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**For more details see**

**[http://www.wavetrak.ca/pdf/Wavetrak\\_Warranty\\_Card.pdf](http://www.wavetrak.ca/pdf/Wavetrak_Warranty_Card.pdf)**

**[www.wavetrak.ca](http://www.wavetrak.ca)**



## **WT-D6-Ex, WT-C6-Ex, WT-D3-Ex, WT-C3-Ex and WT-AA-Ex PIG TRACKING TRANSMITTERS USER MANUAL**

**This manual applies to all IECEx/ATEX certified models of Wavetrak Ex 22 Hz and coded transmitters when used with a Wavetrak WT-Ex-RC receiver.**

**Proudly Manufactured By:  
Wavetrak Electronics Ltd.**

Along with the regular stock transmitters, Wavetrak offers custom transmitters to meet the requirements of different tracking circumstances. Stock size transmitters can be built for specific signal strength or battery life.

**\*NOTE:** Transmitter detection range depends on a number of variables including pipe thickness and amount of earth the signal must pass through. Therefore, the detection range in different field circumstances may not be the same as the open air detection range listed above.

### TROUBLESHOOTING

Problem	Solution
The transmitter will not emit signal:	<ul style="list-style-type: none"> <li>- Ensure that the unit has fresh batteries installed properly with correct polarity and making good contact.</li> <li>- Ensure that the internal sleeve is in good condition.</li> <li>- Ensure that both springs are in good condition.</li> <li>- Check transmitter operation with a different Receiver to ensure that the receiver is working properly.</li> </ul>
Fluid and/or gas leaks into battery compartment:	<ul style="list-style-type: none"> <li>- Inspect o-rings and replace if necessary.</li> </ul>

#### Wavetrak Electronics Ltd.

32 Airport Rd.  
Edmonton, AB, Canada T5G 0W7  
(780) 423-1703  
[www.wavetrak.ca](http://www.wavetrak.ca)

## WT-D6-Ex

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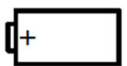
Specification	Value
Operating Voltage	- 6 Volts
Batteries	- 4 x D Cell Alkaline (LR20) - Wavetrak recommends: Duracell Procell PC1300
Power Wattage Rating	- 340 mA 6V
Operating Temperature	- -20°C to +50°C
Weight	- 8.5 lbs
Transmitter Dimensions	- 11.20" x 2.50" - 284.48mm x 63.50mm in diameter
Materials	- 304 Stainless Steel body, 303 Stainless Steel cap
O-Ring Size	- 2—137/V90 (Viton O-ring)
Recommended Cap Torque Setting	- 108 in-lbs - 9 ft-lbs - 12.2 N·m
Delrin Can Size	- 14.430" x 3.48"
Detection Range	- 50 ft. (open air)*
Battery Life:	
Standard	- 350+ hours
Continuous	- 250+ hours
Recommended Pipeline Size	- 10" + in diameter

### Markings:

**[SIGNAL TYPE]**  
 PIPELINE TRANSMITTER  
 MODEL - WT-D6-Ex  
 SER. # 20XX-4XXX  
 340 mA 6V  
 Ex d IIC T4 Gb  
 -20°C ≤ Ta ≤ +50°C  
 Ex II 2 G CE  
 IECEx ITS 16.0001 ITS16ATEX18398

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 CDN PATENT # 2242390  
 USA PATENT # 6088580

**CAUTION**  
 ONLY INSTALL  
 BATTERIES OF  
 TYPE: ALKALINE  
 SIZE D (LR20) - 1.5V



**- ATTENTION -**  
 REPLACE O-RINGS  
 AND REMOVE  
 BATTERIES AFTER  
 EACH DEPLOYMENT

**- WARNING -**  
 DO NOT OPEN  
 WHEN A  
 HAZARDOUS GAS  
 ATMOSPHERE  
 IS PRESENT

**- WARNING -**  
 DO NOT INSTALL  
 OR REMOVE  
 BATTERIES IN  
 HAZARDOUS  
 ENVIRONMENT

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Wavetrak Ex model transmitters come ready to use, with both of the sealing o-rings and a battery sleeve installed.

The body of the transmitter is marked with the type of signal it transmits. they can be one of the following,

- 22Hz Pulse (pulsing 22 Hz signal at 48 beats per minute [bpm])
- 22Hz Continuous (continuous 22 Hz signal)
- Code A (pulsing 22Hz signal at 48 bpm with a Code A signal after each pulse)
- Code B (pulsing 22Hz signal at 48 bpm with a Code B signal after each pulse)
- Code C (pulsing 22Hz signal at 48 bpm with a Code C signal after each pulse)

**OPERATION**

Before using the transmitter, it is recommended that the o-rings be visually inspected for damage. **Always** use fresh batteries of the size appropriate to your transmitter (see the SPECIFICATIONS section for battery specifications for each transmitter model). If either of the o-rings are damaged, replace them with the appropriate o-ring for the transmitter model you are using (see the SPECIFICATIONS section for the o-ring sizes). There is no on/off switch on the transmitter. Power on/off is solely controlled by installing/removing the batteries.

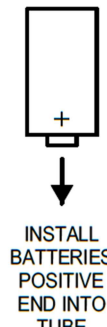
To place the transmitter into operation, insert the batteries into the transmitter with the positive side going in first (as indicated by the markings on the transmitter). Put the cap on the transmitter and screw it on, making sure that it goes all the way down. There should be no gap between the cap and the body of the transmitter when it is properly installed.

Specification	Value
Operating Voltage	- 3 Volts
Batteries	- 2 x D Cell Alkaline (LR20) - Wavetrak recommends: Duracell Procell PC1300
Power Wattage Rating	- 220 mA 3V
Operating Temperature	- -20°C to +50°C
Weight	- 4.5 lbs
Transmitter Dimensions	- 6.436" x 2.50" - 163.48mm x 63.50mm in diameter
Materials	- 304 Stainless Steel body, 303 Stainless Steel cap
O-Ring Size	- 2-137/V90 (Viton O-ring)
Recommended Cap Torque Setting	- 108 in-lbs - 9 ft-lbs - 12.2 N-m
Delrin Can Size	- 8.24" x 3.48"
Detection Range	- 30 ft. (open air)*
Battery Life:	
Standard	- 150+ hours
Continuous	- 125+ hours
Recommended Pipeline Size	- 10" + in diameter

**Markings:**

[SIGNAL TYPE]  
PIPELINE TRANSMITTER  
MODEL - WT-D3-Ex  
SER. # 20XX-5XXX  
220 mA 3V  
Ex d IIC T4 Gb  
-20°C ≤ Ta ≤ +50°C  
Ex II 2 G  
IECEx ITS 16.0001  
ITS16ATEX18398

**CAUTION**  
ONLY INSTALL BATTERIES OF TYPE: ALKALINE SIZE D (LR20) - 1.5V



INSTALL BATTERIES POSITIVE END INTO TUBE

**- ATTENTION -**  
REPLACE O-RINGS AND REMOVE BATTERIES AFTER EACH DEPLOYMENT

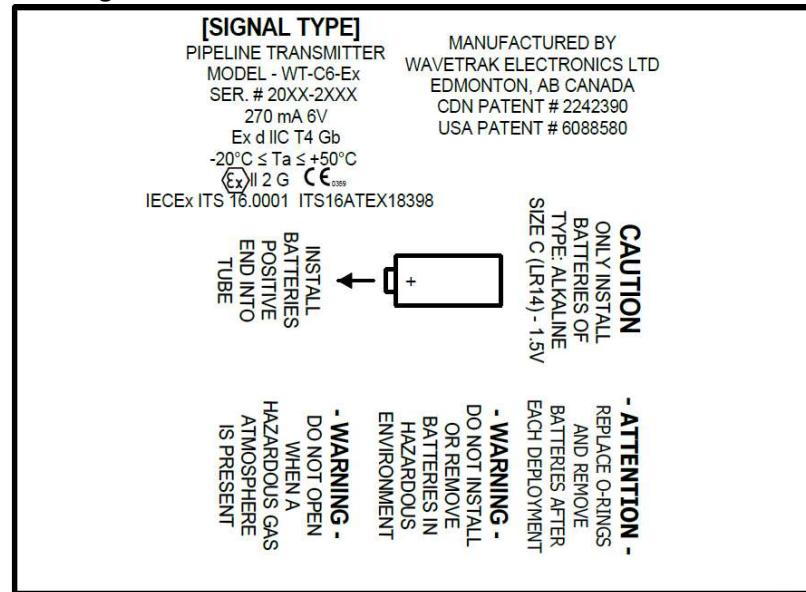
**- WARNING -**  
DO NOT INSTALL OR REMOVE BATTERIES IN HAZARDOUS ENVIRONMENT

**- WARNING -**  
DO NOT OPEN WHEN A HAZARDOUS GAS ATMOSPHERE IS PRESENT

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CDN PATENT # 2242390  
USA PATENT # 6088560

Specification	Value
Operating Voltage	- 6 Volts
Batteries	- 4 x C Cell Alkaline (LR14) - Wavetrak recommends: Duracell Procell PC1400
Power Wattage Rating	- 270 mA 6V
Operating Temperature	- -20°C to +50°C
Weight	- 4 lbs
Transmitter Dimensions	- 9.20" x 1.90" - 233.68mm x 48.26mm in diameter
Materials	- 304 Stainless Steel body, 303 Stainless Steel cap
O-Ring Size	- 2-128/V90 (Viton O-ring)
Recommended Cap Torque Setting	- 54 in-lbs - 4.5 ft-lbs - 6.1 N-m
Delrin Can Size	- 11" x 2.45"
Detection Range	- 40 ft. (open air)*
Battery Life:	
Standard	- 300+ hours
Continuous	- 200+ hours
Recommended Pipeline Size	- 8" + in diameter

Markings:



Check that the transmitter is functioning properly by using a receiver. Place batteries in the transmitter and position it parallel to the receiver, then turn the receiver on. The appropriate light should flash on the receiver for the type of transmitter being used. The standard 22 Hz light (red) will flash if the transmitter is standard and, if the transmitter is coded, before the code light flashes. If coded, the appropriate light should follow the 22 Hz light (red), Code A (yellow), Coded B (blue), Code C (white). The buzzer will sound periodically (if turned on), in harmony with the flash of the lights. If the transmitter is continuous, the same should happen with the difference being that it will not pulse, rather the detect lights on the receiver will remain on continually. This will also be evident by the buzzer sounding constantly (if turned on), while the transmitter is emitting signal.

- 1) **WARNING: NEVER UNSCREW OR OPEN THE BATTERY COMPARTMENT OR INSTALL BATTERIES IN A HAZARDOUS ENVIRONMENT.**
- 2) **Always** install new batteries appropriate to your model of transmitter. Do not mix old and new batteries, or batteries from different manufacturers. Failure to do this can result in reduced battery life or transmitter failure.
- 3) Always remove the batteries from the transmitter after use,
- 4) If installing a heat-shrunk battery pack in place of separate batteries, remove the battery sleeve from the inside of the battery compartment to allow enough room for the battery pack to slide in.
- 5) Always check the condition of the o-rings and internal plastic sleeves.
- 6) Always ensure that the cap is tightened so that it is tight to the body of the transmitter to ensure proper sealing and avoid damage.
- 7) Recommended torque settings for installing the cap to the transmitter body are listed in the specifications table.
- 8) Do not clamp the transmitter in a vice or use a pipe wrench or damage may result.

**ATTACHING THE TRANSMITTER TO THE PIG**

Foam Polypigs

Depending on the transmitter and the pig being used, the transmitter can often be fit into the recessed cavity of the pig.

Metal Bodied Pigs

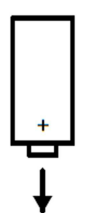
In many cases a flange mount will be required to bolt the transmitter to the pig. Contact the pig manufacturer for mounting hardware and instructions.

Specification	Value
Operating Voltage	- 3 Volts
Batteries	- 2 x C Cell Alkaline (LR14) - Wavetrak recommends: Duracell Procell PC1400
Power Wattage Rating	- 500 mA 3V
Operating Temperature	- -20°C to +50°C
Weight	- 2 lbs
Transmitter Dimensions	- 5.342" x 1.90" - 135.68mm x 48.26mm in diameter
Materials	- 304 Stainless Steel body, 303 Stainless Steel cap
O-Ring Size	- 2-128/V90 (Viton O-ring)
Recommended Cap Torque Setting	- 54 in-lbs - 4.5 ft-lbs - 6.1 N-m
Delrin Can Size	- 6.757" x 2.45"
Detection Range	- 28 ft. (open air)*
Battery Life:	
Standard	- 150+ hours
Continuous	- 100+ hours
Recommended Pipeline Size	- 8" + in diameter

Markings:

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USA PATENT # 6088580

**CAUTION**  
ONLY INSTALL  
BATTERIES OF  
TYPE: ALKALINE  
SIZE C (LR14) - 1.5V



INSTALL  
BATTERIES  
POSITIVE  
END INTO  
TUBE

**- ATTENTION -**  
REPLACE O-RINGS  
AND REMOVE  
BATTERIES AFTER  
EACH DEPLOYMENT

**- WARNING -**  
DO NOT INSTALL  
OR REMOVE  
BATTERIES IN  
HAZARDOUS  
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**- WARNING -**  
DO NOT OPEN  
WHEN A  
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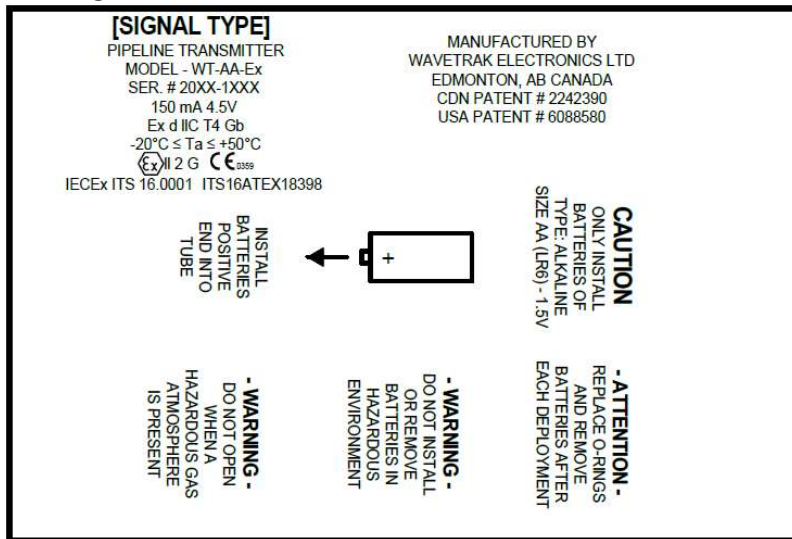
[SIGNAL TYPE]  
PIPELINE TRANSMITTER  
MODEL - WT-C3-Ex  
SER. # 20XX-3XXX  
500 mA 3V  
Ex d IIC T4 Gb  
-20°C ≤ Ta ≤ +50°C  
Ex II 2 G  
IECEX ITS 16.0001  
ITS16ATEX18398



WT-AA-Ex

Specification	Value
Operating Voltage	- 4.5 Volts
Batteries	- 3 x C Cell Alkaline (LR6) - Wavetrak recommends: Duracell Procell PC1500
Power Wattage Rating	- 150 mA 4.5V
Operating Temperature	- -20°C to +50°C
Weight	- 1.5 lbs
Transmitter Dimensions	- 7.23"x 1.42" - 183.64mm x 36.07mm in diameter
Materials	- 304 Stainless Steel body, 303 Stainless Steel cap
O-Ring Size	- 2-024/V90 (Viton O-ring)
Recommended Cap Torque Setting	- 48 in-lbs - 4 ft-lbs - 5.4 N·m
Delrin Can Size	- 8.5" x 1.91"
Detection Range	- 26 ft. (open air)*
Battery Life:	
Standard	- 150+ hours
Continuous	- 100+ hours
Recommended Pipeline Size	- 6" + in diameter

Markings:



- 1) Always attach the transmitter with the transmitter cap end first into the pig.
- 2) Always ensure that the transmitter is attached to an appropriately sized pig that will provide sufficient clearance for the transmitter from the pipe wall.  
**WARNING: ENSURE THAT THE TRANSMITTER WILL AT NO TIME CONTACT THE PIPE WALL WHILE THE PIG IS TRAVELLING THROUGH THE PIPELINE. THIS WILL CAUSE DAMAGE AND WILL VOID THE WARRANTY. THIS COULD ALSO CAUSE THE TRANSMITTERS EXPLOSION PROOF FEATURES LOSE THEIR EFFECTIVENESS.**
- 3) It is recommended that the transmitter be mounted inside a delrin can. These are available as a separate accessory from Wavetrak.

MAINTENANCE

**WARNING: NEVER UNSCREW OR OPEN THE BATTERY COMPARTMENT WHILE IN A HAZARDOUS ENVIRONMENT.**

Always remove the batteries from the transmitter after use. Inspect the transmitter and sleeve in the battery compartment for damage. Contact Wavetrak for new plastic sleeves.

It is recommended that the o-rings be replaced after each use. Consult the specifications in this manual to find the proper size of o-ring for your transmitter and recommended closing torque value.

USE WITH A RECEIVER

Power up the transmitter. Before placing it into use in the pipeline, a function test should be conducted with the receiver to ensure that maximum signal strength is being generated by the transmitter, and that the receiver is operational (Refer to: OPERATION). Once the open air test is complete, fasten the transmitter to the tool and insert into the launch

barrel. Locate the transmitter and ensure transmitter is operational prior to launch. (Refer to: LOCATING THE TRANSMITTER AT THE LAUNCH / TRAP).

### DETECTING TOOL PASSAGE IN THE FIELD

To detect tool passage, the external antenna (or receiver itself if not using the external antenna) should be placed parallel with the pipeline and on top of the pipeline location waiting for the tool to pass. The receiver gain should be set as high as possible without detecting interference or noise. When the tool passes underneath the antenna, the operator should be able to see the transmitter signal rise in strength on the receiver. The 22Hz light and any appropriate code lights will turn on (to match either a standard, continuous, or coded transmitter), and the buzzer will sound. As the transmitter continues on down the pipeline the signal strength will decrease until the transmitter is out of range. When the signal is at its peak the transmitter is directly under the antenna.

### WALKING WITH RECEIVER TO DETECT THE TRANSMITTER

When working near noise generated by neighboring electrical lines, areas with large electrical apparatus, or by erratic movements of the antenna, the technician should recognize that these signals can trigger the 22 Hz detect light and buzzer, as well as the A, B and C code lights of the receiver. If the receiver seems to have picked up a stray signal then simply stop and steady the receiver. Check to see if there is the distinctive solid tone or beat of the transmitter. If no solid tone or pulsing beat is detected then most likely noise triggered the receiver and the operator should continue the search. When walking with the receiver to locate a transmitter (such as to locate a stuck pig), the external antenna is least likely to pick up noise when **gently** suspending the antenna by holding the cable, allowing the antenna to point to the ground. As the technician approaches the transmitter with the antenna

in a vertical position over the line, the signal level indicated by both the meter and lights will increase until the antenna is directly over the transmitter. (Detection could start well over 30 feet from the transmitter's actual location). When the antenna is exactly over the transmitter a sharp signal loss or "null" will occur. As the antenna is moved on either side of the null point the signal strength will again increase. The receiver signal gain should be adjusted to suit the strength of the transmitter and distance between transmitter and receiver.

### LOCATING THE TRANSMITTER AT THE LAUNCH / TRAP

In most cases, technicians find it convenient to use the internal antenna to locate the transmitter at launch and trap facilities. Depending on facility interference, the receiver is usually set on a 3/4 gain and pointed in the direction of the where the transmitter is thought to be. With a slow sweeping motion and advancing towards the transmitter the technician watches the meter or signal lights for the greatest signal, the technician is then able to identify the direction in which the greatest gain comes from. While moving closer to the transmitter the technician will likely be required to turn down the gain due to the proximity of the signal. Move the receiver from side to side or back and forth with receiver or external antenna (if used) pointing perpendicular to the tool. When the receiver is perpendicular to and exactly in the middle of the transmitter a null (sharp loss) in the signal strength will be evident. In fact, at that precise position the receiver may indicate that there is no signal.