

# FACTORY INSTALLED IR WINDOW BENEFITS

hammond  
POWER SOLUTIONS



## What is an IR Window?

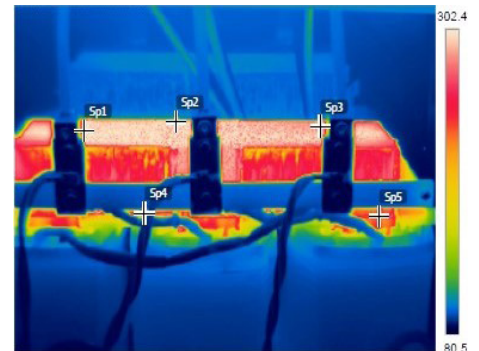
Thermal inspections help in detecting hot spots with cable and busbar connections, unbalanced loads or other potential problems in energized electrical components. Infrared (IR) Windows safely allow these thermal inspections of electrical equipment without removing protective barriers. The thermal inspections are best performed on energized electrical equipment but can result in serious injuries to maintenance personnel because of electrical hazards including arc flash. IR windows allow maintenance personnel to safely and easily perform thermal inspections while keeping protective barriers intact.

The use of IR windows has increased significantly over the past decade because of increases in electrical safety awareness and implementation of various safety standards such as NFPA70E and CSA Z462.



## Features and Benefits

- Reduced risk of downtime because of faulty equipment. IR inspections of transformers typically include even coil heating, primary and secondary lugs and critical bussing joints if applicable
- Enables technicians to perform quick and frequent thermal inspections, in absence of an electrician
- Reduced risk of injury and increased safety for maintenance personnel
- Reduced time to perform thermal inspections
- Helps make preventive maintenance plans more cost efficient



## Cost Savings Analysis

Thermal Inspection Cost		With IR Windows		Without IR Windows	
Description	Hrs	Cost	Hrs	Cost	
Inspection time per transformer (hrs x 2 per team)	0.2	\$25	1.5	\$188	
Time taken to wear PPE suit (2 per team)	0	\$0	0.5	\$63	
<b>Total</b>	<b>0.2</b>	<b>\$25</b>	<b>2.0</b>	<b>\$250*</b>	

\*These are typical values calculated using certain assumptions

\* Calculations are based on \$125 per hour

Description	Savings
Typical savings per inspection cycle (per transformer)	\$225
Typical savings 3 cycle per year for 20 years @ 3% inflation per year	\$18,138

\*All numbers listed above are in USD

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**In addition to the quantifiable benefits some of the other benefits include but not limited to:**

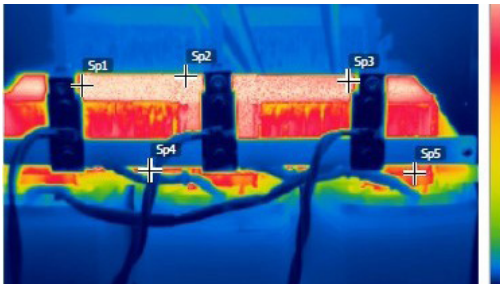
- Improved safety of maintenance personnel
- Option to inspect equipment that wasn't being inspected before
- Increased frequency of thermal inspections
- Decreased workload on electrical personnel which could be utilized for other activities
- Reduced operational disruptions

## Other Benefits of IR Window Include

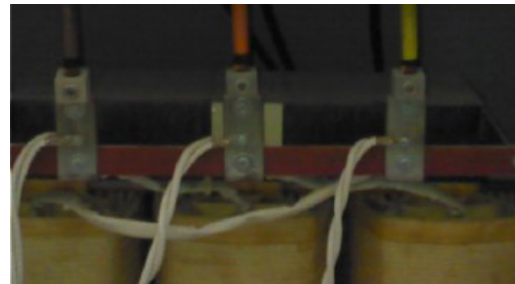
Most transformers will require two IR windows for the proper inspection of lugs, coils and other critical parts. The base specification for HPS provided IR windows includes:

Optic/Crystal Data	IR Window
Crystal insert diameter	80 mm (3.2in)
Viewing aperture diameter	73 mm (2.9in)
Viewing aperture area	4186 mm <sup>2</sup> (5.6in <sup>2</sup> )
Thickness	2 mm (0.08in)
NEMA rating	Type 4/12 (UL Third Party Certified)
Shortwave IR capable	Yes
Midwave IR capable	Yes
Longwave IR capable	Yes
UV capable	Yes

Windows from specific manufacturers can be provided, but this may increase cost and lead times.



With IR camera



Without IR camera

## Why Hammond Power Solutions?

**IR Windows are factory installed:**

- Reduces time required for planning, designing, procurement, and installation for easier implementation
- Typically a 2-3 day shipment if base transformer is in stock
- Proven placement of IR Windows for critical location monitoring
- U.L. listed assembly with full factory warranty
- Available as a standard option on HPS energy efficient distribution transformers