's Barometer Setting output.

To calibrate, set altimeter to 31.00 inches Hg and turn the TAS 1000 selector to show "BARO31 Y".

Push the selector to accept the setting. Failure to obtain a "BARO31Y" display indicates an invalid barometer signal.

Push the selector twice to omit this feature and proceed to next item.

4.6 Barometer Setting Calibration 28 inches of Hg

default NO

Set the altimeter to 28.00 inches Hg. The TAS 1000 shows "BARO28 N". Turn the TAS 1000 selector to display "BARO28 Y" and push the selector to accept the setting. Failure to obtain a "BARO28 Y" display indicates an invalid Barometer signal.

4.7 Maximum Fuel on Board MFO

default 50 gallons

Dealer enters the maximum fuel on board available for that model of aircraft (gallons).

4.8 Fuel Flow Calibration (KL Left/Single Engine)

default 30000 pulses/gallon (AC mode)

For AC mode:

The TAS 1000 must be programmed with the correct K value for each connected fuel flow sensor. Fuel flow sensors differ in their sensitivity (K value expressed in Pulses per Gallon). The TAS 1000 can operate with K values ranging from 1000 to 99900. Insight supplied sensors come with nominal K values of 30000 (leave K value at 30000 for Insight supplied sensors). Sensors from other suppliers do not.

Turn the TAS 1000 selector to show the correct K value for the installed sensor on engine one, and push the selector to accept the value and proceed to the next item.

4.9 Fuel Flow Calibration (KR for Right Engine)

default 30000 pulses/gallon (AC mode)

For AC mode:

The TAS 1000 must be programmed with the correct K value for each connected fuel flow sensor. Fuel flow sensors differ in their sensitivity (K value expressed in Pulses per Gallon). The TAS 1000 can operate with K values ranging from 1000 to 99900. Insight supplied sensors come with nominal K values of 30000 (leave K value at 30000 for Insight supplied sensors). Sensors from other suppliers do not.

Turn the TAS 1000 selector to show the correct K value for the installed sensor on this engine, and push the selector to accept the value and proceed to the next item.

4.10 Altitude Warning Band AWB

default 300 feet

Enter altitude-warning band setting for altitude alert function.

4.11 RS-232 TRANSMIT FORMAT

default C

Turn the selector knob to format D, F, G or Z as appropriate for the connected GPS.

The TAS 1000 is compatible with the following GPS types;

GPS MANUFACTURER	MODEL	TAS TRANSMIT FORMAT
BENDIX/KING	KLN89/B	C OR D
BENDIX/KING	KLN90/B	C OR D
GARMIN	400/500 SERIES	G OR Z
APOLLO	GX SERIES	Z

TAS RS-232 TRANSMIT FORMATS:

DATA TYPE	C	D	F	G	Z
TOTAL FUEL REMAINING	YES	YES	YES	YES	NO
TOTAL FF RATE	YES	YES	YES	NO	NO
ENGINE 1 FF RATE	YES	YES	YES	YES	YES
ENGINE 2 FF RATE	YES	YES	YES	YES	YES
TOTAL FUEL USED	YES	YES	YES	NO	NO
ENGINE 1 FUEL USED	YES	YES	YES	YES	YES
ENGINE 2 FUEL USED	YES	YES	NO	YES	YES
IAS KNOTS	YES	YES	NO	YES	YES
TAS KNOTS	YES	YES	NO	YES	YES
MACH NUMBER	YES	YES	NO	YES	YES
PRESSURE ALTITUDE (FT)	YES	YES	NO	YES	YES
DENSITY ALTITUDE (FT)	YES	YES	NO	YES	YES
TOTAL AIR TEMPERATURE (°C)	YES	YES	NO	YES	YES
WIND DIRECTION (°M)	YES	YES	NO	YES	YES
WIND SPEED (KNOTS)	YES	YES	NO	YES	YES
DRIFT (DEGREES)	YES	YES	NO	YES	NO
RATE CHANGE OF ALTITUDE (FT / MIN)	YES	YES	NO	YES	YES
HEADING (°M)	YES	YES	NO	YES	YES
STATIC AIR TEMPERATURE (°C)	YES	YES	NO	YES	YES
BARO-SETTING (INCHES Hg)	NO	YES	NO	YES	NO
BARO-CORRECTED ALTITUDE	NO	YES	NO	YES	NO
FUEL MEASUREMENT UNITS	YES	YES	YES	NO	NO

NOTE: TAS RS-232 RECEIVES “AVIATION FORMAT” FOR FORMAT

NOTE: For GPS types not listed contact Insight Technical Support.

Turn the TAS 1000 selector to indicate the required code and push the selector to accept.

GPS must also be set-up to communicate with TAS. (See sec. 4)

See GPS manual.

4.12 EXIT DEALER MODE

Push the TAS 1000 selector to switch from DEALER MODE to NORMAL MODE.

5.0 INSTRUCTIONS FOR GARMIN 400/500 SERIES SOFTWARE SET UP:

- 1) To start set up mode.
Press and hold "ENT" button and apply power.
Hold "ENT" until "OK" message appears.
Release "ENT" button.
Momentary press "ENT" button once.
- 2) Turn inner rotary knob until "Main RS-232 Config" appears.
- 3) Use cursor and "ENT" button to select:

	INPUT	OUTPUT
Channel 1	Shadin – fadc	Avtn no alt

- 4) Turn power off.

5.1 FINAL ACCEPTANCE CHECK LIST

All aircraft systems connected to the TAS 1000 must also be checked for correct operation. Refer to AC 43.13-1B Chapter 12 Sections 1, 2, 3, 4 - 12-1, 12-8, 12-9, 12-17, 12-19, 12-20, 12-37. The Pitot/Static system should be checked for leaks prior to flight test. Refer to the TAS 1000 Operating Instructions and conduct a ground check and a test flight before returning the aircraft to service.

GROUND CHECK

1. POWER-ON TAS.
2. WINDICATOR ALL-LED CHECK / WALKING DOT MODE.
3. TAS INITIAL DATA ENTRY (BR / HEADING / FUEL)
4. CHECK TAS AUTO-BRIGHT / DIM FUNCTION.
5. CROSS-CHECK EACH DATA ITEM ON THE TAS CONFIG LIST AGAINST ANOTHER DATA SOURCE.

NOTE: WINDICATOR DATA ONLY AVAILABLE WITH AIRCRAFT IN FLIGHT.

5.2 FLIGHT CHECK

ONLY AFTER SUCCESSFULLY COMPLETING GROUND CHECK.

REPEAT ALL GROUND DATA INDICATIONS.

TAS FUEL FLOW INDICATIONS.

TAS ALTITUDE.

TAS VERTICAL SPEED.

WINDICATOR.

TAS WINDS ALOFT DATA.

5.3 TAS SERVICE

1. The TAS-1000 system should have a long service life and can be used indefinitely on-condition. Insight recommends periodic testing and calibration of the TAS-1000 system every 2 years to ensure continued accuracy and precision.
2. In the unlikely event of operational difficulties during flight, flight crew should turn-off the TAS-1000 system by pulling the circuit-breaker, and report the incident to maintenance personnel. Refrain from further use of the TAS-1000 system in-flight until any service issues are resolved.
3. The TAS-1000 is dependent on internal and external sensors for data measurements and all resulting calculations. In the event that a data type is not available, the TAS-1000 display will show "N/A" or "-----".
4. The core of the TAS-1000 is the pitot/static measurement system with internal, temperature-controlled sensors. Air data will achieve best accuracy after the sensors stabilize at their design operating temperature of 45 degrees C which may require up to ten minutes after power-up. Select the "OV" data type with the selector knob to display the sensor temperature. The TAS-1000 sensors should maintain 45 +/- 0.1 degrees.
5. Data is only available from the TAS-1000 when data dependencies are satisfied. Refer to 5.4: TAS-1000 Data Sources to determine availability of data types. Note that some data types are highly dependent on other data. For example, wind calculations require True Airspeed, Heading, Groundspeed and Track and so are not available unless all four data types are available which cannot occur until the aircraft is in-flight.
6. No field repairs are allowed on the TAS-1000 system or components. Any malfunctioning TAS-1000 system or components must be removed from the aircraft and returned to Insight Instrument Corporation for repair. Removal can be accomplished by reversing the instructions for TAS-1000 component installation. The TAS-1000 wiring and connectors may remain in the aircraft while components are removed for service. Pitot tubes must be securely plugged while the p/n 1000-001 display is disconnected, and a pitot/static leak test performed on the aircraft before flight.

5.4: TAS-1000 Data Sources

Display	Data Type	Units	Dealer Adjust	Data Source(s)	Dependencies
AL	Pressure Altitude	Feet	N/A	Measurement of Static+BR	Internal Static Sensor+BR
BR	Barometric Setting	Inches of Mercury	Requires Cal.	Altimeter or Pilot Input	Baro-pot Altimeter
BR	Barometric Setting	millibars	Requires Cal.	Altimeter or Pilot Input	Baro-pot Altimeter
DA	Density Altitude	Feet	N/A	Calculated	Internal Static Sensor+BR+SAT
DAD	Density Altitude Difference	Feet	N/A	Calculated	DA+AL
IAS	Indicated Air Speed	Knots	N/A	Calculated	TAS+DA
IAS	Indicated Air Speed	Miles per Hour	N/A	Calculated	TAS+DA
TAS	True Air Speed	Knots	N/A	Calculated	MACH+SAT
TAS	True Air Speed	Miles per Hour	N/A	Calculated	MACH+SAT
GRS	Ground Speed	Knots	RSOUT	GPS Interface	Data only valid In-flight
GRS	Ground Speed	Miles per Hour	RSOUT	GPS Interface	Data only valid In-flight
TRK	Track	Degrees Magnetic	RSOUT	GPS Interface	Data only valid In-flight
MACH	Mach Number	Fraction of Mach One	N/A	Measurement+Calculation	Internal Static+Dynamic Sensors
VS	Vertical Speed	Feet per Minute	N/A	Calculated	AL
GR	Gradient	Feet per Nautical Mile	N/A	Calculated	AL+TRK
WSP	Wind Speed	Knots	N/A	Calculated	TAS+HDG+GS+TRK
WSP	Wind Speed	Miles per Hour	N/A	Calculated	TAS+HDG+GS+TRK
WDR	Wind Direction	Degrees Magnetic	N/A	Calculated	TAS+HDG+GS+TRK
HDG	Heading	Degrees Magnetic	Syn./Step/Man.	Compass System or Pilot Input	Slaved Compass System
DRF	Drift	Degrees	N/A	Calculated	TAS+HDG+GS+TRK
WD/WS	Wind Direction/Speed	Degrees Magnetic/Knots	N/A	Calculated	TAS+HDG+GS+TRK
HWD	Head/Tail Wind	Knots	N/A	Calculated	TAS+HDG+GS+TRK
HWD	Head/Tail Wind	Miles per Hour	N/A	Calculated	TAS+HDG+GS+TRK
EF	Engine Efficiency	Miles per Gallon	N/A	Calculated	FF+GS
TAT	Total Air Temperature	Degrees Celsius	N/A	Measurement of OAT Sensor	OAT Sensor
TAT	Total Air Temperature	Degrees Fahrenheit	N/A	Measurement of OAT Sensor	OAT Sensor
SAT	Static Air Temperature	Degrees Celsius	N/A	Calculated	TAT+MACH
SAT	Static Air Temperature	Degrees Fahrenheit	N/A	Calculated	TAT+MACH
ISA	ISA Temperature	Degrees Celsius	N/A	Calculated	AL+SAT
OV	Sensor Temperature	Degrees Celsius	N/A	Internal Measurement	
TR	Total Fuel Remaining	Configurable Units	LIT/GAL/LB	Pilot Input+Calculation+FF	FF Sensor+K Factor
TU	Total Fuel Used	Configurable Units	LIT/GAL/LB	Calculated from FF	FF Sensor+K Factor
TF	Total Fuel Flow	Configurable Units per Hour	LIT/GAL/LB	Measurement of FF	FF Sensor+K Factor
FL	Left Engine Fuel Flow	Configurable Units per Hour	LIT/GAL/LB	Measurement of FF	FF Sensor+K Factor
FR	Right Engine Fuel Flow	Configurable Units per Hour	LIT/GAL/LB	Measurement of FF	FF Sensor+K Factor
UL	Left Engine Fuel Used	Configurable Units	LIT/GAL/LB	Calculated from FF	FF Sensor+K Factor
UR	Right Engine Fuel Used	Configurable Units	LIT/GAL/LB	Calculated from FF	FF Sensor+K Factor
FL/FR	Fuel Flow Left and Right	Configurable Units per Hour	LIT/GAL/LB	FF Sensor(s)	FF Sensor+K Factor
BT	Battery Voltage	Volts	N/A	Internal Measurement	Supply Bus Voltage
AA	Altitude Alert	Feet	AWB	Pilot Input+AL+AWB	Expansion Module
AD	Altitude Difference	Feet	N/A	Calculated from AL+AA	AL+AA
OVS	Overspeed Warning	Knots	Factory Preset	Factory Preset+TAS	Expansion Module
N/A	K Factor(s), KL, KR	Pulses per Gallon	default=30,000	Set during installation	Internal Memory
N/A	Maximum Fuel Onboard	Gallons	Dealer Set	Set during installation	Internal Memory

TAS 1000 DRAWING LIST

Drawing No.	Rev.	Drawing Title
1000-001	D	TAS 1000 AIR DATA COMPUTER
1000-002	C	WINDICATOR
1000-301	J	TAS 1000 INSTALLATION SCHEMATIC Pages 1-4
1000-302	-	OAT MOUNTING DIAGRAM
1000-303	E	FUEL FLOW SENSOR MOUNTING DIAGRAM Pages 1-3 (P/N 1000-004)
1000-303	F	FUEL FLOW SENSOR MOUNTING DIAGRAM Pages 1-3 (P/N 1000-004A)
1000-304	-	TAS 1000 PANEL CUT-OUT
1000-305	B	WINDICATOR MOUNTING DIAGRAM Pages 1-3
1000-816	A	TF500 Sensor Installation Schematic

The TAS installation must be performed in accordance with Advisory Circular 43.13-1B Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair.

REVISIONS		
REV	DESCRIPTION	DATE
A	Added Specifications and Limitations.	FEB 17/00
B	Added test and calibration label. See ECN #TAS003.	OCT 30/00
C	Added modification level to drawing	APR 8/03
D	Added modification level to drawing	AUG 9/05
		JMT RR RR

SIDE VIEW

FRONT VIEW

SPECIFICATIONS AND LIMITATIONS

SYSTEM COMPONENTS:

- 1000-001 PANEL MOUNT COMPUTER
- 1000-002 WINDICATOR (Optional)
- 1000-003 EXPANSION MODULE (ALTITUDE ENCODER, OVERSPEED WARNING) (Optional)
- 1000-004 FUEL FLOW SENSOR (1 OR 2 Optional)
- 1000-006 TS500 FLOW SENSOR (Optional)

Power: 10 TO 30 VDC, 30 W Maximum, 5 W Continuous.
Weight: 1.0 lb.
Fuel Flow Rate: 1.0 to 400 GPH.
Maximum Fuel Quantity: 2000 U.S.G. or 9999 lb.
Altitude: -1000 to 55000 ft.
Maximum Airspeed: 500 knots.
Operating Temperature: -30° C to +60° C.
Accuracy: better than 1.5 %.
Serial Interface: RS-232.
Environmental: DO-160D Env. Cat. F1BABSXXXXXZBBBBBXXXXX.
Software: DO-178B Level C.
TSO: C106, C44b, C101, C88a.

BOTTOM VIEW

Insight

TAS 1000
TRUE AIR DATA COMPUTER SYSTEM

Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6

SIZE	FILE NAME	DRAWING NO.	REV	DOC	REV
A	tas1000D	1000-001	001	000	000
SCALE	DATE				
none	June 1/99				1 of 1

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ALL DIMENSIONS IN INCHES, TOLERANCE +/- 0.050.

REVISIONS		
REV	DESCRIPTION	DATE
A	CHANGED BEZEL DIM. FROM 1.366 TO 1.373	Sept 1/99 JWT
B	ADDED TYPE B	June 22/00 JWT
C	REMOVED PRE-TERMINATED CABLE AT WINDICATOR	June 18/02 RR

1.405 DIA (BEZEL RING)

FRONT VIEW

1.373 DIA (BODY)

SIDE VIEW

1000-002-A
(FRONT MOUNT)

1.490 DIA (FLANGE)

FRONT VIEW

1.373 DIA (BODY)

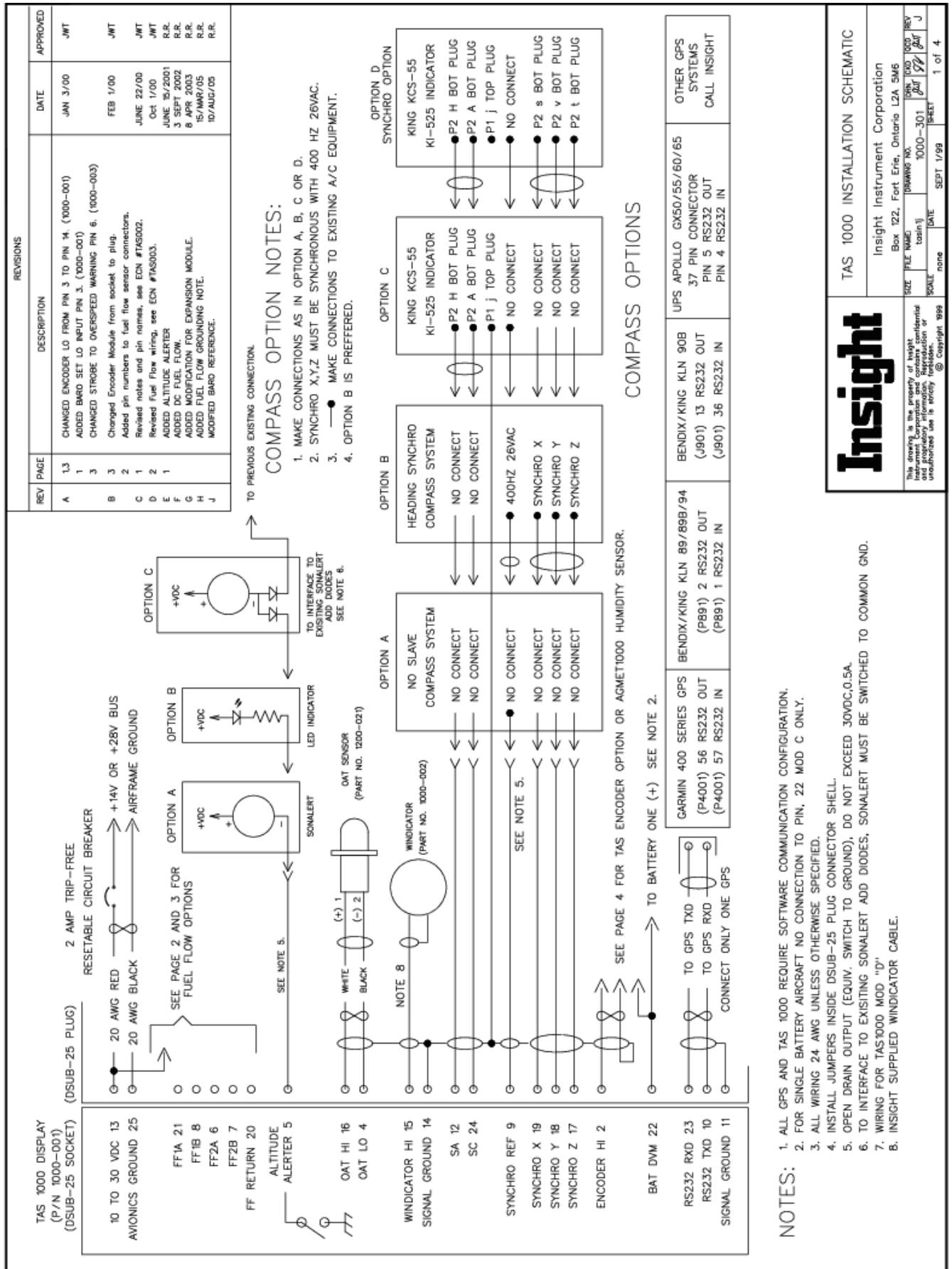
SIDE VIEW

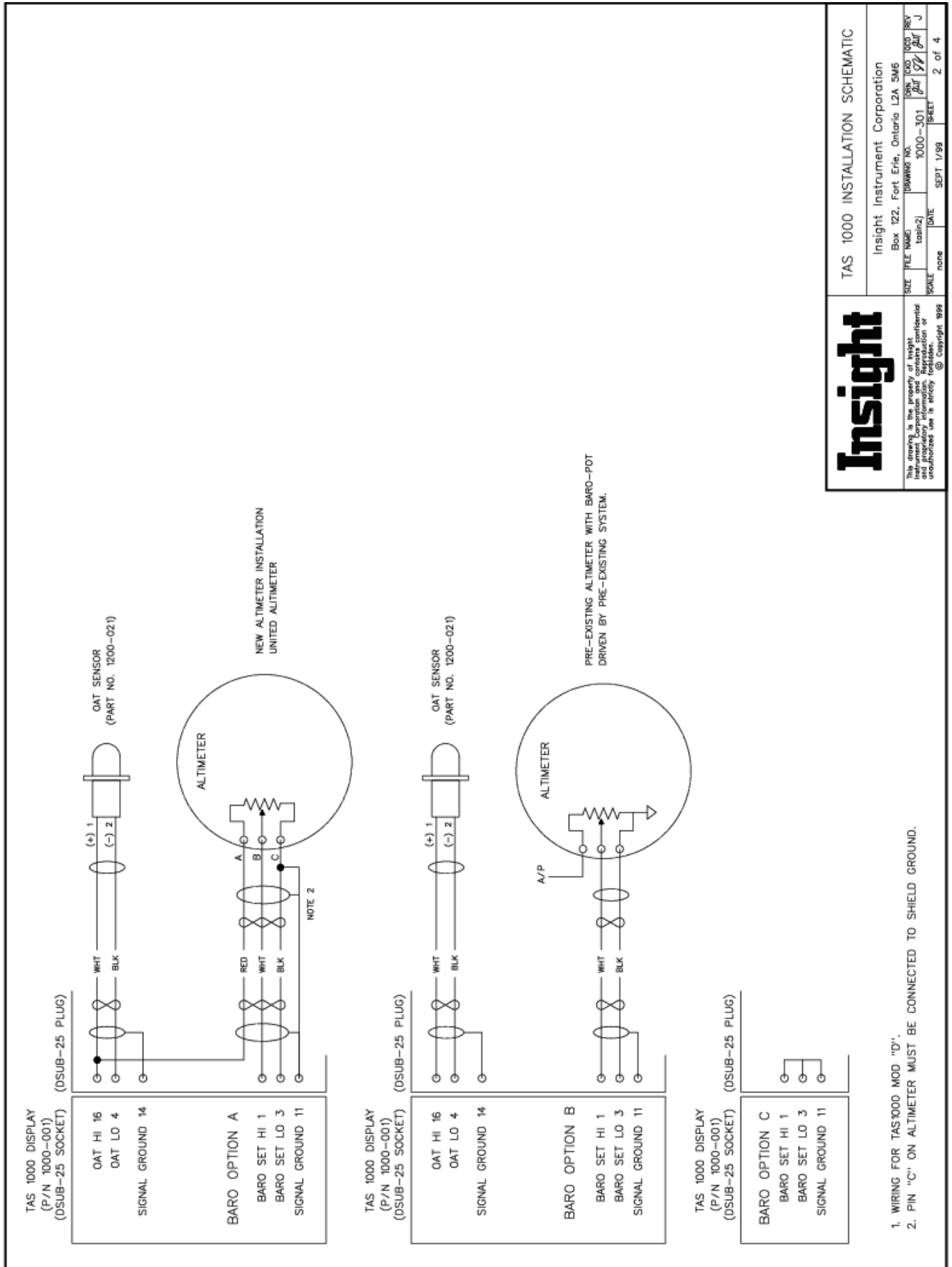
1000-002-B
(REAR MOUNT)

NOTES:

1. P/N 1000-503 WINDICATOR NAMEPLATE.
2. All dimensions in inches, tolerance +/- 0.010 U.O.S.

Insight	WINDICATOR
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6	
This drawing is the property of Insight Instrument Corporation. It is to be used for confidential and proprietary information. Reproduction or unauthorized use is strictly forbidden. © Copyright 2000	SIZE FILE NAME: WIND NO. WIND NO. REV WIND1000c 1000-002 1000-002 1000-002 1000-002 SCALE NONE DATE June 1/99 SHEET 1 of 1





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TAS 1000 INSTALLATION SCHEMATIC

Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6

SIZE	FILE NAME	DRAWING NO.	DATE	REV
	1000-301	1000-301	1/99	J

SCALE none SHEET 2 of 4

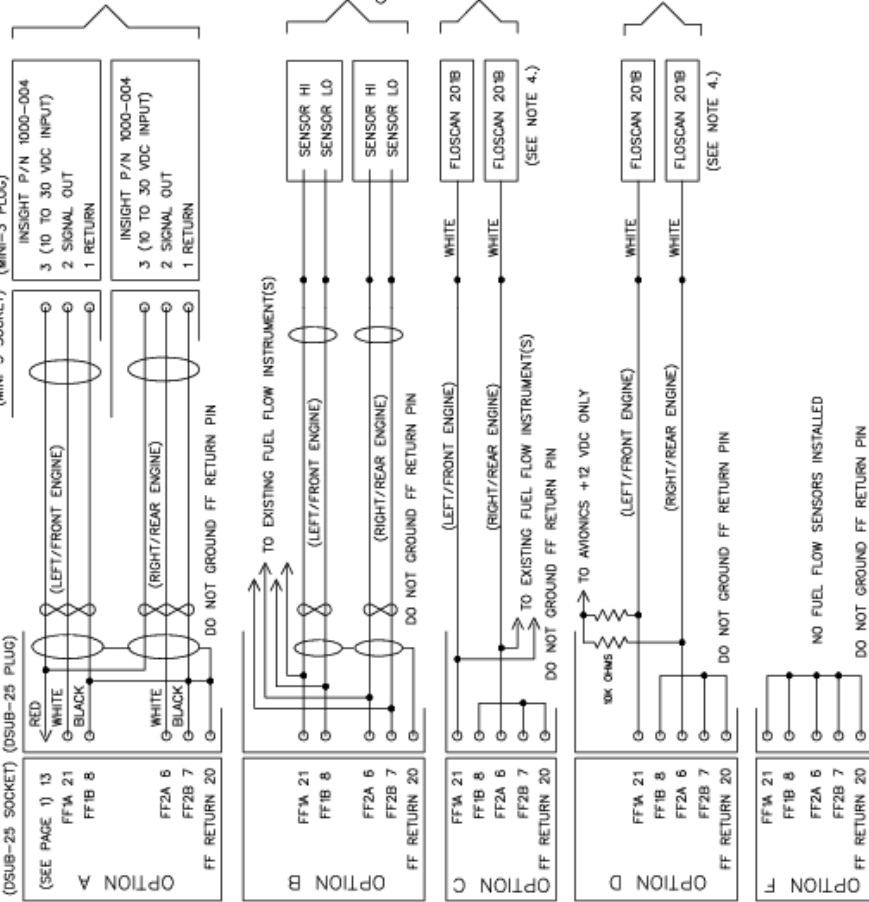
1. WIRING FOR TAS1000 MOD "D".
2. PIN "C" ON ALTIMETER MUST BE CONNECTED TO SHIELD GROUND.

SEE PAGE ONE FOR REVISION LOG

FUEL FLOW SENSOR CONNECTIONS

(TWIN ENGINE INSTALLATION SHOWN)
(SEE NOTE 1 FOR SINGLE ENGINE INSTALLATION)

TAS 1000 DISPLAY
(P/N 1000-001)
(DSUB-25 SOCKET)



INSIGHT FUEL FLOW
SENSORS INSTALLED
(SEE NOTE 6.)

SINEWAVE AC FUEL FLOW
EXISTING SENSORS
CONNECTED TO EXISTING FUEL FLOW INSTRUMENT

FLOSCAN 201 FUEL FLOW
EXISTING SENSORS
CONNECTED TO EXISTING FUEL FLOW INSTRUMENT
(10K PULL-UPS NOT SHOWN)

FLOSCAN 201 FUEL FLOW
EXISTING SENSORS
CONNECTED ONLY TO INSIGHT TAS SYSTEM

NOTES:

1. SINGLE ENGINE AIRCRAFT USE FF1 INPUTS, TERMINATE FF2A AND FF2B AS IN OPTION F.
2. ALL WIRING 24 AWG U.O.S., INSTALL JUMPERS INSIDE DSUB-25 CONNECTOR SHELL.
3. ALL FUEL FLOW INPUTS (PINS 6, 7, 8, 21) MUST BE TERMINATED.
4. TERMINATE FLOSCAN 201B RED WIRE TO FUSED 12VDC, BLACK WIRE TO AIRFRAME GROUND.
(ALL FLOSCAN 201B SENSORS REQUIRE 10K PULL-UP FROM WHITE WIRE TO 12VDC)
5. WIRING FOR TAS1000 MOD D.
6. FOR INSIGHT FUEL FLOW SENSORS, THE BRACKET MUST BE CONNECTED TO AIRFRAME GROUND.

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TAS 1000 INSTALLATION SCHEMATIC

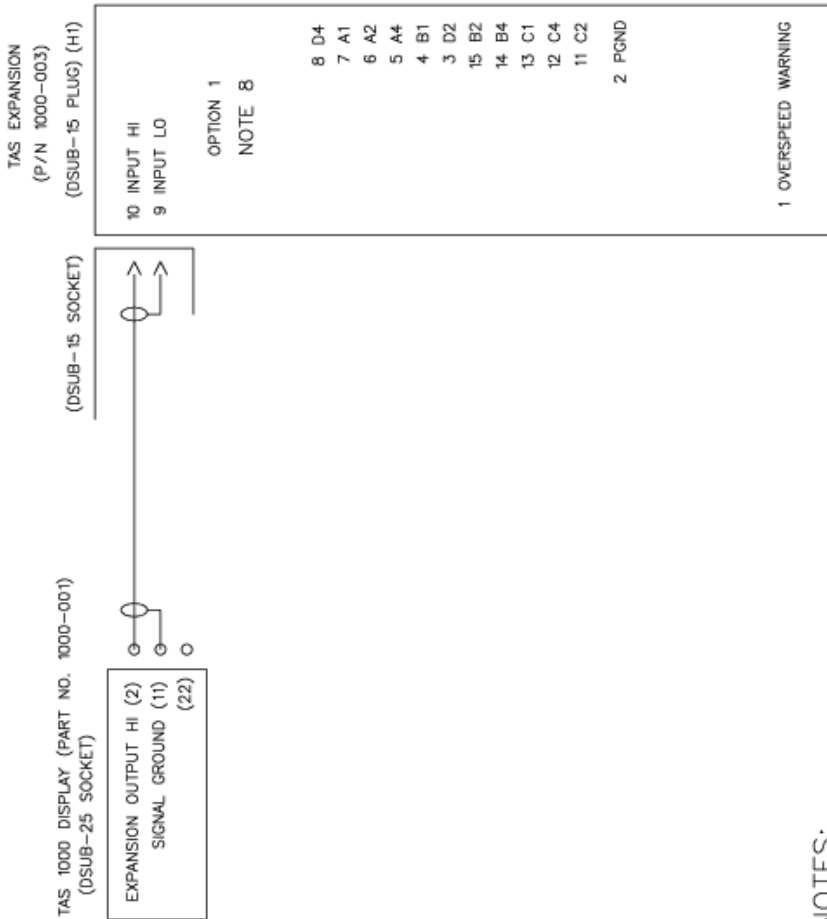
Insight Instrument Corporation

Box 122, Fort Erie, Ontario L2A 5M6

SIZE	FILE NAME	DRAWING NO.	DATE	REV
A	1000-301	1000-301	SEPT 1/99	J
SHEET			3 of 4	

TAS EXPANSION MODULE CONNECTIONS

SEE PAGE ONE FOR REVISION LOG



NOTES:

1. NO CONNECTION TO TAS 1000 PIN 2 IF TAS EXPANSION IS NOT INSTALLED.
2. NO CONNECTION TO TAS EXPANSION PIN 2.
3. ALL WIRING 24 AWG UNLESS OTHERWISE SPECIFIED.
4. INSTALL JUMPERS INSIDE DSUB15 CONNECTOR SHELL.
5. ISOLATION DIODES ARE RECOMMENDED FOR ALL GRAY-CODE RECEIVING DEVICES.
SOME BUT NOT ALL GRAY-CODE RECEIVERS CONTAIN INTERNAL ISOLATION DIODES.
FOR GRAY-CODE RECEIVERS WITHOUT INTERNAL ISOLATION DIODES, INSERT A 1N4007 OR EQUIVALENT IN SERIES WITH EACH LINE (ANODE TO RECEIVER).
6. CONNECT TO OVERSPEED WARNING OUTPUT ONLY IF PART NO. 1000-003 MATCHES AIRCRAFT TYPE AND CONFIGURATION.
OVERSPEED WARNING OUTPUT IS NORMALLY OPEN (HI-Z) AND SWITCHES TO GROUND DURING OVERSPEED CONDITION.
OVERSPEED WARNING OUTPUT RATED 28VDC 0.25 AMPS MAXIMUM. (SEE INSTALLATION MANUAL)
7. INSTALLER PROVIDED CONNECTORS.
8. EXPANSION MODULE 1000-004 MOD.B

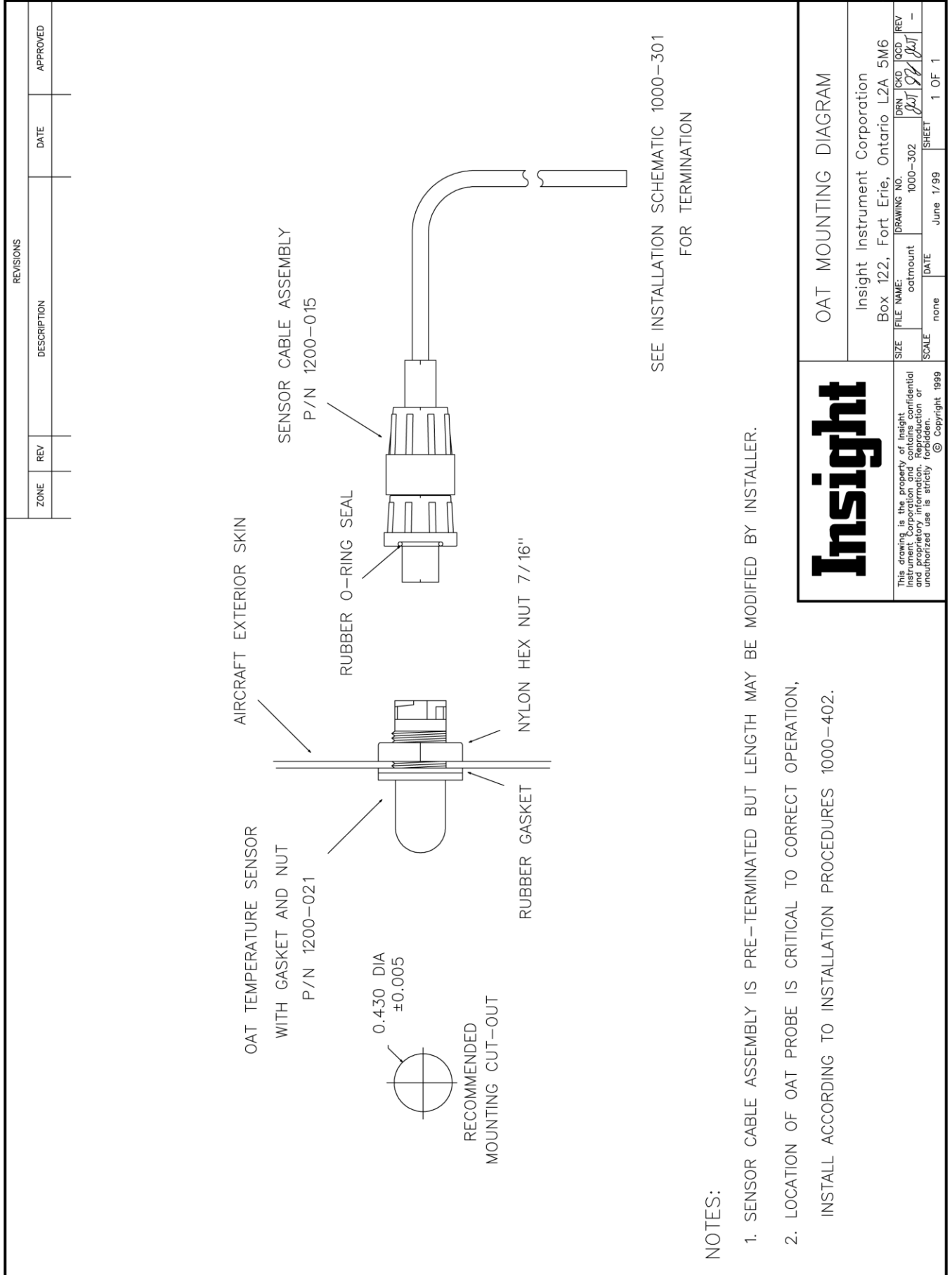
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TAS 1000 INSTALLATION SCHEMATIC

Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6

SIZE	FILE NAME	DRAWING NO.	ISSN	END	GOOD	REV
A	InsInstSI	1000-301	02/97	02/97	02/97	J
SCALE	DATE	SCALE	DATE	SCALE	DATE	SCALE
none	SEPT 1/98	none	SEPT 1/98	none	SEPT 1/98	4 of 4



NOTES:

1. SENSOR CABLE ASSEMBLY IS PRE-TERMINATED BUT LENGTH MAY BE MODIFIED BY INSTALLER.
2. LOCATION OF OAT PROBE IS CRITICAL TO CORRECT OPERATION,
INSTALL ACCORDING TO INSTALLATION PROCEDURES 1000-402.

Insight

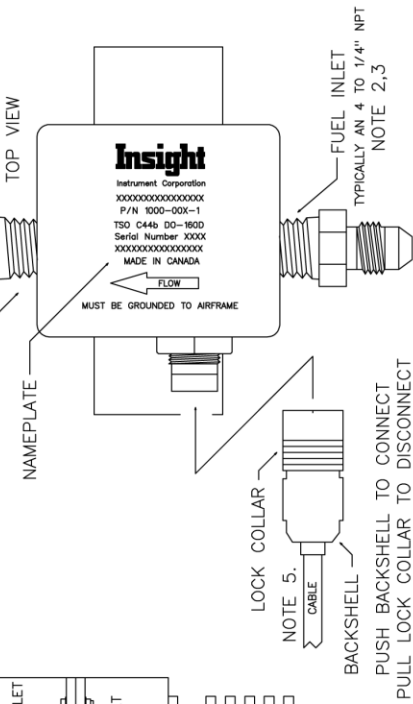
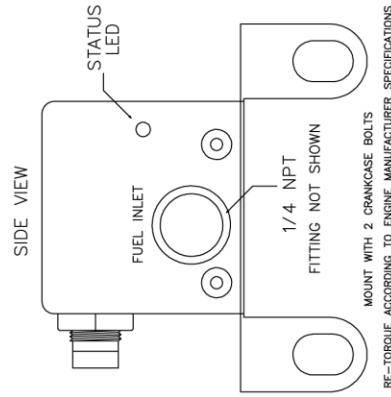
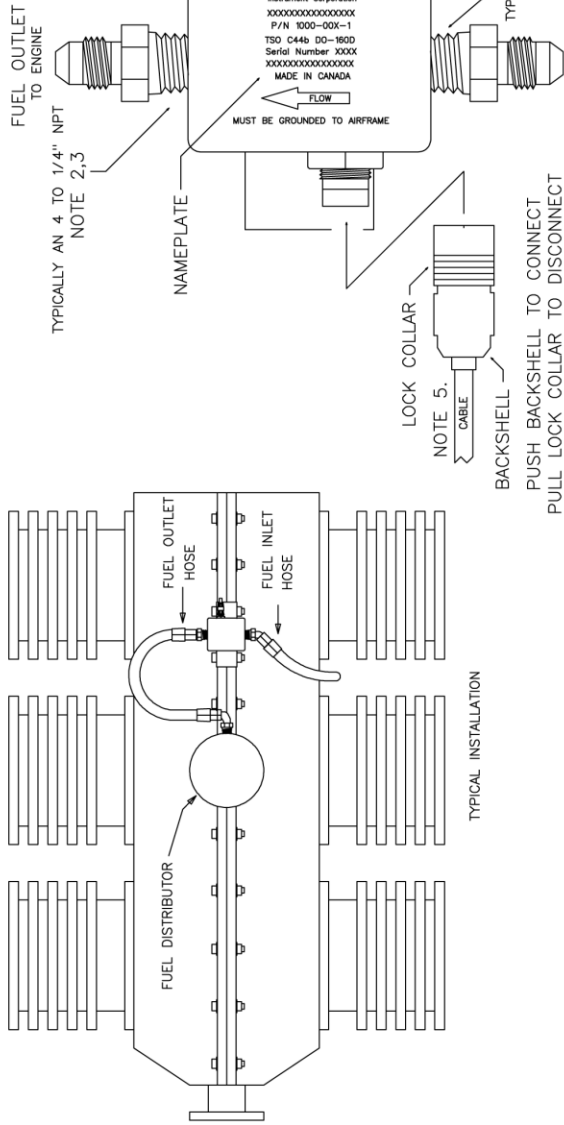
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OAT MOUNTING DIAGRAM

Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6

SIZE	DRAWING NO.	DRN	GKD	IQCD	REV
SCALE	none	DATE	June 1/99	SHEET	1 OF 1

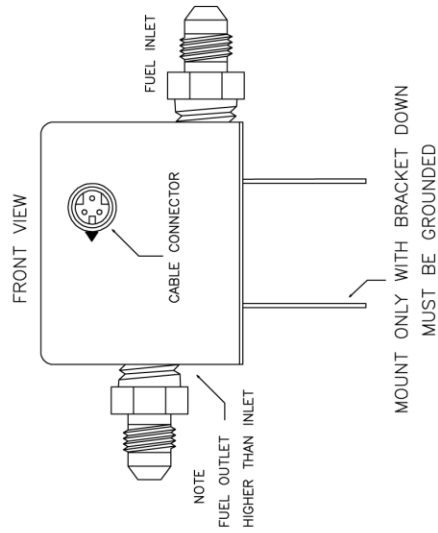
REVISIONS			
REV/	DESCRIPTION	DATE	APPROVED
A	Added housing and bracket.	June 22/00	JWT
B	CHANGED TITLE	June 15/01	R.R.
C	ADDED 2 ADDITIONAL MOUNTING OPTIONS	MAY 26/03	R.R.
D	ADDED VIBRATION AND K-FACTOR OPTIONS	DEC 10/10	JY
E	CHANGED CONNECTOR.	NOV 30/12	JY



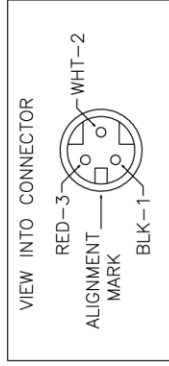
PART NUMBERS		
FLOW SENSOR	INJECTOR	CARBURETOR
TRUE FLOW SENSOR	1000-004-1(-Knnnn)(-EPR)	1000-004-4(-Knnnn)(-EPR)
	1000-006-1X	1000-006-4X

NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine, TWO per engine for pressure carburetor.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (180 in. lbs.)
5. INSIGHT supplied electrical harness with 3-pin connector, P/N 1000-809.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP.
8. Mount transducer with NAMEPLATE facing up.
9. Confirm all wiring PRIOR to powering up.
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MANUFACTURE AND MODEL WHEN ORDERING TRUE FLOW SENSOR, BENDIX KING B-FORMAT, APOLLO AND GARMIN Z-FORMAT.
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -Knnnn.
14. FLOW SENSOR DATA SIGNAL 5V UNLESS -EPR, EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.



PIN FUNCTION	WIRE COLOUR
1 COMMON (DO NOT GROUND)	BLACK OR WHITE/BLUE
2 SIGNAL OUT	WHITE
3 10 TO 30 VDC INPUT	RED OR WHITE/ORANGE

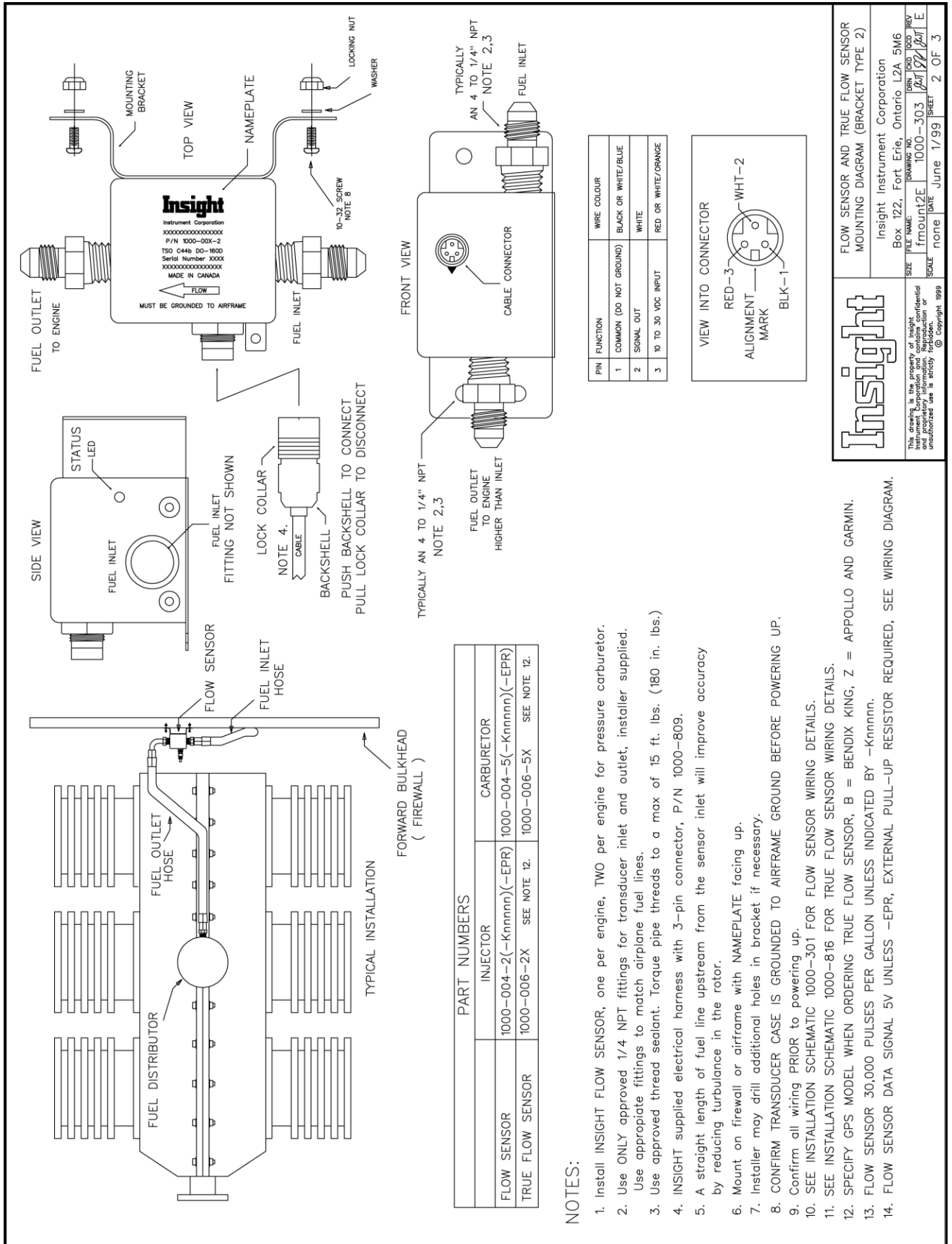


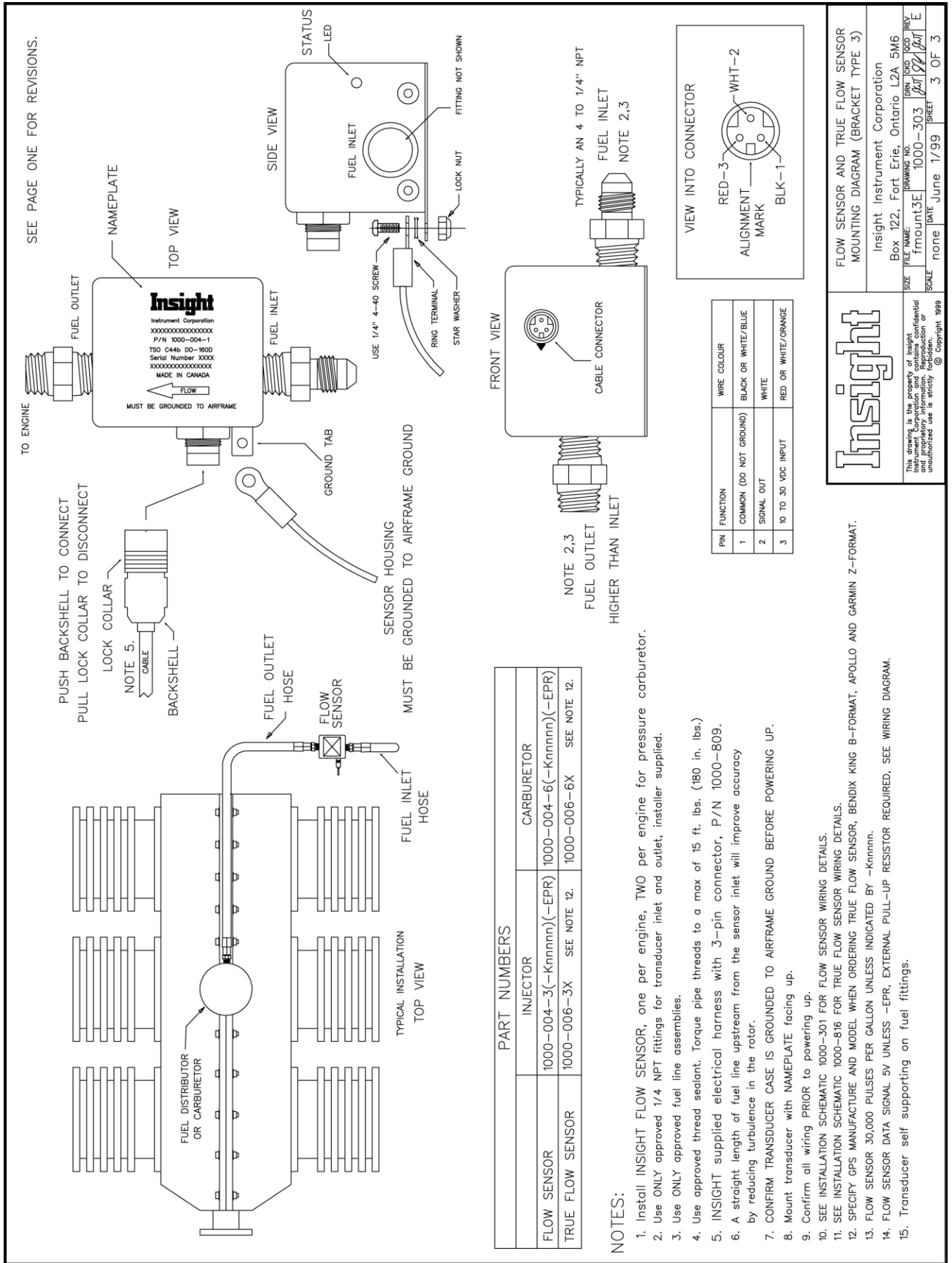
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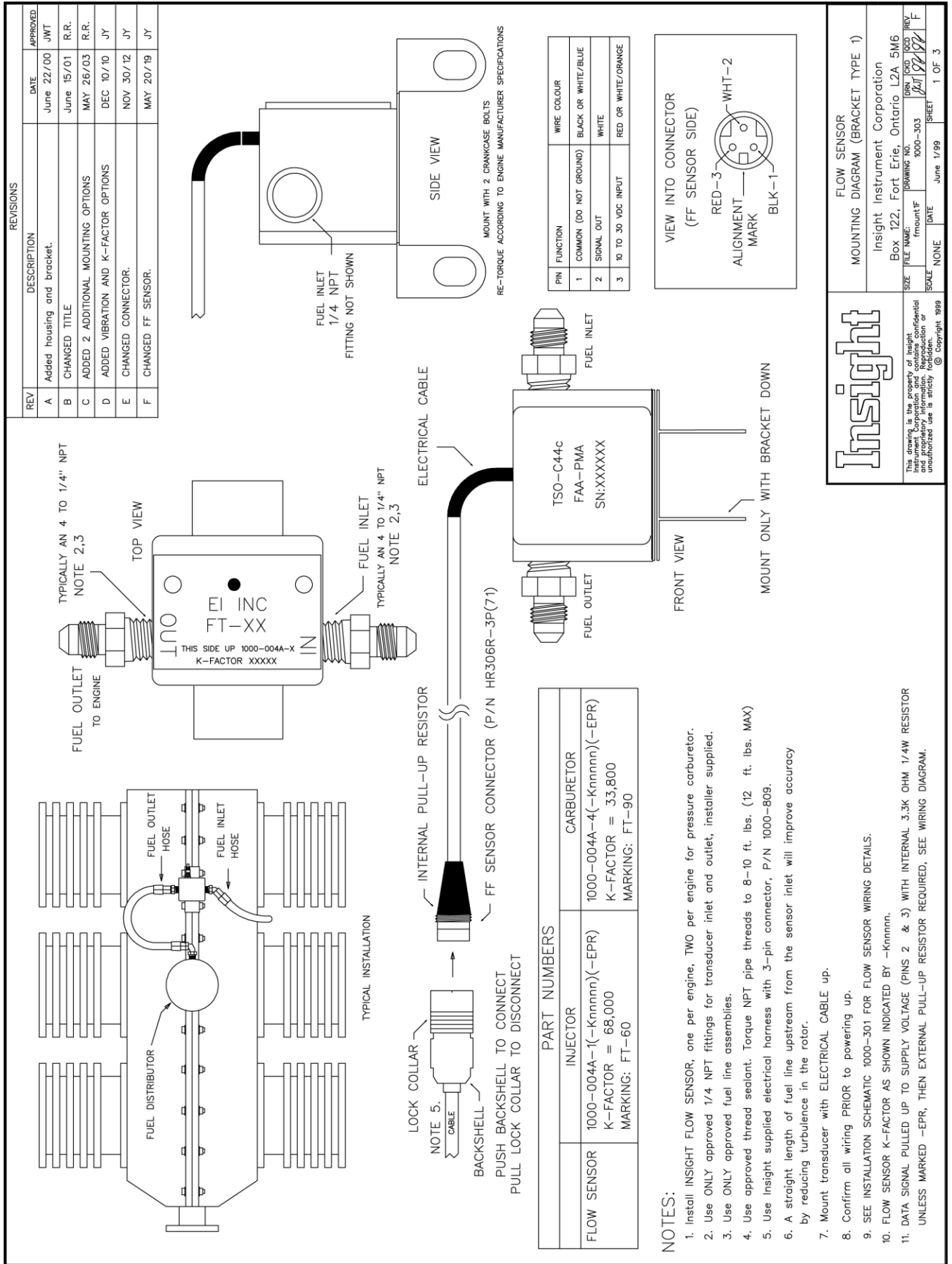
SIZE	DRW	PCD	REV
FILE NAME:	1000-303	1000-303	E
SCALE	DATE	June 1/99	SHEET 1 OF 3

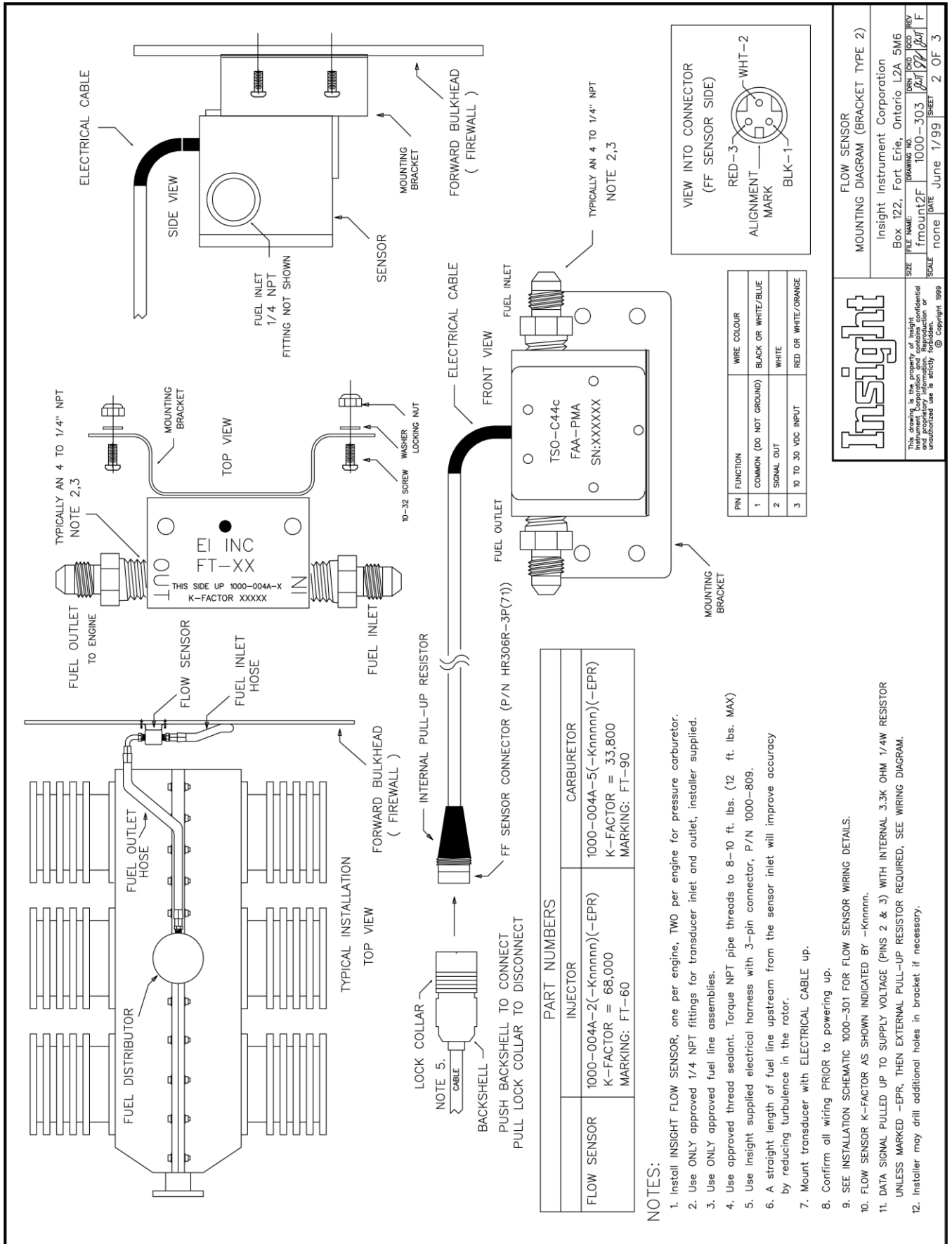
FLOW SENSOR AND TRUE FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 1)

Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6









Insight

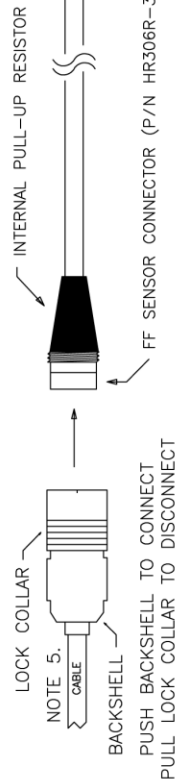
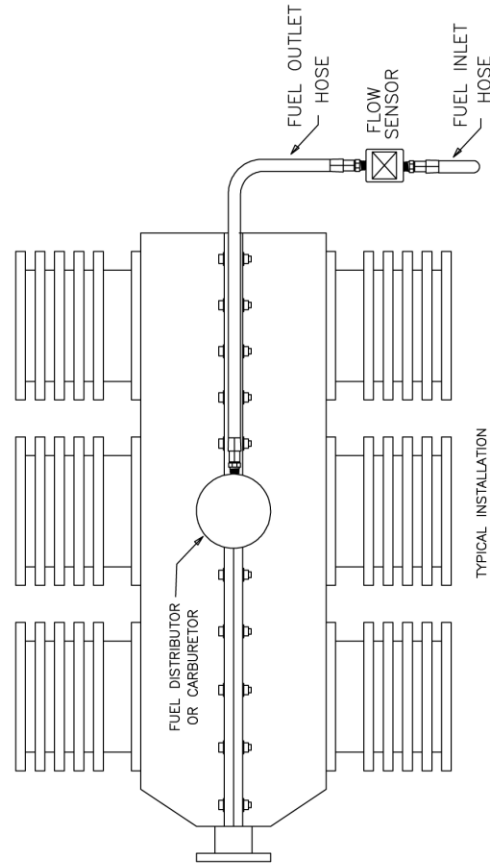
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FILE NAME: fmount2F
DRAWING NO.: 1000-303
SCALE: none
DATE: June 1/99
SHEET: 2 OF 3

FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 2)
Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6

SEE PAGE ONE FOR REVISIONS.

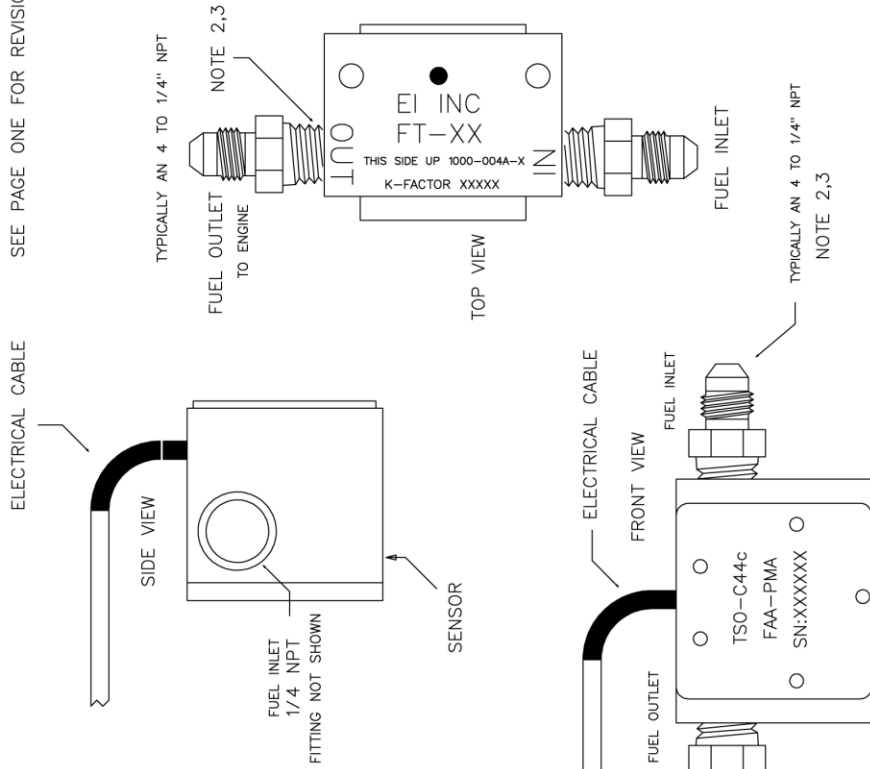
ELECTRICAL CABLE



PART NUMBERS	
INJECTOR	CARBURETOR
FLOW SENSOR 1000-004A-3(-Knnnn)(-EPR) K-FACTOR = 68,000 MARKING: FT-60	1000-004A-6(-Knnnn)(-EPR) K-FACTOR = 33,800 MARKING: FT-90

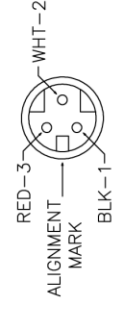
NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine, TWO per engine for pressure carburetor.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque NPT pipe threads to 8-10 ft. lbs. (12 ft. lbs. MAX)
5. INSIGHT supplied electrical harness with 3-pin connector, P/N 1000-809.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. Mount transducer with ELECTRICAL CABLE up.
8. Confirm all wiring PRIOR to powering up.
9. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
10. FLOW SENSOR K-FACTOR AS SHOWN INDICATED BY -Knnnn.
11. DATA SIGNAL PULLED UP TO SUPPLY VOLTAGE (PINS 2 & 3) WITH INTERNAL 3.3K OHM 1/4W RESISTOR UNLESS MARKED -EPR, THEN EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.



VIEW INTO CONNECTOR
(FF SENSOR SIDE)

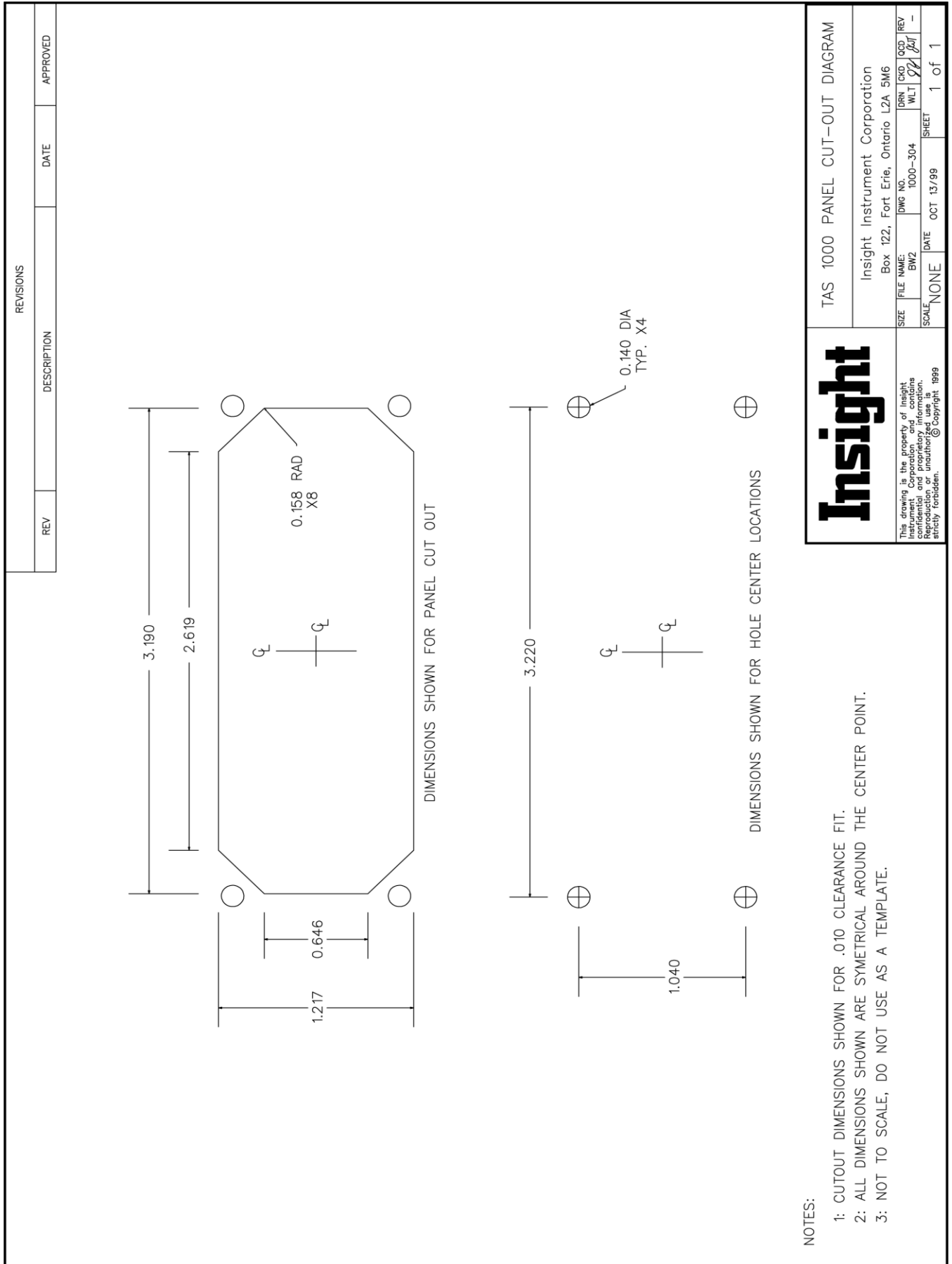
PIN	FUNCTION	WIRE COLOUR
1	COMMON (DO NOT GROUND)	BLACK OR WHITE/BLUE
2	SIGNAL OUT	WHITE
3	10 TO 30 VDC INPUT	RED OR WHITE/ORANGE



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FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 3)	
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6	
FILE NAME: Trmount3F	DRAWING NO. 1000-303
SCALE: none	DATE: June 1/99
SHEET 3 OF 3	



NOTES:

- 1: CUTOUT DIMENSIONS SHOWN FOR .010 CLEARANCE FIT.
- 2: ALL DIMENSIONS SHOWN ARE SYMMETRICAL AROUND THE CENTER POINT.
- 3: NOT TO SCALE, DO NOT USE AS A TEMPLATE.

Insight		TAS 1000 PANEL CUT-OUT DIAGRAM	
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6			
FILE NAME	DWG NO.	DRN	CVD
BW2	1000-304	WLT	REV
SCALE	NONE	DATE	OCT 13/99
		SHEET	1 of 1

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REVISIONS		DATE	APPROVED
REV	DESCRIPTION		
A	Added type B windicator (1000-002-B).	June 15/00	JMT
B	ADDED ADDITIONAL MOUNTING OPTIONS.	July 10/01	R.R.

FRONT OF PANEL

RECOMMENDED DRILL LOCATION

INSTALLATION

1. LOCATE WINDICATOR ON PANEL.
2. DRILL 11/64 HOLE IN PANEL.
3. PASS WINDICATOR CABLE FROM BEHIND PANEL THROUGH DRILL HOLE.
4. CONNECT WINDICATOR CABLE TO WINDICATOR. CONNECTOR HAS A SNAPPING ACTION.
5. APPLY RTV TO BACK OF WINDICATOR, SUGGEST 1 DROP 4 PLACES.
6. USING CIRCUMFERENCE OF WINDICATOR, PRESS FIRMLY AGAINST PANEL UNTIL RTV IS CURED.
7. SEE INSTALLATION SCHEMATIC 1000-301 FOR TERMINATION DETAIL.

NOTES

1. USE FRONT MOUNT OR REAR MOUNT WINDICATOR; P/N 1000-002-A OR 1000-002-B.
2. USE WINDICATOR CABLE P/N CAB-1000-507-06.
3. WHEN ORDERING THE WINDICATOR, MOUNTING MUST BE SPECIFIED.

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WINDICATOR SURFACE MOUNT TYPE 1

Insight Instrument Corporation

Box 122, Fort Erie, Ontario L2A 5M6

SIZE	DRAWING NO.	DRN	OCG
FILE NAME: windsm1	1000-305	JMT	JMT
SCALE	DATE	SHEET	REV
none	June 1/99	1 OF 3	B

REVISIONS		
REV	DESCRIPTION	DATE
A	Added type B windicator (1000-002-B).	June 15/00
B	ADDED ADDITIONAL MOUNTING OPTIONS.	July 10/01
		JMT R.R.

FRONT OF PANEL

1.375 D/A
±0.005

RECOMMENDED
MOUNTING CUT-OUT
(NOT REQUIRED IF SURFACE MOUNTED)

INSTALLATION

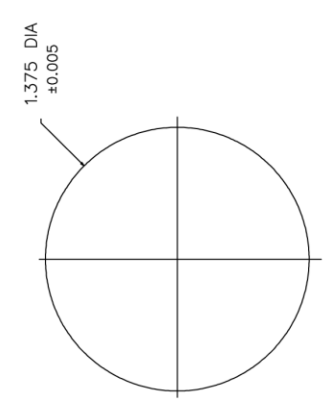
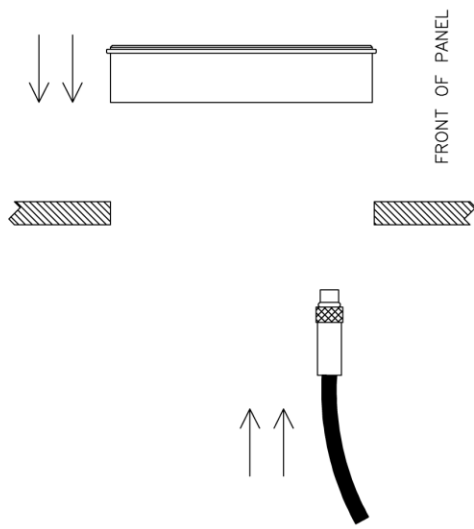
1. LOCATE WINDICATOR ON PANEL.
2. USE 1.375 ROUND PANEL PUNCH. INSIGHT P/N MCF-730BB-1-38.
3. CONNECT WINDICATOR CABLE TO WINDICATOR. CONNECTOR HAS A SNAPPING ACTION.
4. USING CIRCUMFERENCE OF WINDICATOR, PRESS FIRMLY INTO PANEL.
5. APPLY RTV TO BACK OF WINDICATOR; SUGGEST 1 DROP 4 PLACES.
6. HOLD IN PLACE UNTIL RTV IS CURED.
7. SEE INSTALLATION SCHEMATIC 1000-301 FOR TERMINATION DETAIL.

NOTES

1. FOR MOUNTING FRONT MOUNT WINDICATOR ONLY, P/N 1000-002-B
2. USE WINDICATOR CABLE P/N CAB-1000-507-06.
3. WHEN ORDERING THE WINDICATOR, MOUNTING MUST BE SPECIFIED.

Insight	WINDICATOR REAR MOUNT TYPE 2
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6	
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SCALE none	DATE June 1/99
	SHEET 2 OF 3

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	Added type B windicator (1000-002-B).	June 15/00	JWT
B	ADDED ADDITIONAL MOUNTING OPTIONS.	July 10/01	R.R.



RECOMMENDED
MOUNTING CUT-OUT
(NOT REQUIRED IF SURFACE MOUNTED)

INSTALLATION

1. LOCATE WINDICATOR ON PANEL.
2. USE 1.375 ROUND PANEL PUNCH. INSIGHT P/N MCF-730BB-1-38
3. PASS WINDICATOR CABLE FROM BEHIND PANEL THROUGH CUTOUT.
4. CONNECT WINDICATOR CABLE TO WINDICATOR. CONNECTOR HAS A SNAPPING ACTION.
5. USING CIRCUMFERENCE OF WINDICATOR, PRESS FIRMLY INTO PANEL.
6. APPLY RTV TO BACK OF WINDICATOR, SUGGEST 1 DROP 4 PLACES.
7. HOLD IN PLACE UNTIL RTV IS CURED.
8. SEE INSTALLATION SCHEMATIC 1000-301 FOR TERMINATION DETAIL.

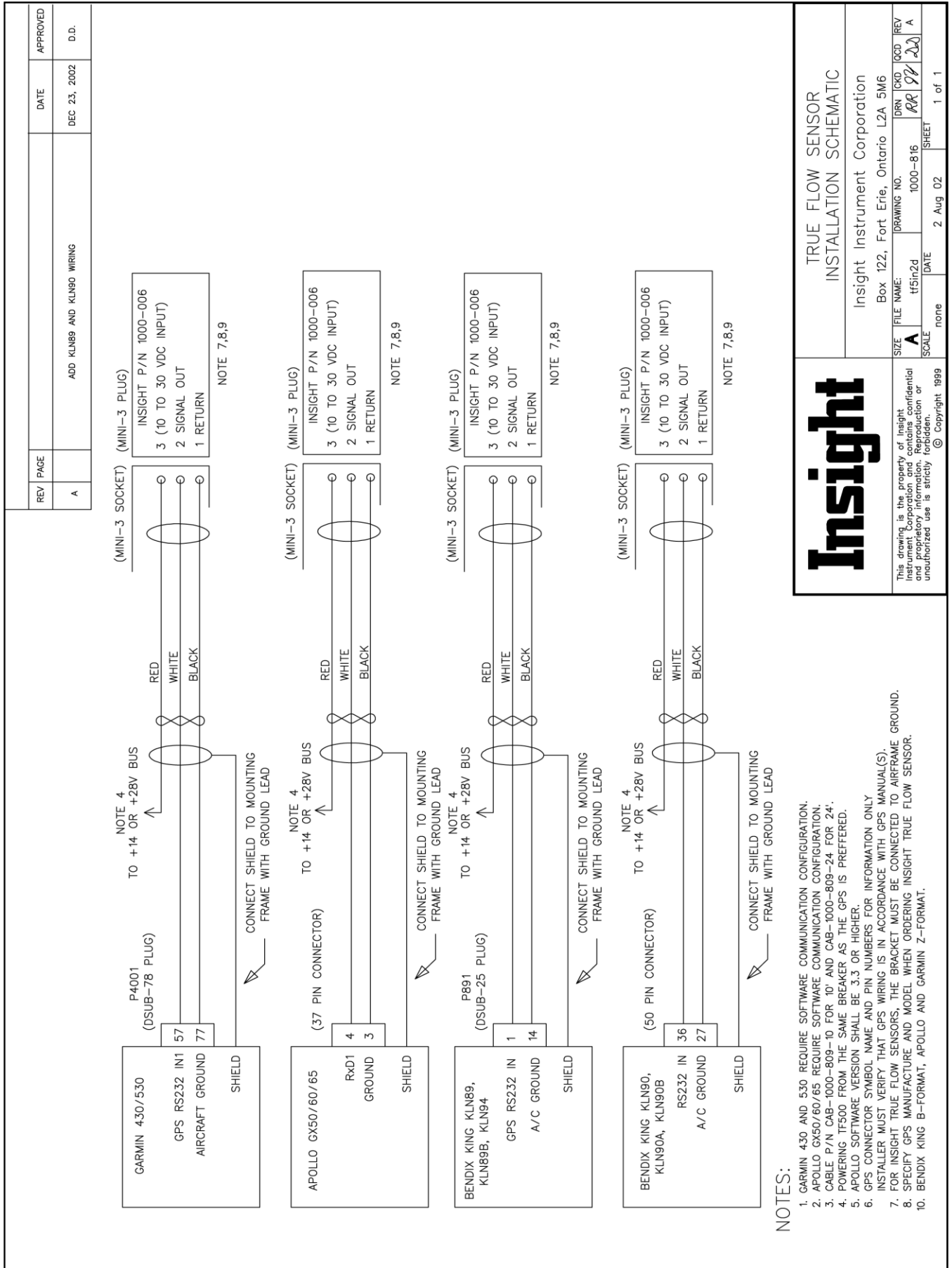
NOTES

1. FOR MOUNTING FRONT MOUNT WINDICATOR ONLY, P/N 1000-002-A
2. WINDICATOR CABLE P/N CAB-1000-507-06.
3. WHEN ORDERING THE WINDICATOR, MOUNTING MUST BE SPECIFIED.



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WINDICATOR FRONT MOUNT TYPE 3			
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6			
SIZE	DRAWING NO.	DRN	CKD
FILE NAME:	1000-305	JWT	JWT
SCALE	none	DATE	JUNE 1/99
		SHEET	3 OF 3



NOTES:

1. GARMIN 430 AND 530 REQUIRE SOFTWARE CONFIGURATION.
2. APOLLO GX50/60/65 REQUIRE SOFTWARE CONFIGURATION.
3. CABLE P/N CAB-1000-809-10 FOR '10' AND CAB-1000-809-24 FOR '24'.
4. POWERING TF500 FROM THE SAME BREAKER AS THE GPS IS PREFERRED.
5. APOLLO SOFTWARE VERSION SHALL BE 3.3 OR HIGHER.
6. GPS CONNECTOR SYMBOL NAME AND PIN NUMBERS FOR INFORMATION ONLY. INSTALLER MUST VERIFY THAT GPS WIRING IS IN ACCORDANCE WITH GPS MANUAL(S).
7. FOR INSIGHT TRUE FLOW SENSORS, THE BRACKET MUST BE CONNECTED TO AIRFRAME GROUND.
8. SPECIFY GPS MANUFACTURE AND MODEL WHEN ORDERING INSIGHT TRUE FLOW SENSOR.
10. BENDIX KING B-FORMAT, APOLLO AND GARMIN Z-FORMAT.

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TRUE FLOW SENSOR INSTALLATION SCHEMATIC	
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6	
SIZE FILE NAME: A tf51n2d SCALE: none DATE: 2 Aug 02 SHEET: 1 of 1	DRAWING NO: 1000-816 DRN: RR QCD: JY REV: A