

Table of Contents

Tachometers

| | |
|--|----|
| Introduction | 1 |
| TACHLINK | 4 |
| Tachpak 10 & 30 (T77510 & T77530) | 5 |
| Tachtrol 10 & 30 (T77610 & T77630) | 10 |
| Tachtrol plus (T77810) | 16 |
| Accessories | 20 |
| Tachtrol 20 (T77250) | 22 |

About AI-Tek® Tachometers

Not all tachometers are the same, and this is certainly true of the **AI-Tek** Instruments tachometry line. Designed with severe industrial environments in mind, these units will provide reliable around-the-clock operation for years under adverse conditions.

AI-Tek Instruments is a leader in manufacturing this type of instrument.

Our prices reflect the design, quality, ruggedness and engineering of the equipment. What you really get with **AI-Tek** Instruments is a superb price performance ratio. It may not initially be the least expensive equipment available; but, in the long run, the value of this equipment is that it will outperform and outlast others.

Introduction of the New Generation Tachometer Line

The new generation **TACHPAK** and **TACHTROL** series tachometers have been designed with all of the functions and durability embodied in the previous tachometer series as well as improvements to extend performance, accuracy and function. With the exception of the **Tachtrol 20**, both **TACHPAK** and **TACHTROL** now share a common processing platform. This commonality allows both to perform identical tachometry functions, streamlines programming and minimizes the learning curve. The main physical difference between the two is the characteristic integrated display function found in all **TACHTROL** series tachometers.

Common Specifications:

Temperature -10°C to +55°C operating; -40°C to +80°C storage

Thermal Cycle 50 cycles: -40°C to +80°C; 200 cycles: -10°C to +55°C

Humidity 90% RH non-condensing per IEC 654-1, IEC 68-2-3

Vibration MIL-STD-810C Environmental Test Methods, method 514.2, procedure VIII, figure 514.2-6, curve V; 1.5g's 10-2000 Hz, 5.5 hrs./axis, 3 axis
IEC 60068-2-6, 10-150Hz, 2g, 10 sweep cycles / axis, 3 axis

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

EMC CE Compliant
EN 61326:1997 Class A radiated and conducted emissions with amendments A1-A3
EN 61326:1997 with amendments A1-A3, Immunity
EN 61000-4-2: 1998 Electrostatic Discharge: ±4kV contact, ±8kV air
EN 61000-4-3: 1998 Radiated Immunity: 10V/m
EN 61000-4-4: 1995 Electrical Fast Transients/Burst: ±2kV AC, ±1kV I/O > 3m
EN 61000-4-5: 1995 Surges: ±1kV differential mode, ±2kV common mode, ±1kV 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 cycles each polarity

RoHS RoHS compliant per European Directive 2002/95/EC

Support Documents On Website Include: TACHLINK, Manual, Tach Training Video

Tach Package Contents: **TACHPAK 10 & 30** and **TACHTROL 10 & 30** are shipped in a single carton containing one instrument, **TACHLINK**, a manual on CD ROM, and a USB cable.

TACHTROL plus is shipped in a single carton containing one instrument and a display cable with RJ-11 terminations. **TACHTROL 10 & 30** and **TACHTROL plus Explosion Proof and NEMA 4X** are shipped in a single carton containing one instrument and accessories as described above, one infrared remote and one DIN rail mounting kit. **TACHPAK 10 & 30 Explosion Proof and NEMA 4X** are shipped in a single carton containing one rated enclosure and one instrument and accessories as described above.

It is the customer's responsibility to determine whether the product is proper for customer's use and application.

The information contained herein is subject to change without notice. Refer to the factory for verification of any details.

Specifications (Continued):

Electrical

All measurements taken at 25°C unless otherwise specified.

Input Power

Power consumption

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

DC Voltage

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

AC Voltage

80-264 Vac 50-60 Hz

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.

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.

Input Signal Characteristics

Channel A & B

Frequency

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

Input Impedance

12 k Ω typical

Input Sensitivity

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

Common Mode Rejection Ratio

>40 db @1kHz typical

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

Verify and Reset

Frequency

Essentially DC, Minimum Pulse Width: 250 μ sec.

Input Impedance

10mA current regulated

Input Sensitivity

3.5 volts min. pulse to ground

Common Mode Rejection Ratio

>40 db @ DC typical

Electrical Isolation

Signal to signal 500 Vrms
Signal to ground 500 Vrms

Direction

Frequency

Essentially DC
Minimum Pulse Width: 0.5 μ sec.

Input Impedance

12 k Ω typical

Input Sensitivity

Upper and Lower Limit: +/-30 volts max. (AC or DC).
Logic 0 and Logic 1 thresholds are user adjustable from 0 to 28 volts in approx. 20mV steps +/-3%.

Common Mode Rejection Ratio

>40 db @1kHz typical

Electrical Isolation

Channel A, B and Direction share common ground
Direction to output: 500 Vrms
Direction to ground: 500 Vrms

Output Characteristics

Relays (Mechanical)

Physical

Form C

Contact Rating

10A @125/250 Vac, 6A @ 277 Vac, 5A @ 30Vdc,
0.5A @ 100Vdc
2500 VA

Response Time (operate and release)

Input to output 16.5 msec max.
(10 msec relay only)

Electrical Isolation

1500 Vrms, 1 minute coil to contacts

Switchpoint Accuracy

Internal instrument accuracy to alarm setpoint: \pm .005%

Relays (Solid State)

Physical

Form A

Contact Rating

400mA @ 60V (AC or DC)

On resistance: 2Ω max

Response Time (operate and release)

Operate: 2 ms max, 0.8 ms typical

Release: 0.5 ms max, 0.1 ms typical

Electrical Isolation

500 Vrms, 1 minute

Switchpoint Accuracy

Internal instrument accuracy to alarm

setpoint: ±.005%

Analog Output

Ranges

0 to 20mA, 4 to 20mA, -20 to 0 to +20mA;

user selectable

Accuracy

Internal instrument accuracy: ±.005%; plus ±.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.

Resolution

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

Linearity

±0.02% typical

Loop Impedance

100-1000 Ω

Response Time

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

Electrical Isolation

500 Vrms continuous

Display (applies to TT & TTplus)

Resolution

Black and White graphics display. 64x128 Pixels.

Accuracy

±.05% of full scale

Communication Protocol

RS485: 19.2kbaud, 8-n-1 protocol, Half duplex,

Tachometer is bus master

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

Electrical Isolation

500Vrms to ground continuous

Utility RS485

Full access to TACHLINK, single drop only

Communication Protocol

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

Maximum Transmission Distance

8000 ft (2400m)

Electrical Isolation

500Vrms to ground continuous

USB

Full access to TACHLINK,

Version 1.1 / 2.0 compatible

Processing Platform

PIC18F series micro controller

Clock Speed

10MHz, ±50 ppm at room temp

Acquisition Time

Basic instrument acquisition time / period 6.55 ms

Accuracy

Basic instrument accuracy ±.005% (50 ppm)

Resolution

Basic instrument resolution: ±.025% or better

TACHLINK

- TACHLINK is a Windows-based program developed to simplify programming, communication and monitoring with the new generation of AI-TEK tachometers via USB2.0 or RS485.
- Programming is much faster and simpler with **TACHLINK**.
- Tachometer configuration databases can be stored, backed up and retrieved easily. A stored database can be used to program multiple tachometers and can be e-mailed to remote locations.
- The **TACHLINK** graphical user interface allows any PC to be used as a remote display.
- Analog output calibration is available only through **TACHLINK** and allows the customer to perform and verify calibration status.
- Plotting function is available only through **TACHLINK** and allows the customer to monitor a process over time while monitoring speed and relay status. Output is available to be viewed real-time or can be captured and imported into a spreadsheet format for future analysis.



ai.tek
instruments

TACHLINK™

For TACHTROL® and TACHPAK® 10 & 30 Tachometers



TM5-600
August 2007
AI-TEK

- PC Interface for Windows 2000 & XP •
- TACHTROL® and TACHPAK® Operation Manual •
- Starter Database Files •

www.aitekinstruments.com

TACHPAK® 10 & 30 Digital Process Tachometer

Part Number Series
T77510 & T77530

CE
RoHS



T77510



T77530

TACHPAK 30 Key Features (T77530):

- Wide range of AC or DC power (12-30 Vdc, 80-264Vac 50-60Hz)
- Greatly improved instrument accuracy, processing speed and response time.
- Frequency, period or counter modes.
- User-defined inputs for logic level, averaging, alarm set points and hysteresis,
- Signal normalization and math functions allow mathematical manipulation of input signals. Results can be displayed along with user-defined units.
- Accepts sinusoidal and square wave inputs as found in variable reluctance and digital output speed sensors.
- Accepts bi-directional sensor inputs and will decode quadrature or direction signal logic
- 2 solid state relays (fast response time) and 2 mechanical relays (high power)
- Analog output: 0-20mA, 4-20mA, -20-0-(+) 20mA (can be used with bi-directional sensor)
- Two programming methods: Front panel on display or USB2.0 connectivity to PC / Windows-based **TACHLINK**.
- Utility RS485 communication allows full **TACHLINK** function over longer distances (up to 8000 ft)
- Drives up to 8 remote displays (TACHTROL plus). A single display can be up to 1000 ft away with a simple RJ11 (phone jack) connection. Longer runs, cable type and number of displays will affect distance.
- Security mode protects unauthorized access for programming or alarm resets (through display or **TACHLINK**)
- Mounts to DIN rail. Power can be applied through special DIN bus when used with **AI-TEK** power supply.
- Environmentally hardened for temperature, vibration and shock. EMC / CE compliant to current BS/ EN directives.
- Designed and manufactured compliant with RoHS.

TACHPAK 10 Key Features (T77510):

- Same as TACHPAK 30 but excludes solid state relays, analog output and utility **RS485**

Programming Features:

Programming has been greatly simplified and can be accomplished by 2 different methods. Many configurable attributes have been added to improve flexibility and function.

- **TACHPAK** 10 and 30 can be programmed with the addition of a **TACHTROL plus** remote display. Programming is accomplished by navigating through a series of nested menus. In the

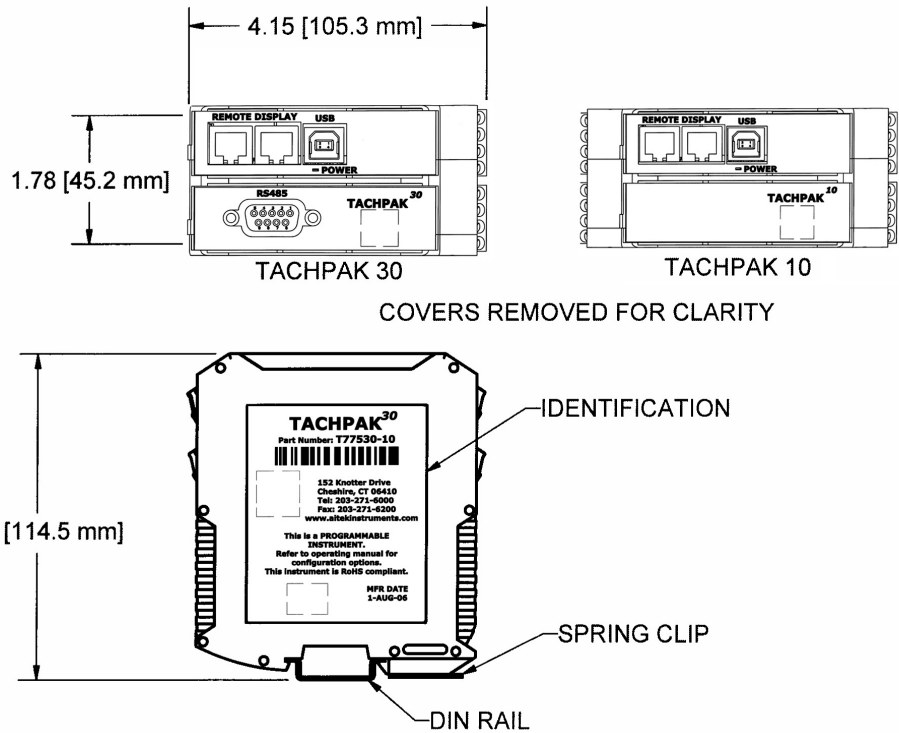
Programming Features (continued):

case of tachometer instruments embedded in explosion proof or **NEMA 4X** enclosures, remote access solves the problem of programming by making use of an IR link to allow full front panel control via a hand-held remote.

- **TACHLINK®**: PC / Windows-based custom software allows the user to program all configurable attributes of **TACHPAK** by PC via a USB2.0 or RS485 connection. In addition, the PC can be used to display data, perform security functions, diagnostics, analog output calibration and real-time data logging; all available through the **TACHLINK**.

Applications:

- Fast response overspeed shutdown
- Petrochemical production applications
- Pump or generator alarm
- Low speed switching
- Start-up, over/under speed switching
- Textile production applications
- Machine control
- Paper & pulp production
- Turbine speed control
- Food processing
- Conveyor alarms
- Printing industry
- Metal production
- Mining applications
- Test labs
- Generator set
- Broken or slipping belt drives



| Ordering P/N | Input Power | Enclosure | Net Weight (lbs.) |
|--------------|----------------------|-----------------|-------------------|
| T77510-10 | 80-264 Vac/12-30 Vdc | Standard | 0.6 |
| T77510-40 | 80-264 Vac/12-30 Vdc | NEMA 4X | 3.4 |
| T77510-70 | 80-264 Vac/12-30 Vdc | Explosion Proof | 24.0 |
| T77530-10 | 80-264 Vac/12-30 Vdc | Standard | 0.7 |
| T77530-40 | 80-264 Vac/12-30 Vdc | NEMA-4X | 3.5 |
| T77530-70 | 80-264 Vac/12-30 Vdc | Explosion Proof | 24.0 |

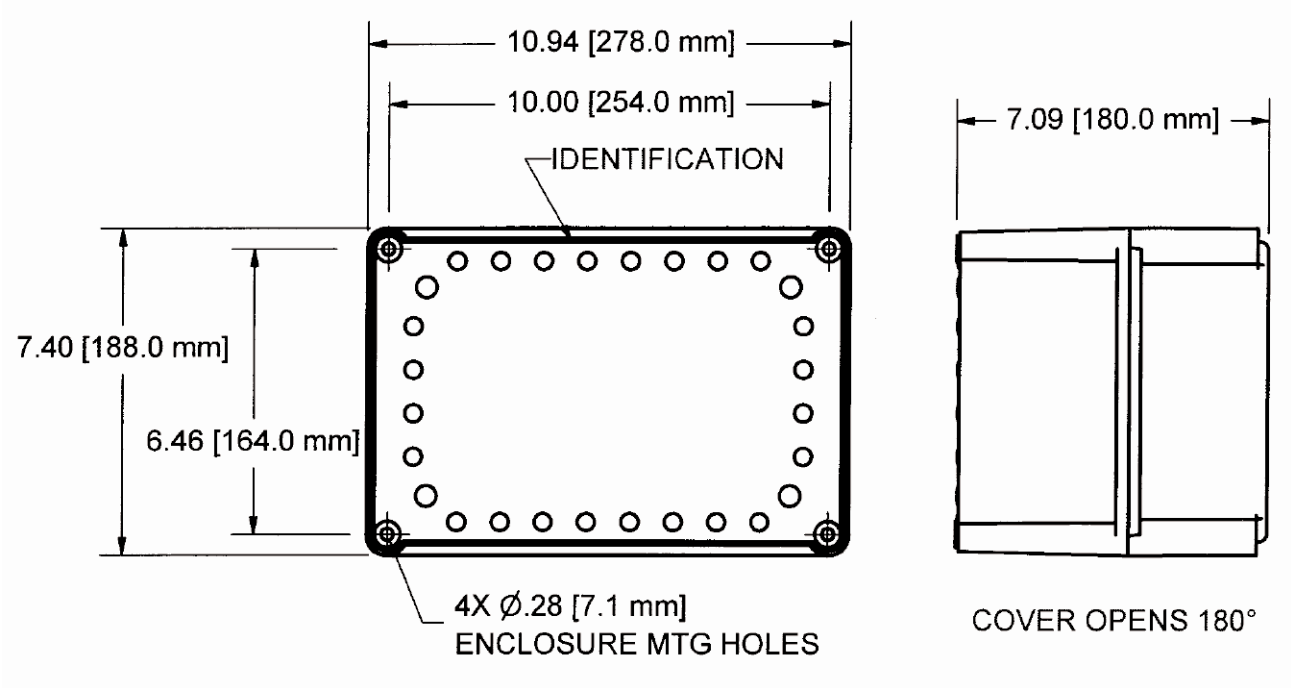
| Table 2: Connection Information | | | |
|---------------------------------|---|------------|---------------|
| Terminal Block | Pin # | TACHPAK 30 | TACHPAK 10 |
| Remote Display | Use RJ11 type connector. No individual breakout of pins. | | |
| USB | Use USB "B" type connector. No individual breakout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

| Table 3: Connection Information | | | |
|---------------------------------|-------|-------------------------|-----------------|
| 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 adapter is available as an accessory and works with the accessory power supply.

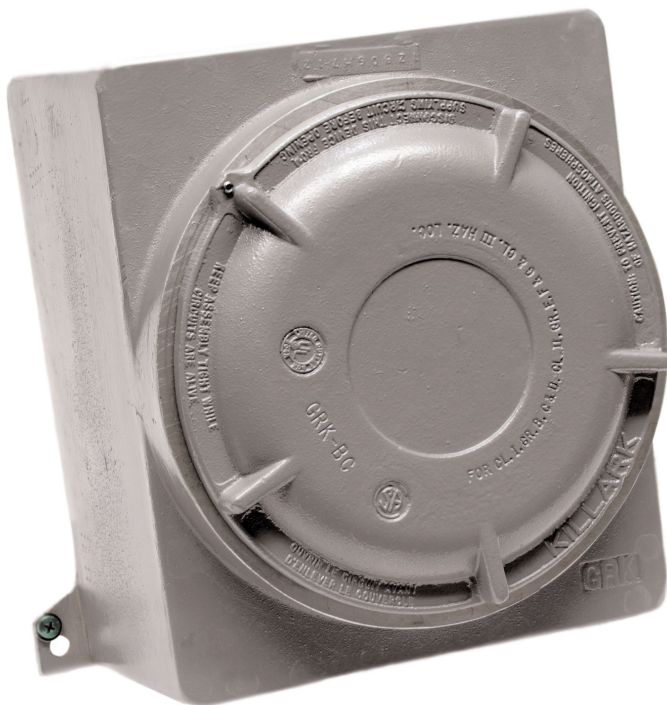
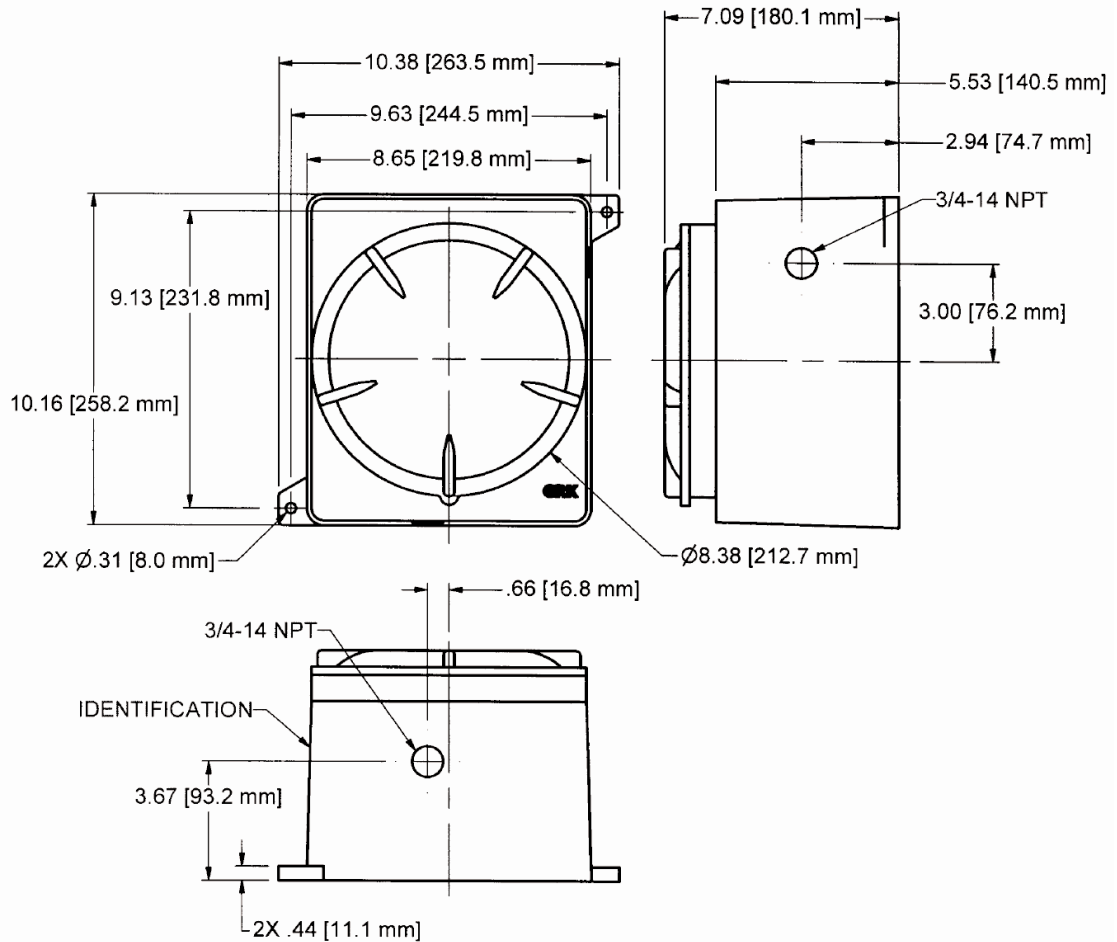
TACHPAK Enclosure Options

T77510-40 / T77530-40



TACHPAK Enclosure Options

T77510-70 / T77530-70



EXPLOSION PROOF

UL/CSA for hazardous locations

Class I, Groups B, C & D;

Class II, Groups E, F & G

Class III

also

Class I, Zone 1, 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

Certifications Inside Enclosure
(Consult Factory for Latest Update)



TACHTROL® 10 & 30 Dual Input Digital Tachometer

Part Number Series
T77610 & T77630

CE
RoHS

TACHTROL 30 Key Features (T77630):

- Wide range of **AC or DC** power (12-30 Vdc, 80-264Vac 50-60Hz)
- Greatly improved instrument accuracy, processing speed and response time.
- Frequency, period or counter modes.
- User-defined inputs for logic level, averaging, alarm set points and hysteresis,
- Signal normalization and math functions allow mathematical manipulation of input signals. Results can be displayed along with user-defined units.
- Accepts sinusoidal and square wave inputs as found in variable reluctance and digital output speed sensors.
- Accepts bi-directional sensor inputs and will decode quadrature or direction signal logic
- 2 solid state relays (fast response time) and 2 mechanical relays (high power)
- Analog output: 0-20mA, 4-20mA, -20-0-(+) 20mA (can be used with bi-directional sensor)
- Two programming methods: Front panel on display or USB2.0 connectivity to PC / Windows-based **TACHLINK**.
- Utility **RS485** communication allows full **TACHLINK** function over longer distances (up to 8000 ft)
- Drives up to 7 remote displays (**TACHTROL plus**). A single display can be up to 1000 ft away with a simple **RJ11** (phone jack) connection. Longer runs, cable type and number of displays will affect distance.
- Security mode protects unauthorized access for programming or alarm resets (through display or **TACHLINK**)
- Environmentally hardened for temperature, vibration and shock. **EMC / CE** compliant to current BS / EN directives.
- Has integrated display and will mount in same panel opening as **TACHTROL 3**
- Display capabilities include two independent output channels for speed, count period or equation results, Alarm status / security, Mode, User defined units for each channel, 128x64 LCD graphics display with backlight.
- Designed and manufactured compliant with RoHS.

TACHTROL 10 Key Features (T77610):

- Same as **TACHTROL 30** but excludes solid state relays, analog output and utility **RS485**

It is the customer's responsibility to determine whether the product is proper for customer's use and application.

Programming Features

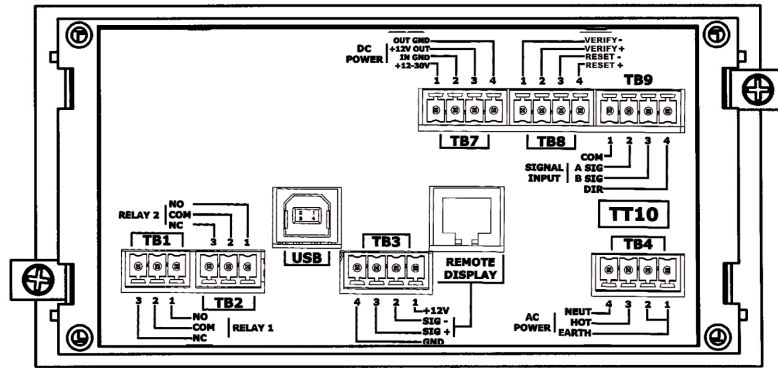
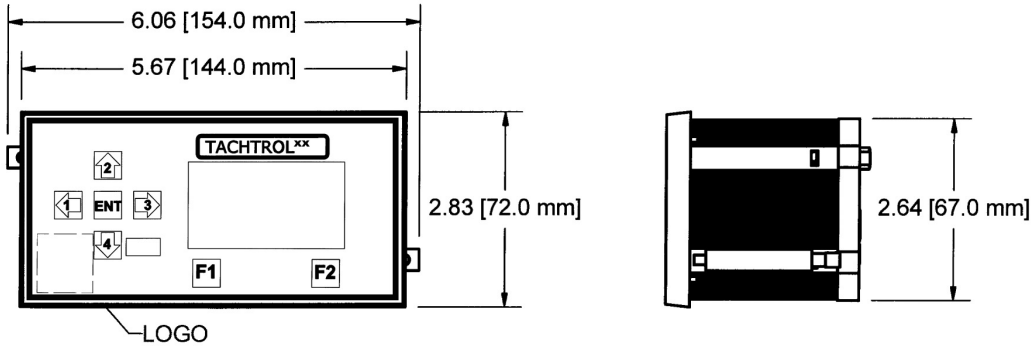
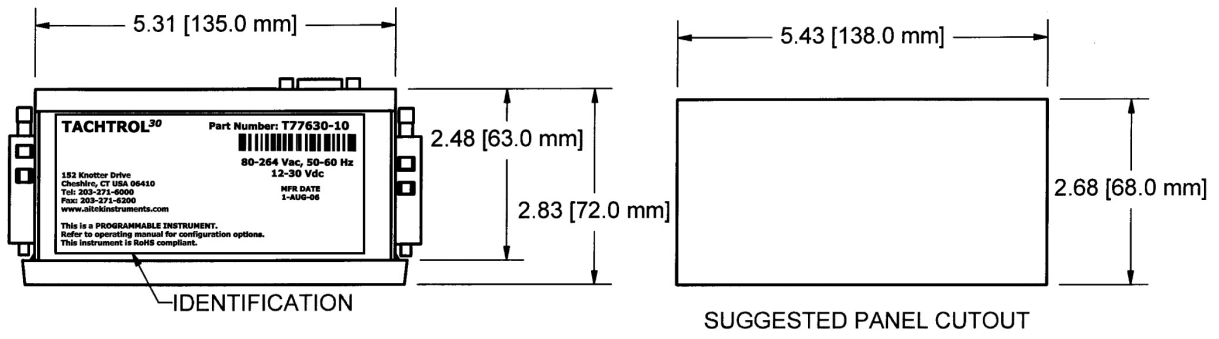
Programming has been greatly simplified and can be accomplished by 2 different methods. Many configurable attributes have been added to improve flexibility and function.

- Display front panel: **TACHTROL 10 and 30** can be programmed through the integrated display/membrane panel. Programming is accomplished by navigating through a series of nested menus. In the case of tachometer instruments embedded in explosion proof or NEMA 4X enclosures, remote access solves the problem of programming by making use of an IR link to allow full front panel control via a hand-held remote.
- PC / Windows-based **TACHLINK**: Custom software allows the user to program all configurable attributes of **TACHTROL by PC** via a **USB2.0** or **RS485** connection. In addition, the **PC** can be used to display data, perform security functions, diagnostics, analog output calibration and real-time data logging; all available through the **TACHLINK**.

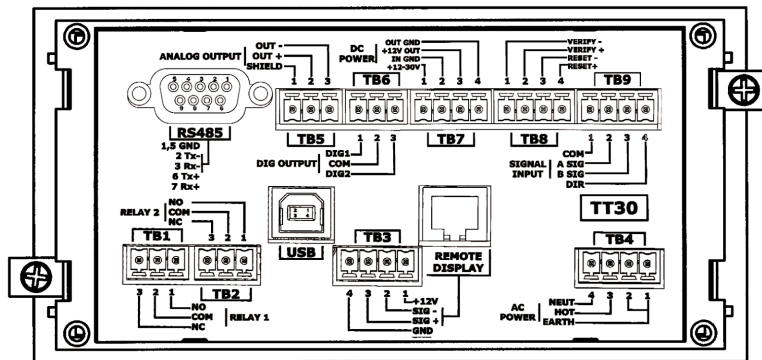
Applications:

- Fast response overspeed shutdown
- 2 Channel Speed/Draw Monitor
- Bi-directional Tachometer
- Reverse Rotation Alarm
- Low Speed Tachometer
- Clutch Slip Alarm
- Winder Control
- Ahead/Astern Marine Tachometer
- Expanded analog Scale Speed Transmitter
- Flow Rate Monitor
- Process Time Monitor
- Time per Event Monitor
- Autoranging Tachometer
- Computer Signal Conditioner
- Averaging Tachometer
- Line Frequency Monitor 60.00 Hz/400.0 Hz
- RS485 Speed Transmitter

| Ordering P/N | Input Power | Enclosure | Net Weight (lbs.) |
|--------------|----------------------|------------------|-------------------|
| T77610-10 | 80-264 Vac/12-30 Vdc | Std. Panel Mount | 0.8 |
| T77610-40 | 80-264 Vac/12-30 Vdc | NEMA 4X | 3.9 |
| T77610-70 | 80-264 Vac/12-30 Vdc | Explosion Proof | 42.0 |
| T77630-10 | 80-264 Vac/12-30 Vdc | Std. Panel Mount | 0.9 |
| T77630-40 | 80-264 Vac/12-30 Vdc | NEMA-4X | 4.0 |
| T77630-70 | 80-264 Vac/12-30 Vdc | Explosion Proof | 42.0 |



REAR VIEW TACHTROL 10



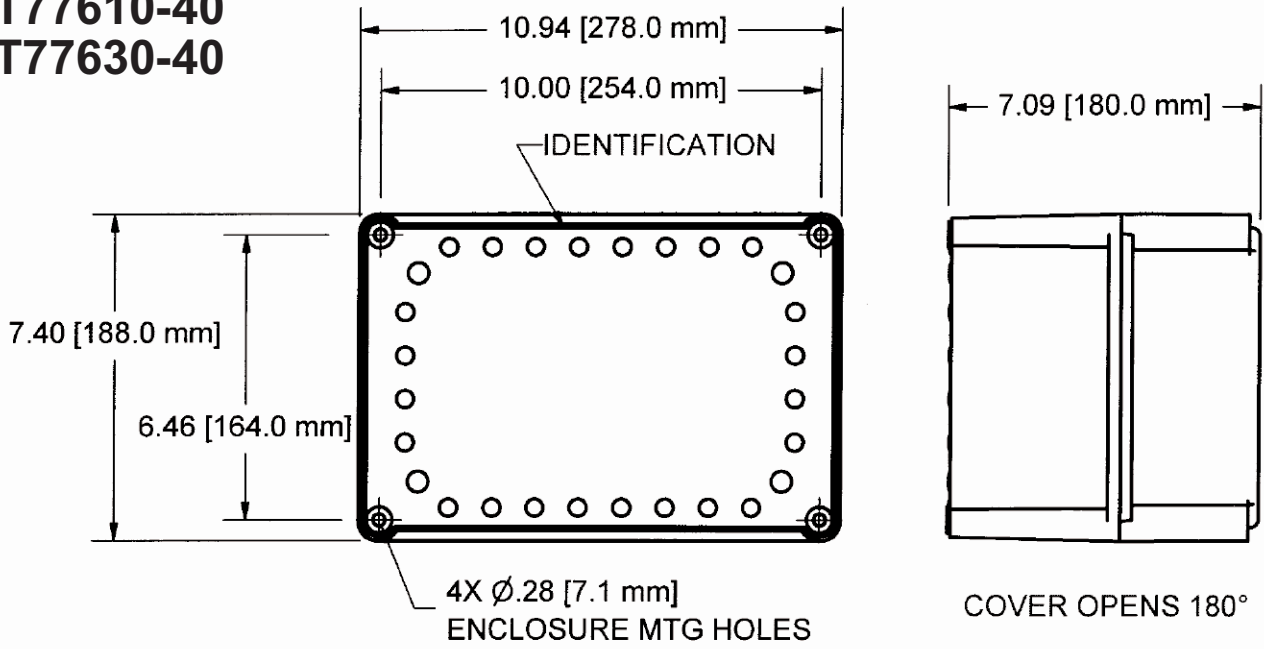
REAR VIEW TACHTROL 30

| Table 2: Connection Information | | | |
|--|---|--------------------|--------------------|
| Terminal Block | Pin # | TACHTROL 30 | TACHTROL 10 |
| Remote Display | Use RJ11 type connector. See TB3 for 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 | |

| Table 3: Connection Information | | | |
|--|--------------|--------------------|--------------------|
| Terminal Block | Pin # | TACHTROL 30 | TACHTROL 10 |
| TB1 | 1 | Relay 1 N.O. | Relay 1 N.O. |
| | 2 | Relay 1 Com | Relay 1 Com |
| | 3 | Relay 1 N.C. | Relay 1 N.C. |
| TB2 | 1 | Relay 2 N.O. | Relay 2 N.O. |
| | 2 | Relay 2 Com | Relay 2 Com |
| | 3 | Relay 2 N.C. | Relay 2 N.C. |
| TB3 Remote Display | 1 | +12vdc Out | +12vdc Out |
| | 2 | Sig - | Sig - |
| | 3 | Sig + | Sig + |
| | 4 | Gnd | Gnd |
| TB4 | 1 | AC/Earth Gnd | AC/Earth Gnd |
| | 2 | AC/Earth Gnd | AC/Earth Gnd |
| | 3 | AC Hot | AC Hot |
| | 4 | AC Neutral | AC Neutral |
| TB5 | 1 | Analog Shield | Not Available |
| | 2 | Analog Out + | |
| | 3 | Analog Out - | |
| TB6 | 1 | Digital 1 | Not Available |
| | 2 | Dig Com | |
| | 3 | Digital 2 | |
| TB7 | 1 | 12-30 Volt In | 12-30 Volt In |
| | 2 | In GND | In GND |
| | 3 | +12 Vdc Out | +12 Vdc Out |
| | 4 | Out GND | Out GND |
| TB8 | 1 | Verify - | Verify - |
| | 2 | Verify + | Verify + |
| | 3 | Reset - | Reset - |
| | 4 | Reset + | Reset + |
| TB9 | 1 | Input Com | Input Com |
| | 2 | A Sig | A Sig |
| | 3 | B Sig | B Sig |
| | 4 | Direction Input | Direction Input |

TACHTROL Enclosure Options

T77610-40
T77630-40

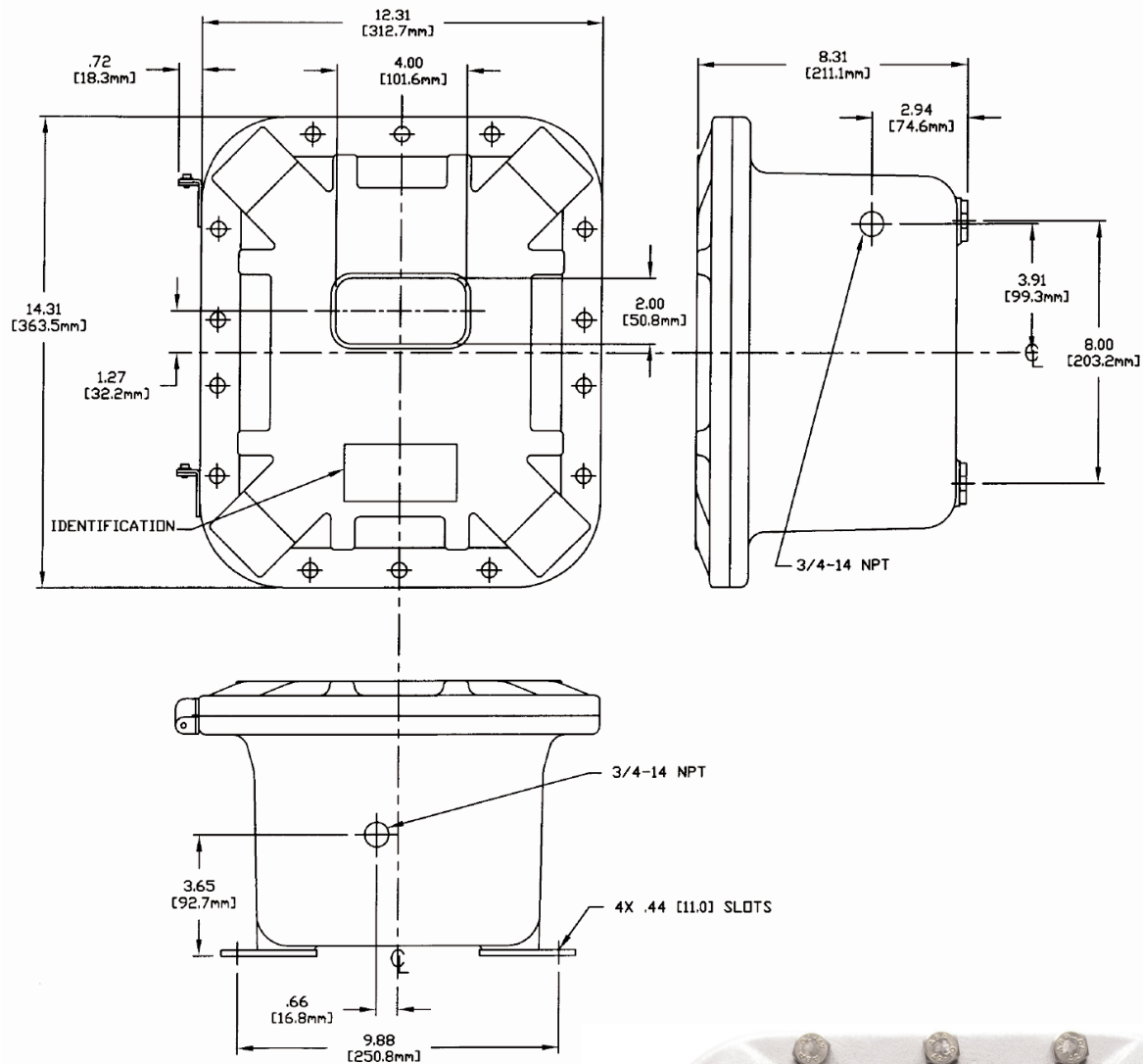


NEMA 4X



TACHTROL Enclosure Options

T77610-70 / T77630-70



EXPLOSION PROOF

UL/CSA for Hazardous Locations

Class I, Groups B, C & D

Class II, Groups E, F & G

Class III

Also Class I, Zone 1, Groups IIB + H₂, IIA

ATEX

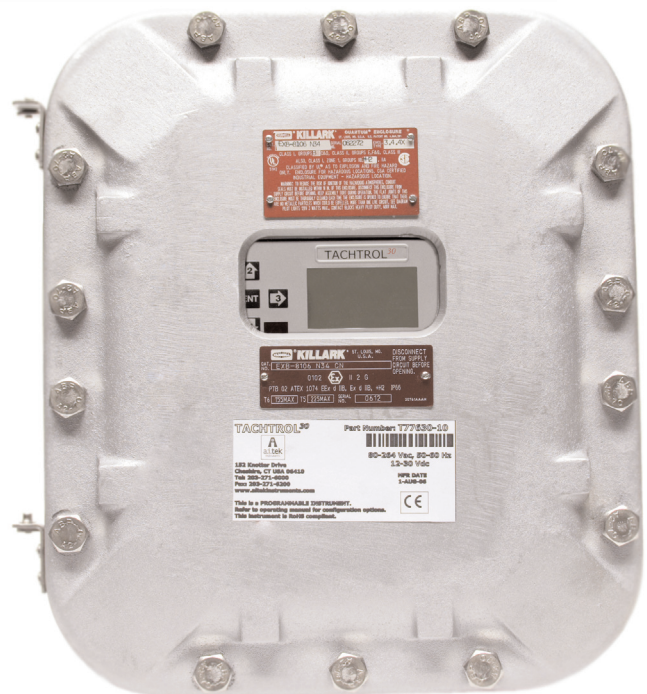
0102 EX II 2 G

For use in Zone 1 Groups

IIA, IIB & IIB+H₂ T6 or T5,

IP66 hazardous locations

Certifications Inside Enclosure
(Consult Factory for Latest Update)





TACHTROL® plus Digital Remote Display

Part Number Series
T77810

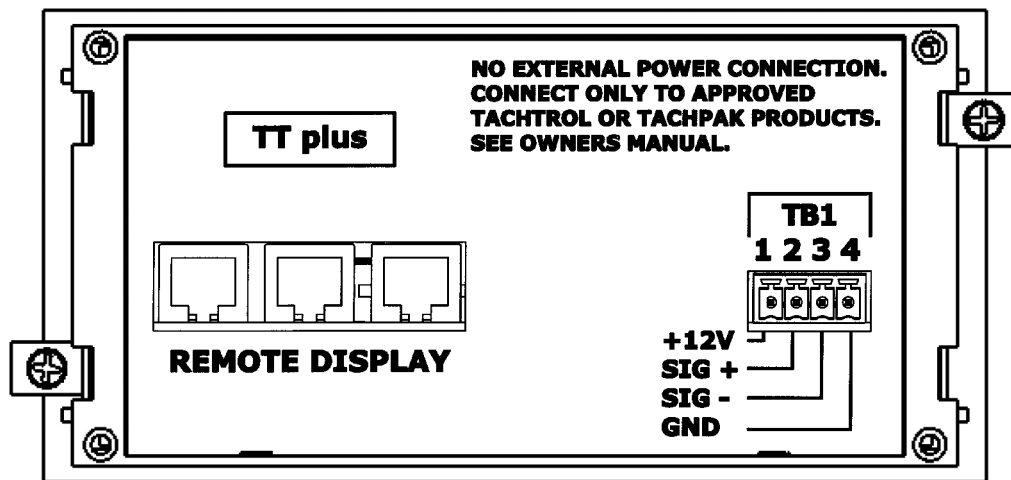
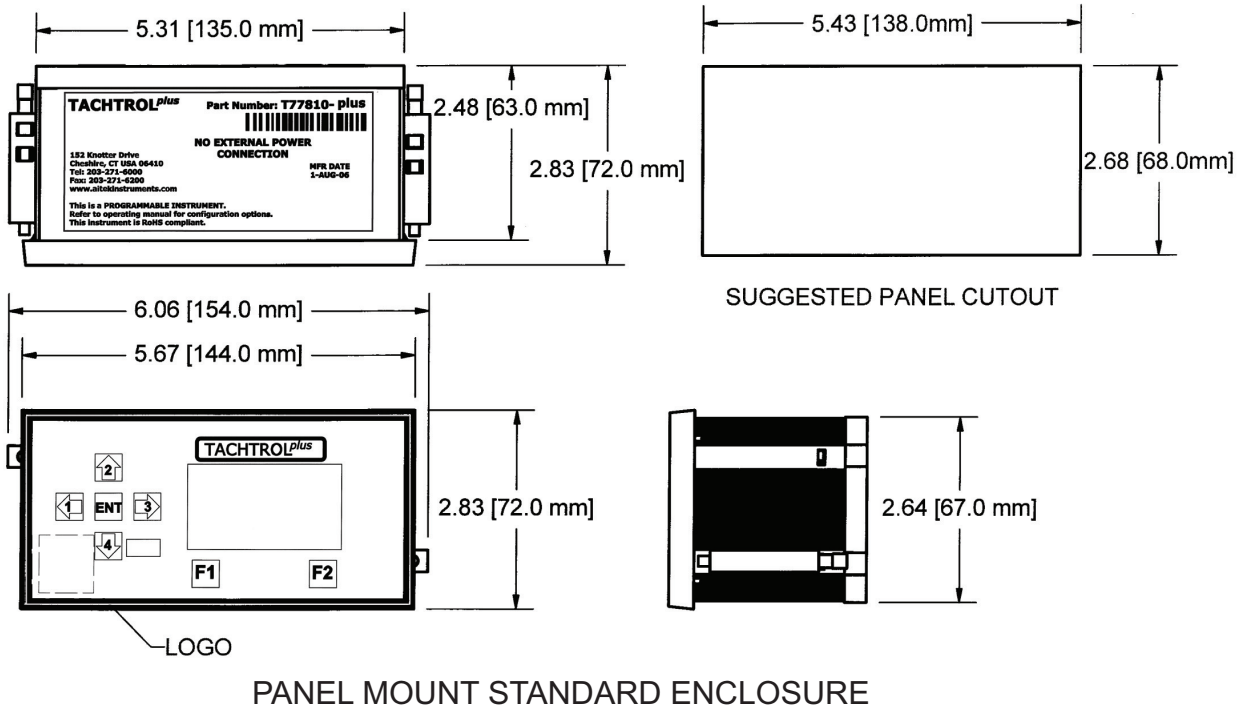
CE
RoHS

TACHTROL plus :

- An extension of the **TACHPAK** and **TACHTROL** lines. While this device has no intrinsic tachometer function, it forms a network with **TACHPAK 10 & 30** and **TACHTROL 10 & 30** and can be used as a remote display or programming pendant.
- Serves as a gateway with both **TACHPAK** and **TACHTROL** instruments for secure, remote programming and alarm reset.
- Front panel operation and display is identical to **TACHTROL 10 & 30**
- Each display can be configured to display individual combinations of Channel A, B and Equation.
- Security can be applied to prevent unwanted access in remote locations.
- Acts as a hub for multiplexing up to seven additional displays with a single tachnometer up to 125 feet away using an RJ11 (1:1) type phone cord.
- No external power connection. Connect only to approved **TACHTROL** and **TACHPAK** products.

| Ordering P/N | Enclosure | Net Weight (lbs.) |
|--------------|------------------|-------------------|
| T77810-10 | Std. Panel Mount | 0.6 |
| T77810-40 | NEMA 4X | 3.7 |
| T77810-70 | Explosion Proof | 42.0 |

It is the customer's responsibility to determine whether the product is proper for customer's use and application.

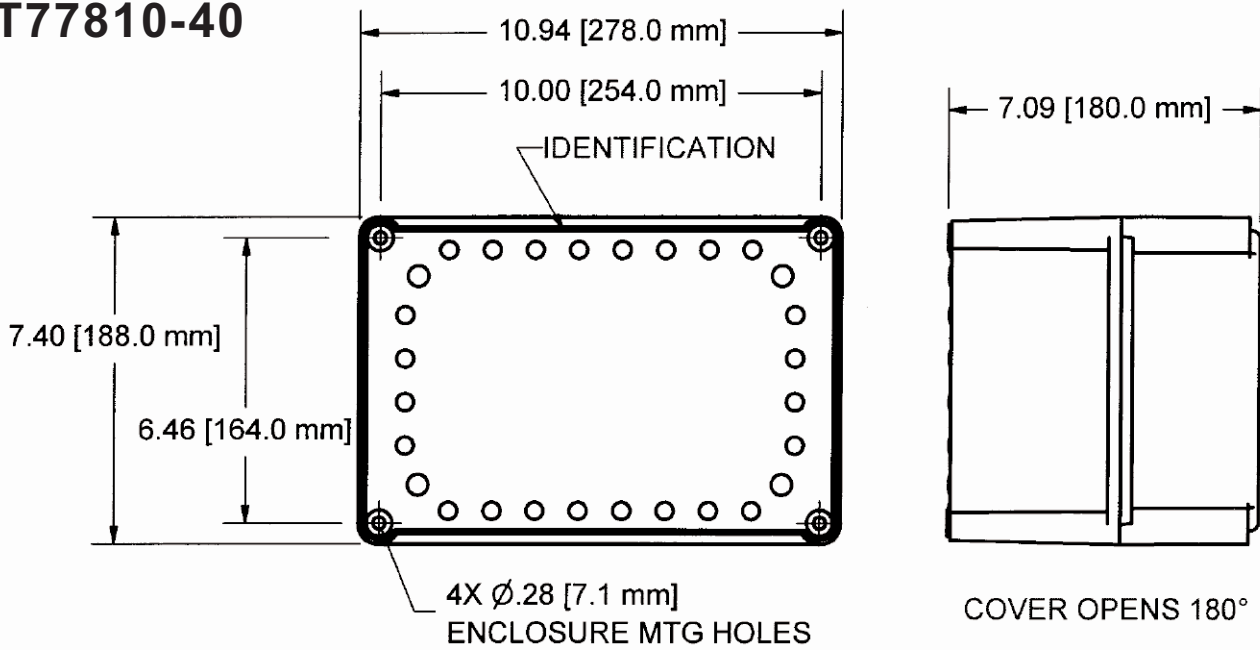


REAR VIEW - CONNECTIONS

| Terminal Block | Pin # | TACHTROL ^{plus} |
|--------------------------|---|--------------------------|
| TB1 Remote Display | 1 | +12vdc In |
| | 2 | Sig + |
| | 3 | Sig - |
| | 4 | Gnd |
| Remote Display | Use RJ11 type connector. See TB1 for individual breakout of pins. | |

TACHTROL plus Enclosure Options:

T77810-40

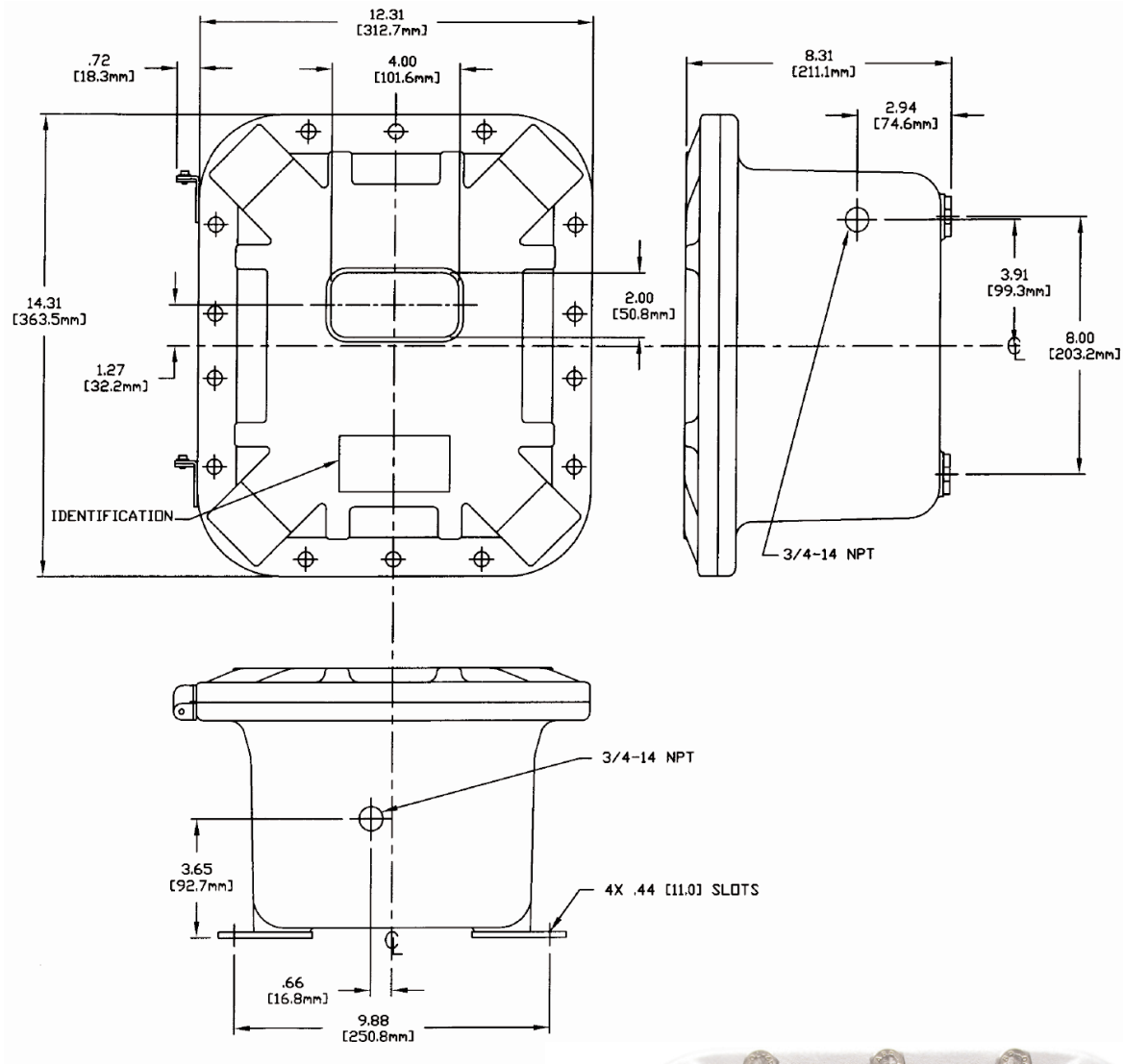


NEMA 4X



TACHTROL plus Enclosure Options

T77810-70



EXPLOSION PROOF

UL/CSA for Hazardous Locations

Class I, Groups B, C & D

Class II, Groups E, F & G

Class III

Also Class I, Zone 1, Groups IIB + H₂, IIA

ATEX

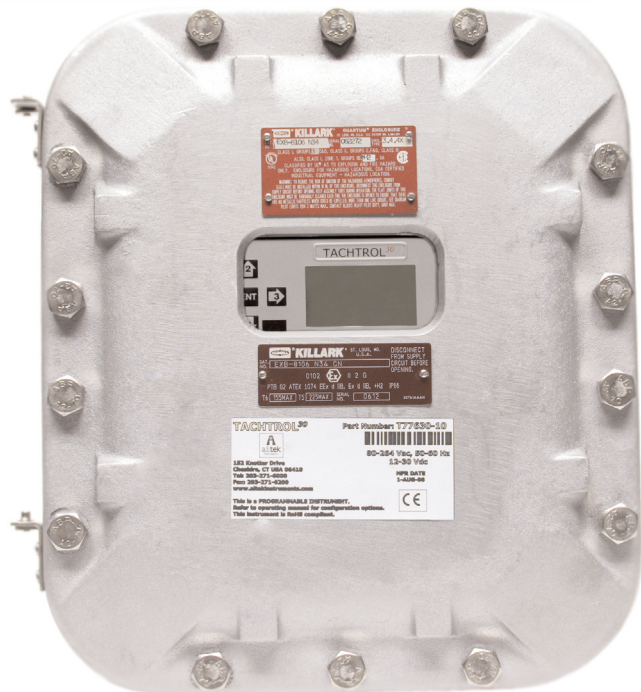
0102 EX II 2 G

For use in Zone 1 Groups

IIA, IIB & IIB+H₂ T6 or T5,

IP66 hazardous locations

Certifications Inside Enclosure
(Consult Factory For Latest Update)



NEW GENERATION TACHOMETER ACCESSORIES

RoHS



REMOTE

P/N: T776/8 - REMOTE

Used with all TACHTROL 10 & 30 & plus Devices

Net weight: 0.15 lbs

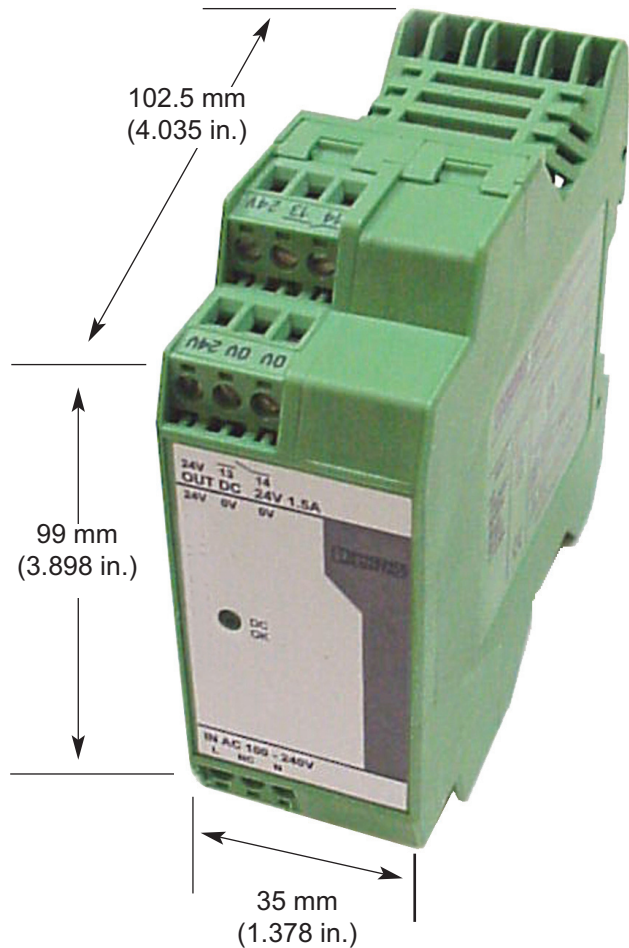
Optional, Power Supply Kit with T-Bus Connector

P/N: T775/6-PWR SPLY

Optional use with all TACHPAK 10 & 30 & TACHTROL 10 & 30 when more supply power required.

Rating: 100-240 VAC/24 VDC/1.5A

Net weight: 1 lb.



NEW GENERATION TACHOMETER ACCESSORIES

RoHS

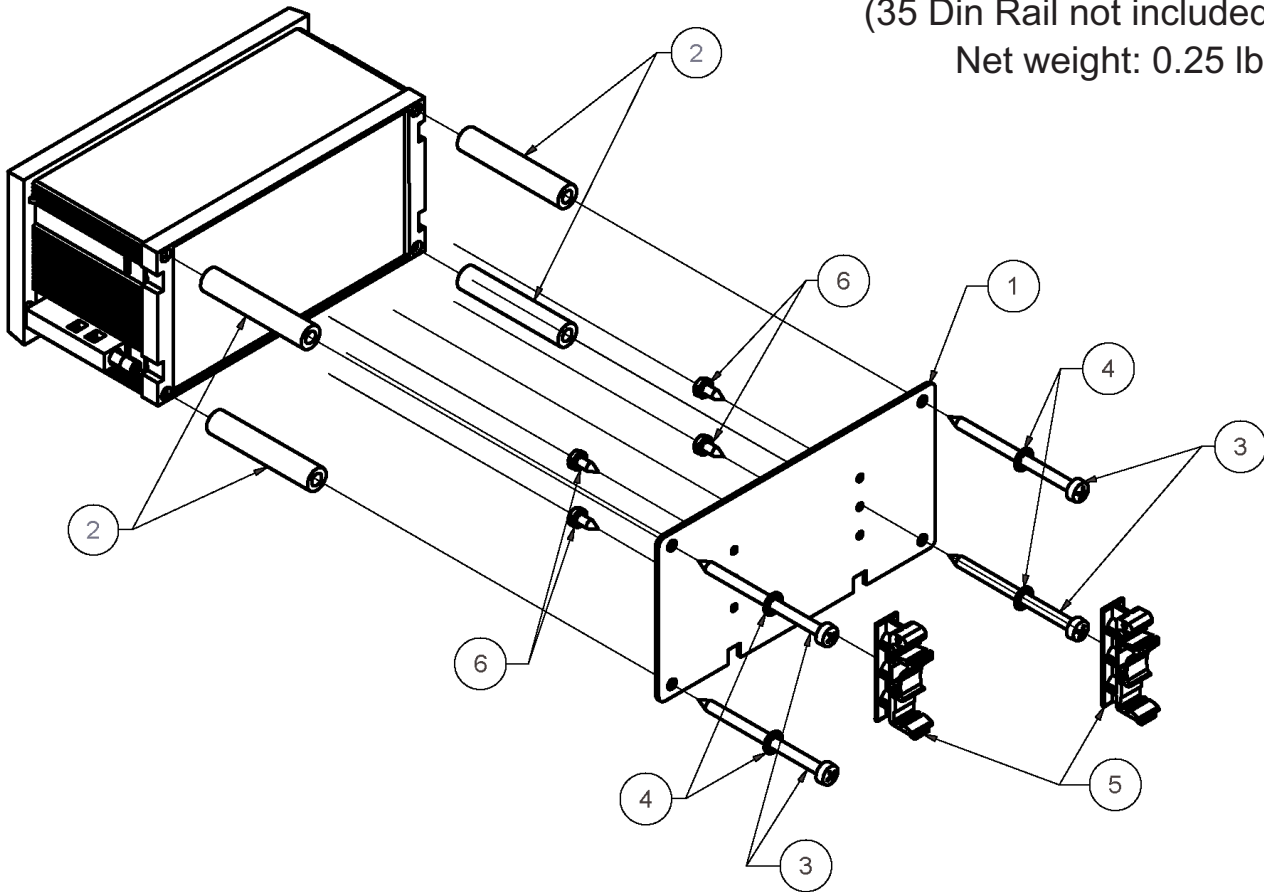
TACHTROL-TO-DIN RAIL MOUNTING KIT

P/N: 675-0300-001

Used with all TACHTROL 10 & 30 & plus

(35 Din Rail not included)

Net weight: 0.25 lbs



Overall Depth = 5.75 inches

| 675-0300-001, Tachtrol Mounting Kit | | | |
|-------------------------------------|-----|--------------|---------------------------------|
| ITEM | QTY | PARTNUMBER | DESCRIPTION |
| 1 | 1 | 150-0201-001 | PLATE |
| 2 | 4 | 196-0202-002 | SPACER, NYLON |
| 3 | 4 | 186-0206-001 | SCREW, TAPPING #8 X 2.5:, SST |
| 4 | 4 | 227-0301-002 | WASHER, #8, INTERNAL TOOTH LOCK |
| 5 | 2 | 020-0310-001 | BRACKET, DIN RAIL CLIP |
| 6 | 4 | 186-0209-001 | SCREW, SHEET METAL #4-40 |



TACHTROL® 20 Single Input Digital Tachometer

Part Number Series

T77250

CE

RoHS

TACHTROL® 20:

The newest member of the **AI-TEK** Tachometer family.

The **TACHTROL® 20** is a single input digital instrument designed to provide the versatility and flexibility needed to accommodate virtually any rate measuring application. Configurable to display application-specific rate information in raw frequency or engineering units such as RPM or FPM.

The **TACHTROL® 20** can accommodate magnetic pickups, logic sensors, and NPN open collector sensors. The pulses are received and scaled so the desired display can be achieved. The meter is programmed through both the front panel buttons and DIP switches. Once the programming is complete, the front panel buttons can be disabled by a DIP switch setting.

The meter has been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing to meet CE requirements, the meter provides a tough, yet reliable application solution.

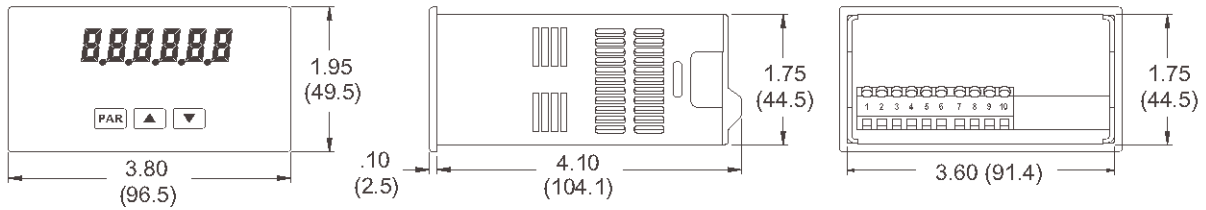
FEATURES AND ADVANTAGES:

- Single-channel precision speed or rate monitoring
- Field adjustable scaling
- Bright six-digit LED display
- Wide frequency range 0.1 to 25 kHz
- Active or passive sensor input
- Panel Mount 1/8 DIN standard housing
- Fast response
- Low cost
- Easy set-up
- High precision
- Operating temperature range 0° to 60° C
- AC power: 115 / 230 volts selectable
- DC power: 10-16 volts at 0.1A max

It is the customer's responsibility to determine whether the product is proper for customer's use and application.

DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H X 5" (127) W.

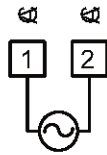


PANEL MOUNT STANDARD ENCLOSURE

3.1 POWER WIRING

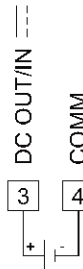
AC Power

Terminal 1: VAC
Terminal 2: VAC



DC Power

Terminal 3: +VDC
Terminal 4: COMM



3.2 INPUT WIRING

| | | |
|---|---|---|
| <p>Magnetic Pickup</p> | <p>AC Inputs From Tach Generators, Etc.</p> | <p>Two Wire Proximity, Current Source</p> |
| <p>Current Sinking Output</p> | <p>Current Sourcing Output</p> | <p>Interfacing With TTL</p> |
| <p>Emitter Follower; Current Source</p> | <p>SAFETY SUMMARY All safety related regulations, local codes and instructions that appear in the literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.</p> | |

*Switch position is application dependent.



CAUTION: Risk of Danger.
Read complete instructions prior to installation and operation of the unit.

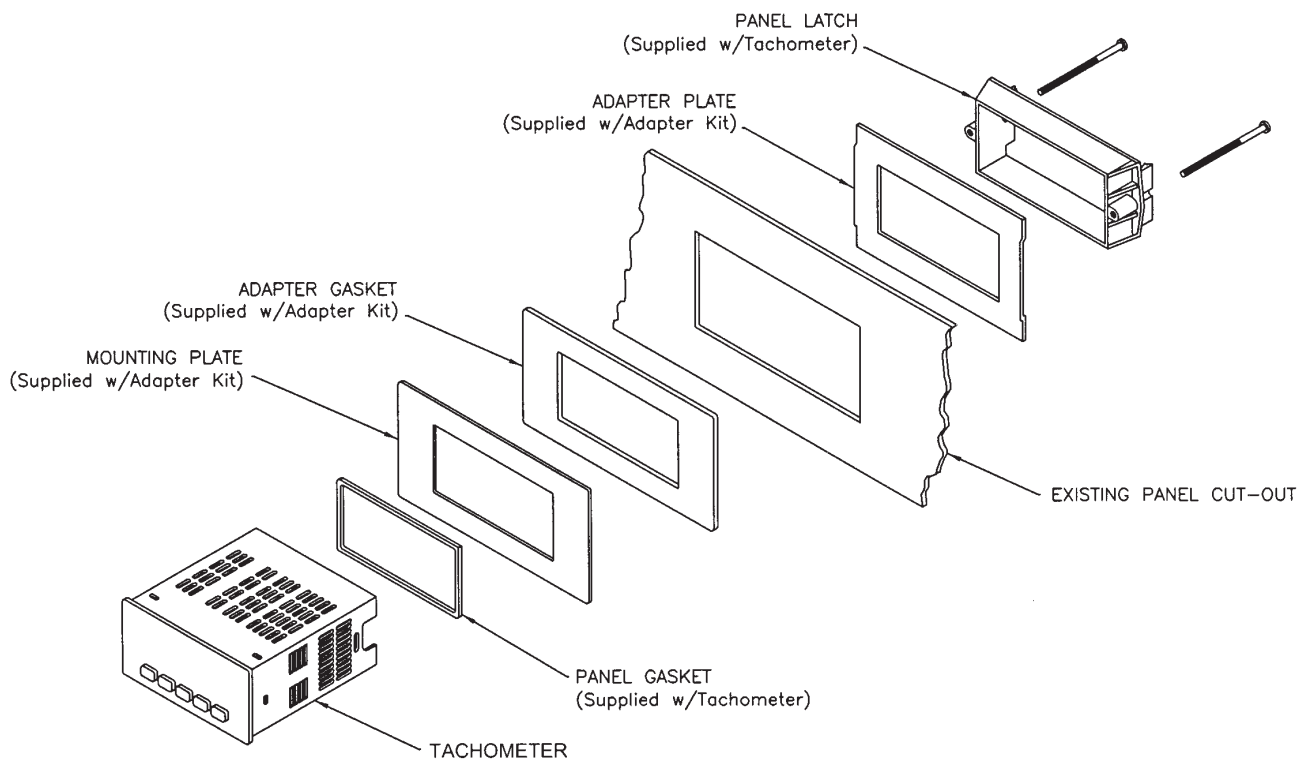


CAUTION: Risk of electric shock.

TACHTROL® 20

Panel Mount Adapter Installation Instructions

1. Apply the panel gasket (*supplied with Tachometer*) over the **TACHTROL® 20** meter.
2. Insert the **TACHTROL® 20** meter through the mounting plate.
3. Apply the panel gasket (*supplied with the adapter kit*) over the **TACHTROL® 20** meter behind the mounting plate.
4. Insert the **TACHTROL® 20** meter with mounting plate and gaskets into the front of the existing **Tachtrol 2** meter hole cut-out. Slide the adapter plate over the rear of the **TACHTROL® 20** meter.
5. Slide the panel latch (*supplied with the Tachometer*) over the rear of the **TACHTROL® 20** meter and tighten the screws.



TACHTROL® 20 PANEL MOUNT ADAPTER — P/N: 675-0303-001

Target / Speed Variables Conversion

$$f = \frac{\text{RPM}}{60} \times \text{PPR} = \frac{\text{SS} \times \text{PPR}}{\pi \times D} = \frac{\text{UPM}}{60} \times \text{PPU} = \frac{\text{UPH}}{3600} \times \text{PPU}$$

$$\text{SS} = \frac{\text{RPM}}{60} \times \pi \times D = \frac{f \times \pi \times D}{\text{PPR}}$$

$$\text{RPM} = \frac{60 \times f}{\text{PPR}} = \frac{60 \times \text{SS}}{\pi \times D}$$

$$D = \frac{(\text{PPR} + 2)}{\text{DP}} = \frac{\text{SS} \times \text{PPR}}{f \times \pi}$$

$$\text{DP} = \frac{(\text{PPR} + 2)}{D} = \frac{25.4}{M}$$

$$\text{CP} = \frac{\pi}{\text{DP}} = \frac{\pi \times \text{PD}}{\text{PPR}}$$

$$\text{PD} = \frac{\text{PPR}}{\text{DP}} = \frac{\text{CP} \times \text{PPR}}{\pi}$$

$$M = \frac{25.4}{\text{DP}} = \frac{25.4 \times D}{(\text{PPR} + 2)}$$

$$\text{PPR} = (D \times \text{DP}) - 2 = \frac{60 \times f}{\text{RPM}} = \frac{f \times \pi \times D}{\text{SS}}$$

Definitions:

- f = frequency in Hz or cycles per second (cps)
- SS = surface speed in inches per second (ips)
- RPM = rotary speed in revolutions per minute
- PPR = pulses per revolution or number of gear teeth
- D = outside diameter of target (gear) in inches
- PD = pitch diameter of target (gear) in inches
- π = 3.14
- UPM = unit measure per minute
- UPH = unit measure per hour
- PPU = pulses per unit measure
- DP = diametral pitch = number of teeth in 1 inch pitch diameter
- CP = circular pitch = arc distance between teeth on pitch circle
- M = metric module = pitch diameter in mm divided by number of gear teeth

