



### PRODUCT FEATURES / BENEFITS

- Locates multiple leaks without loss of accuracy or sensitivity
- Detects growing leaks
- Locates breaks and shorts to reduce downtime
- Displays location of leaks up to location of breaks/shorts
- Ethernet and RS-232/RS-485 serial ports
- Able to commission system with limited initial lengths of wet cable
- Not susceptible to dust/dirt contamination of the sensor string
- Modbus TCP, RTU, and RTU over TCP protocols
- Optional BACnet IP gateway available
- FM Approved for FM 7745 - Diesel Leak Detector
- Zener barrier panel (ZBP) provides intrinsically safe sensor cable output circuits for hazardous locations:  
Class I, Division 1, Groups C & D  
Zone 0, Group IIB

### PRINCIPLE OF OPERATION

**PAL-AT®'s** TDR pulse echo technology operates similar to radar. Thousands of times each minute, safe energy pulses are sent out on the sensor cables. As these energy pulses travel down the cable, reflections are returned to the monitoring unit and a "map" of the reflected energy from the cable is stored in memory. The presence of liquids on the sensor cable, in sufficient quantities to "wet" the cable, will alter its electrical properties. This alteration will cause a change of the reflection at that location. When PAL-AT recognizes a change, it enters into alarm mode and automatically creates a new "map". This becomes the base line for the system, allowing PAL-AT to continue monitoring the cable for growing leaks, new leaks, breaks, shorts and/or

faults. The alarms are stored in an alarm queue to be acknowledged by an authorized user.

### SECURITY SYSTEM

**PAL-AT** requires a password entry before alarms can be acknowledged or system information can be changed. This feature limits access to only those employees who have been authorized to perform the advanced functions.

### SYSTEM ARCHIVES

Date and time history of significant events including power failure and cable leak/fault/break/short are stored in nonvolatile memory providing a documented record of system alarms.

### OUTPUT RELAYS

**PAL-AT** has several dry contact output relays, rated for 10 A @ 250 VAC. A fault relay monitors for loss of power. A common alarm relay is

activated when any fault is detected on any cable. It is reset when the audible alarm is silenced. A cable relay can be programmed to activate when any fault occurs or only when leaks are detected. The relay will stay active until the alarm is acknowledged.

### COMMUNICATION

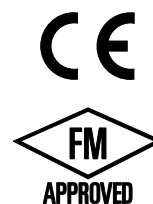
**PAL-AT** has an Ethernet port and two serial ports, RS-485 and RS-232, to interface with PALCOM® 10 w/GLS software or custom software. Refer to the Communication Options Data Sheet for detailed information.

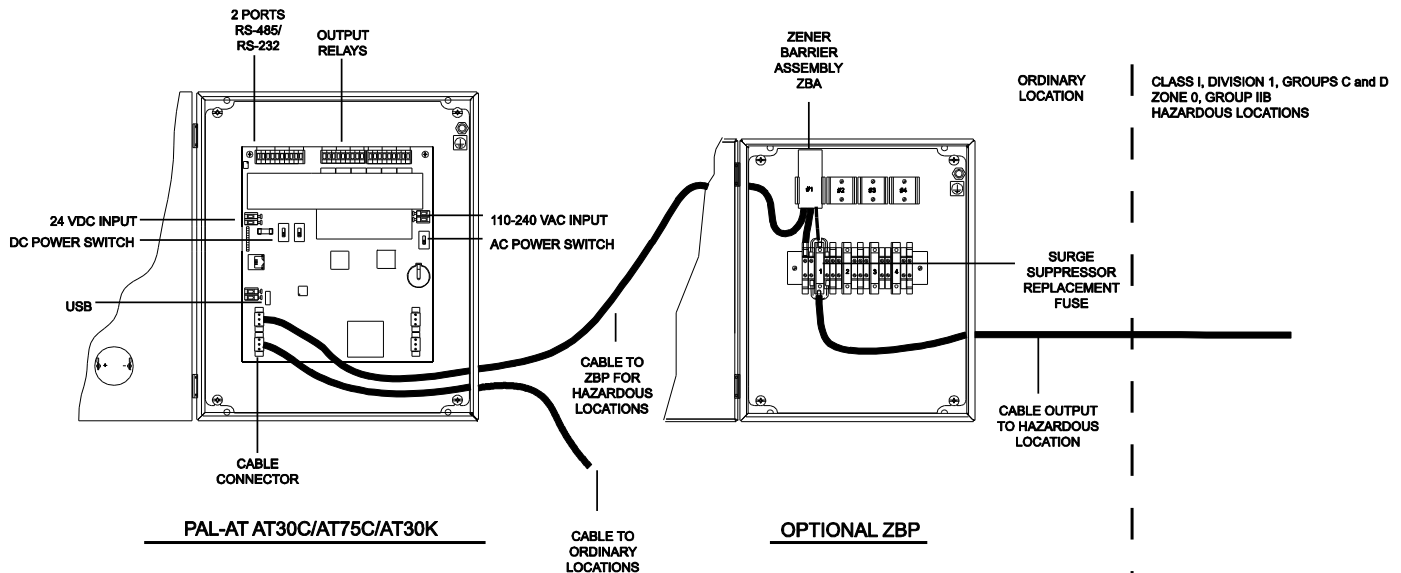
### MODBUS

**PAL-AT** communicates via Modbus TCP and Modbus RTU to pass system and cable status data to a Modbus host. It also enables the host to acknowledge the alarm queue remotely.

Model No.	Part No.	Cable Capacity	Maximum Cable Range Feet	Maximum Cable Range (Meters)
AT30C	8028300	1	3000	(900)
AT75C	8028310	1	7500	(2300)
AT30K	8028320	4	7500	(2300)

\*Refer to Sensor Cables Product Data for Technical details





#### HAZARDOUS AREAS

An optional **Zener Barrier Panel (ZBP)** is available if PAL-AT cables or probes are installed in Class I, Division 1, Groups C & D / Zone 0, Group IIB hazardous locations. The ZBP includes one **Zener Barrier Assembly (ZBA)**. One ZBA is required for each cable sensing string. The ZBP is expandable to hold up to four ZBAs.

#### FM 7745 Approval

The PAL-AT system has been certified by FM Approvals as a diesel leak detector per FM 7745. **Contact PermAlert for specific FM requirements.**

#### SURGE SUPPRESSOR

Each ZBA also functions as a surge suppressor to reduce damage to the PAL-AT from external voltage surges. It is used when cable locations are subject to frequent voltage surges or nearby lightning strikes. It has a replaceable fuse to get the system back on-line quickly. Each ZBA protects one cable string.

Model Number	Part Number	Description
ZBP	8028115	Zener Barrier Panel
ZBA	8028110	Zener Barrier Assembly
	8027884	FM Approval Modification



#### TECHNICAL DATA:

##### PAL-AT

- Dimensions: 13.75" x 11.81" x 4.00"  
(350 mm x 300 mm x 102 mm)  
Type 12 (IP52)
- Power: 110-240 VAC, 50/60 Hz, 0.3 A/50 VA  
24 VDC, 1 A/24 VA
- Weight: 14.6 lb (6.6 kg)
- Operating Range: -4°F to 122°F  
(-20°C to 50°C)

##### ALARM OUTPUTS:

- Fault Conditions: Leak, Break, Short or Probe Activation
- Distance to Fault Location
- Date and Time of Fault
- Activation of Output Relays
- Red LED Optical Alarm
- BMS Interface
- Modbus TCP/RTU Output
- BACnet IP gateway available

##### ZBP:

- Dimensions: 11.81" x 9.84" x 4.00"  
(300 mm x 250 mm x 102 mm)  
Type 4, 12 (IP66)
- Weight: 12.0 lb (5.4 kg)
- Operating Range: -4°F to 140°F  
(-20°C to 60°C)

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