

Moisture & Condensation Trouble Shooting Guide

Please read & follow all installation instructions provided in Dotworkz Product User / Installation Manual

All Dotworkz enclosures are created to operate fully sealed, to fully protect your camera and other electronics.

The installer must take care to follow proper installation instructions to preserve a fully sealed installation, and for enclosure to operate properly. The following is to find an eliminate causes sources of condensation or moisture found in or on enclosure.

Installer must check all seals and ports for leaks.

Unsealed conduit is the most common installation mistake, and the source of most condensation issues on all enclosure models.

Here are the sources and symptoms to check for, and resolve moisture & condensation issues:

- 1) Air & water leaks from unsealed cable bundles, wire feed ports, or compromised seal ports. (inside condensation)
- 2) Moist air trapped in enclosure when enclosure is open and closed. (inside condensation)
- 3) Cooling differential of cool air inside enclosure, with relatively warmer moist air outside of enclosure. Typically only possible with (CD = COOLDOME option). (Outside condensation) happens only in extreme humid environments.
- 4) Super-cooling of interior of enclosure (CD Only), Cooler not shutting off and creating similar effect as line 3 above. (causing outside condensation)
- 5) Interior fan should be always on in all models when the enclosure is powered up. If interior fans have failed, condensation may occur on interior cold sink of CD, or super-cooled surfaces of any models, including on the lens.

Symptom 1: All Dotworkz enclosures are engineered to be Low to no Maintenance over a long reliable service life, but it requires that there is NO air / moisture exchange between inside and outside air. All seals must be intact and properly secured, and making a good seal.

Great care has been taken to be sure that each enclosure will fully sealed when it leaves the factory, but due to final installation requirements, and installation modifications, seals must be checked, confirmed, and maintained during its deployment lifespan. Typically this requires little or no maintenance beyond closing enclosure properly and properly tightening wire sealing port nuts.

Proper wiring of enclosure includes using only one round cable per seal port / cable gland, and using drip loops for wiring that is fed from above enclosure, then tightening seal nuts adequately.

If conduit ports are installed in place of the Dotworkz provided sealed wire ports / cable glands, be sure that they are of the liquid tight rating, **and seal the inside of conduit wire feeds, after feeding wires**. This will prevent moist air from traveling thru conduit and into enclosure, then condensing on inside of enclosure. Use foam plugs provided by Dotworkz, along with installer provided sealant, putty, or caulk, to create a fully airtight seal in wire feeds at enclosure when liquid tight conduit is used.

Check entire housing for seal integrity, that all seals are present, tightened properly, and in good condition. (Use sealant or caulk if you suspect seal break, & repair or replace worn, damaged, or missing seals).

Symptom 2: Moist air trapped inside enclosure due to humid conditions at time of last servicing enclosure, may condense on inside surfaces as temperatures drop. Desiccants can be used to eliminate moisture in air inside enclosure.

Dotworkz provides desiccant canister as standard in COOLDOME product only, but is available as an optional accessory sold separately for other models.

Our desiccant canisters are serviceable, & service cycle depends on humidity in deployment area and timing of servicing. It is typically years before servicing needed depending on humidity at deployment site. A second desiccant canister can be added to extend required service cycles.

Symptom 3: (CD only) This only shows up in the most humid deployments for CD model only, where the Dew point is very close to the outside air temperature. One solution is to change thermostat to one with a warmer shut off set-point. A controller board swap may be needed for areas with this chronic atmospheric condition, to provide a thermostat that allows interior to stay above the dew point temperature.

Symptom 4: (CD only) If cooler is not shutting off, you will get exterior condensation on lens due to a super-cooling condition, similar effect as a cold drink in a glass on a hot day that created condensation on outside of glass.

Be sure that thermostats are working properly turning 'on' and 'off' the cooling system. A quick test for this is a solder iron placed on the face of the thermostat for about 15-30 seconds to get it to trip on, and a can of compressed air turned upside down and sprayed on the face of the thermostat to shut it off, to be sure that the cooler, thermostat, and relay are cycling properly. Make sure nothing is touching thermostats or relay, causing relay shorting, and thus an "always on" condition.

Symptom 5: Check fuses enclosure on green controller PCB (inside black fan chassis of RF, HB, or TR). (For CD models) Be sure that the wires on the interior and exterior fans are properly placed on circuit controller PCB terminals for "always on" operation. On CD there are four fan terminals; two for always on, two for thermostatically switched on/off:

On CD PCB models, See print on green PCB for proper interior or exterior fan placement plug in, & following wire to fan. Be sure interior fan is always "ON", as all models are wired this way. Check all fuses on controller PCB, Replace fuses or fans if all is powered but still not functioning/ turning on. (CD only) Exterior fan will only cycle on and off with cooler thermostat cycle.

For any further technical support issues, contact Dotworkz Tech Support:

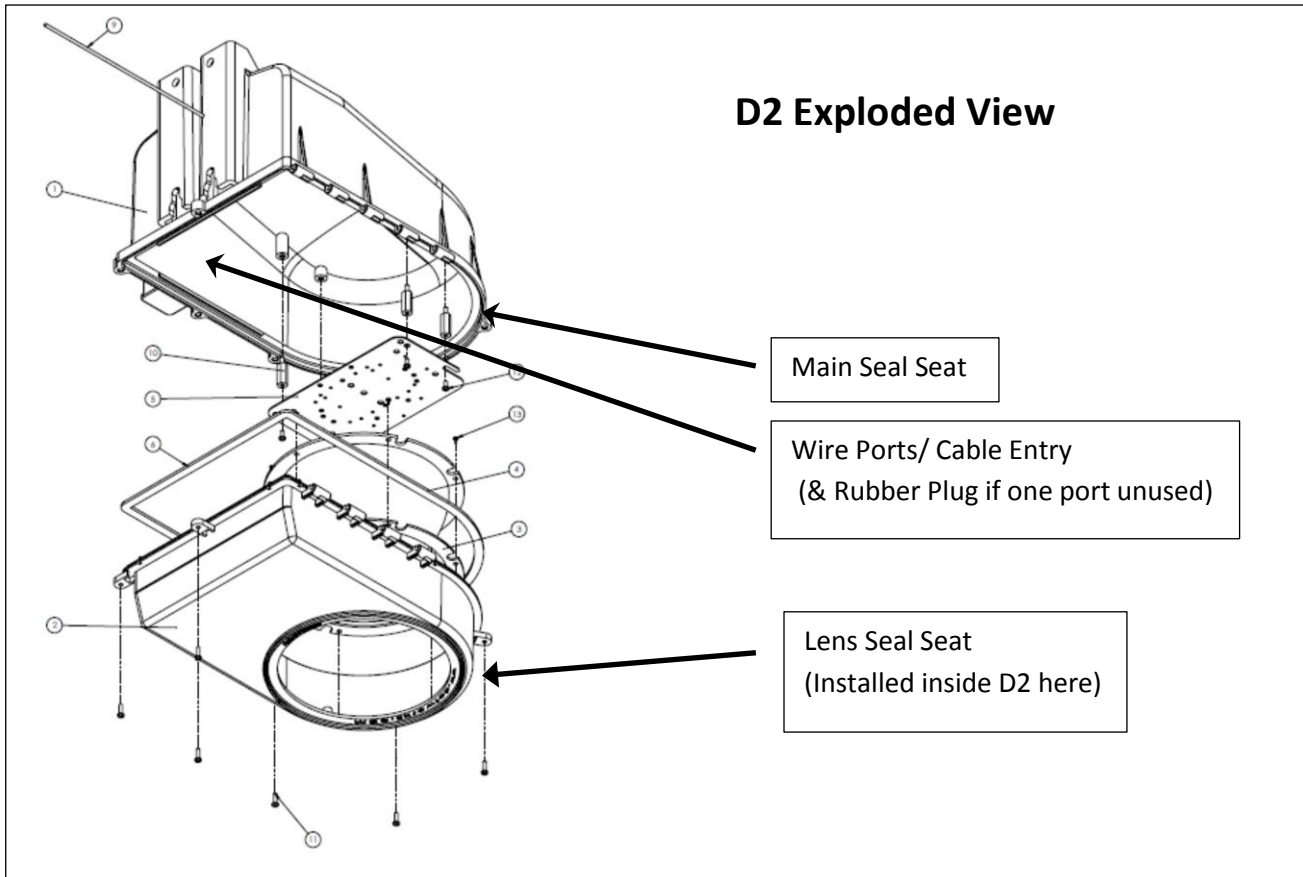
+1 (866) 575-4689

Or

www.dotworkz.com

On an unmodified D2, there are only 3 areas that moisture can enter:

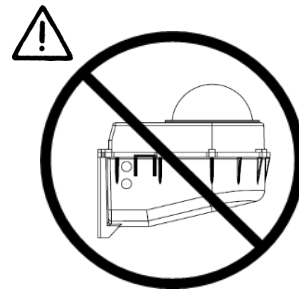
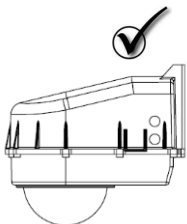
- 1) Most common is wire ports & or/ seals on these wire feeds, or if changed out to conduit, the wire feeds on the conduit. Check all seals and that all are properly installed & Seal nuts are fully tightened around a single round cable – one cable per wire port. If one port was unused, there will be a rubber plug that must be intact and in good condition.
- 2) Second, check condition of main seal, where hinged cover and lower seal together. Be sure it is intact, not damaged or worn out.
- 3) Lens seal: be sure lens screws are gently, but securely tightened to make a proper seal.



Dotworkz D2 Mounting Guidelines

Dotworkz D2 Seals & drip edges are engineered for horizontal installation Only: Dome bubble faces down.

Vertical and dome-up installations are not advised, and will be prone to moisture incursion within housing, and will void warranty.



Proper Cable Management to Enclosure

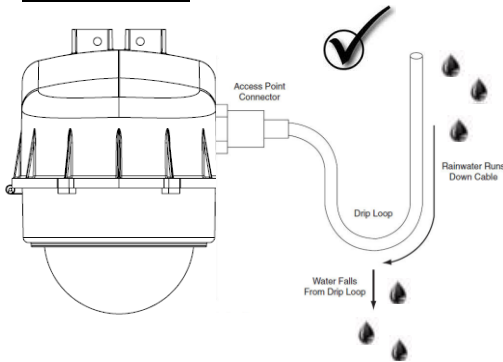
Avoid common Installation Mistakes



Only Use Qualified Installation or Service Technician for Installing & Servicing Dotworkz Enclosures.
Power Must be disconnected and kept off while installing or Servicing Enclosure.
Follow All Local and Applicable Electrical Codes and Standards for Installation of Electrical components.

All Cable Ports, wire feeds, or Conduit **must be fully sealed** to eliminate moisture within Enclosure.
All Dotworkz Enclosures are required to be fully sealed before placing into service, to protect integrated products, to eliminate any moisture driven shock hazard, to perform optimally as designed.

DRIP LOOPS



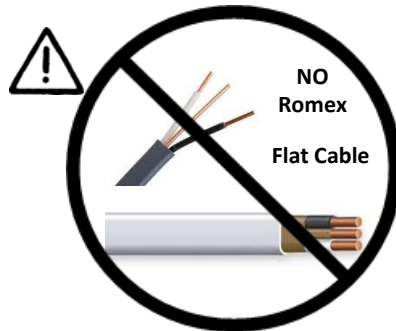
Always Create a Drip Loop for all Cables or Conduit Entering Dotworkz D2 Housing from level or Above D2 Conduit, Power, Data, & Antennae
To avoid gravity driven moisture entry into Enclosure

Cable Gland Strain Relief Port Seals

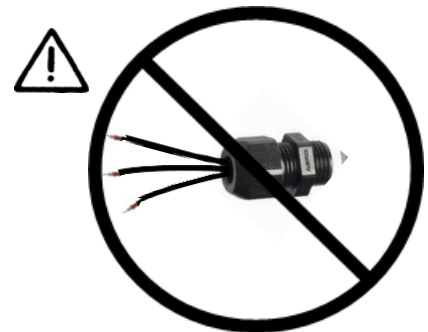
To properly seal, Dotworkz Cable Gland Strain Relief Ports will only accept **One single round cable per port**



- * SJOOW
- * Cat5/ Cat6
- * Coaxial



Use Round Cable Only with provide Cable Gland Port Seal



Dotworkz Standard Cable Gland Port Seals are designed for **ONE** single round cable only per port

Cable can be multi-conductor in single round cable bundle such as Cat5/6e (burial rated), or Conductor cable SJOOW (water rated)

Conduit

If Conduit is used in Lieu of Cable Gland Port Seals provided,
Then Use Only Liquid Tight Conduit & fittings properly sealed.



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Internal Wire feeds must be fully sealed prior to placing Enclosure into Service.
See Conduit Guidelines section of this manual.



Electrical Conduit Guidelines

For optimal performance, your Dotworkz Enclosure is designed to be Air & Water Tight to eliminate any moisture, dust, and insect damage, safety, performance, reliability, and maintenance related issues.



Use of Electrical Conduit, without sealing the entry ports/ inside wire feeds within Camera Enclosure, will subject the inside of your enclosure to possibility of condensation driven moisture, dust, and insect contamination hazards.



Dotworkz has provided each enclosure with two Cable Gland Strain Relief seal ports that fully seal enclosure to an IP68 rating, Waterproof and Airtight Seal. To properly seal, only one round cable is used in each cable gland port. (Holes on enclosure are 7/8" diameter, ready for standard 1/2" I.D. NPT connector, or PG13 fittings.)

However, we realize our customers are retrofitting these connectors with electrical conduit fittings. We acknowledge this industry customization and installation practice, and would like to guide customers to properly install these products.

Conduit Guidelines:

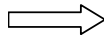
- 1) If wires, cabling, or conduit are coming at enclosure wire entry level, or above, always create a drip loop.
- 2) Please use only approved watertight electrical conduit and connectors, IP66 or better, with proper seals and fittings installed & fully seal.
- 3) **Then**, after all wire and cables are installed into enclosure, Seal wire entry ports inside of enclosure with any number of commercially available sealing putty's, Silicone Sealant, or similar products that are approved by applicable local and relevant electrical codes.



Dotworkz supplies two 1/2" diameter foam conduit plugs, that when installed, will assist in sealing off airflow in conduit feed thru, at cable entry inside of enclosure. Putty or Sealant can be used in conjunction with these plugs, to assure a full seal inside enclosure cable feed entry.

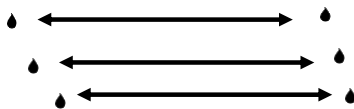
FORCES AT WORK IN ANY UNSEALED, CONDUIT WIRE FEED ENCLOSURE SYSTEM

WARM/MOIST IN UNSEALED CONDUIT MOVES THRU CONDUIT FEEDS EXPAND & CONTRACT WHEN CONDUIT HEATS & COOLS WITH OUTSIDE TEMPERATURES

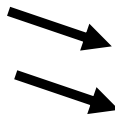


EXPANDING HEATED AIR IS PUSHED INTO ENCLOSURE THEN COOLS & CONDENSES, HUMID AIR CONDENSES ON SURFACES INSIDE ENCLOSURE

Humid Air



Condensing to Water



SHOCK HAZARD!

Failure to fully seal enclosure wire and cabling entry ports may lead to shock hazard, unsatisfactory product performance, a possibility of damage to electronics in the Dotworkz enclosure product, including camera damage, and damage to integrated electronics due to air driven moisture traveling thru the conduit, condensing and collecting in the enclosure creating a short circuit hazard.



Electrical Putty & Putty Tapes



Silicone Sealants

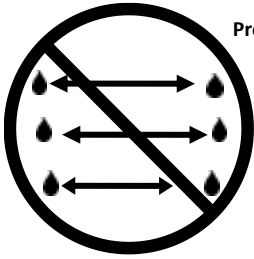


Foam Sealants (use very sparingly)

Dotworkz does not endorse, nor has it evaluated any of these products. Test products first, and follow all manufacturers' instructions. Follow all applicable electrical and building codes and installation guidelines. End user assumes liability for applicability of these products and their effectiveness and incurred liability in using these products.

VENT STOPPER PLUGS for Conduit

Foam Conduit Feed Plugs for 1/2" I.D. (PG-13) Conduit



Prevents Humid Air exchange from venting thru electrical conduit into Dotworkz sealed enclosures,

Thus eliminating condensation issues within Dotworkz sealed enclosures.

QUICK INSTALLATION GUIDE



1) Pull wires to final installed length.



4) Push plug into conduit mouth with finger tips till it flush with outside of fitting



2) Open Vent Stop Plug and install over wire.



5) Repeat steps 1-4 for any other conduit feeds as needed.



3) Pinch Plug to compress over wire, and insert into conduit feed mouth.



6) To assure an airtight seal, caulk around wires and cables, coating entire plug surface with sealant.