

PYROSPOT DT 54L

Pyrometer for industrial application

Overview

Digital pyrometers with RS-485 interface



Special features

- For temperature measurements between -40 °C and 1000 °C
- Temperature linear output 0/4 to 20 mA, switchable
- Integrated RS-485 interface
- Integrated double laser
- Robust stainless steel housing
- Very short response time of 10 ms

Description and application

The digital DIAS pyrometers DT 54L are specially designed for industrial purposes. They are suitable for temperature measurement between -40 °C and 1000 °C on different non-metallic or coated metallic surfaces.

The solid and compact stainless steel housing allows usage even under rough ambient conditions. The PYROSPOT DT 54L realizes measurement field sizes from 2.6 mm. With a minimum response time of only 10 ms (t_{90}) the devices are also suitable for fast measuring tasks.

The standard 0/4 to 20 mA temperature linear output signal allows an easy implementation in existing measurement and control systems.

Use the integrated double laser for a correct alignment of the pyrometer to the measurement object. The double laser simplifies substantially the adjustment under difficult local conditions where the pyrometer is difficult to reach or the measurement object cannot be viewed directly.

The DT 54L possesses a galvanically isolated RS-485 interface. So the devices are bus-compatible and use the Modbus RTU protocol.

You can connect the pyrometer via an optional available interface adapter RS-485 to USB with a computer. By connecting the pyrometer with a PC parameters like emissivity, sub temperature range, data storage settings and response time can be adjusted by using the comfortable parameterization and evaluation software PYROSOFT Spot.

The parameters can also be adjusted via RS-485 interface and the optional available handheld programming device DHP 1040.

Typical application areas:

- Glass and ceramic industry
- Kiln engineering
- Paper and packaging industry
- Food industry

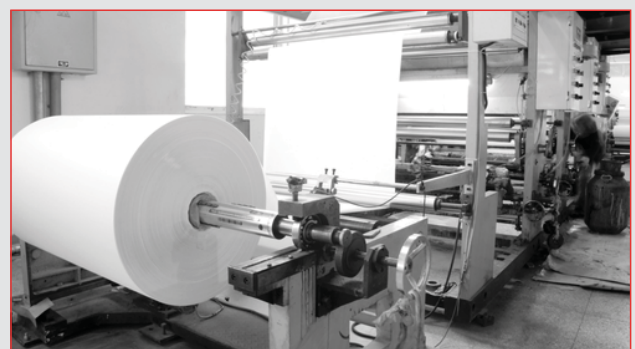


Image credit: „Equipment of paper mill“ by Naqiewei, Copyright 2014, used with licence from Shutterstock.de

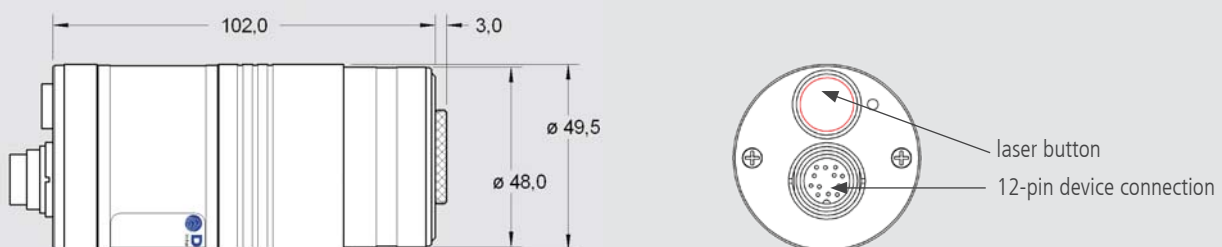
PYROSPOT DT 54L

Pyrometer for industrial application

| Technical data | | | | |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------|------------|
| Type | DT 54L | | | |
| Temperature range | 0 °C to 1000 °C | -40 °C to 1000 °C | | |
| Fixed optics | 75 | 200 | 600 | 1500 |
| Part number | 4548261202 | 4548262201 | 4548263201 | 4548264201 |
| Sub temperature range | adjustable via RS-485 interface within temperature range, minimum span 50 °C | | | |
| Spectral range | 8 µm to 14 µm | | | |
| Distance ratio | approx. 100 : 1 | approx. 75 : 1 | | |
| Measurement uncertainty ¹ | 0.6 % of measured value in °C or 1 K ² | | | |
| Reproducibility ¹ | 0.3 % of measured value in °C or 0.5 K ² | | | |
| NETD ³ | < 0.15 K ⁴ | | | |
| Response time (t90) | 10 ms (min.), adjustable via RS-485 interface | | | |
| Emissivity | 0.200 to 1.000, adjustable via RS-485 interface | | | |
| Data storage | minimum/maximum data storage, adjustable via RS-485 interface | | | |
| Output | 0/4 to 20 mA, temperature linear, max. burden: 700 Ω | | | |
| Interface | RS-485 (galvanically isolated), half duplex, max. baud rate 115 kBd, data protocol Modbus RTU | | | |
| Aiming | double laser, 645 nm to 660 nm, class II, < 1 mW | | | |
| Switching output/threshold | 1 opto relay, R _{Load} min. 48 Ω (galvanically isolated)/adjustable within temperature range | | | |
| Software | PYROSOFT Spot for Windows®, optional: PYROSOFT Spot Pro | | | |
| Parameters | emissivity, response time, data storage, sub temperature range, transmissivity, ambient radiation, adjustable via RS-485 interface | | | |
| Power supply | 24 V DC ± 25 %, residual ripple 500 mV | | | |
| Power consumption | max. 1.5 W | | | |
| Operating temperature | 0 °C to 70 °C | | | |
| Storage temperature | -20 °C to 70 °C | | | |
| Weight | approx. 600 g | | | |
| Housing | stainless steel round housing with plug connector, length approx. 105 mm, diameter 50 mm | | | |
| Protection class | IP 65 (according to DIN EN 60529 und DIN 40050) | | | |
| CE symbol | according to EU regulations (EN 50 011) | | | |
| Scope of delivery | PYROSPOT DT 54L, manual, inspection sheet, PYROSOFT Spot for Windows® (without connection cable, please order separately) | | | |

¹ Specifications for black bodies, T_{ambient} = 23 °C, t95 = 1 s. ² Whichever is higher value. ³ Noise equivalent temperature difference. ⁴ T_{ambient} = 23 °C, ε = 1, t95 = 100 ms, T_{Object} = 100 °C

Dimensional drawing pyrometer



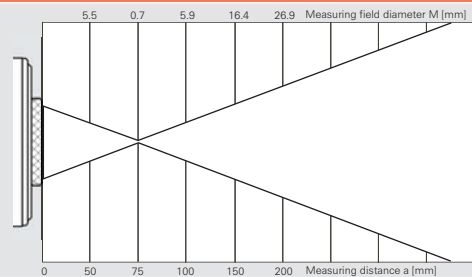
PYROSPOT DT 54L

Pyrometer for industrial application

Optics types 75, 200, 600 and 1500 (aperture D = 15 mm)

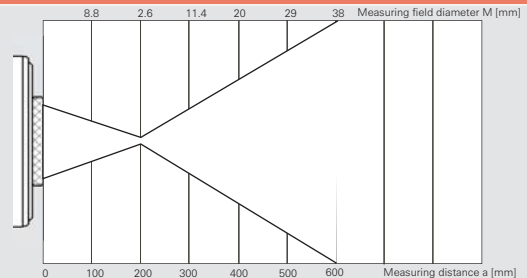
Optics 75 (sharp point at a = 75 mm measuring distance, marked bold)

| Measuring distance a [mm] | 0 | 50 | 75 | 100 | 150 | 200 | 250 |
|---------------------------|---------------------------------|-----|------------|-----|------|------|------|
| Temperature range | Measuring field diameter M [mm] | | | | | | |
| DT 54L (0°C to 1000 °C) | 15.0 | 5.5 | 0.7 | 5.9 | 16.4 | 26.9 | 37.3 |



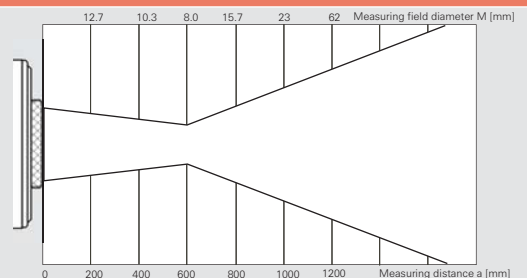
Optics 200 (sharp point at a = 200 mm measuring distance, marked bold)

| Measuring distance a [mm] | 0 | 100 | 200 | 300 | 400 | 500 | 600 |
|----------------------------|---------------------------------|-----|------------|------|-----|-----|-----|
| Temperature range | Measuring field diameter M [mm] | | | | | | |
| DT 54L (-40 °C to 1000 °C) | 15.0 | 8.8 | 2.6 | 11.4 | 20 | 29 | 38 |



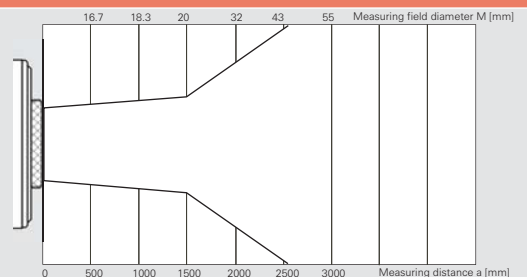
Optics 600 (sharp point at a = 600 mm measuring distance, marked bold)

| Measuring distance a [mm] | 0 | 200 | 400 | 600 | 800 | 1000 | 2000 |
|----------------------------|---------------------------------|------|------|------------|------|------|------|
| Temperature range | Measuring field diameter M [mm] | | | | | | |
| DT 54L (-40 °C to 1000 °C) | 15.0 | 12.7 | 10.3 | 8.0 | 15.7 | 23 | 62 |



Optics 1500 (sharp point at a = 1500 mm measuring distance, marked bold)

| Measuring distance a [mm] | 0 | 500 | 1000 | 1500 | 2000 | 2500 | 3000 |
|----------------------------|---------------------------------|------|------|-------------|------|------|------|
| Temperature range | Measuring field diameter M [mm] | | | | | | |
| DT 54L (-40 °C to 1000 °C) | 15.0 | 16.7 | 18.3 | 20.0 | 32 | 43 | 55 |



Software PYROSOFT Spot

For evaluation and processing of measured data obtained DIAS provides two software variants for its pyrometer PYROSPOT. These are the free Windows software **PYROSOFT Spot** and the pay version **PYROSOFT Spot Pro**. The Pro version allows the measurement, visualization and measurement recording of several simultaneously connected pyrometers, whereas this is possible with the free version only for one connected pyrometer.



^{*)} only for PYROSOFT Spot Pro

Further functions are for example:

- Measurement data logging with real-time display, parameterization of DIAS pyrometers
- Trigger functions^{*)} and auto save^{*)}
- Extensive statistical analysis of measurement data
- Measurement cursor, print functions, automatic emissivity determination
- Export of measured data as text file and automatic creation of Microsoft Excel® spreadsheets
- Integrated report function with customized templates for Microsoft Word®
- Integrated calculator for easy calculation of optics parameters







PYROSPOT DT 54L

Pyrometer for industrial application

| Electrical, mechanical and optical accessories ¹ | | Part number |
|-------------------------------------------------------------------|------------------------------------------------------------|-------------|
| Connection cable, straight plug, 12 pin | Length 2 m | 3310A11111 |
| | Length 5 m | 3310A11112 |
| | Length 10 m | 3310A11113 |
| | Length 15 m | 3310A11114 |
| | Length 20 m | 3310A11115 |
| | Length 25 m | 3310A11116 |
| | Length 30 m | 3310A11117 |
| Connection cable, angulate plug, with aiming light button, 12 pin | Length 2 m | 3310A11151 |
| | Length 5 m | 3310A11152 |
| | Length 10 m | 3310A11153 |
| | Length 15 m | 3310A11154 |
| | Length 20 m | 3310A11155 |
| | Length 25 m | 3310A11156 |
| | Length 30 m | 3310A11157 |
| Mounting angle | adjustable | 3310A21050 |
| Cooling jacket | including air purge unit, without mounting angle | 3310A23050 |
| Ball flange | M40 × 1.5 | 3310A24020 |
| Air purge unit | | 3310A22050 |
| Power supply PSU 15 | 24 V DC, 0.6 A | 3310A12010 |
| DHP 1040 | handheld programming device for pyrometer parameterization | 3310A17010 |

¹ Further accessories on request.

Selected accessories – pictures

| Mounting angle, adjustable | Cooling jacket | Air purge unit |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Part number: 3310A21050  | Part number: 3310A23050  | Part number: 3310A22050  |
| Ball flange | Screwed coupling for ball flange | Handeld programming device DHP 1040 |
| Part number: 3310A24020  | Part number: 3310A24021  | Part number: 3310A17010  |