optris **Bottom Up GIS 640i G7**
TECHNICAL DATA

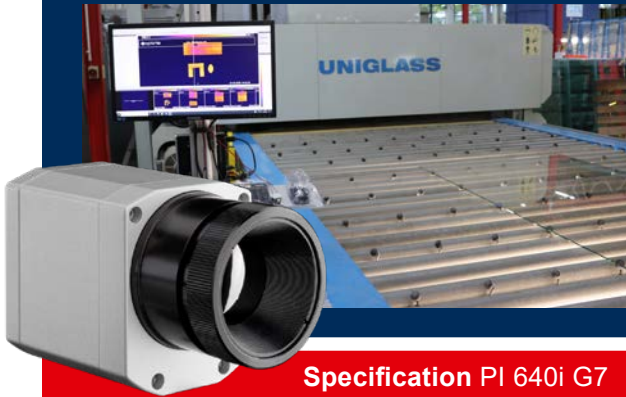**optris** infrared measurements

High resolution Bottom up glass inspection system for process control in glass tempering machines

Features

- Compact bottom up system for coating independent underneath measurement
- Excellent 1600 px resolution on maximum 4.3 m scan width (@ 90 cm distance)
- Integrated ultra-fast glass breakage detection combined with Digitally controlled lens protection system (DCLP)
- No cooling or air purge requirement
- Glass area calculation
- Pre-assembled system for easy installation on glass tempering furnaces

Specification PI 640i G7

Optical resolution	640 x 480 pixels
Detector	FPA, uncooled (17 µm x 17 µm)
Spectral range	7.9 µm
Temperature ranges	150 ... 900 °C, 200 ... 1500 °C
Sighting range	0 ... 250 °C
Frame rate	32 Hz / 125 Hz @ 640 x 120 pixels
Optics (FOV)	90° x 66° FOV / f = 7.7 mm or 60° x 45° FOV / f = 10.5 mm max. FOV: 111°/ 1600 pixels per scan line[1] 4.3 m scan width @ 90 cm distance
Thermal sensitivity (NETD)[2]	80 mK (at T_{Obj} = 650 °C)
Accuracy	±2 °C or ±2 %, whichever is greater
PC interface	USB 2.0 / USB to GigE (PoE) interface
Process interface (PIF), industrial	2x 0 – 10 V input, digital input (max. 24 V), 3x 0/4 – 20 mA output, 3x relais (0 – 30 V/ 400 mA), fail-safe relay
Ambient temperature	0 ... 50 °C
Relative humidity	20 – 80 %, non-condensing
Enclosure (size / rating)	46 x 56 x 76 – 100 mm (depending on lens + focus position) / IP 67 (NEMA)
Weight	269 - 340 g (depending on lens)
Vibration	IEC 60068-2-6 / -64
Shock	IEC 60068-2-27 (25 G and 50 G)

Specification glass breakage sensor CTlaser 4ML

Temperature range	0 °C ... 500 °C
Spectral range	2.2 - 6 µm
Optical resolution (90 % energy)	30:1
System accuracy[3] (at T_{Amb} 23 ±5 °C)	± (0.3% of reading +2 °C)
Temperature resolution (NETD)[4]	120 mK
Exposure time	90 µs (90% signal)
Response time	300 µs (90% signal)
Emissivity/ Gain (adjustable via programming keys or software)	0.100 – 1.100
Environmental rating	IP 65 (NEMA-4)
Ambient temperature[5]	–20 °C ... 70 °C (sensing head: 50 °C with laser on) 0 °C ... 85 °C (electronics)
Vibration (sensor)	IEC 60068-2-6 / -64
Shock (sensor)	IEC 60068-2-27 (25 G and 50 G)
Weight	600 g (sensing head) 420 g (electronics)

1) With 90° optics and usage of a diagonal scan line; maximum pixel count based on two cameras without overlapping
2) Measurement of the noise equivalent temperature difference (NETD) according to VDI 5585 standard, method B; 650 °C black body temperature, frame rate 20 Hz averaged
3) ε = 1, response time 1 s
4) At time constant 1 ms and T_{Obj} = 50 °C
5) The functioning of the LCD display may be limited at ambient temperatures below 0 °C

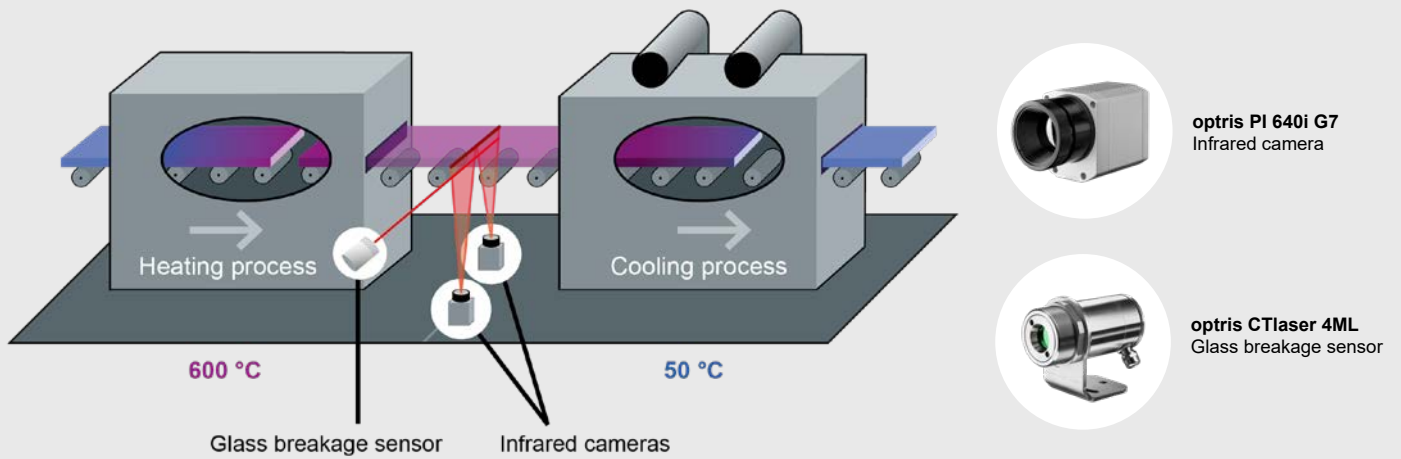### Scope of supply Bottom Up GIS 640i G7

- 2x PI 640i G7 imager with 90° or 60° FOV
- 2x Industrial Process Interface
- CTlaser 4ML glass breakage sensor with USB interface
- 2x DCLP Shutter system with mounting brackets for imagers
- 2x USB Server Gigabit
- Control cabinet with cable set (10 m each) and remote control box
- Software package
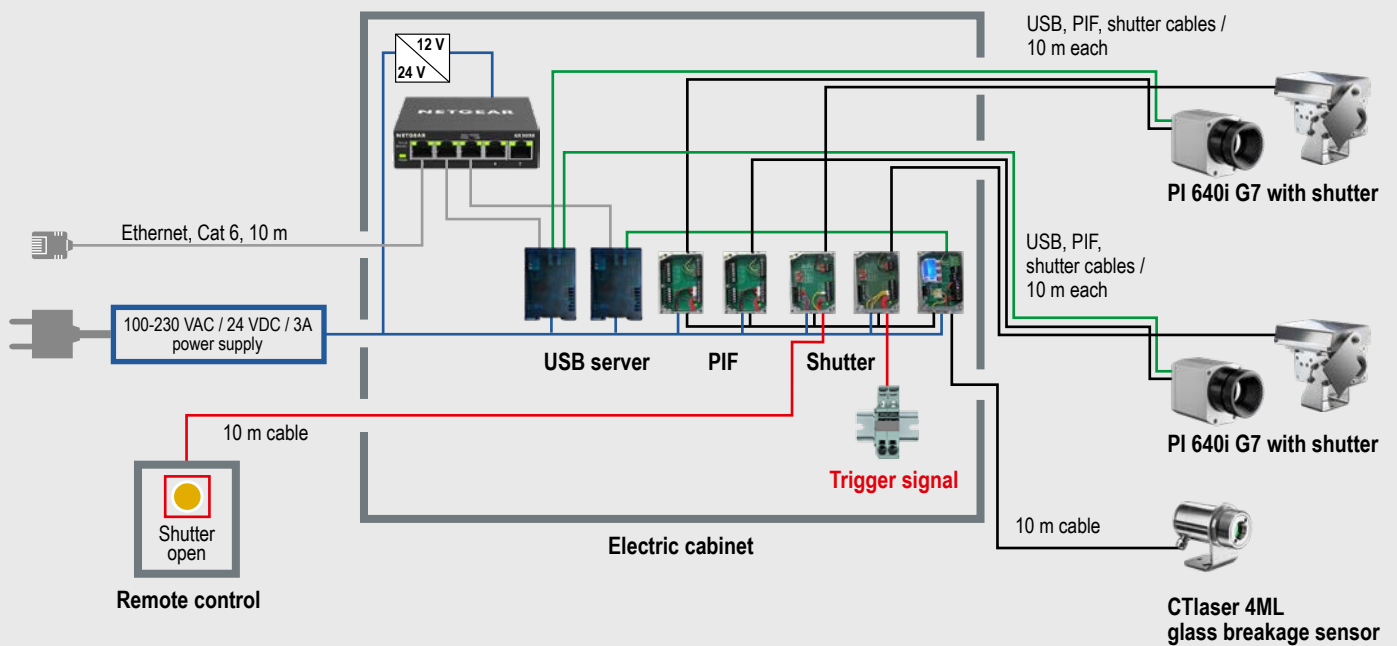- 100-230 V AC/ 24 V DC power supply for initial start-up
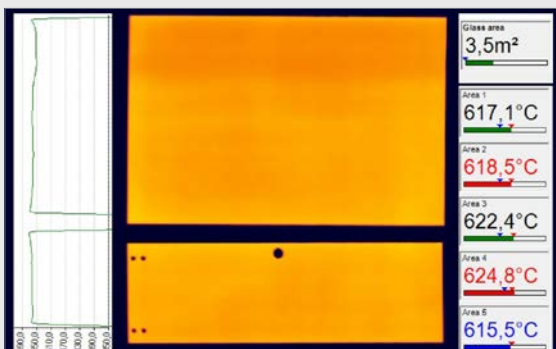
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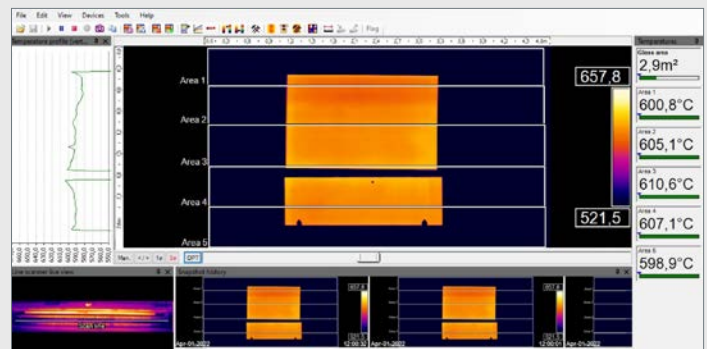## TECHNICAL DATA

Measurement principle

Heating process 600 °C → Cooling process 50 °C

Glass breakage sensor · Infrared cameras

optris PI 640i G7
Infrared camera

optris CTlaser 4ML
Glass breakage sensor

System overview

12 V / 24 V

USB, PIF, shutter cables /
10 m each

Ethernet, Cat 6, 10 m

100-230 VAC / 24 VDC / 3A
power supply

USB server · PIF · Shutter

PI 640i G7 with shutter

USB, PIF,
shutter cables /
10 m each

PI 640i G7 with shutter

Trigger signal

10 m cable

10 m cable

Shutter open

Remote control

Electric cabinet

CTlaser 4ML
glass breakage sensor

Software PIX Connect

Glass area 3,5m²
Area 1 617,1°C
Area 2 618,5°C
Area 3 622,4°C
Area 4 624,8°C
Area 5 615,5°C

The software provides excellent image quality and manifold analysis features as profiles, measurement areas and alarm indication

Glass area 2,9m²
Area 1 600,8°C
Area 2 605,1°C
Area 3 610,6°C
Area 4 607,1°C
Area 5 598,9°C
657,8
521,5

Exemplary software layout with thermal profile, IR live view, snapshot history, five measurement zones and glass area calculation