

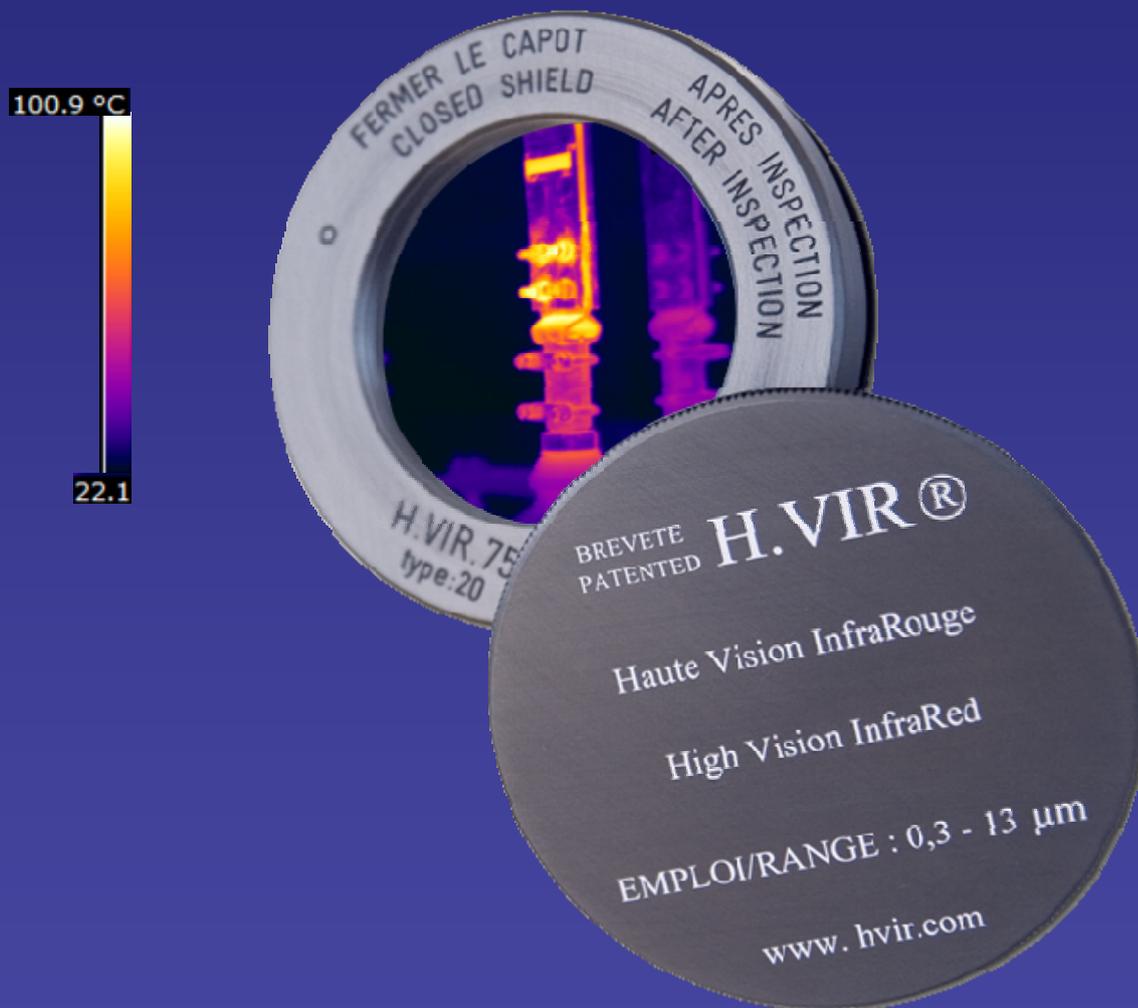


# Inventor & World Leader of Infrared Window

For 15 years we make your electrical cells transparent!

## H.VIR® WINDOW

Transparency range :  
UV - visible- infrared ( $\lambda$  0.3 à 13 $\mu$ m )



Improves productivity, reliability of your  
Equipment and safety of your personnel  
IR thermography for low, medium and high voltage.

## Prevention of risks associated to medium and high voltage electrical equipment

Electrical equipment may be submitted to more or less intensive internal electrical arcs which can lead to severe burning and even explosion with possible injured people. Besides it is now well established that about 40% of fires originate in electrical equipment.

These facts have promoted preventive maintenance actions. Among them the periodic IR thermographic inspection of the critical areas is an efficient method which is recommended by the Insurance Companies and encourages it through financial advantages.

But the conditions of its application present some difficulties:

a) This operation needs that the IR beam emitted in the zone controlled enters into the camera without significant modification and that the equipment must be on representative electrical charge condition.

The inspection must then carry out after dismantling the protective panels, allowing direct view of the zones. But this requirement is time consuming and makes the control very dangerous for the inspectors who must on these conditions be specially qualified and wear protective clothes. In case of accident the responsibility of the company inspected may be involved.

The duration of the process must include long preparation and refit stages

b) Moreover in many countries, the access to middle and high voltage equipment is only permitted if the electrical current is cut off. This regulation imposes to stop the unit which is a serious handicap for operational unit and consequently movements of deactivation / reactivation which are always risky.

### An economic, efficient and precise alternative solution:

The **H.VIR®** window definitely placed on appropriate position on the external front faces of electrical equipment has been specially designed and patented in order to avoid all these constraints and which present numerous advantages:

#### ● ECONOMY

- The **H.VIR®** avoids any preparation and refit stages of the electrical equipment before inspection and any interruption of operations (no electrical cut-off).
- The **H.VIR®** has been defined (performances and sizes) for an optimum yield and a minimum investment.
- The **H.VIR®** can be placed on new or in service equipment.

#### ● EFFICIENCY AND PRECISION

- With the **H.VIR®** window, the inspection can be made on normal conditions of electrical charge.
- The transmission characteristics of the window material, adapted to the different families of IR cameras, assure a high precision in the temperature measurement. This allows to detect all premonitory signs of damage and to take always the appropriate decision.
- The **H.VIR®** window has a unique compromise of performance, cost and ease of use.

#### ● SAFETY AND AGREEMENT

The setting up of a thermal inspection window on electrical equipment must not affect or degrade the safety level of the electrical equipment on which it is placed. The window must also be in conformance with the different international norms and specifications of electrical equipment manufacturers. As far as the **H.VIR®** is concerned, it is in conformance with the current standards applicable for the applications, has been submitted since 1995 to numerous tests and has been approved by most of the major electrical equipment manufacturers:

# Technical information

## • QUALIFICATIONS :

### ❖ The H.VIR® are conformed to:

- NF EN 60529 standards =  
Water and dust penetration:
  - Code IP X 7 : Bureau Véritas (1997)
  - Code IP 6 X : LCIE (2002)
  - Code IP X5 : LCIE (2004)
  - Code IP X6 : LCIE (2004)
  - Code IP67-IK07 : LCIE (2008)
  - Vibration : CETIM (2008)

### IP 67 Qualification

- To NF EN 50102 standard  
(cover in position closed) = resistance to impacts
  - Code ID 07: Bureau Véritas
- To NEMKO (Norvège) and  
NEK- EN 60439-3 and NEK 511(186) (Avril  
97) standards
- To US standard = approval pronounced by  
UL (1995) to (2008) for USA and CANADA  
and annually renew.

### ❖ Manufacturers Tests :

#### ❖ Internal Arc fault Behaviour :

- AREVA tests (2008)
- KEMA tests (1998)
- ABB tests (1999)
- NATA tests Australia (1997)
- NEMCO tests (1996)

#### ❖ Oxydation/ corrosion Behaviour:

SOREM Internal Tests.

## • THE WINDOW COMPRISES:



- **A metallic waterproof framework** to be fitted on the support panel with a given crown (fixation like stuffing box) and a gasket.

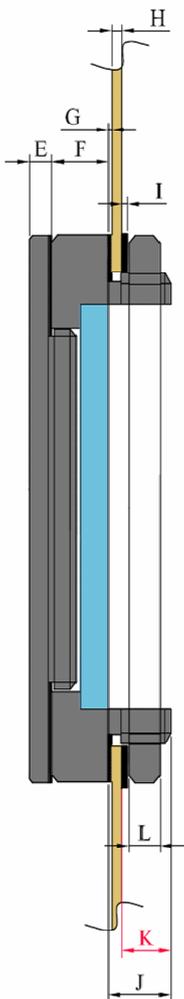
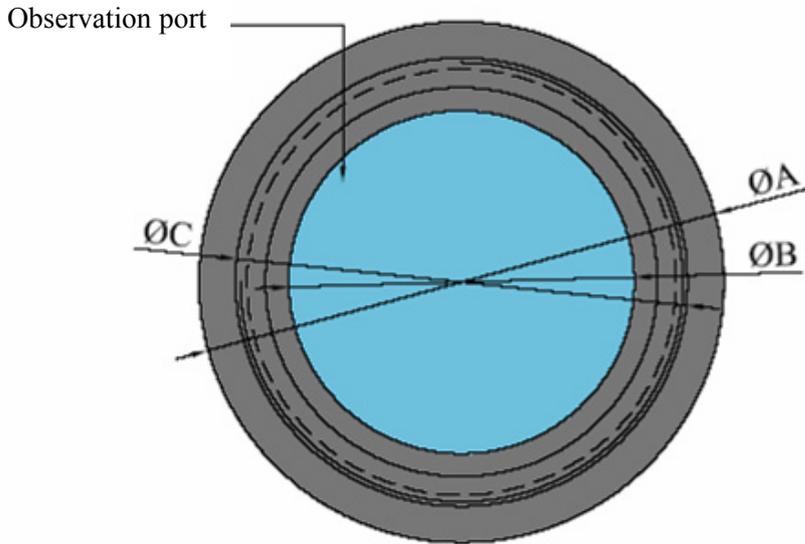
- **An external opaque protection** , screwed, resistant to impacts being able to be placed next to the window with its magnet during the inspection.

- **An optical window** transparent to UV, visible and IR radiations and covering the wavelength of work.

**HVIR is the only window having the best transmission in II and III bands.**

# Technical Informations

- Sizes :



	HVIR 75	HVIR 85	HVIR 105
φ A	79	99	133
φ B	52	71	95
φ C	M68x1,5	M88x2	M113x3
E	4	4	4
F	10	10	10
G(flat ring)	1,5	2	2
I	1	1	1
J	10	10	10
L	5	8	8
K=J-(G+H+I)	5,7+/-0,3	5,2+/-0,3	5,2+/-0,3

	HVIR 75	HVIR 85	HVIR 105
φ A	79	99	133
φ B	52	71	95
φ C	M68x1,5	M88x2	M113x3
E	4	4	4
F	10	10	10
G(flat ring)	1,5	1	1
I	1	1	1
J	10	10	10
L	5	8	8
K=J-(G+H+I)	according to H	according to H	according to H

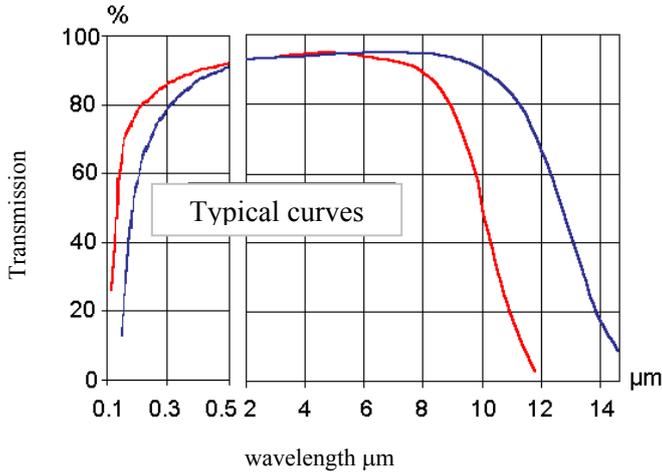
# Technical informations

## • STANDARD MODELS :

One type of materials are used for the standard versions:

• THE TYPE CAN BE USED FOR :  $\lambda = 0,3 \text{ à } 13 \mu\text{m}$

- H-VIR 75 / 85 ou 105.  
RECOMMENDED BOTH BAND II (2 – 5 $\mu$ )  
III (7 – 13 $\mu$ ) IR CAMERAS.



There are different sizes in each group according to the effective diameter of the window.

Group \ $\varnothing$	52 mm	71 mm	95 mm
HVIR	H.VIR75	H.VIR85	H.VIR105

- All types provide a total transmission in the **visible range**. This enables rapid visual control of critical areas and make easy to interpret the results by comparing images from classical numerical camera and from IR inspection.
- All types proved sufficient transmission ratio in the **UV range** for inspection by UV cameras to detect current loss, isolation faults (CORUNA effect).

## • SOME EXAMPLES OF INSTALLATION:



# Practical Information

## • APPLICATIONS

The H.VIR® window is particularly adapted to following applications:

- High voltage protection cells ( connecting cable head visualization, circuit breakers, fuses and fuse-boxes);
- High- low voltage transformers : low voltage connection boxes;
- Low voltage distribution ( 400V) : main circuit breakers ( distribution bar connectors, bar connectors and crimping), low voltage output, plug in racks;
- Electric motors (medium and low voltage except ADF): connection boxes, DC motor commutators, synchronous or asynchronous motor rings;

The standard models meet the normal use conditions of electric cells and transformers :

- Temperatures from  $-40^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$  included and differential pressures up to 1.2 bar.
- They are exclusively designed for inside use under standard environmental conditions.

For outside application or non standard environment, **contact us**.

## • INSTALLATION

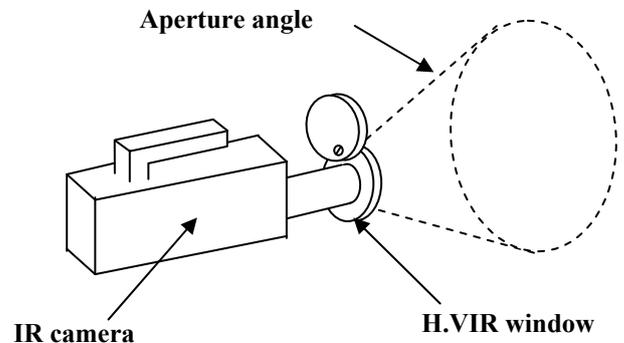
The H.VIR® window are supplied with directions for use and assembling, as well as all of the elements ( screw and o-rings) to fasten them on a flat surface.

The position has to be accurately settled according to the areas to be inspected.

Assembling comprises:

- Carrying out a round aperture  $\varnothing B$ .
- Drilling three holes.
- Installing screws and o- ring.

Assembling is easy and can be carried out by a worker.



## MAINTENANCE

- The H.VIR® windows do not need any particular maintenance procedure when they are used according to our recommendations.
- In case of superficial dirty marks, a cleaning procedure according to our indications should be applied.

## • RECOMMANDATIONS

- The accuracy of the measured temperature depends on the emissivity of the target, the transmission characteristics of the window and the performance of the camera. It is recommended not to use **TYPE 1** window with IR camera operating in band III.

**It is reminded that the use of non qualified window or equip with a short wave crystal with infrared cameras working in band III cause a sensible risk of degradation of the results.**

- In order to avoid any confusion the range of use is marked on each window.
- **The standard version cannot be used in explosive atmosphere ( ATEX Norm).**
- For specific environmental conditions, please do not hesitate to contact us.

# **H-VIR®**

**Worldwide reference.**

**International agreements :**

(EN in Europe, UL in the USA, NEMKO in Norway, ...)

**Diversified applications :**

(paper factories, agroalimentary, automotive industry, energy, oil, chemical industry, hospitals, museums, aerospace industry, pharmaceutic, ...).

**Near services.**

**TEST-THERM Sp. z o.o. 30-009 Krakow**

**tel 12 632 13 01 ☎ 632 61 88 fax 12 632 10 37**

**e-mail : office@test-therm.pl ☎ www.test-therm.pl**