

- ▶ norm version
- ▶ fiber optics version

NOTES

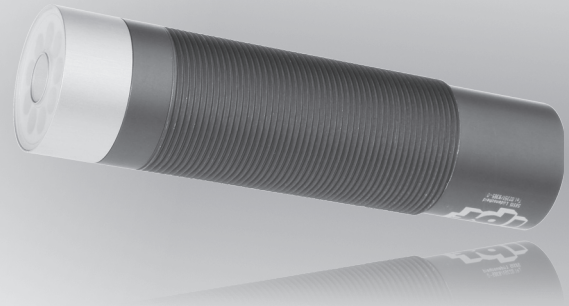
A large grid area for taking notes, consisting of a 30x30 grid of small squares. The grid is empty and occupies the majority of the page.

dimensions **M34 x 1.5mm**

measuring range diffuse light **10 ... 60mm**

transmitted light **dependent on fiber optics**

- ✓ **color and grayscale detection**
- ✓ **extremely high switching frequency 30kHz**
- ✓ **suitable for industrial use**
- ✓ **switchable brightness control**
- ✓ **temperature-compensated**
- ✓ **several TEACH options (button, PLC or PC)**
- ✓ **various algorithms can be activated**
- ✓ **color diagram display under Windows**
- ✓ **fiber optic versions can also be used in explosion-hazardous areas**



**store up to 31 reference colors
true color detection**



description

ipf color sensors make it possible to distinguish between very similar shades of color with a high level of accuracy. With the devices of this series, we offer a family of color sensors specifically designed for True Color detection (“human color reception”) and a high switching frequency. With the help of pulsed white-light LEDs, a light spot is projected onto the surface that is to be controlled. Part of the light reflected by the measurement object is now directed to a color-sensitive detector element by means of receiving optics. The received light is thereby split according to the 3-color-range method (red, green, blue) as well as by intensity. The devices can be operated both in alternating-light mode with high insensitivity to ambient light as well as in constant-light mode with high scanning frequency (30 kHz) with integrated or external light source. Illumination can be switched off via the Windows software included in the scope of delivery, thereby making possible the color and brightness inspection of self-luminous objects, such as LEDs, vehicle tail lights, halogen lamps or even fluorescent lamps. Devices with UV light source enable the detection and differentiation of fluorescent colors; the use of polarizing filters or diffuse illumination variants allows highly glossy surfaces to be detected.

Up to 31 colors can be output via the 5 digital outputs. With the help of the various front ends, operating distances from nearly 0 to 500 mm can be achieved with detection ranges from Ø 0.5mm to approx. Ø 100mm. The use of fiber optic versions allows scans to be performed in explosion-hazardous areas. The color sensors are configured via the serial interface (RS232) with converters for USB or Ethernet under Windows®. Up to 31 colors can thereby be taught and stored in the sensor with the option to configure individual evaluation tolerances for each of these colors.

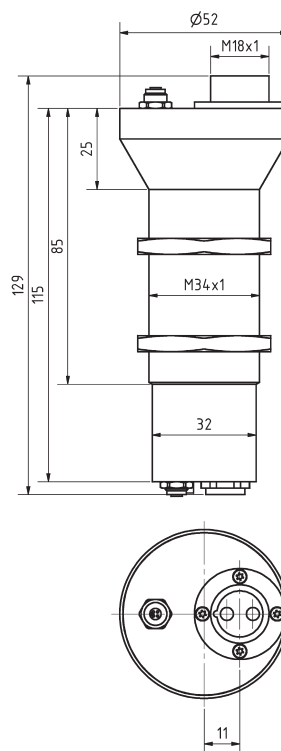
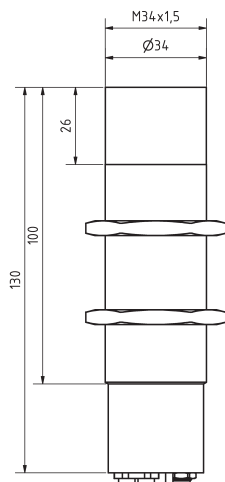
application examples

- ▶ monitoring the cover color of installation parts
- ▶ color inspection of painted components, imitation leathers, plastics and textiles in car interiors
- ▶ ejection of faulty parts based on color markings
- ▶ material sorting using color markings
- ▶ monitoring the sequence of connector strands
- ▶ trigger sensor in the printing industry (print-mark detection)
- ▶ detection of the color of inserts in production systems
- ▶ color differentiation of glass panes

article-no.
version
sensing range

OF340140
diffuse
10 ... 60mm

OF340180
fiber optics
dependent on fiber optics



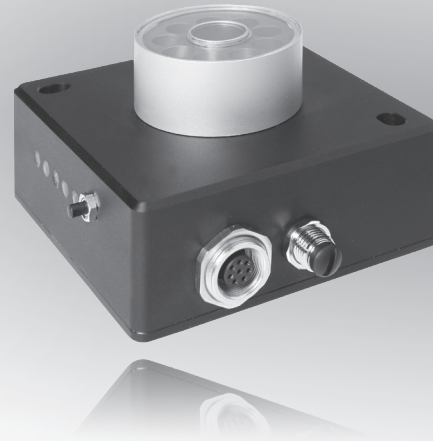
TECHNICAL DATA

| | | |
|---------------------------------|-------------------------------------|-------------------------------------|
| sensing range | 10 ... 60mm | dependent on fiber optics |
| output signal | 5 x pnp/npn, no/nc | 5 x pnp/npn, no/nc |
| light spot size | Ø 20mm at 40 mm distance | - |
| operating voltage | 24V DC ±10% | 24V DC ±10% |
| current consumption (w/o load) | 320mA | 320mA |
| output current (max. load) | ≤ 100mA | ≤ 100mA |
| switching frequency | ≤ 30kHz | ≤ 30kHz |
| transmitting element (pulsed) | white light LED | white light LED |
| display (signal) | 5x yellow LED | 5x yellow LED |
| setting | teach-in: button + input + software | teach-in: button + input + software |
| short-circuit protection | + | + |
| reverse polarity protection | + | + |
| pulse stretching | 0 ... 100ms | 0 ... 100ms |
| dimensions | M34x1.5 | M34x1.5 |
| housing material | aluminum, anodized | aluminum, anodized |
| operating temperature | -20 ... +55°C | -20 ... +55°C |
| degree of protection (EN 60529) | IP64 | IP64 |
| connection | PLC: 8-pin flange socket | PLC: 8-pin flange socket |
| connection accessories | 2m PLC cable e.g. VK207B45 | 2m PLC cable e.g. VK207B45 |
| interface | RS232 | RS232 |
| connection | PC: 5-pin flange socket | PC: 5-pin flange socket |
| connection accessories | 2m PC cable, e.g. VK207U44 | 2m PC cable, e.g. VK207U44 |

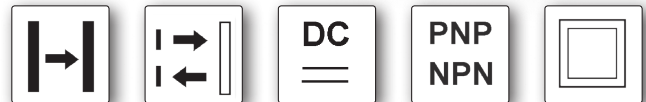
dimensions **65 x 65 x 42mm**

measuring range diffuse light **10 ... 60mm**

transmitted light **dependent on fiber optics**



**store up to 31 reference colors
true color detection**



description

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Up to 31 colors can be output via the 5 digital outputs. With the help of the various front ends, operating distances from nearly 0 to 500 mm can be achieved with detection ranges from \varnothing 0.5mm to approx. \varnothing 100mm. The use of fiber optic versions allows scans to be performed in explosion-hazardous areas. The color sensors are configured via the serial interface (RS232) with converters for USB or Ethernet under Windows®. Up to 31 colors can thereby be taught and stored in the sensor with the option to configure individual evaluation tolerances for each of these colors.

application examples

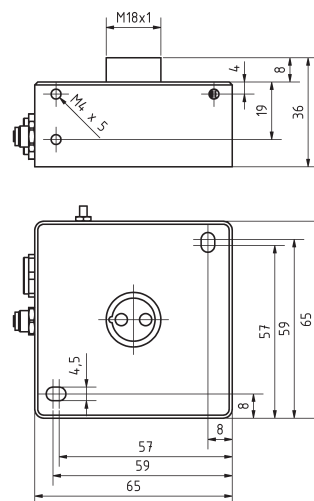
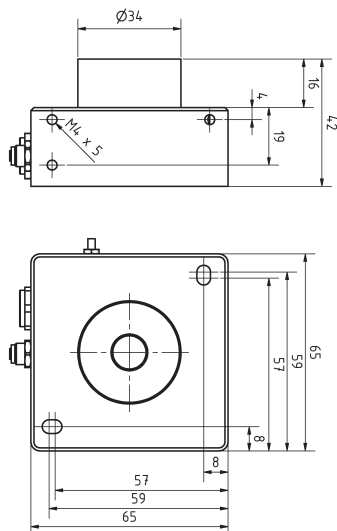
- ▶ monitoring the cover color of installation parts
- ▶ color inspection of painted components, imitation leathers, plastics and textiles in car interiors
- ▶ ejection of faulty parts based on color markings
- ▶ material sorting using color markings
- ▶ monitoring the sequence of connector strands
- ▶ trigger sensor in the printing industry (print-mark detection)
- ▶ detection of the color of inserts in production systems
- ▶ color differentiation of glass panes



article-no.
version
sensing range

OF650140
diffuse
10 ... 60mm

OF650180
fiber optics
dependent on fiber optics



TECHNICAL DATA

| | | |
|---------------------------------|-------------------------------------|-------------------------------------|
| sensing range | 10 ... 60mm | dependent on fiber optics |
| output signal | 5 x pnp/npn, no/nc | 5 x pnp/npn, no/nc |
| light spot size | Ø 20mm at 200 mm distance | - |
| operating voltage | 24V DC ±10% | 24V DC ±10% |
| current consumption (w/o load) | 320mA | 320mA |
| output current (max. load) | ≤ 100mA | ≤ 100mA |
| switching frequency | ≤ 32kHz | ≤ 32kHz |
| transmitting element (pulsed) | white light LED | white light LED |
| display (signal) | 5x yellow LED | 5x yellow LED |
| setting | teach-in: button + input + software | teach-in: button + input + software |
| short-circuit protection | + | + |
| reverse polarity protection | + | + |
| pulse stretching | 0 ... 100ms | 0 ... 100ms |
| dimensions | 65x65x42mm | 65x65x42mm |
| housing material | aluminum, anodized | aluminum, anodized |
| operating temperature | -20 ... +55°C | -20 ... +55°C |
| degree of protection (EN 60529) | IP54 | IP54 |
| connection | PLC: 8-pin flange socket | PLC: 8-pin flange socket |
| connection accessories | 2m PLC cable e.g. VK207B45 | 2m PLC cable e.g. VK207B45 |
| interface | RS232 | RS232 |
| connection | PC: 5-pin flange socket | PC: 5-pin flange socket |
| connection accessories | 2m PC cable, e.g. VK207U44 | 2m PC cable, e.g. VK207U44 |

connection

PLC connection cable

| pin: | wire color | assignment: |
|------|------------|--------------------|
| 1 | white | GND (0V) |
| 2 | brown | 12 ... 30V DC |
| 3 | green | input |
| 4 | yellow | switching output 0 |
| 5 | gray | switching output 1 |
| 6 | pink | switching output 2 |
| 7 | blue | switching output 3 |
| 8 | red | switching output 4 |

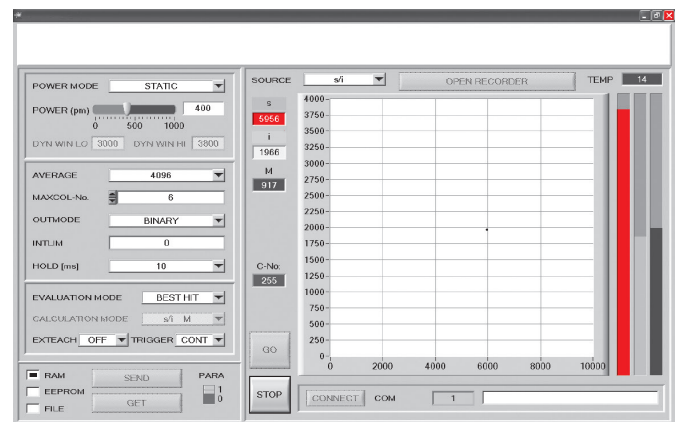
visualization

With the help of 5 yellow LEDs, the number of the detected color is displayed on the housing and simultaneously output as 5-bit binary information at digital outputs 0 to 4.

The Windows user interface simplifies the teach-in process on the sensor and supports the operator when making adjustments to and during the initial setup of the color sensor. Various evaluation processes can easily be selected for the color evaluation.

The color value is displayed in graphical form with the help of a color triangle as well as in the alphanumeric output fields.

The current raw data (red, green, blue) from the color detector are displayed in a bar graph.



connection accessories

PLC connection cable

| article no. | description |
|-------------|---|
| VK207B41 | connection cable 2m, 8-pin, angular |
| VK207B45 | connection cable 2m, 8-pin, straight |
| VK507B41 | connection cable 5m, 8-pin, angular |
| VK507B45 | connection cable 5m, 8-pin, straight |
| VKA07B45 | connection cable 10m, 8-pin, straight |
| VKB07B41 | connection cable 20m, 8-polig, angular |
| VKBE7B45 | connection cable 25m, 8-polig, straight |

connection accessories

PC connection cable

| article no. | description |
|-------------|--------------------------------------|
| VK207U40 | connection cable 2m, 5-pin, angular |
| VK207U44 | connection cable 2m, 5-pin, straight |
| VK507U40 | connection cable 5m, 5-pin, angular |
| VK507U44 | connection cable 5m, 5-pin, straight |

fiber optics versions

version fiber optics, dif. reflection sensor

article-no. LT060180

light beam (angle of beam spread) 22°

version fiber optics, dif. reflection sensor

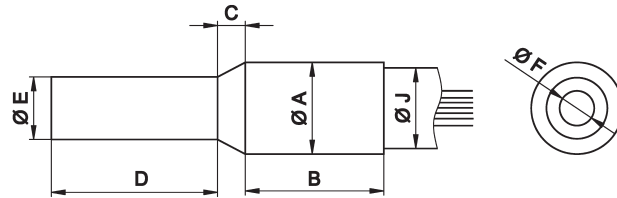
article-no. LT060181

light beam (angle of beam spread) 67°

version fiber optics, dif. reflection sensor

article-no. LT120181

light beam (angle of beam spread) 67°

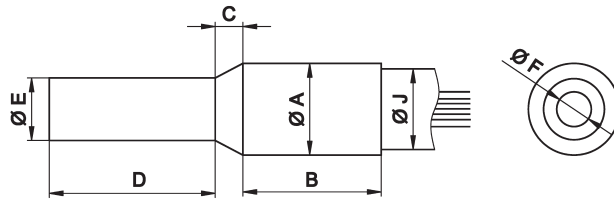


TECHNICAL DATA

| | | |
|-------------------------|-----------------------|-----------------------|
| standard lengths | 600mm | 1200mm |
| fiber bundle diameter F | 1.5mm | 1.5mm |
| material (outer jacket) | silicone-metal sheath | silicone-metal sheath |
| end sleeve | stainl. steel | stainl. steel |
| diameter A | 6.6mm | 6.6mm |
| dimension B | 8mm | 8mm |
| dimension C | 2mm | 2mm |
| dimension D | 11mm | 11mm |
| diameter E | 2.5mm | 2.5mm |
| diameter J | 4.4mm | 4.4mm |
| bending radius | 4 x dimension J | 4 x dimension J |



| | | |
|-----------------------------------|--------------------------------------|--------------------------------------|
| version | fiber optics, dif. reflection sensor | fiber optics, dif. reflection sensor |
| article no. | LT060380 | LT120380 |
| light beam (angle of beam spread) | 22° | 22° |
| version | fiber optics, dif. reflection sensor | fiber optics, dif. reflection sensor |
| article no. | LT060381 | LT120381 |
| light beam (angle of beam spread) | 67° | 67° |

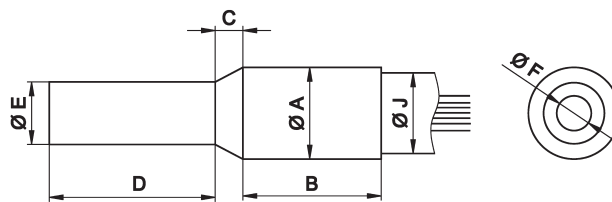


TECHNICAL DATA

| | | |
|-------------------------|----------------------|----------------------|
| standard lengths | 600mm | 1200mm |
| fiber bundle diameter F | 2.5mm | 2.5mm |
| material (outer jacket) | silicon metal sheath | silicon metal sheath |
| end sleeve | VA | VA |
| diameter A | 6.6mm | 6.6mm |
| dimension B | 10mm | 10mm |
| dimension C | 2mm | 2mm |
| dimension D | 12mm | 12mm |
| diameter E | 4.5mm | 4.5mm |
| diameter J | 5.8mm | 5.8mm |
| bending radius | 4 x dimension J | 4 x dimension J |



| | | |
|-----------------------------------|------------------------------------|------------------------------------|
| version | fiber optics, through-beam sensors | fiber optics, through-beam sensors |
| article-no. | LS060380 | LS120380 |
| light beam (angle of beam spread) | 22° | 22° |
| version | fiber optics, through-beam sensors | fiber optics, through-beam sensors |
| article-no. | LS060381 | LS120381 |
| light beam (angle of beam spread) | 67° | 67° |



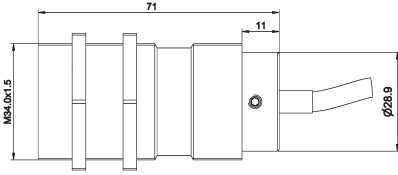
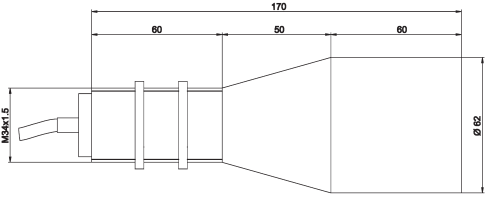
TECHNICAL DATA

| | | |
|-------------------------|-----------------------|-----------------------|
| standard lengths | 600mm | 1200mm |
| fiber bundle diameter F | 2.5mm | 2.5mm |
| material (outer jacket) | silicone-metal sheath | silicone-metal sheath |
| end sleeve | stainl. steel | stainl. steel |
| diameter A | 6.6mm | 6.6mm |
| dimension B | 10mm | 10mm |
| dimension C | 2mm | 2mm |
| dimension D | 12mm | 12mm |
| diameter E | 4.5mm | 4.5mm |
| diameter J | 5.8mm | 5.8mm |
| bending radius | 4 x dimension J | 4 x dimension J |

* smallest detectable object



| | | |
|-----------------------|--------------------------------------|--------------------------------------|
| operating range | 60 ... 120mm | 20 ... 30mm |
| article no. | AL000039 | AL000042 |
| version | 11mm spot | 6mm spot |
| | | |
| TECHNICAL DATA | | |
| light spot size | 11mm at 80mm distance | 6mm at 25mm distance |
| operating range | 60 ... 120mm | 20 ... 30mm |
| material (housing) | aluminum | aluminum |
| material (optics) | glass, scratch resistant | glass, scratch resistant |
| comment | for fiber optic through-beam sensors | for fiber optic through-beam sensors |
| operating range | 20 ... 65mm | |
| article no. | AL000045 | |
| version | 4.5mm spot | |
| | | |
| TECHNICAL DATA | | |
| light spot size | 4,5mm bei 65mm Abstand | |
| operating range | 20 ... 65mm | |
| material (housing) | aluminum | |
| material (optics) | glass, scratch resistant | |
| comment | for fiber optic through-beam sensors | |

| | | |
|-----------------------|---|--|
| operating range | 10 ... 250mm | 80 ... 150mm |
| article no. | AL000046 | AL000048 |
| version | 3mm spot | 3mm spot |
| |  |  |
| TECHNICAL DATA | | |
| light spot size | 19mm at 200mm distance | 3mm at 120mm distance |
| operating range | 100 ... 250mm | 80 ... 150mm |
| material (housing) | aluminum | aluminum |
| material (optics) | glass, scratch resistant | glass, scratch resistant |
| comment | for fiber optic through-beam sensors | for fiber optic through-beam sensors |