Infrared Window Installation Hints and Tips

1. Take Plenty of High Quality Digital Images

Once the infrared windows are installed, we will use infrared inspections to inspect the switchgear and the results from these inspections are then put into reports. Many infrared cameras do not have a digital camera and the windows do not normally allow for clear visual images due to issues with light, field of view or lens materials. High quality images taken of the internal components of the switchgear can be kept on report templates, and used for future reference. Remember, the thermographer using the infrared windows may not be as knowledgeable about the switchgear as you are.

2. Know Your IR Cameras Minimum Focus Distance

Ensure that you make a note of the distance the components that you are interested in are from the cover or infrared windows. Many entry level cameras have a minimum focus distance of up to 20 inches and will have trouble focusing on targets that are too close.

3. Check Operation of IR window Before Energizing The Equipment

Ensure that you make a note of the distance the components that you are interested in are from the cover or infrared windows. Many entry level cameras have a minimum focus distance of up to 20 inches and will have trouble focusing on targets that are too close.

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4. Use Mock ups to Identify Where to Place Your Infrared Windows

Some clients use false fronts made from card and temporary heat sources such as portable hand warmers to identify what they can see through an infrared window. This gives the thermographer exactly what he needs to place the windows in the correct place and saves trying to calculate the FOV.

5. Modified Internal Perspex Covers.

Infrared Cameras cannot see through Perspex / Plexiglas and this can give thermographers a great deal of problems especially when it comes to live inspections.

In some cases companies have adopted the approach that they will never open the covers live and have removed the Plexiglas shields all together and installed IR windows to allow constant monitoring of the internal components. They then label the switchgear accordingly to ensure that the covers are never removed live. This is at the discretion of the companies involved.

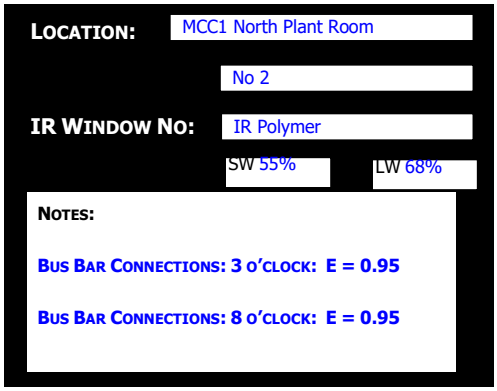
There are times however when the internal Plexiglas cannot be removed as there may be fuses or resets within the cabinets. A way of allowing IR to be completed under these circumstances is to modify the switchgear with internal grills in the Plexiglas.

Note: Any proposed modifications to these systems will require full consultation with the persons responsible with the electrical plant on site.

6. Ensure You Put The Following on The Window Label

All relevant data should be placed on the labels provided with your IRISS infrared windows. This ensures that the thermographers using the window will have all the information necessary to get all the inspection points and inspection parameters correct. These may include:

- Unique identification number.
- IR window Transmission Rate (short and long wave)
- Number of targets (may be more than one)
- Location of targets (use clock face method)
- Target Emissivity (try to standardize)
- Calculated setting for IR camera if using emissivity setting to compensate for window transmission losses
- Calculated setting for IR camera if using distance and emissivity to compensate for window transmission losses



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7. Using an IR Camera to Measure FOV

Some thermographers find it easier to let the camera show them what it can see rather than completing a number of calculations. The following procedure is a quick method of working out what you can see at set distances with your own equipment and lenses.

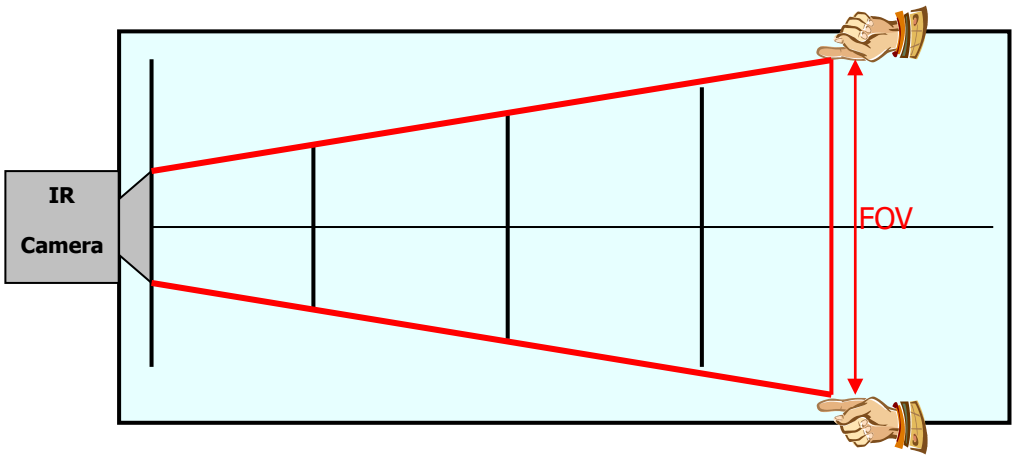
1. Place a piece of paper on a flat even surface and mark out a line with increments of 2 inches up to approx 24 inches.
2. Place the camera lens at the 0 datum line.
3. Using a heat source (finger, warm coffee cup, etc.), move the object in from the LH side outside the visual frame until it can be seen and mark the paper, repeat the same procedure for the RH side and mark the paper.
4. Measure the distance between the 2 points and this will give you what you can see using the camera and lens at a set distance.

Note: Once you have worked out the FOV distance, you will need to account for the IR viewing window that you intend to use. This is done by subtracting the camera lens diameter from the FOV and adding the IR viewing window diameter.

Example:

FOV of a 24 degree lens at 16 inches as measured using the above process = 8 inches. The camera lens = 1.75 inches, thus the FOV of the camera = 6.25 inches.

- Using a 2 inch IR Viewing Window would give an approx FOV of 8.25 inches
- Using a 3 inch IR Viewing Window would give an approx FOV of 9.25 inches
- Using a 4 inch IR Viewing Window would give an approx FOV of 10.25 inches



Most thermographers measure a point at 18 inches and then join the points together at the increments marked on the paper and then keep a chart with their camera for easy reference.

At this point, you should complete the exercise using any other lens assemblies that you may have, and you should also use this exercise to work out the minimum focus distance of your camera by moving the target as close to the lens as possible until it is out of focus.

Note: Although the above technique is not 100 % accurate it gives an extremely good result. Try it for yourself; it is a simple technique that really works well!

8. Fit Additional Locking Screws if Required

Each IRISS infrared inspection window is provided with an additional stainless steel Torx locking screw. The screw is used where additional security is required. The IRISS locking tool has both a Phillips and Torx bit and is designed specifically to fit the IRISS range of infrared inspection windows, ports and grills.

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