

深圳市永旭伟业贸易有限公司 REVISIONS

T775XX	B	LTR	DESCRIPTION	DATE	APVD
		1	Preliminary	10/25/06	BRC
		2	Updated Fig 3		
		3	Updated Environmental Specs. Added Table 2 & 3	1/31/07	BRC
		A	Original Release Per C.O.5854	3/21/07	BRC
		B	Updated Input Sensitivity, EMC and Shock / Vib specs. C.O.5878	6/6/07	Brc

RECORD OF REVISION STATUS OF EACH SHEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	1	1	1	1	1	1	1	1	1	1	1	1	/															
2	1	1	1	1	1	1	1	1	1	1	1	2	/															
3	1	1	1	1	1	2	2	2	2	2	2	2	3	/														
A	A	A	A	A	A	A	A	A	A	A	A	A	A	/														
B	B	B	A	A	A	A	B	A	A	A	A	A	A	/														

PRODUCT SPECIFICATION				AI-TEK Instruments, LLC CHESHIRE, CT USA 06410			
APPROVALS			DATE	TITLE: TACHPAK 30/10			
PREPARED	BRClark / KAErasmus		10/9/06				
CHECKED	BClark		3/22/07				
DSGN ENGR	BClark		3/22/07				
QUAL ENGR	CEGerard		3/22/07				
MFG ENGR	PJulian		3/23/07	SIZE A	CODE IDENT. NUMBER 1XP56	DWG. NO. T775XX	
						CAD	SHEET 1 OF 14

Scope

This product specification covers the requirements for AI-TEK Instruments, LLC TACHPAK 10 and 30 part numbers T77510-XX and T77530-XX.

2.0 **Applicable Documents**

The documents listed in this section are specified in sections 3 and 4 of this specification. In the event of a conflict between documents referenced herein and the contents of this specification, the contents of this specification takes precedence.

2.1 **Company Documents**

See Engineering Bill

2.2 **Government**

MIL-STD-810C Environmental Test Methods

2.3 **Third Party Documents**

- EN 61326:1997 Class A radiated and conducted emissions
- EN 61326:1997 with amendments A1, A2 and A3, Immunity
- EN 61000-4-2:1998 Electrostatic Discharge
- EN 61000-4-3:1998 Radiated Immunity
- EN 61000-4-4:1995 Electrical Fast Transients/Burst
- EN 61000-4-5:1995 Surges
- EN 61000-4-6:1996 Conducted Immunity
- EN 61000-4-11:1994 Supply Dips and Variations

3.0 **Requirements**

3.1 **General**

This specification delineates all functional and dimensional requirements for AI-TEK Instruments, LLC TACHPAK 10 and 30 series tachometers. See Table I for part numbers.

3.2 **Characteristics**

3.2.1 **Physical**

3.2.1.1 **Configuration**

Outline dimensions shall be in accordance with Figures indicated in Table I

3.2.2 **Electrical**

All measurements taken at 25°C unless otherwise specified.

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3.2.2.1 **Input Power**

3.2.2.1.1 **Power consumption**

3.5 watts, typical for tachometer only
 Add 0.5 watts per remote display
 Add 2.0 watts for 12V out

3.2.2.1.2 **DC Voltage**

12-30 volts. Reverse polarity protected. Available on terminal blocks and din rail in parallel (TACHPAK only).

3.2.2.1.3 **AC Voltage**

80-264 Vac 50-60 Hz

3.2.2.1.4 **Power Sharing**

If DC input and AC input are both supplied, DC will be loaded above approximately 15 volts. Below 15Vdc input, AC will be loaded.

3.2.2.2 **Output Power**

Regulated to 12 volts @ 150mA when input voltage is 13.6 volts and above. Below 13.6 volts output voltage \approx input voltage -1.5V.

3.2.2.3 **Input Signal Characteristics**

3.2.2.3.1 **Channel A & B**

3.2.2.3.1.1 **Frequency**

Upper Limit: 50 kHz absolute maximum (20 μ sec period); 40kHz typical
 Lower Limit: 0.005 Hz absolute minimum (200 sec. period); .05 typical
 Minimum Pulse Width: 0.5 μ sec.
 Wave shape: Square or Sinusoidal

3.2.2.3.1.2 **Input Impedance**

12 k Ω typical

3.2.2.3.1.3 **Input Sensitivity**

Upper and Lower Limit: +/-30 volts max. (AC or DC). Logic 0 and Logic 1 threshold is user adjustable from 200mV to +28 volts in approx. 20mV steps +/-3%.
 200 mV pk absolute minimum input sensitivity.

3.2.2.3.1.4 **Common Mode Rejection Ratio**

>40 db @1kHz typical

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- 3.2.2.3.1.5 **Electrical Isolation**
 Channel A, B and Direction share common ground
 Channel A , B or Direction to output: 500 Vrms
 Channel A , B or Direction to ground: 500 Vrms
- 3.2.2.3.2 **Verify and Reset**
- 3.2.2.3.2.1 **Frequency**
 Essentially DC, Minimum Pulse Width: 250 μ sec.
- 3.2.2.3.2.2 **Input Impedance**
 10mA current regulated
- 3.2.2.3.2.3 **Input Sensitivity**
 3.5 volts min. pulse to ground
- 3.2.2.3.2.4 **Common Mode Rejection Ratio**
 >40 db @ DC typical
- 3.2.2.3.2.5 **Electrical Isolation**
 Signal to signal 500 Vrms
 Signal to ground 500 Vrms
- 3.2.2.3.3 **Direction**
- 3.2.2.3.3.1 **Frequency**
 Essentially DC
 Minimum Pulse Width: 0.5 μ sec.
- 3.2.2.3.3.2 **Input Impedance**
 12 k Ω typical
- 3.2.2.3.3.3 **Input Sensitivity**
 Upper and Lower Limit: +/-30 volts max. (AC or DC). Logic 0 and Logic 1 threshold is user adjustable from 0 to 28 volts in approx. 20mV steps +/-3%.
- 3.2.2.3.3.4 **Common Mode Rejection Ratio**
 >40 db @1kHz typical
- 3.2.2.3.3.5 **Electrical Isolation**
 Channel A, B and Direction share common ground
 Direction to output: 500 Vrms
 Direction to ground: 500 Vrms

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3.2.2.4 **Output Characteristics**

3.2.2.4.1 **Relays (Mechanical)**

3.2.2.4.1.1 **Physical**
Form C

3.2.2.4.1.2 **Contact Rating**
10A @125/250 Vac, 6A @ 277 Vac, 5A @ 100V dc
2500 VA

3.2.2.4.1.3 **Response Time (operate and release)**
Input to output 16.5 msec max. (10msec relay only)

3.2.2.4.1.4 **Electrical Isolation**
1500 Vrms, 1 minute coil to contacts

3.2.2.4.1.5 **Switchpoint Accuracy**
Internal instrument accuracy to alarm setpoint: .005%

3.2.2.4.2 **Relays (Solid State)**

3.2.2.4.2.1 **Physical**
Form A

3.2.2.4.2.2 **Contact Rating**
400mA @ 60V (AC or DC)
On resistance: 2Ω max

3.2.2.4.2.3 **Response Time (operate and release)**
Operate: 2 ms max, 0.8 ms typical
Release: 0.5 ms max, 0.1 ms typical

3.2.2.4.2.4 **Electrical Isolation**
500 Vrms, 1 minute

3.2.2.4.2.5 **Switchpoint Accuracy**
Internal instrument accuracy to alarm setpoint: .005%

3.2.2.4.3 **Analog Output**

3.2.2.4.3.1 **Ranges**
0 to 20mA, 4 to 20mA, -20 to +20mA; user selectable

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3.2.2.4.3.2 **Accuracy**

Internal instrument accuracy: .005% plus;
 0.05% of full scale range at room temp with 400 ohm load
 0.1% over temp range and load range.
 Unit is factory calibrated. Can be re-calibrated using TACHLINK.

3.2.2.4.3.3 **Resolution**

Step size: 610 nanoamps per lsb. 16 bit D/A

3.2.2.4.3.4 **Linearity**

0.02% typical

3.2.2.4.3.5 **Loop Impedance**

100-1000 Ω

3.2.2.4.3.6 **Response Time**

Input to output 6.55 msec+ 1 msec settle at 1kΩ (worst case) to .1% of final value

3.2.2.4.3.7 **Electrical Isolation**

500 Vrms continuous

3.2.2.4.4 **Display (applies to remote displays)**

3.2.2.4.4.1 **Resolution**

Black and White graphics display. 64x128 Pixels.

3.2.2.4.4.2 **Accuracy**

.05% of full scale

3.2.2.4.4.3 **Communication Protocol**

RS485: 19.2kbaud, 8-n-1 protocol, Half duplex, Tachometer is bus master

3.2.2.4.4.4 **Network**

- Multiplex up to seven displays plus one integrated display. Displays are addressable.
- With all seven displays at the end of one RJ11 6-4 cable, max length would be 125 ft (38m), limited by voltage drop in cable. Cable must be 1:1 type (not flipped), described as RJ11 6-4 reversed cable. For longer distances the RJ type cable should not be used. With #18 wire max run to a single display is 1000 ft (305m).
- Response time: 1 second update to all displays, PC, and RS485

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- 3.2.2.4.4.5 **Electrical Isolation**
500Vrms to ground continuous
- 3.2.2.4.5 **Utility RS485**
Full access to TACHLINK, single drop only
- 3.2.2.4.5.1 **Communication Protocol**
RS485: 19.2kbaud, 8-n-1 protocol, Half duplex, Tachometer is bus master
- 3.2.2.4.5.2 **Maximum Transmission Distance**
8000 ft (2400m)
- 3.2.2.4.5.3 **Electrical Isolation**
500Vrms to ground continuous
- 3.2.2.4.6 **USB**
Full access to TACHLINK,
Version 1.1 / 2.0 compatible
- 3.2.2.5 **Processing Platform**
PIC18F series micro controller
- 3.2.2.5.1 **Clock Speed**
10MHz, +/-50 ppm at room temp
- 3.2.2.5.2 **Acquisition Time**
Basic instrument acquisition time / period 6.55 milliseconds
- 3.2.2.5.3 **Accuracy**
Basic instrument accuracy +/- .005% (50 ppm)
- 3.2.2.5.4 **Resolution**
Basic instrument resolution: +/- .025% or better
- 3.3 **Environmental**
- 3.3.1 **Operating Temperature**
-10 to 55°C
- 3.3.2 **Thermal Cycle**
50 cycles: -40°C to +80°C
200 cycles: -10°C to +55°C
- 3.3.3 **Dielectric Strength**
See applicable Specifications sub-sections

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- 3.3.4 **Humidity**
90% RH non-condensing per IEC 654-1, IEC 68-2-3
- 3.3.5 **Vibration**
MIL-STD-810C Environmental Test Methods, method 514.2, procedure VIII, figure 514.2-6, curve V; 1.5g's 10-2000Hz, 5.5 hrs. / axis, 3 axis

IEC 60068-2-6, 10-150Hz, 2g, 10 sweep cycles / axis, 3 axis
- 3.3.6 **Shock**
MIL-STD-810C Environmental Test Methods, method 516.2, procedure I and figures 516.2-2, for ground equipment; 30g's half sine, 11ms, 3 axis, 18 total

IEC 60068-2-27; 50g half sine, 11ms, 3 axis, 18 total
- 3.3.7 **EMC**
EN 61326:1997 Class A radiated and conducted emissions with amendments A1, A2 and A3

EN 61326:1997 with amendments A1, A2 and A3, Immunity
EN 61000-4-2:1998 Electrostatic Discharge: $\pm 4\text{kV}$ contact, $\pm 8\text{kV}$ air
EN 61000-4-3:1998 Radiated Immunity: 10V/m
EN 61000-4-4:1995 Electrical Fast Transients/Burst: $\pm 2\text{kV}$ AC, $\pm 1\text{kV}$ I/O > 3m
EN 61000-4-5:1995 Surges: $\pm 1\text{kV}$ differential mode, $\pm 2\text{kV}$ common mode, $\pm 1\text{kV}$ line to ground I/O > 30m
EN 61000-4-6:1996 Conducted Immunity: 3V
EN 61000-4-11:1994 Supply Dips and Variations: 100%, 0.5 cycle each polarity
- 3.4 **Material**
PA 6.6, UL 94 V-0
- 3.5 **Identification Of Product**
The unit and shipping carton will be permanently marked. See Engineering Bill
- 4.0 **Quality Assurance Provisions**
- 4.1 **Quality Conformance Inspection**
See Engineering Bill
- 5.0 **Preparation For Delivery**
See Engineering Bill
- 6.0 **Notes**
N/A

SIZE A	CODE IDENT. NUMBER 1XP56	DWG NO.: T775XX	REV B
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Table 1	
See Table 3 for applicable options	
Part Number	Figure
T77510-10 TACHPAK 10, Std enclosure	1
T77530-10 TACHPAK 30, Std enclosure	1
T77510-40 TACHPAK 10, NEMA 4X enclosure	2
T77530-40 TACHPAK 30, NEMA 4X enclosure	2
T77510-70 TACHPAK 10, UL / ATEX Explosion proof enclosure	3
T77530-70 TACHPAK 10, UL / ATEX Explosion proof enclosure	3

Table 2: Connection Information			
Terminal Block	Pin #	TACHPAK 30	TACHPAK 10
Remote Display	Use RJ11 type connector. No individual breakout of pins.		
USB	Use USB "B" type connector. No individual breakout of pins.		
RS485 DB9	1,5	GND	Not Available
	2	Tx -	
	3	Rx -	
	6	Tx +	
	7	Rx +	
	4,8,9	Not Used	

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Table 3: Connection Information (Ref. Fig. A)			
Terminal Block	Pin #	TACHPAK 30	TACHPAK 10
TB1	1	Input Com	Input Com
	2	A Sig	A Sig
	3	B Sig	B Sig
	4	Direction Input	Direction Input
TB2	5	Verify -	Verify -
	6	Verify +	Verify +
	7	Reset -	Reset -
	8	Reset +	Reset +
TB4	9	Analog Out +	Not Available
	10	Analog Shield	
	11	Analog Out -	
	12	Not Used	
TB3	13	In GND	In GND
	14	12-30 Volt In	12-30 Volt In
	15	+12 Vdc Out	+12 Vdc Out
	16	Out GND	Out GND
TB5	17	Relay 1 Com	Relay 1 Com
	18	Relay 1 N.C.	Relay 1 N.C.
	19	Relay 1 N.O.	Relay 1 N.O.
	20	Not Used	Not Used
TB6	21	Relay 2 Com	Relay 2 Com
	22	Relay 2 N.C.	Relay 2 N.C.
	23	Relay 2 N.O.	Relay 2 N.O.
	24	Not Used	Not Used
TB8	25	AC/Earth Gnd	AC/Earth Gnd
	26	Not Used	Not Used
	27	AC Hot	AC Hot
	28	AC Neutral	AC Neutral
TB7	29	Digital 1 (no polarity)	Not Available
	30	Digital 1 (no polarity)	
	31	Digital 2 (no polarity)	
	32	Digital 2 (no polarity)	

Connection to 12-30 Volt In is also available on the bottom of TACHPAK 10 & 30. A special DIN rail power bus adaptor is available as an accessory and works with the accessory power supply.

SIZE A	CODE IDENT. NUMBER 1XP56	DWG NO.: T775XX	REV A
			SHEET 10

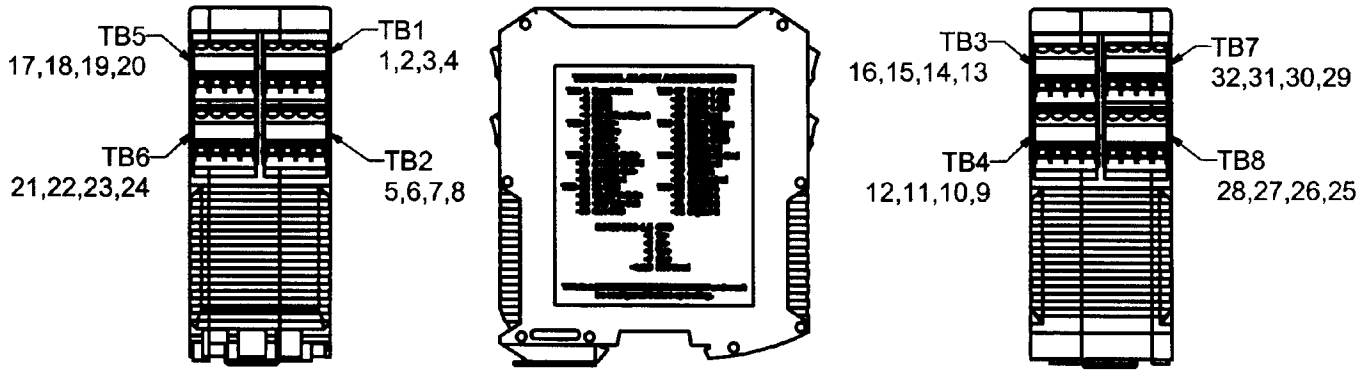


FIGURE A

SIZE A	CODE IDENT. NUMBER 1XP56	DWG NO.: T775XX	REV A
			SHEET 11

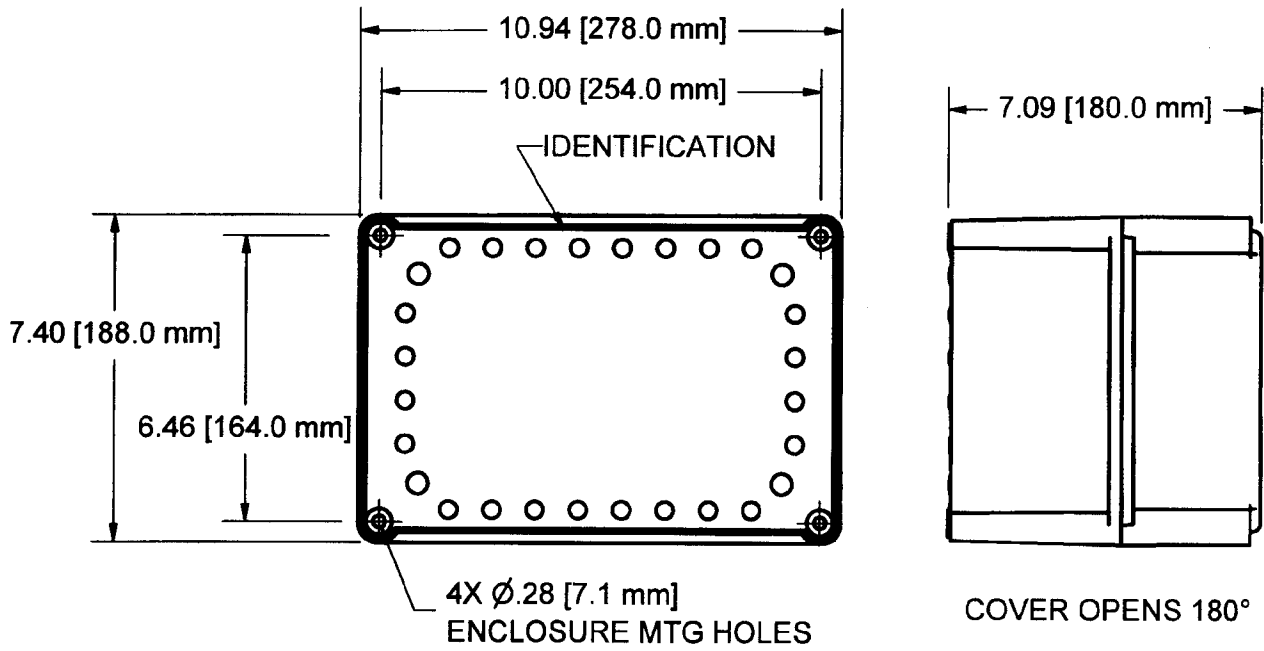


FIGURE 2
NEMA 4X

SIZE A	CODE IDENT. NUMBER 1XP56	DWG NO.: T775XX	REVA
			SHEET 13

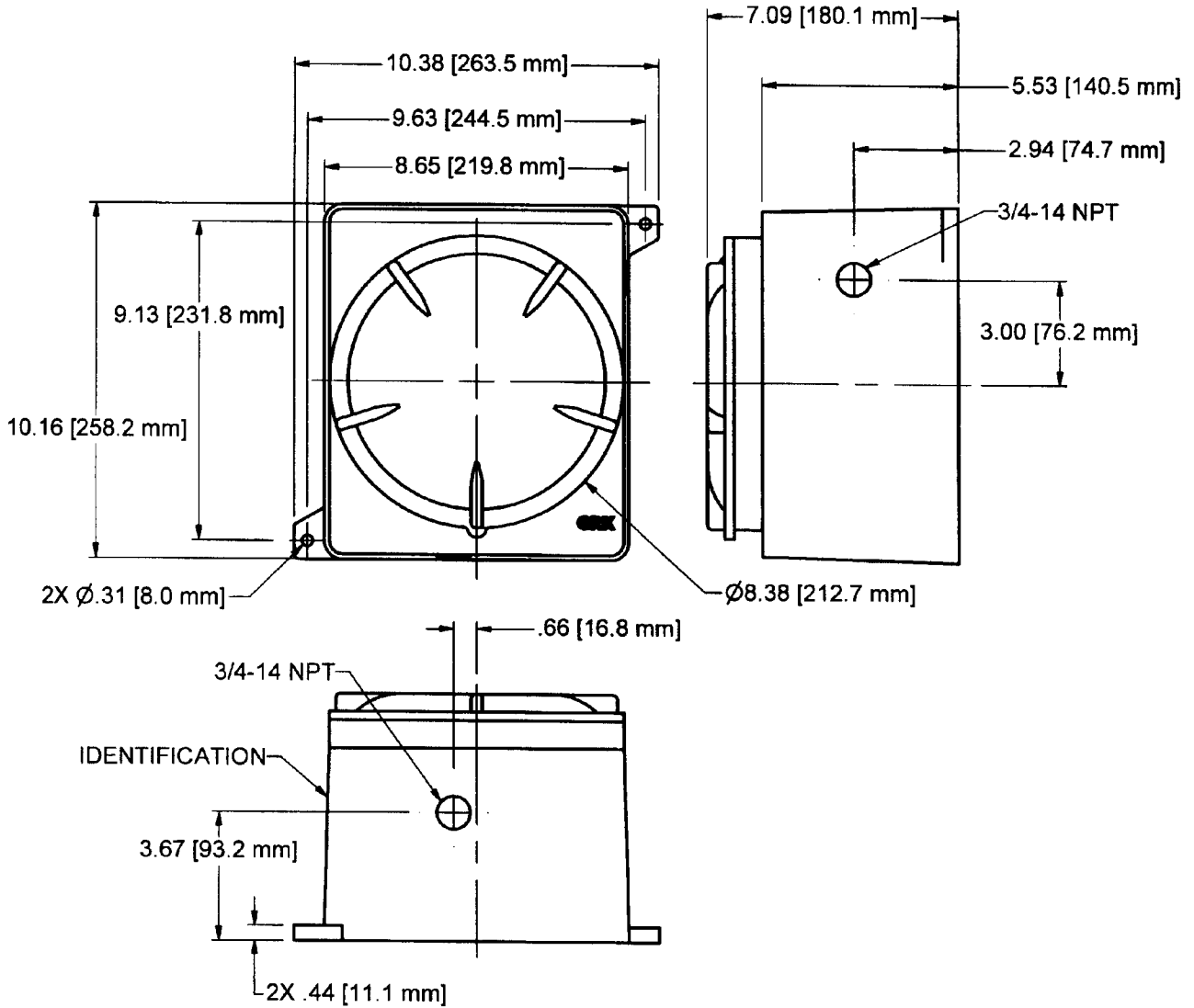


FIGURE 3

UL/CSA for hazardous locations
 Class I, Groups B, C & D; Class II, Groups E, F & G
 also, Class I, Zone I, Groups IIB, H2, IIA

ATEX
 0102 Ex II 2 G EEx d IIC
 For use in Zone 1, Group IIC, Category 2 G, IP66 hazardous locations

SIZE A	CODE IDENT. NUMBER 1XP56	DWG NO.: T775XX	REV A
			SHEET 14