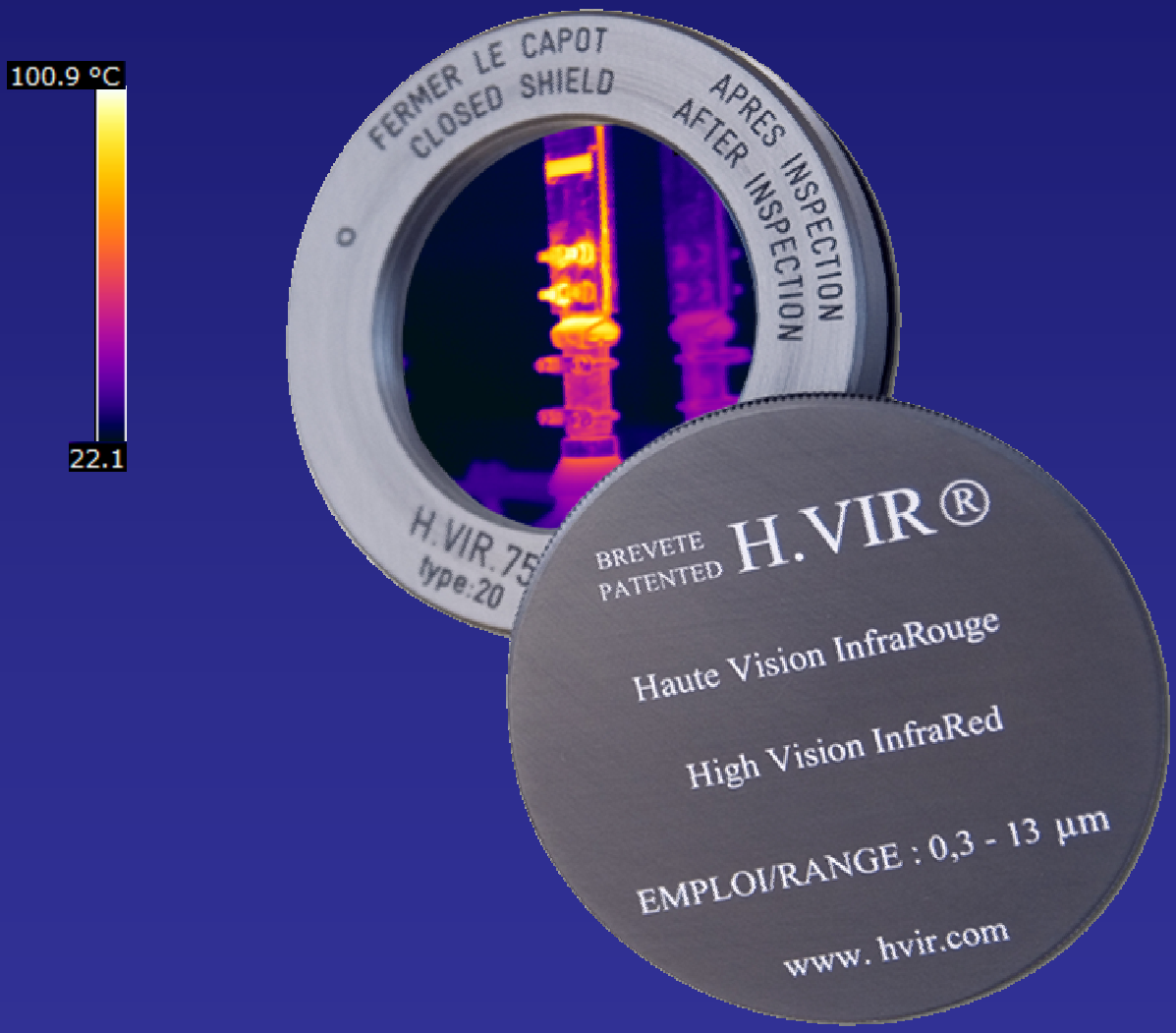
Inventor & World Leader of Infrared Window

For 15 years we make your electrical cells transparent!

H.VIR ® WINDOW

Transparency range :
(UV - visible- infrared λ0.3 à 13µm)



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

General

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 (difficulties for rearming).

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, once for quite (no limit of life).

- **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:

- CEI 60529 standard =
  Water and dust penetration:
  - IP67 code : **LCIE** (2008)
- To CEI 62262 standard
  Mechanical impact
  - IK 07 code : **LCIE** (2008)

IP 65/66/67 Qualification

- CEI 60255-21-1 and CEI 60255-21-3 standards
  CETIM (2008)
  - Vibration and seism categories (severity class : 1)
- To NEMKO (Norway) and
  NEK- EN 60439-3 and NEK 511(186) (April 97) standards
- **UL certification** (2008) :
  USR and CNR recognized

❖ Manufacturers Tests :

- **Internal pressure behaviour**
  (with cover open)
  - SOREM internal test
  - Square D test

  The guaranteed behaviour of the windows (standard versions) is :
  - H.VIR 75 = 4 bars
  - H.VIR 85 = 3 bars
  - H.VIR 105 = 2 bars

❖ Internal Arc fault Behaviour :

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

❖ Oxydation/ corrosion Behaviour:

SOREM Internal Tests.

• THE WINDOW COMPRISES:

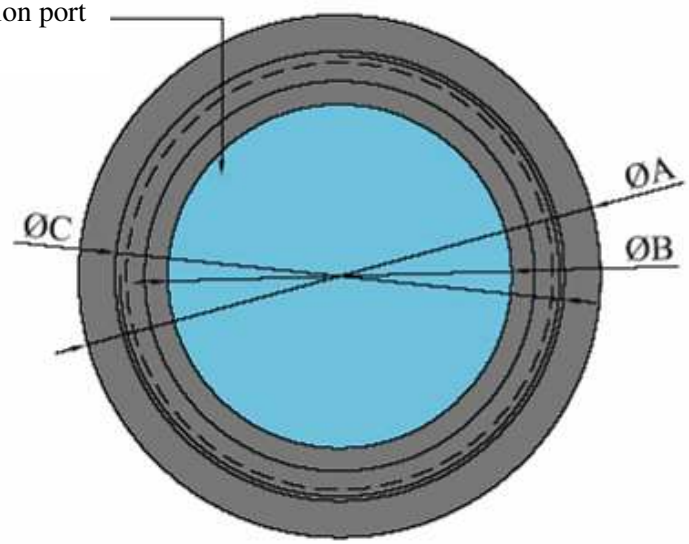
- **A metallic waterproof framework** to be fitted on the support panel with a crown (fixation like stuffing box) and two provided gaskets .
- **An external opaque protection** , screwed, resistant to impacts being able to be placed next to the window with its magnet during the inspection.
- **An optical window** transparent to UV, visible and IR radiations and covering the wavelength of work**.**

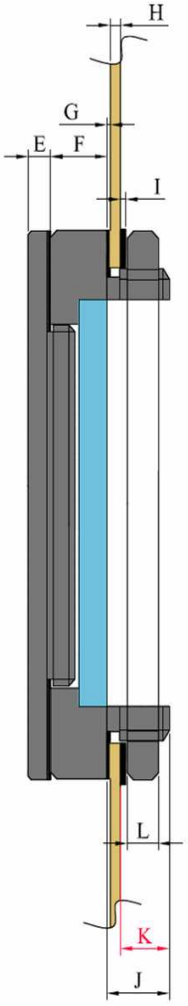
HVIR is the only window having the best transmission in II and III bands.

Technical Informations

- **Sizes :**

Observation port





H = Sheet thickness 1.8 mm

	H.VIR 75	H.VIR 85	H.VIR 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

H = Sheet upper 2 mm

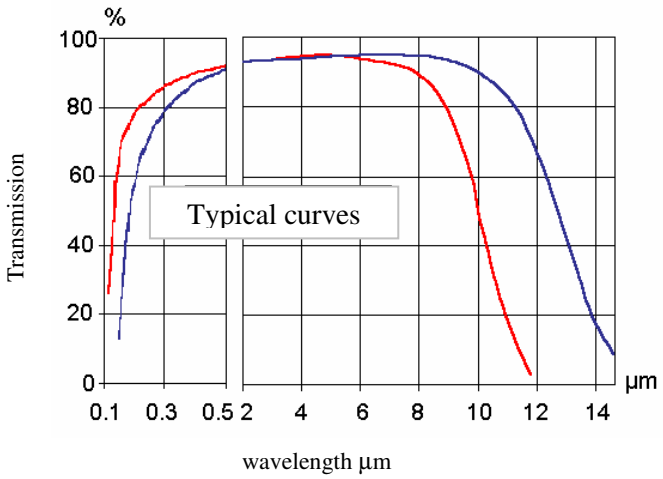
	H.VIR 75	H.VIR 85	H.VIR 105
ϕ A	79	99	133
ϕ B	52	71	95
ϕ C	M68x1.5	M88x2	M113x3
E	4	4	4
F	10	10	10
G(flat ring)	1.5	1	1
I	1	1	1
J	10	10	10
L	5	8	8
K=J(G+H+I)	According H	According H	According H

Technical informations

• STANDARD MODELS :

One type of windows is proposed covering all the infrared field of application :

THE TYPE CAN BE USED FOR : λ = 0,3 à 13 µm



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

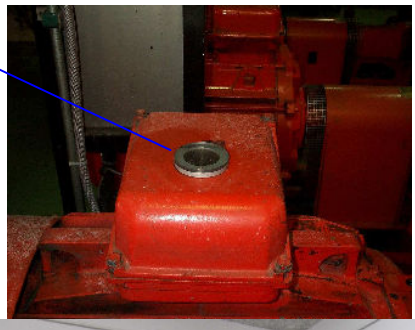
There are different sizes in each group according to the effective diameter of the window.

Group \ ∅	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 which are :

- Temperatures from – 40°C to + 55°C included and differential pressures up to 1.2 bar.

They are exclusively designed for **inside and outside** use under standard environmental conditions. The cover must be screw on the frame beyond the inspection sequences.

• INSTALLATION

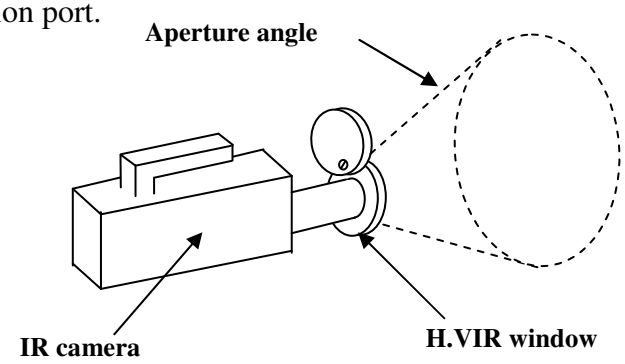
The **H.VIR®** window are supplied with directions for use and assembling, as well as all of the elements to fasten them on a flat surface.

The position has to be accurately settled according to the areas to be inspected, the lens of the camera used and the diameter of the observation port.

Assembling comprises:

- Carrying out a round aperture **Ø C**.
- Assembly of the window (fixation like stuffing box) with the special tool key and gaskets.

Assembling is easy but must be carried out by a qualified worker for operations on electrical material.



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 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 during inspection, the range of use of each H.VIR ® is marked on each window.

- **The standard versions type 20-21-22 cannot be used in explosive atmosphere (ATEX Norm).**

H-VIR®

Worldwide reference.

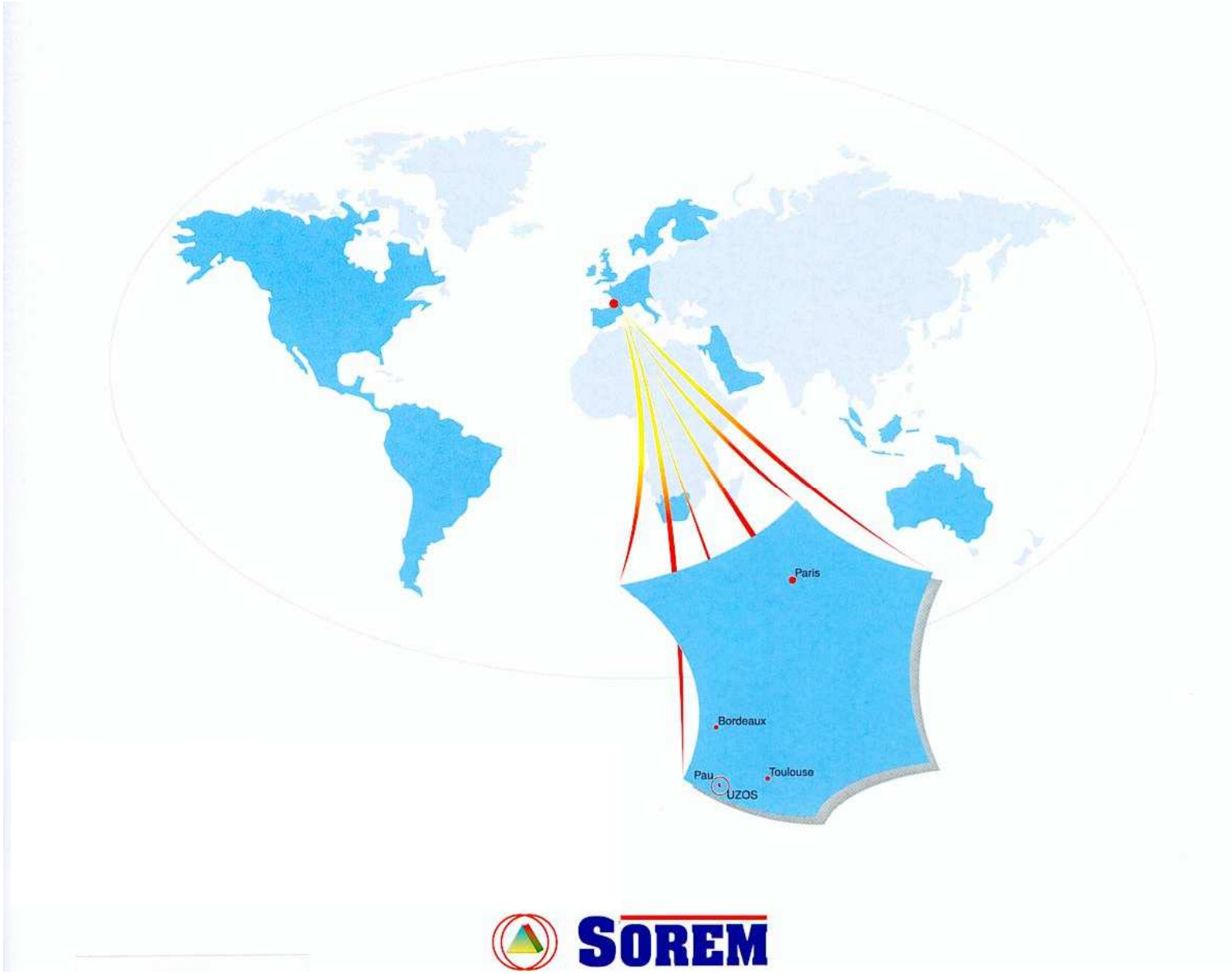
International agreements :

(CEI 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.



SOREM