



PULSAR® R86 RADAR

The Smarter Non-Contact Radar Transmitter

Frequently Asked Questions

What is the Pulsar® Model R86?

The Pulsar Model R86 is Magnetrol's first industrial, 26 GHz Pulse Burst Non-Contact Radar transmitter. Although it looks very similar to our previous Model R96 from the outside, the design and performance improvement offered by the higher frequency signal makes this transmitter the first choice for most applications.

What makes this unit different from any of the other previously released Pulsar transmitters?

With a platform built off of the highly successful Eclipse® Model 706 Guided Wave Radar (GWR) transmitter, this upgrade of the Pulsar transmitter encompasses over 13 years of Magnetrol Radar design and application experience. Hardware, firmware, and mechanical changes have been made to improve specifications, reliability, and overall performance.

What are the primary advantages of the Pulsar Model R86?

Primary advantages include:

- ± 3 mm measured error
- 1 mm resolution
- 1.7 minimum dielectric (1.4 in stillwells)
- 1½" to 4" Horn antennas
- Nozzle extensions to 72" (1.8 meters)
- HTHP antennas: 750°F (400°C) / 2320 psi (160 bar)

Are there other improvements with this new model?

Yes, there are numerous improvements. These consist of:

- Circular Polarization
 - Eliminates the need for antenna adjustment during the installation and commissioning process
- An 8-line by 22 character graphic LCD display
 - This display not only allows larger characters to be shown, it also allows us to display an echo curve at the transmitter.
- 4-button keypad
- Fully encapsulated electronics with gasketed LCD module, making the assembly "splash proof"
- Die-cast aluminum and 316ss housings, making the transmitter much lighter
- A larger, more powerful microprocessor has been incorporated into the design. This microprocessor has significantly increased the amount of memory available, allowing us to include some exciting new features such as:
 - Volumetric capability with nine (9) common tank shapes and a 30-point strapping table for uncommonly shaped vessels
 - Data logging, which can be programmed to save data/echo curves on either event-based or time-based conditions
- 130 feet (40 meters) measuring range covers >99% of all known radar applications
- SIL 2 hardware compliance (with third party exida FMEDA Report) as standard. Safe Failure Fraction (SFF) = 93.2%

What are the primary features and benefits of the new Pulsar Model R86?

The top features and benefits of the new Model R86 are:

- Improved Performance
The 26 GHz radar signal has a smaller wavelength, allowing for smaller antennas and improved resolution.
- Circular Polarization
This eliminates the need for rotating the antenna to the proper orientation. It simplifies the installation process and almost guarantees proper alignment.
- Nozzle extensions to 72" (1.8 meters)
The R86 can be installed into nozzles longer than 12" (300mm), which has been our standard for years. This means non-standard nozzle lengths and buried vessel standpipes are no longer a problem.
- Improved Diagnostics
The graphic LCD display clearly communicates performance issues and displays troubleshooting tips when necessary. The benefit is reduced downtime.
- SIL 2 capability
The Safe Failure Fraction (SFF) of 93.2% reflects design robustness and encourages confidence in the device.
- HTHP Antennas
The antenna range of 750°F (400°C) / 2320psi (160 bar) allows installation in numerous applications greater than the previous 400°F (200°C) range that has been a common limitation.

Is the Model R86 backward compatible with older Model R96 antennas?

No, the different operating frequencies (26 GHz for the Model R86 vs. 6 GHz for the Model R96) mean a different set of antennas is required.

Will the Pulsar Model Number structure remain the same?

Yes. The 10-digit model number structure of the transmitter will be very similar to the Model R96.

Will the Pulsar Model R96 DTM operate with the new Pulsar Model R86 transmitters?

No. A brand new, enhanced PACTware™ DTM has been released for the Model R86. This new DTM is very similar to that of the Model 706. It offers improved troubleshooting capability and is much easier to navigate.

The new DTM includes:

- Automated Echo Capture, as with the Model 706 and Model R96
- An expanded Event History (now with 20 events) that includes diagnostic and configuration data. This is the go-to screen for troubleshooting
- Setup and Echo Rejection Wizards will easily guide new customers through the process
- Custom Echo Rejection allows users to modify an existing Echo Rejection curve to fit around moving echoes encountered in applications of mixing blades

It sounds like a lot of extra capability has been included in the Model R86. Is the device more complicated to use?

Absolutely not. As we do with all products, Magnetrol took great care in making the Model R86 easy to use. An average Pulsar user will be able to configure the new transmitter just as easily as with the existing R96 product. Wizards have been added to walk a new user through fundamental Configuration and Echo Rejection routines.

Does this extra capability affect the response time or initialization time of the Model R86?

No, with a power supply design similar to that of the Eclipse Model 706, the response time and the turn-on time of the new Model R86 are still the best in class.

Does the Model R86 utilize the very useful “Echo Margin” parameter like the Model R96?

Yes, Echo Margin is offered in the Model R86. When used in conjunction with the original Echo Strength parameter, this is a very useful troubleshooting tool. Echo Margin can be thought of as equivalent to a Signal-to-Noise Ratio, which is defined as a numeric value that is related to the strength of the target peak relative to noise (other competing waveforms) in the radar scene.

Is the Model R86 suitable for out of tank installations?

Yes, the Model R86 has FCC, ETSI, and Industry Canada communications approval for use on outdoor vessels.