

Accurate, rugged, and reliable pyrometer for non-contact temperature measurement on thin and thinnest glass sheets in ranges between 400 and 1100 °C

IN 6/78-L



- Temperature range from 400 to 1100 °C
- Measurement of ultra-thin glass sheets with less than 1 mm thickness
- Easy installation and maintenance due to compact, rugged IP65 stainless steel housing for harsh environments
- Multiple onboard digital and analog interfaces for direct and fast PLC communication
- Specially designed and coated high-end optics for high accuracy and excellent size of source effects
- Global support by locally available application engineers



The IN 6/78-L is a pyrometer especially designed for non-contact temperature measurements on the thinnest of glass surfaces. Its special 7.8 µm wavelength makes it possible to accurately and reliably measure glass sheets below 1 mm thickness (ultra-thin glass). As such, it sets new standards for stress-free sheet glass production on manufacturing lines all around the world.

The full digital core sensor design provides a wide temperature range with high accuracy. Its small form factor and robust design allows for easy integration into the process – even in harsh environments.

The IN 6/78-L is equipped with specially designed and coated high-end optics, which reduce the effects of ambient reflectance and guarantee the best possible accuracy.

You can connect the pyrometer to a PC through an RS485 to USB connection. You can then use the InfraWin software to make parameter adjustments, get temperature details, log data, and further analyze your complete temperature processes.

Typical applications:

- Glass industry: measurement of ultra-thin glass sheets

Technical Data

Measurement Specifications

Temperature Range:	400 to 1100 °C		
Sub Range:	Adjustable to any range within the temperature range. Min. span is 51 °C		
Spectral Range:	7.8 µm, FWHM 0.6 µm		
Optics:	Silicon		
Resolution:	0.1 °C on interface, < 0.1% of temperature range at the analog output		
Measurement Uncertainty: ($\varepsilon = 1$ $t_{90} = 1$ S)	0.7% of reading or 3.5 °C, whatever is greater, in °C ($T_{amb} = 44$ °C)		
Repeatability ($\varepsilon = 1$ $t_{90} = 1$ S):	1°C		
Noise Equivalent Temperature Difference (NETD):	Temperature / °C	NETD at $t_{90} = 80$ ms / °C	NETD at $t_{90} = 1$ s / °C
$\sigma = 1$ ($\varepsilon = 1$, $t_{amb} = 44$ °C)	500	0.3	0.1
	800	0.3	0.1

Environmental

Operating Temperature:	0 to 70 °C
Storage Temperature:	-20 to 80 °C
Protection Class:	IP 65 IEC 60529 (value in mated condition)
Relative Humidity:	Non-condensing conditions
Enclosure Rating:	IP65 (IEC 60529)
Housing:	Stainless steel
Power Supply:	24 V DC (18 to 30 V DC) nominal, ripple must be less than 0.5 V
Power Consumption:	Max. 50 mA
Load:	Max. 500 Ohm at 24 V (Max. 200 Ohm at 18 V)
Isolation:	Power supply, analog outputs, and digital interfaces are electrically isolated from each other
Weight:	410 g
Connection:	12-pin connector
Operating Position:	Any

Parameters

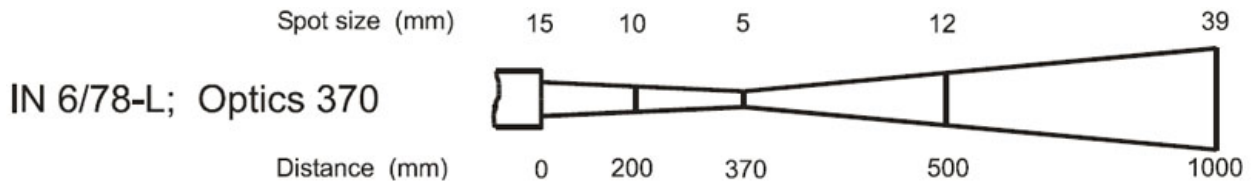
Digital Interface:	RS485 (half-duplex)
Analog Output:	0 to 20 mA or 4 to 20 mA (linear)
Emissivity ε :	10 to 125%, adjustable in steps of 0.1%
Transmittance τ :	10 to 100%, adjustable in steps of 0.1%
Exposure time t_{90} :	0.08 s, adjustable to 0.5 s, 1 s, 2 s, 5 s, 10 s, or 30 s
Maximum Value Storage:	Built-in single and double store clearing with clear time t_{cl} (0.1 s, 0.25 s, 0.5 s, 1 s, 5 s, or 25 s), via interface or automatically with each new item to be measured
RS485 Bus Address:	Set via digital interface
RS485 Baud Rate:	1200 Bd to 115.2 kBd
Temperature Output:	Adjustable to °C or °F

Certifications and Standards

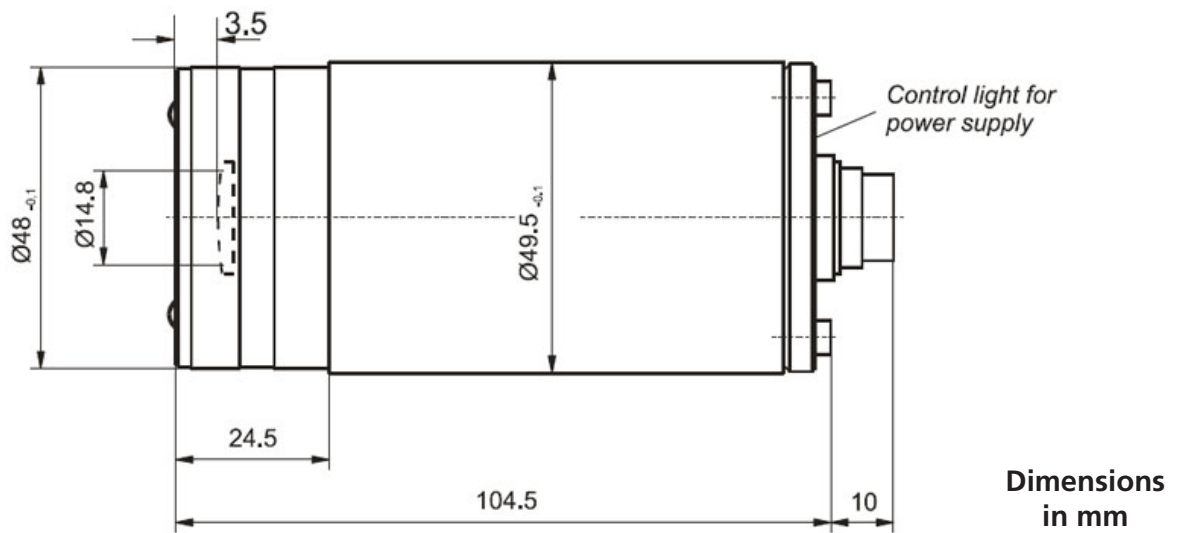
CE Label:	According to EN directives about electromagnetic immunity
Sighting:	None

Note: The calibration / adjustment of this pyrometer is carried out in accordance with VDI/VDE 3511, Part 4.4. See <http://info.lumasenseinc.com/calibration> for more information.

Optics



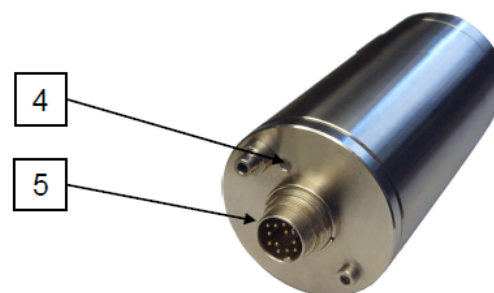
Dimensions



Overview



- 1 Stainless steel housing
- 2 Optics
- 3 Type label



- 4 Control light for power supply
- 5 Electrical connector

Reference Numbers

Type	Temperature Range	Reference Number
IN 6-78L	400 to 1100 °C	3 906 010

Scope of delivery: Pyrometer with PC software InfraWin for adjustment and evaluation, Works Certificate, and Manual
Ordering note: A connection cable is not included in scope of delivery and must be ordered separately

Accessories

3 820 330	Connection cable, 5 m, straight connector*	3 890 640	DA 4000-N: LED digital display to be built into the switchboard
3 820 500	Connection cable, 10 m, straight connector*	3 890 650	DA 4000: like the DA 4000-N, but additionally with 2 limit switches
3 820 510	Connection cable, 15 m, straight connector*	3 890 570	DA 6000-N digital display, to allow adjustment of Pyrometer through RS485 interface
3 820 810	Connection cable, 20 m, straight connector*	3 890 530	DA 6000: like the DA 6000-N, but with analog input and 2 limit switches for the RS485 interface
3 820 820	Connection cable, 25 m, straight connector*	3 826 500	HT 6000: portable battery driven indicator and instrument for pyrometer parameter settings; RS232 / RS 485
3 820 520	Connection cable, 30 m, straight connector*	3 826 510	PI 6000: PID programmable controller
3 820 740	Connection cable, 5 m, temperature resistant up to 200 °C (straight connector)*	3 826 720	USB to RS485 adapter cable, 1.8 m long
3 820 340	Connection cable, 5 m, 90° connector*	3 852 440	Protocol converter RS485 (switchable) ↔ Profibus-DP for 1 instrument
3 820 530	Connection cable, 10 m, 90° connector*	3 852 460	Protocol converter RS485 ↔ Profibus-DP for 32 instruments
3 820 540	Connection cable, 15 m, 90° connector*	5 837 410	Cooling jacket for IN 6/78-L
3 820 830	Connection cable, 20 m, 90° connector*	3 834 210	Adjustable mounting support
3 820 840	Connection cable, 25 m, 90° connector*	3 835 160	Air purge unit, aluminium
3 820 550	Connection cable, 30 m, 90° connector*	3 835 440	Air purge unit, stainless steel
3 852 290	Power supply NG DC for DIN rail mounting; 100 to 240 V AC ⇒ 24 V DC, 1 A	3 846 100	Mounting tube
3 852 540	Power supply NG 0D 85 to 265 V AC ⇒ 24 V DC, 600 mA	3 846 120	Flange tube
3 852 550	Power supply NG 2D for DIN rail mounting; 85 to 265 V AC ⇒ 24 V DC, 600 mA with 2 settable limit switches		

*All connection cables include a short adapter cable with a 12-pin SUB-D connector. This connector may be used in combination with the RS485 to USB adapter.

Accessory Overview

Electrical Accessories



Industrial Power Supplies



Digital Display



Fast Digital Controllers

Mechanical Accessories



Mounting Brackets



Air Purges



Air/Water Cooled enclosures

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