MALLORY SONALERT PRODUCTS, INC.

Product APPLICATION Guide

Product Application Guide- 30mm Stacklights

30 mm Stacklight- Light Only

Part Number Structure

JR 28 - RYG - 4

Series: **JR** = 30mm Round Stacklight

Maximum Voltage:
16 = 9 to 16 Vdc; **28** = 20 to 28 Vac/dc

Stack Colors:
R = Red; **Y** = Yellow/Amber; **G** = Green

Mounting Type:
D = Direct
4 = 4 inch Black Plastic Pole

30 mm Stacklight with Sound

Part Number Structure

JR 28 - RYG - 4 L CT1 15

Series: **JR** = 30mm Round Stacklight

Maximum Voltage:
16 = 9 to 16 Vdc; **28** = 20 to 28 Vac/dc

Stack Colors:
R = Red; **Y** = Yellow/Amber; **G** = Green

Mounting Type:
D = Direct
4 = 4 inch Black Plastic Pole

Sound Loudness (Typical @ 1 Meter):
L = Loud (80 to 85 dB); **M** = Medium (70 to 75 dB)

Sound Function:
CT1 = Continuous; **CM1** = Chime; **FP1** = Fast Pulse;
DP2 = Fast Double Pulse; **DP3** = Slow Double Pulse
MP1 = Medium Pulse; **SP1** = Slow Pulse

Optional Sound Off After 15 Seconds:
Blank = Sound stays on
15 = After 15 sec, sound changes to a short pulse sound- 1 pulse per second

Sound Types

- Continuous Tone: Constant tone until power is removed
- Chime Tone: Repeating chime sound at one chime every 3 seconds
- Fast Pulse Tone: 10 pulses per second
- Fast Double Pulse Tone: 1 double beep every half second
- Slow Double Pulse Tone: 1 double beep every 2 seconds
- Medium Pulse Tone: 5 pulses per second
- Slow Pulse Tone: 1 pulse per second
- Note: Adding a “15” after the sound type means that after 15 seconds, the sound will change to a short pulse sound- 1 pulse per second.

30mm Round (JR Series) Stack Light Instructions

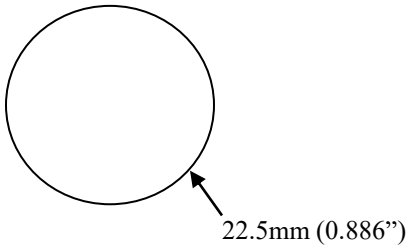
Warnings:

- Turn power off before installation, repair, or maintenance to avoid shock, burns, or damage to the stack light and the equipment in which it is installed.
- This unit is not designed to support any external weight. It is not to be used as a hand-hold or support for a person.

Cautions:

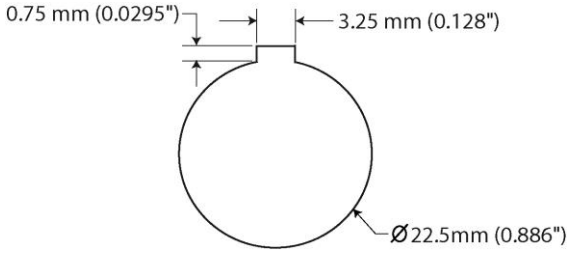
- This unit is rated for indoor use only.
- The direct mount models can be mounted upward, sideways or inverted (anyway you want). The pole mount models should be mounted vertically upwards.
- Make sure that the unit is rated for the voltage being applied.
- It is recommended to only use a slightly damp cloth to clean this unit. Other cleaning agents could affect the waterproof integrity or mar the surface finish potentially affecting its visual characteristics.
- Do not push or pull on wires.

Pole Mounting:



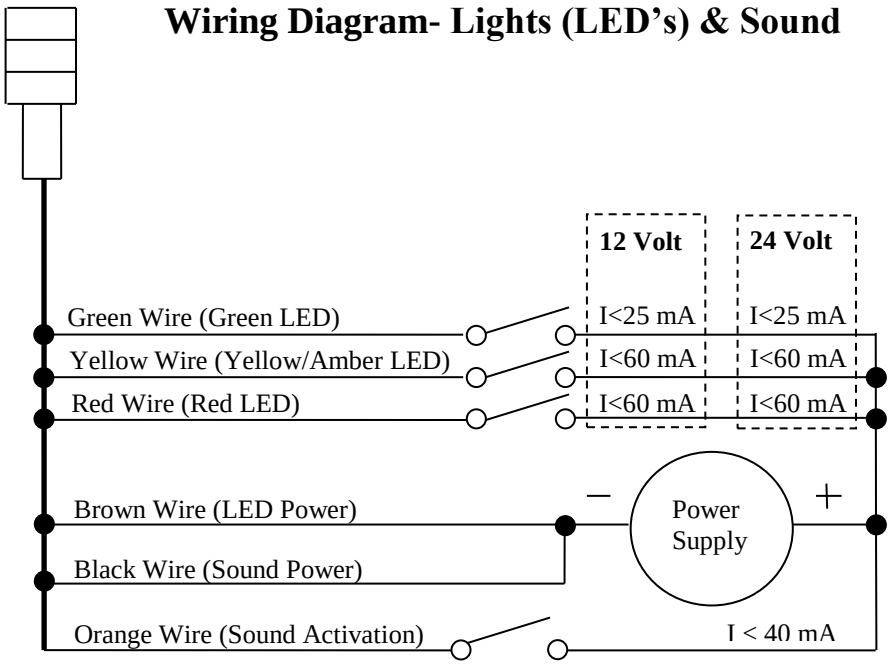
1. Per the diagram on the left, drill or punch a 0.886" (22.5 mm) hole into the installation surface. Maximum installation surface thickness is 6.35 mm (1/4 inch).
2. Remove the nut from the Stacklight pipe (leave the gasket on the pipe end.
3. Carefully insert the wires and Stacklight pipe through the hole being careful not to pinch the wires.
4. Put the nut over the wires and carefully thread the nut onto the Stacklight pipe.
5. Tighten the nut making sure not to over-torque it. Maximum torque is 10 in-lbs (1.13 n-m).

Direct Mounting:



1. Per the diagram on the left, drill and/or punch a 0.886" (22.5 mm) hole with Keyway into the installation surface. Maximum installation surface thickness is 12.7 mm (1/2 inch).
2. Remove the nut from the Stacklight. Leave the gasket on the Stacklight.
3. Carefully insert the wires and Stacklight through the hole being careful not to pinch the wires.
4. Put the nut over the wires and carefully thread the nut onto the Stacklight.
5. Tighten the nut making sure not to over-torque it. Maximum torque is 10 in-lbs (1.13 n-m).

Wiring Diagram- Lights (LED's) & Sound



Notes:

1. Transistors or FET's can be used as switches as long as the device can handle the current draws listed.
2. Stack lights come with a wiring harness which has enough wires to do the three stack model with sound as shown in the above wiring diagram. If your stack light model has less than 3 stacks and/or does not come with sound, not all of the above wires will used. The unused wires can be cut off or ignored as they are not connected internally to anything inside the Stacklight.
3. The 12 volt models are polar and operate on DC voltage only. The brown and black wires must be connected to the negative side of the power supply. The 24 volt models are non-polar (operate on AC or DC voltage), so it does not matter which way power supply's positive and negative terminals are connected in the above diagram.
4. The sound and each LED light operate independently of each other.

LED Operation:

1. The brown wire must be connected to one side of the power supply and the appropriate LED stack color wire connected to the other side of the power supply.
2. One or more stacks can be activated at the same time.
3. For 12 Vdc models, the brown wire must be connected to the negative side of the power supply and the appropriate LED stack color connected to the positive of the supply.
4. For 24 Vac/dc models, the brown wire can be connected to either side of the power supply and the appropriate LED stack color wire connected to the other side of the supply.

Sound Operation:

1. The black wire must be connected to one side of the power supply and the orange wire to the other side of the supply.
2. For 12 Vdc models (polar), the black wire must be connected to the negative side of the power supply and the orange wire connected to the positive side of the supply.
3. For 24 Vac/dc models (non-polar), the black wire can be connected to either side of the power supply and the orange wire connected to the other side of the supply.

On-Line UL Listing

ONLINE CERTIFICATIONS DIRECTORY

NKCR2.E478987
Auxiliary Devices - Component
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Auxiliary Devices - Component

See General Information for Auxiliary Devices - Component

MALLORY SONALERT PRODUCTS INC E478987
4411 S High School Rd
Indianapolis, IN 46241-6404 USA

Investigated to ANSI/UL 508

Auxilary Device Open type, Industrial, "Sonalert - JT Series" Model(s) JT followed by 28 or 120, followed by combination of R, Y, G, B, and/or C, followed by C, followed by D, S or E, followed by L, M or S or blank.

Auxilary Device Open type, Industrial, "Sonalert - ZT Series" Model(s) ZT may be followed by 016, 028, or 120, may be followed by L, M or S, may be followed by A or D, may be followed by any two characters or maybe followed by three alphanumeric characters, may be followed by any letter, may be followed a blank or by any two alphanumeric character.

Auxiliary Devices, "Sonalert JR Series" Model(s) JR followed bv 16 or 28, followed by upto 3 letters R, Y and/or G, followed by D or a number, followed by L, M or S, followed by upto three digit code, followed by blank, 15, 30 or a number.

Marking: Company name and model designation.

Last Updated on 2019-01-02

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On-Line CUL Listing

ONLINE CERTIFICATIONS DIRECTORY

NKCR8.E478987
Auxiliary Devices Certified for Canada - Component
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Auxiliary Devices Certified for Canada - Component

See General Information for Auxiliary Devices Certified for Canada - Component

MALLORY SONALERT PRODUCTS INC E478987
4411 S High School Rd
Indianapolis, IN 46241-6404 USA

Investigated to CAN/CSA C22.2 No. 14-13

Auxilary Device Open type, Industrial, "Sonalert - JT Series" Model(s) JT followed by 28 or 120, followed by combination of R, Y, G, B, and/or C, followed by C, followed by D, S or E, followed by L, M or S or blank.

Auxilary Device Open type, Industrial, "Sonalert - ZT Series" Model(s) ZT may be followed by 016, 028, or 120, may be followed by L, M or S, may be followed by A or D, may be followed by any two characters or maybe followed by three alphanumeric characters, may be followed by any letter, may be followed a blank or by any two alphanumeric character.

Investigated to CAN/CSA-C22.2 No. 14

Auxiliary Devices, "Sonalert JR Series" Model(s) JR followed bv 16 or 28, followed by upto 3 letters R, Y and/or G, followed by D or a number, followed by L, M or S, followed by upto three digit code, followed by blank, 15, 30 or a number.

Marking: Company name, model designation and the Recognized Component Mark for Canada, c UL us.

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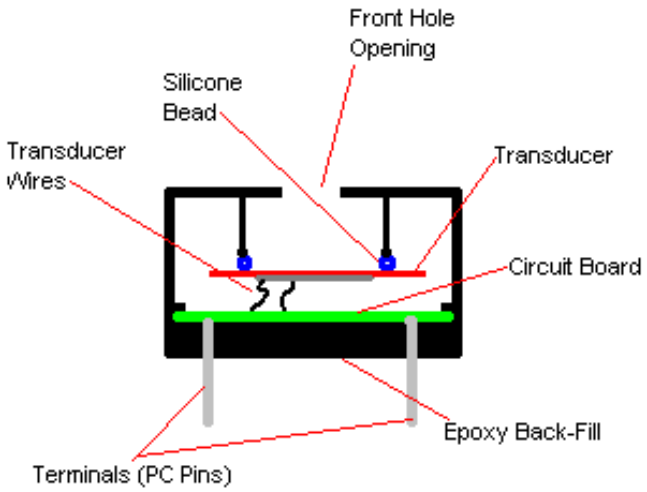
Piezoelectric Electronic Alarm Construction

Piezoelectric Audible Signal Basic Construction



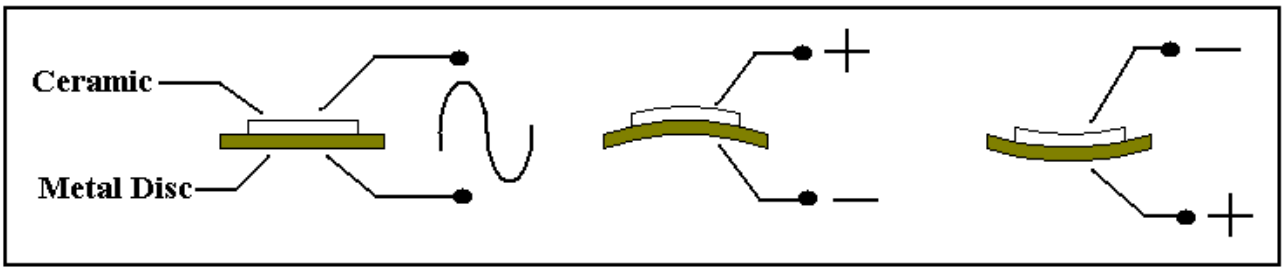
The above cross section picture shows the basic elements used in a piezoelectric audible alarm. The area in front of the transducer element including the front hole opening forms an acoustic cavity that lets the sound radiate out with the most efficiency (i.e. loudest sound level). If the alarm is an indicator that contains a circuit board, the circuit board is attached to the piezoelectric sounder element via soldered wires.

The above picture can be interpreted to represent a board mount package with pc pin terminations, but the same concept is used when building audible alarms in other mounting configurations such as SMT, Flange Mount, and Panel Mount alarms.

If the back of the alarm is sealed with epoxy or other material, the “guts” of the alarm (including the circuit board and components) are protected against fluid intrusion. However, fluid sitting inside the front cavity can obstruct the operation of the device causing the sound level to decrease significantly. If you need to wash the alarms after a soldering operation, it is strongly recommended to use an alarm that comes with a wash label that keeps the washing fluid from getting inside of the front cavity.

Operation of Piezoelectric Audible Alarms

Piezoelectric electronic audible alarms work by converting the user input voltage to an appropriate oscillating signal that is applied to a sounder element that is mounted in a housing. The piezoelectric sounder element consists of a metal disc that has a special ceramic material



bonded to it that physically bends when voltage is applied to it.
The above picture shows a bare piezoelectric sounder element. By applying a sinusoidal wave-form at an appropriate frequency, the transducer will physically deflect in one direction and then in the opposite direction following the shape of the input wave-form. If this oscillation occurs in the audible frequency range (1 Hz to 20 kHz), then air pressure waves are produced that the human ear interprets as an audible sound.

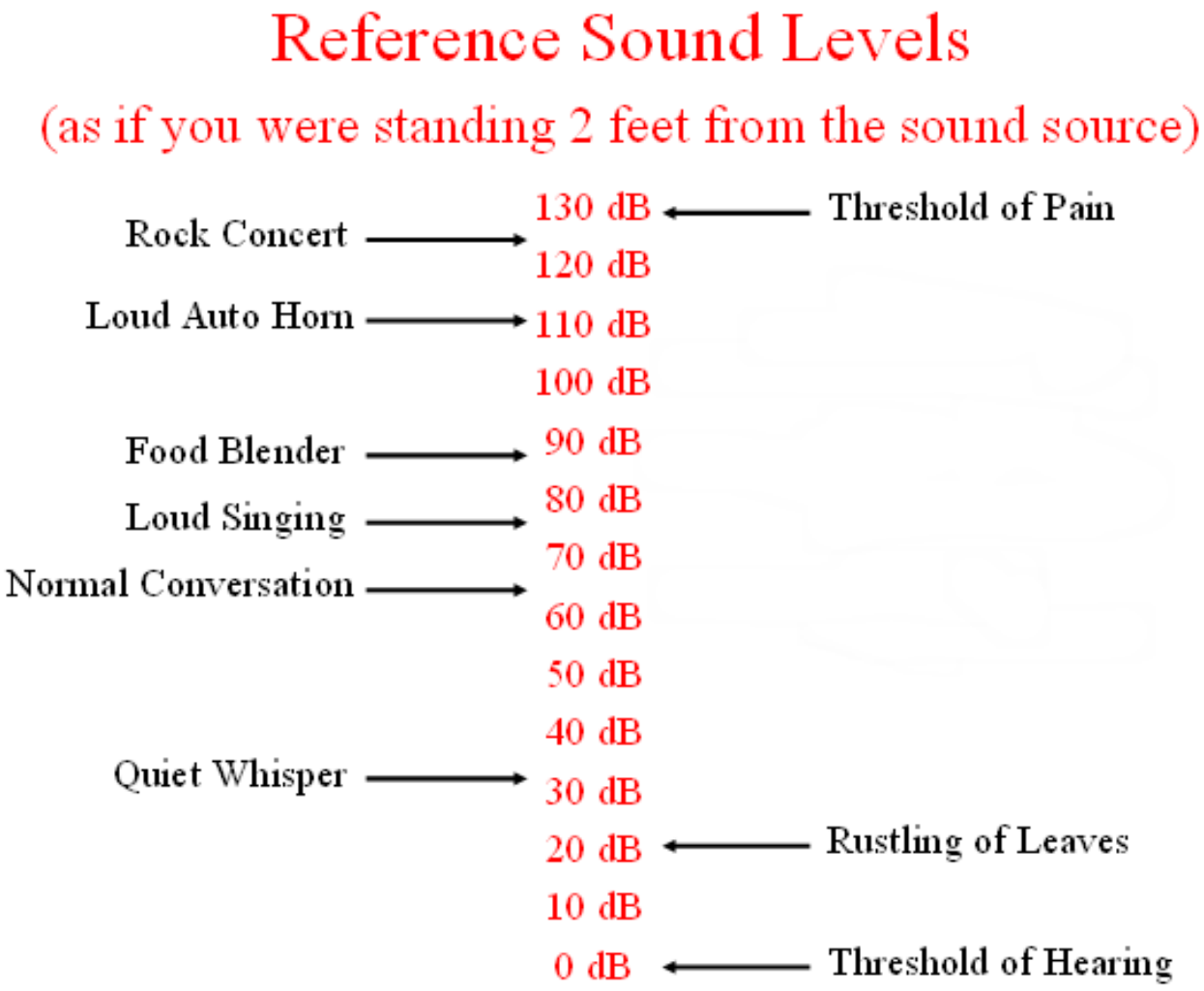
The larger the voltage of the applied wave-form, the larger the amplitude of the air pressure waves resulting in a louder sound level. However, the ceramic portion of the transducer can only bend so far before there is a risk of a catastrophic failure. This maximum voltage is somewhere around 40 to 50 volts. However, it is rare to apply this much voltage to a transducer as you reach a point of diminishing returns for voltages much greater than 32 volts.

By itself, the sound level produced by a transducer element is insignificant. To increase the size of the air pressure waves (and thus the sound level), the transducer element must be mounted inside an acoustic chamber that is optimized for the transducer size and resonant frequency. Every transducer has one frequency where it flexes more efficiently producing the louder sound levels. This frequency where the transducer performs the best is called the resonant frequency.

Self-Drive type devices provide a 3rd terminal that connects to an isolated portion of the piezoelectric transducer. This third terminal provides a feed-back signal that is 180 degrees out of phase with the drive signal. This signal can be fed back into the circuit to allow the sounder element to self-tune itself to the transducer's resonant frequency.

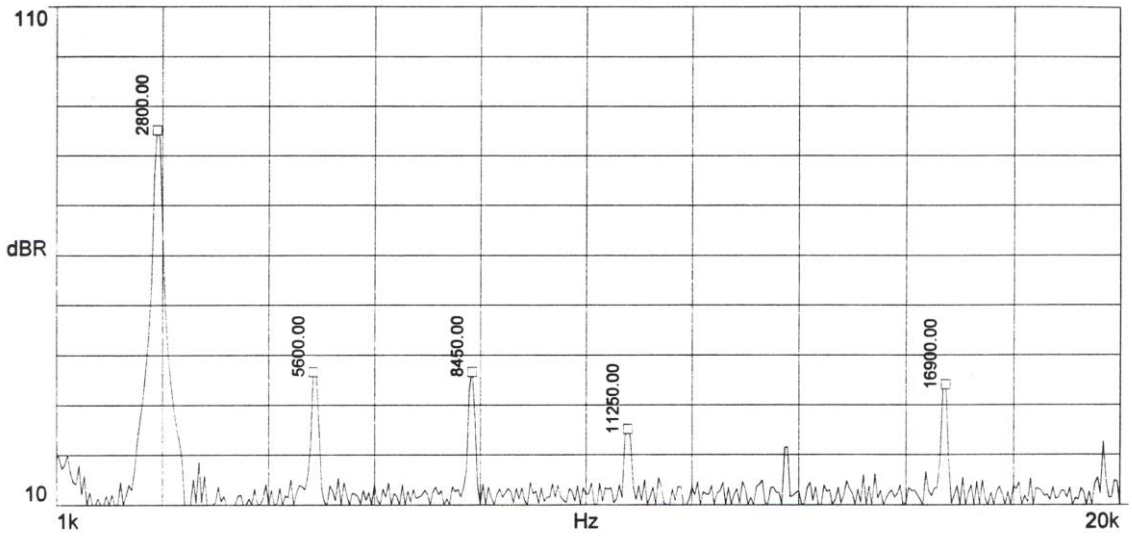
Decibel Sound Level Scale

The decibel sound level scale is an arbitrary scale that ranges from 0 dB (threshold of hearing) to 130 dB (threshold of pain). The chart below shows where some common sounds fall on this dB scale. Audible alarms are available that have sound levels as soft as 55 dB at 2 feet and as loud as 110 dB at 2 feet.



Fundamental Frequency & Harmonics

Below is a frequency scan of a piezoelectric audible alarm that has a resonant frequency of 2,800 Hz. As you can see, there is a strong frequency peak at 2.8 kHz and several smaller frequency peaks that follow called harmonic frequencies. The table below the chart shows that the size of the harmonic frequencies are significantly smaller than the fundamental frequency for this particular alarm unit. Because this alarm has a large fundamental frequency and much smaller harmonic frequencies, the sound quality of this part will be very good. When this alarm is activated, the listener will hear one clear frequency (also called sound pitch) from the alarm. Other electronic alarm technologies such as electro-magnetic or electro-mechanical type alarms often have much larger harmonic frequency components resulting in less clear tone.



	Frequency	dB	% dB of Fundamental
Fundamental:	2.800 KHz	86.1	100.0%
2nd Harmonic:	5.600 KHz	37.6	43.7%
3rd Harmonic:	8.450 KHz	37.6	43.7%
4th Harmonic:	11.250 KHz	26.1	30.3%