

**PREVENTIVE MAINTENANCE OF INDUSTRIAL  
ELECTRICAL EQUIPMENT**

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# **INFRARED WINDOWS**

**H.VIR® WINDOWS  
TYPE 20/21/22**

# WHY CHOOSE H.VIR® WINDOWS?

The interior of electrical equipment is often inaccessible for carrying out checks. With H.VIR windows, it will be possible to perform maintenance by infrared thermography **under representative load conditions**.

**H.VIR® is the only infrared window on the market to be equipped with a Wide-Band crystal** (Bands I, II and III), this makes it possible to cover the field of use for the whole cameras on the market. (0,3  $\mu\text{m}$  to 13  $\mu\text{m}$ ). Thermograph technicians and operators will have real protection against electric arcs.

Properties of our windows are no longer to be proven. Approved by the largest electrical equipment manufacturers in the world, the performance of the H.VIR® range has been validated by numerous tests and certifications.



**H.VIR Type  
20/21/22**



# ADVANTAGES

- H.VIR® is designed to be installed on new equipment as well on equipment already in operation (retrofit).
- It is suitable for viewing all the connections of electrical equipments : cable heads, circuits breaker, fuses, motors, transformers, ...
- It's no longer necessary to turn off power when inspecting electrical equipment.
- After installed, window has no fixed life limit.
- Checking your electrical equipment will no longer require having several electricians / technicians and engineers to perform preventive maintenance. It will save you time and money.
- IR windows are installed in strategic places on inspected the cells. You'll be able to use the time saved to perform in-depth maintenance.

# CHARACTERISTICS

- Use from 0,3  $\mu\text{m}$  to 13  $\mu\text{m}$
- UV sensitivity : none
- Optical component quality :  
Parallelism : < 3  $\mu\text{m}$   
Flatness : 5(2)
- Surface condition : P4 (S/D : 20/40)
- Operating temperature -40°C + 70°C
- Electric insulation of the frame :  
Resistivity
  - ➔ 4 x 10<sup>15</sup> ohms cm<sup>2</sup>/m à 20°C
  - ➔ 8 x 10<sup>15</sup> ohms cm<sup>2</sup>/m à 100°C
- **For cameras including only the emissivity parameter:** integrate an emissivity of 0.85.
- **For cameras with emissivity setting and transmission percentage:** integrate an emissivity of 0.90 and a transmission of 85%.



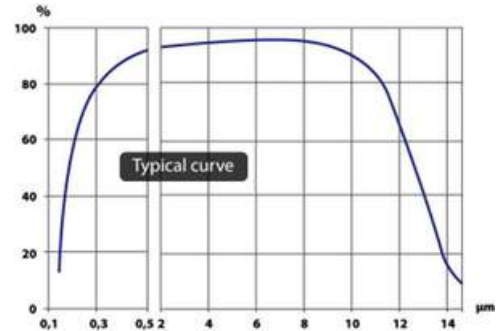
# TECHNICAL SPECIFICATIONS

## NOMENCLATURE KIT

## TRANSMISSION CURVE

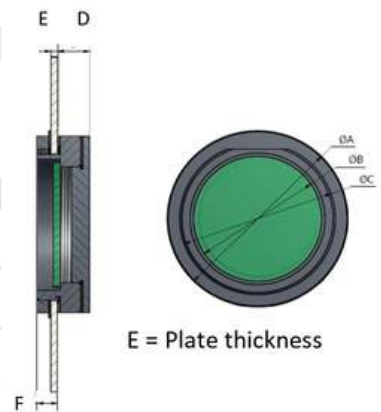


- 1) Tightened protection cover, equipped with self-adhesive gasket and magnet
- 2) Frame
- 3) Optical window
- 4) Gasket
- 5) Self-adhesive gasket
- 6) Nut



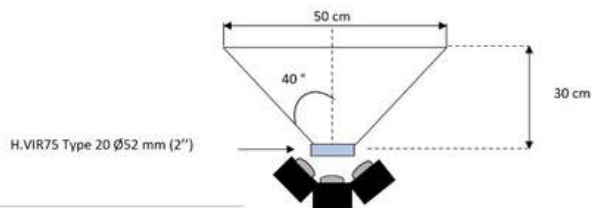
## PRODUCT SPECIFICATIONS

Model	H.VIR 75 type 20	H.VIR 85 type 21	H.VIR 105 type 22
<b>Window size</b>			
∅ A	79 mm	99 mm	133 mm
∅ B Aim	52 mm	71 mm	95 mm
∅ C	M68 x 1,5	M88 x 2	M113 x 3
D	14 mm	14 mm	14 mm
<b>Installation informations</b>			
Standard	F = 10 mm	F = 15 mm	F = 15 mm
E ≤ 4mm			
L1			
E > 4 mm ≤ 8 mm	F = 15 mm	F = 15 mm	F = 15 mm
L2			
E > 8 mm ≤ 12 mm	F = 20 mm	F = 20 mm	F = 20 mm
<b>Tightening couple Min</b>	<b>25 Nm or 2,5 Kg</b>	<b>30 Nm or 3,0 Kg</b>	<b>40 nm or 4,0 Kg</b>

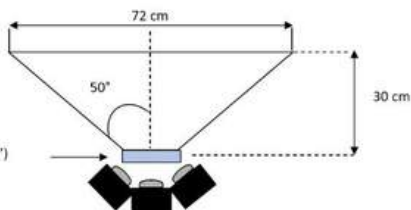


## VIEWING ANGLES FOR THE DIFFERENT WINDOWS TYPES

Drawing of viewing angle for H.VIR 75 type 20.

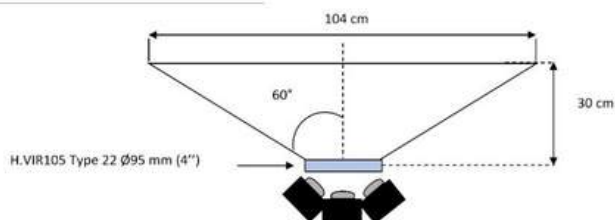


H.VIR85 Type 21 ∅71 mm (3")



Drawing of viewing angle for H.VIR 85 type 21.

Drawing of viewing angle for H.VIR 105 type 22.



# PRODUCTS CERTIFICATIONS AND MANUFACTURERS' TESTS

Windows H.VIR® are compliant to :



- CEI 60529 standard (Water and dust penetration) : IP 67 code : LCIE (2008)
  - To CEI 62262 standard (mechanical impact) : IK07 code : LCIE (2008)
- IP 67 Qualification**
- CEI 60255-21-1 & CEI 60255-21-3 standards Vibration and seism categories (severity class : 1) : CETIM (2008)
  - To NEMKO (Norway) standards : NEK – EN 60439-3 & NEK 511 (18b-18 c)
  - Certification UL (2008) : USR et CNR recognized

- **Internal pressure behaviour** (with cover open) : SOREM internal tests / Square D tests  
Guaranteed behaviour of the windows (standard versions) is :
  - o H.VIR 75 = 4 bars
  - o H.VIR 85 = 3 bars
  - o H.VIR 105 = 2 bars
- **Internal Arc fault Behaviour :**  
High Voltage Tests :
  - o EFFACEC (2014) : 31,5 kA/1s (17,5 kV)
  - o KEMA (1998) : 135 kA/0,12s (11,5 kV)
  - o ABB (1998) : 20 kA/1s (6,5 kV)
  - o AREVA (2008) : 16 kA/1s
 Low Voltage Test :
  - NATA (1997) : 50 kA-63 kA/0,1s (457V)

## FITTING EXAMPLES



H.VIR® Windows on SM6 and Vercor cells.



H.VIR® Windows on Alstom cells.



H.VIR® implanted on Pix cells.



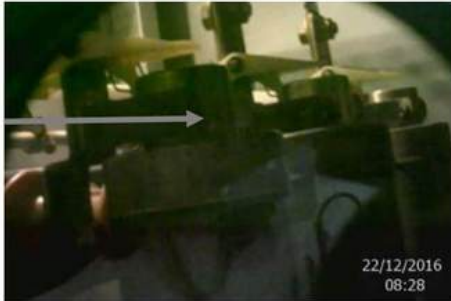
H.VIR 85® on oil transformer.



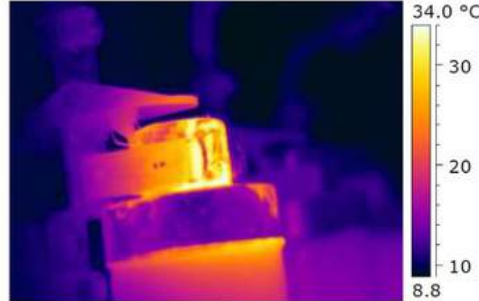
H.VIR® implanted on LV switchboards.

# EXAMPLES OF APPLICATIONS

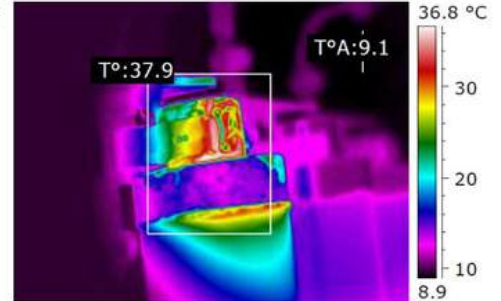
5 KV Motor cells :



Through a window H.VIR



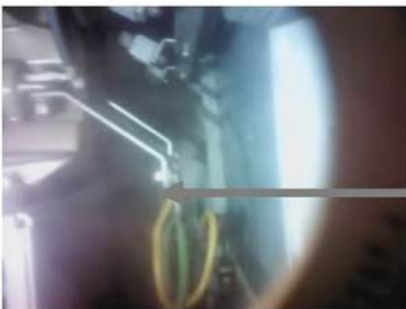
Detection thermography



Measurement thermography

Thermographer verdict : An abnormal heating of the fuse is observed at the contacts level. It is advisable to clean and revise the fuse contacts. In addition it's necessary to check connection and contacts fixing.

High voltage cell :



Through a window H.VIR



Detection thermography



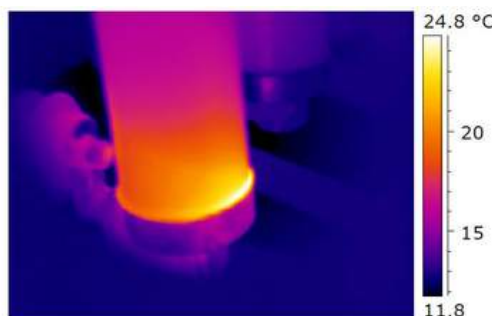
Measurement thermography

Thermographer verdict : There is an abnormal heating in the end of the cable. The hot spot is located at the crimping of the terminal. The thermograph recommends replacing the terminal and checking the connection area where it's connected.

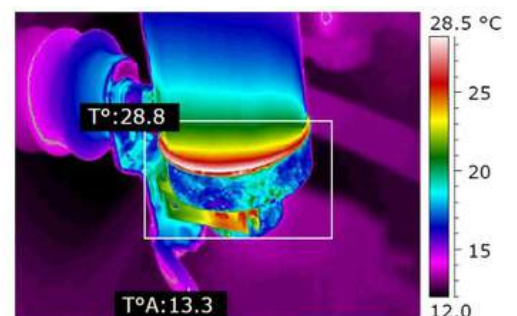
5 kV Motor cells :



Through a window H.VIR



Detection thermography



Measurement thermography

Thermographer verdict : There is a slight heating of the fuse at the pliers which receive it. It is recommended by the thermographer to clean and revise the fuse contacts, as well as to check the contacts fixing.

# INSTALLATION GUIDE FOR H.VIR® WINDOWS



With E. Robur drilling tool, drill a hole of  $\varnothing$  10 mm.



Enlarge the hole with cup shape drilling tool  $\varnothing$  28.3 mm.



Hole  $\varnothing$  28 mm.



Put Axis  $\varnothing$  28 mm in.



Mount the cup shape drilling tool and counter cup shape on both sides of the sheet metal on axis  $\varnothing$  28 mm.



Screw axi  $\varnothing$  28 mm on the piston.



Connect the pump to the piston.



Operate the pump to cut the sheet metal.



Take off the tools after cutting.



## Check that you have:

- A. The self-adhesive gasket
- B. The appropriate key install tool with H.VIR model
- C. The Torque wrench
- D. Yellow magnet support for cover with instructions.

# INSTALLATION GUIDE FOR H.VIR® WINDOWS



Stick the gasket on the inner side of the cell.



Put the window in the drilling, engraved cover on the outer side of the cell.



Then, put the nut on the thread and tighten with hand.



Next, torque with the appropriate key install tool and torque wrench (torque value given on DC).



Check the good rotary position, marking must be aligned horizontally



Stick of self-adhesive supports of cover with instructions next to each porthole.



Electrical equipment ready for inspection.



# WINTECH GROUPE

**INPROTEC IRT**

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FOR THE PROTECTION OF YOUR  
TEAMS AND YOUR ASSETS**



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