

PD8-154/158 Explosion-Proof Alarm Annunciators

Data Sheet



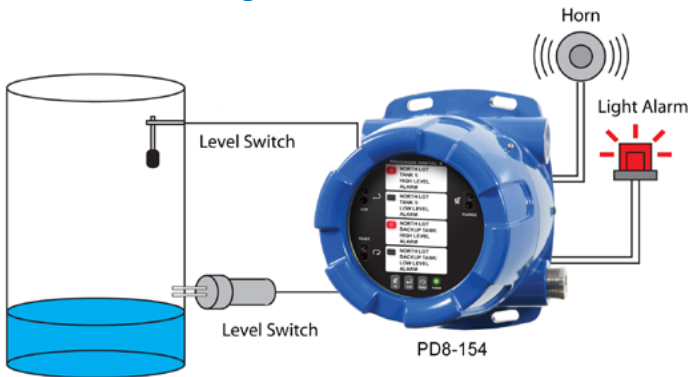
ProtEXTM
MAX



- Fully Approved Explosion-Proof Annunciators
- Switch, Open Collector NPN Transistor, and Logic Level Inputs
- 4- or 8-Point Monitoring
- 8 Field Selectable ISA Sequences Including First-Out
- Multiple-Unit First-Out Indication
- Free Custom Message Labels
- Silence, Acknowledge, and Reset Functions
- Sunlight Readable Indication
- SafeTouch Through-Glass Button Programming
- Annunciator Mountable at 0°, 90°, 180°, & 270°
- 24 VDC @ 200 mA Power Available to Drive Other Devices (AC Models)
- 2 SPDT Relays for Alarm Activated Devices
- Operating Temperature Range: -55 to 65°C (-67 to 149°F)
- CSA Certified as Explosion-Proof / Dust-Ignition-Proof / Flame-Proof
- ATEX and IECEx Certified as Dust-Ignition-Proof / Flame-Proof
- Input Power Options Include 85-265 VAC or 12-36 VDC
- Built-in internal Audible Alarm with Silence Pushbutton
- Flanges for Wall or Pipe Mounting
- Explosion-Proof Aluminum or Stainless Steel NEMA 4X / IP68 Enclosures
- Four 3/4" NPT Threaded Conduit Openings
- Pipe Mounting Kits
- Stainless Steel Tag Available
- 3-Year Warranty

APPLICATIONS

Level Monitoring with Level Switches



The ProtEX-MAX Annunciator is ideal for tank level switch monitoring.

- Up to 8 Individually Labeled Level Switch Inputs
- 24 VDC Level Switch Power Supply
- Relays for External Horns and Light Alarms
- Easy NEMA 4X Mounting Enclosures
- Sunlight Readable Indication

Temp Monitoring with ProtEX-MAX Meters



Connect PD8-765 and PD8-7000 alarm relays to the PD8-154 or PD8158 for temperature alarm monitoring.

- First-Out Indication for Heating/Cooling Systems
- Multiple Unit First-Out Indication
- Remote Silence, Acknowledge, and Reset
- Fail-Safe Relays for Critical Applications

Multiple Unit First-Out Alarm Indication



Multiple Unit First-Out Indication

If multiple ProtEX-MAX™ annunciators are connected for multiple unit first-out indication, only one input from all connected devices will display as a first-out alarm.

First-Out Alarm Indication

The ProtEX-MAX Annunciator can be programmed for multiple sequences with first-out alarm indication. This feature indicates the first point of failure of a system when multiple alarms occur.

ALARM SEQUENCES

The ProtEX-MAX Alarm Annunciator can be programmed for all common ISA sequences including A, F1A, F2A, F3A, M, F1M. Selectable ISA -1 (Silence Button), -4 (No Lock-In), and horn disable options. Two popular sequences are detailed below.

ISA Alarm Sequence A

Acknowledgement and Automatic Reset

Momentary Alarm

Condition	LED	Horn
Normal	Off	Off
Alert	Flash	On
Normal	Flash	On
User Acknowledged		
Acknowledge	Off	Off

Maintained Alarm

Condition	LED	Horn
Normal	Off	Off
Alert	Flash	On
User Acknowledged		
Acknowledge	Steady	Off
Normal	Off	Off

ISA Alarm Sequence F2A

First-Out Alarm Indication with Acknowledgement and Automatic Reset

Momentary Alarm

Condition	LED		Horn
	1 st Pt	Next Pt	
Normal	Off	Off	Off
Alert	Flash	Steady	On
Normal	Flash	Steady	On
User Acknowledged			
Ack	Off	Off	Off

Maintained Alarm

Condition	LED		
	1 st Pt	Next Pt	Horn
Normal	Off	Off	Off
Alert	Flash	Steady	On
User Acknowledged			
Ack	Steady	Steady	Off
Normal	Off	Off	Off

FRONT PANEL

Button			
Description	Silence Horn	Acknowledge Alarm	Reset Inputs
LED	Description		
	Point status indicators		
	Indicates power is on		

LED Test: Press and release the SILENCE and ACK pushbuttons to flash the channel indicator LEDs for an LED function test.

Full Function Test: Press and hold the SILENCE and ACK pushbuttons for 3 seconds to initiate a full function test.

External Connections: All three pushbuttons may be activated remotely via rear terminal connections.

MESSAGE LABELS

Alarm message labels for the alarm annunciator may be factory printed at no charge, or field printed using a laser printer with clear self-adhesive labels.

Factory printed message labels may be ordered at any time by completing the following form.

_____ Please include label with my order
 _____ I have the Annunciator, please send label

Quantity _____
 Name _____
 Title _____
 Company _____
 Mailing Address _____
 City, St., Zip _____
 Phone _____
 Fax _____
 E-Mail _____
 PO# _____

Area available per message: PD154, 1.25" x 0.60" (32 mm x 15 mm); PD158, 1.25" x 0.25" (32 mm x 6 mm); user may specify any size and length that will fit in this area. Lines of 14 characters max at 9 point type will fit.

PD154							PD158						
Message 1							Message 1 & 2						
Message 2							Message 3 & 4						
Message 3							Message 5 & 6						
Message 4							Message 7 & 8						

SPECIFICATIONS

Except where noted all specifications apply to operation at +25°C.

General

Display: PD8-154: Four red LED channel indicators. PD8-158: Eight red LED channel indicators. One green LED power indicator.

Alarm Messages: Custom printed adhesive clear labels.

Area: PD8-154, 1.25" x .60" (32 mm x 15 mm), 4 messages PD8-158, 1.25" x .25" (32 mm x 6 mm), 8 messages

User specified size and length, up to 4 lines (PD8-154)

or 2 lines (PD8-158) of 14 characters of size 9 pt fonts.

Programming Methods: Rear 4-position switch for sequence selection and horn operation. Three SafeTouch through-glass buttons for NO/NC input selection, sequence option, and operation when cover is installed. Three internal pushbuttons when cover is removed.

Audible Alarm: 85 dB internal horn. The use of an external explosion-proof horn is recommended due to the internal horn's audibility being dampened by the explosion-proof enclosure.

Noise Filter: 40 ms debounce on inputs and external push buttons.

Shared First-Out Systems: 1 ms unit-to-unit delay. Maximum of 200 units in the shared first-out system.

Non-Volatile Memory: All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost.

Power Options: 85-265 VAC, 50/60 Hz; 90-265 VDC, 20 W max; or 12-36 VDC, 12-24 VAC, 6 W max.

Fuse: Required external fuse: UL Recognized, 5 A max, slow blow.

Up to 6 annunciators may share one 5 A fuse

Isolated Power Supply: 24 VDC ± 10% @ 200 mA max standard on 85-265 VAC powered units only.

Isolation: 4 kV input/output-to-power line.

Overvoltage Category: Installation Overvoltage Category II: Local level with smaller transient overvoltages than Installation Overvoltage Category III.

Environmental: T6 Class operating temperature range Ta = -55 to 60°C. T5 Class operating temperature range Ta = -55 to 65°C. Storage temperature range: -55 to 85°C (-67 to 185°F). Relative humidity: 0 to 90% non-condensing.

Connections: Removable screw terminal blocks accept 12 to 22 AWG wire.

Mounting: Two slotted flanges for wall mounting or NPS 1½" to 2½" or DN 40 to 65 mm pipe mounting.

Overall Dimensions: 6.42" x 7.97" x 8.47" (W x H x D)
 (163 mm x 202 mm x 215 mm)

Weight: Aluminum: 14.7 lbs (6.67 kg); Stainless Steel: 23.5 lbs (10.66 kg)

Warranty: 3 years parts & labor

Inputs

Input Types: NO or NC switches: No external excitation required.

Open collector transistor (NPN): Open circuit voltage approx. 3.3 VDC. Logic Levels: LOW = 0 to 0.9 VDC, HIGH = 2.4 to 28 VDC

Update Rate: 41 ms following alarm state; 1 ms for alarm state clear.

Sequences: Input follower, ISA Sequences A, F1A, F2A, F3A, M, F1M, and F3M per ISA Standard ISA-18.1-1979 R2004.

Sequence Options: A, F1A, F2A, F3A, M, F1M, F2M, and input follower with selectable options -1 (silence pushbutton), -4 (no lock-in), and -6 (no horn) per ISA Standard ISA-18.1-1979 R2004.

Relays

Rating: 2 SPDT (Form C); rated 3 A @ 30 VDC or 3 A @ 250 VAC resistive load; 1/14 HP @ 125/250 VAC for inductive loads.

Electrical Noise Suppression: A suppressor (snubber) should be connected to each relay contact switching inductive loads to prevent disruption to the microprocessor's operation. Recommended suppressor value: 0.01 µF/470 Ω, 250 VAC (PDX6901).

Relay Operation: Relay 1: Alarm state until alarm is acknowledged.

Relay 2: Alarm state if any channel indicating alarm condition.

Fail-Safe Operation: Programmable independent for each relay.

Note: In fail-safe mode, relay coil is energized in non-alarm condition. In case of power failure, relay will go to alarm state.

Enclosure

Material: AL Models: ASTM A413 LM6 die-cast aluminum, copper-free, enamel coated. SS Models: ASTM A743 CF8M investment-cast 316 stainless steel

Gasket: Fluoroelastomer

Rating: NEMA 4X, IP68 Explosion-proof

Color: AL: Blue. SS: Silver.

Window: Borosilicate glass

Conduits: Four 3/4" NPT threaded conduit openings

Conduit Stopping Plugs: Sold separately

Flanges: Two built-in flanges for wall and pipe mounting.

Tamper-Proof Seal: Cover may be secured with tamper-proof seal.

Overall Dimensions: 6.42" x 7.97" x 8.47" (W x H x D) (163 mm x 202 mm x 215 mm)

Weight: AL: 14.7 lbs (6.67 kg). SS: 23.5 lbs (10.66 kg).

ATEX: Flameproof protection

II 2 G D

Ex db IIC Gb

Ex tb IIIC Db

IP66/IP68

Tamb: -55°C to +85°C

Certificate Number: Sira 19ATEX1252U

IECEX: Flameproof and dust protection

Ex db IIC Gb

Ex tb IIIC Db

IP66/IP68

Tamb: -55°C to +85°C

Certificate Number: IECEX SIR 19.0075U

CSA:

Class I, Division 1, Groups A, B, C, D

Class II, Division 1, Group E, F, G

Class III

Ex db IIC Gb

Ex tb IIIC Db

Class I, Zone 1, AEx db IIC Gb

Zone 21, AEx tb IIIC Db

IP66/IP68/TYP E 4X

Tamb: -55°C to +85°C

Certificate Number: CSA19.80011200U

UL:

Class I, Division 1, Groups A, B, C, D

Class II, Division 1, Groups E, F, G

Class III

Class I, Zone 1, AEx db IIC Gb

Zone 21, AEx tb IIIC Db

Ex db IIC Gb

Ex tb IIIC Db

IP66/IP68/TYP E 4X

Tamb: -55°C to +85°C

Certificate Number: E518920

Note: The above approvals are for the enclosure only. See next page for approvals on the entire instrument.

General Compliance Information

Electromagnetic Compatibility

Emissions

EN 55022

Class A ITE emissions requirements

Radiated Emissions: Class A

AC Mains Conducted Emissions: Class A

Immunity

EN 61326-1

Measurement, control, and laboratory equipment

EN 61000-6-2

EMC heavy industrial generic immunity standard

RFI - Amplitude Modulated:

80 -1000 MHz 10 V/m 80% AM (1 kHz)

1.4 - 2.0 GHz 3 V/m 80% AM (1 kHz)

2.0 - 2.7 GHz 1 V/m 80% AM (1 kHz)

Electrical Fast Transients: ±2kV AC mains, ±1kV other

Electrostatic Discharge: ±4kV contact, ±8kV air

RFI - Conducted: 10V, 0.15-80 MHz, 1kHz 80% AM

AC Surge: ±2kV Common, ±1kV Differential

Surge: 1KV (CM)

Power-Frequency Magnetic Field:

30 A/m 70%V for 0.5 period

Voltage Dips: 40%V for 5 & 50 periods

70%V for 25 periods

Voltage Interruptions: <5%V for 250 periods

Note: Testing was conducted on meters with cable shields grounded at the point of entry representing installations designed to optimize EMC performance.

PD8-154/158 ProtEX-MAX Explosion-Proof Alarm Annunciators

Product Ratings and Approvals

CSA: Class I, Division 1, Groups B, C, D
 Class II, Division 1, Groups E, F, G
 Class III, Division 1, T5
 Class III, Division 1, T6 (Ta max = 60°C)
 Ex db IIC T5
 Ex db IIC T6 (Ta max = 60°C)
 Ex tb IIIC T90°C
 Ta = -55°C to +65°C
 Enclosure: Type 4X & IP66 / IP68
 CSA Certificate: CSA 12 2531731

ATEX: II 2 G D
 Ex db IIC T* Gb
 Ex tb IIIC T90°C Db IP68
 Ta = -55°C to +*°C
 *T6 = -55°C to +60°C
 *T5 = -55°C to +65°C
 Certificate Number: Sira 12ATEX1182X

IECEX: Ex db IIC T* Gb
 Ex tb IIIC T90°C Db IP68
 Ta = -55°C to +*°C
 *T6 = -55°C to +60°C
 *T5 = -55°C to +65°C
 Certificate Number: IECEX SIR 12.0073X

ATEX/IECEX Specific Conditions of Use:

- The equipment label and epoxy coating may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
- Flameproof joints are not intended to be repaired.
- All entry closure devices shall be suitably certified as "Ex d", "Ex t" and "IP66/68" as applicable. Suitable thread sealing compound (non-setting, non-insulating, non-corrosive, not solvent based, suitable for the ambient rating) must be used at the NPT conduit entries to achieve the IPx8 rating while maintaining the Ex protection concept.

Year of Construction

This information is contained within the serial number with the first four digits representing the year and month in the YYMM format.

For European Community

The ProtEX-MAX must be installed in accordance with the ATEX directive 2014/34/EU, the product manual, and the product certificate Sira 12ATEX1182X.

WARNING

Cancer and Reproductive Harm - www.P65Warnings.ca.gov

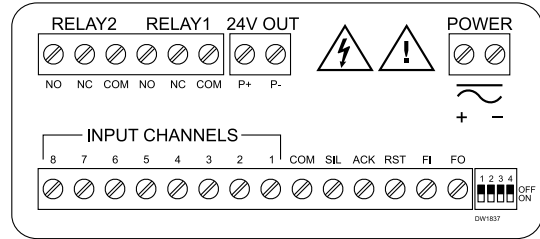
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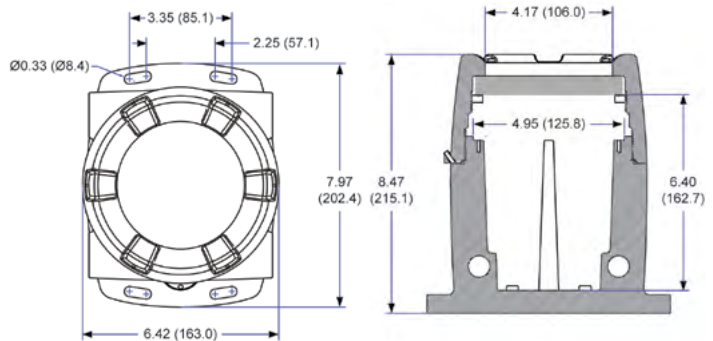
CONNECTIONS

PD158 connections for 85-265 VAC powered model.



DIMENSIONS

Units: Inches (mm)



ORDERING INFORMATION

PD8-154 and PD8-158 • Aluminum Enclosure		
85-265 VAC Model	12-36 VDC Model	Description
PD8-154-6R2-1	PD8-154-7R2-0	4-Point Annunciator
PD8-158-7R2-0	PD8-158-7R2-0	8-Point Annunciator

PD8-154 and PD8-158 • Stainless Steel Enclosure		
85-265 VAC Model	12-36 VDC Model	Description
PD8-154-6R2-1-SS	PD8-154-7R2-0-SS	4-Point Annunciator
PD8-158-7R2-0-SS	PD8-158-7R2-0-SS	8-Point Annunciator

Accessories	
Model	Description
PDA0001	3/4" M-NPT to F-M20 Reducer
PDA0002	3/4" M-NPT to 1/2" F-NPT Reducer
PDAPLUG75	3/4" NPT 316 Stainless Steel Stopping Plug with Approvals
PDA-SSTAG	Custom Stainless Steel Tag (see website for convenient ordering form)
PDA6848	Pipe Mounting Kit Zinc Plated
PDA6848-SS	Pipe Mounting Kit Stainless Steel
-	Free Custom Message Labels

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