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camera sensors

Incident light transmitting element white or infrared light

ipf electronic gmbh • Kalver Straße 25 - 27 • 58515 Lüdenscheid • Germany | Tel +49 2351 9365-0 • Fax +49 2351 9365-19 |
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NOTES

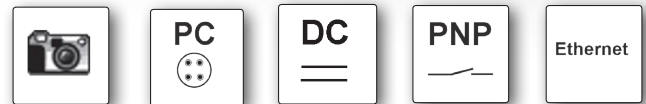| dimensions	**53 x 99.5 x 38mm**	
camera sensor	operating distance	**min. 50mm**

✓ **integrated incident light transmitting element in white light or infrared light**

✓ **short set-up times because of up to 255 check programs with up to 32 inspection tasks per sensor**

✓ **simple product change via control inputs, software, web-interface or Ethernet/Profinet**

✓ **codeable, digital outputs for up to 5 status signals**

✓ **stand-alone solution**

✓ **robust metal housing**

✓ **ambient light shielding**

✓ **process interface**

fully integrated camera system contour-based recognition

| 📷 | PC | DC | PNP | Ethernet |

description

In addition to a range of functions, the contour-based camera sensors of the 'opti-check' series are characterized by speed and a high level of external light shielding.

Possible applications range from classic optical sensors (through-beam sensors and diffuse reflection sensors) through to industrial image processing (computer-supported camera systems).

With a variable working distance (min. 50mm), the camera sensors are an all-in-one image processing unit in a compact and robust housing and are also suitable for harsh environments (IP67).

The 'opti-check' is equipped with a CMOS sensor (1/3"), optics (10mm or 16mm), illumination (a powerful white light LED or infrared LED), electronics/software (>5000 inspections/minute) as well as Ethernet and digital interfaces (5 inputs/5 outputs).

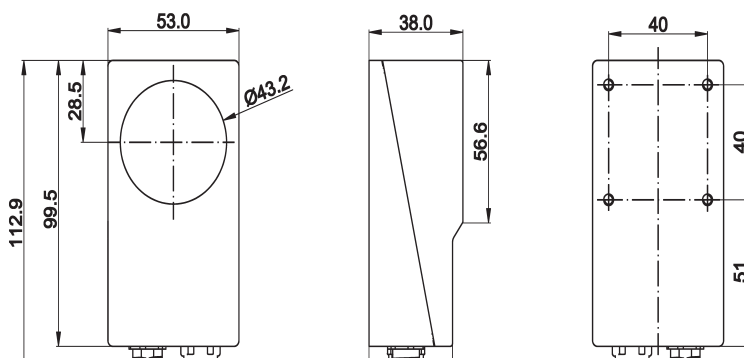Using the simple user interface, it only takes a few steps to configure the sensor. From various functional groups (position tracking, geometry, feature comparison, identification) the user can select and combine inspection tasks.

During the manufacturing process, the integrated web interface can be accessed by means of the web browser in order, for example, to carry out subsequent parameterization.

application examples

▶ checking and contour testing of mechanical components, e.g. plastic screws, nuts and metal rings
▶ completeness check (e.g. in the case of circuit boards)
▶ evaluation of installation positions of mounted assemblies
▶ querying of parts and differentiating different grades in packaging (present/incorrect/absent)
▶ evaluation of printing (present/quality)
▶ position control of markings and imprints
▶ feeding of components (position correct/incorrect)
▶ reading of barcodes and their quality
▶ OCR recognition of texts

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CAMERA SENSORS

1050 IPF OPTI-CHECK

article-no.	OC538120	OC538121
transmitting element	infrared	infrared
version	position and location check	position and location check
operating range	from 50mm	from 70mm
focal distance	f = 10mm	f = 16mm

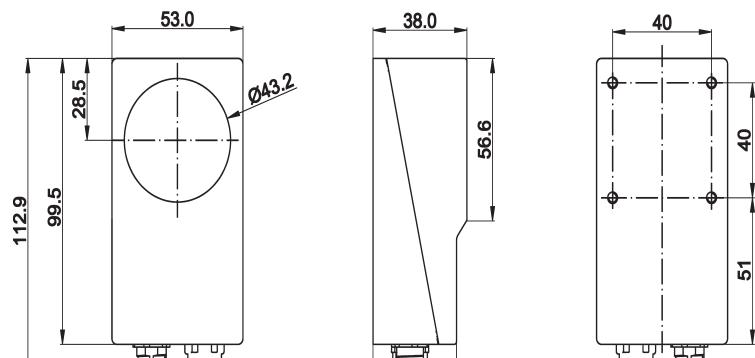| article-no.	OC539120	OC539121
transmitting element	white light	white light
version	position and location check	position and location check
operating range	from 50mm	from 70mm
focal distance	f = 10mm	f = 16mm

TECHNICAL DATA

version	position and location check
focal distance	see above
resolution	752 x 480 pixels
measuring time	high resolution: 50 x per sec. / high speed: 100 x per sec.
operating voltage	18 ... 30V DC
power consumption	type 5W
output	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	see above
setting	via software (included in the scope of delivery)
display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53x99.5x38mm
housing material	aluminum
lens material	PMMA
operating temperature	+5 ... +50°C
operating humidity	0 ... 90% non condensing
degree of protection (EN 60529)	IP 67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	process: M12-connector, 12-pin
interface	Ethernet: M12-connector, 4-pin
connection accessories	e.g. VK205C25 (process) / e.g. VK208F25 (Ethernet)
accessories	adapter plate **AO000371**

article-no.	OC539220
transmitting element	white light
version	reading of matrix codes and barcodes
operating range	from 50mm
focal distance	f = 10mm

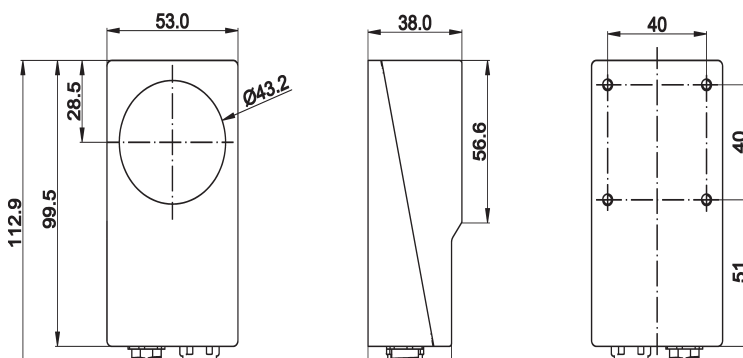| article-no.	OC539221
transmitting element	white light
version	reading of matrix codes and barcodes
operating range	from 70mm
focal distance	f = 16mm

TECHNICAL DATA

version	reading of matrix codes and barcodes
focal distance	see above
resolution	752 x 480 pixels
measuring time	high resolution: 50 x per sec. / high speed: 100 x per sec.
operating voltage	18 ... 30V DC
power consumption	type 5W
output	pass / fail 1 ... 3, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	white, LED class: risk group 1 (low risk, EN 62471: 2008)
setting	via software (included in the scope of delivery)
display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53x99.5x38mm
housing material	aluminum
lens material	PMMA
operating temperature	+5 ... +50°C
operating humidity	0 ... 90% non condensing
degree of protection (EN 60529)	IP 67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	process: M12-connector, 12-pin
interface	Ethernet: M12-connector, 4-pin
connection accessories	e.g. VK205C25 (process) / e.g. VK208F25 (Ethernet)
accessories	adapter plate AO000371

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article-no.	**OC538320**
transmitting element	**infrared light**
version	**reading of matrix codes, barcodes, plain writing with quality evaluation**
operating range	**from 50mm**
focal distance	**f = 10mm**

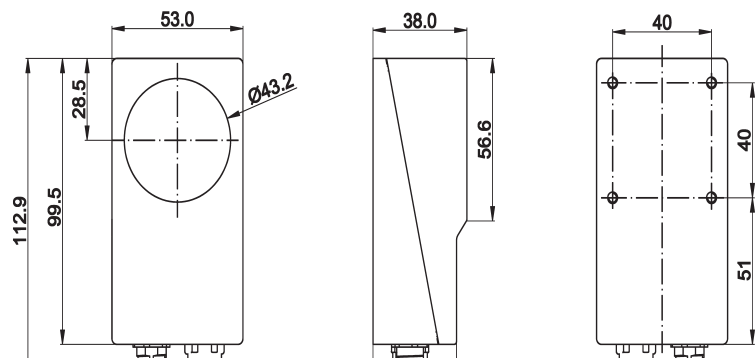| article-no.	**OC539320**
transmitting element	**white light**
version	**reading of matrix codes, barcodes, plain writing with quality evaluation**
operating range	**from 50mm**
focal distance	**f = 10mm**

TECHNICAL DATA

version	reading of matrix codes, barcodes, plain writing with quality evaluation
focal distance	see above
resolution	752 x 480 pixels
measuring time	high resolution: 50 x per sec. / high speed: 100 x per sec.
operating voltage	18 ... 30V DC
power consumption	type 5W
output	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	see above
setting	via software (included in the scope of delivery)
display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53x99.5x38mm
housing material	aluminum
lens material	PMMA
operating temperature	+5 ... +50°C
operating humidity	0 ... 90% non condensing
degree of protection (EN 60529)	IP 67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	process: M12-connector, 12-pin
interface	Ethernet: M12-connector, 4-pin
connection accessories	e.g. VK205C25 (process) / e.g. VK208F25 (Ethernet)
accessories	adapter plate **AO000371**

article-no.	OC538420	OC538421
transmitting element	infrared	infrared
version	quality check and identification	quality check and identification
operating range	from 50mm	from 70mm
focal distance	f = 10mm	f = 16mm

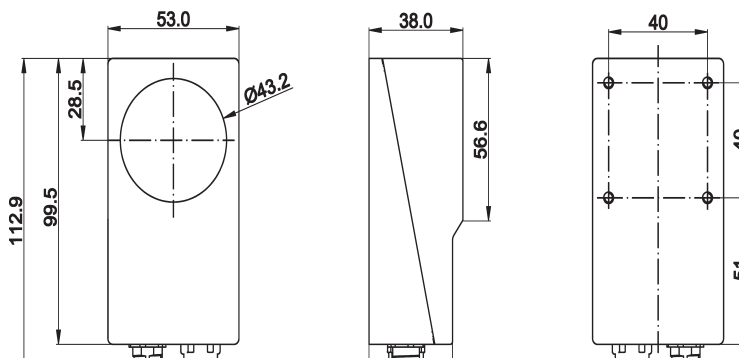| article-no.	OC539420	OC539421
transmitting element	white light	white light
version	quality check and identification	quality check and identification
operating range	from 50mm	from 70mm
focal distance	f = 10mm	f = 16mm

TECHNICAL DATA

version	quality check and identification
focal distance	see above
resolution	752 x 480 pixels
measuring time	high resolution: 50 x per sec. / high speed: 100 x per sec.
operating voltage	18 ... 30V DC
power consumption	type 5W
output	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	see above
setting	via software (included in the scope of delivery)
display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53x99.5x38mm
housing material	aluminum
lens material	PMMA
operating temperature	+5 ... +50°C
operating humidity	0 ... 90% non condensing
degree of protection (EN 60529)	IP 67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	process: M12-connector, 12-pin
interface	Ethernet: M12-connector, 4-pin
connection accessories	e.g. VK205C25 (process) / e.g. VK208F25 (Ethernet)
accessories	adapter plate **AO000371**

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article-no.	OC538520
transmitting element	infrared
version	quality check, identification, reading of matrix codes, barcodes, plain writing with quality evaluation
operating range	50mm
focal distance	f = 10mm

article-no.	OC539520
transmitting element	white light
version	quality check, identification, reading of matrix codes, barcodes, plain writing with quality evaluation
operating range	50mm
focal distance	f = 10mm

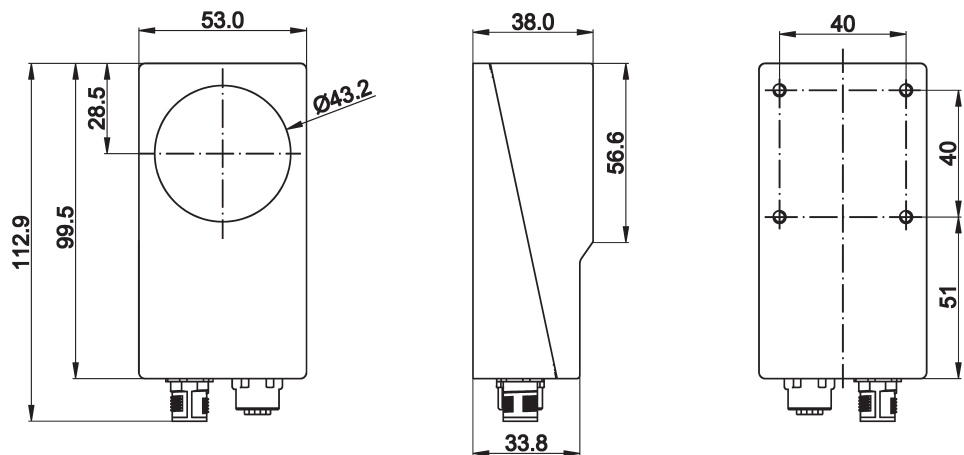| article-no.	OC539521
transmitting element	white light
version	quality check, identification, reading of matrix codes, barcodes, plain writing with quality evaluation
operating range	70mm
focal distance	f = 16mm

TECHNICAL DATA

version	quality check, identification, reading of matrix codes, barcodes, plain writing with quality evaluation
focal distance	see above
resolution	752 x 480 pixels
measuring time	high resolution: 50 x per sec. / high speed: 100 x per sec.
operating voltage	18 ... 30V DC
power consumption	type 5W
output	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	see above
setting	via software (included in the scope of delivery)
display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53x99.5x38mm
housing material	aluminum
lens material	PMMA
operating temperature	+5 ... +50°C
operating humidity	0 ... 90% non condensing
degree of protection (EN 60529)	IP 67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	process: M12-connector, 12-pin
interface	Ethernet: M12-connector, 4-pin
connection accessories	e.g. VK205C25 (process) / e.g. VK208F25 (Ethernet)
accessories	adapter plate **AO000371**

article-no.		OC538120	OC538121	-	-	OC538320
		OC539120	**OC539121**	**OC539220**	**OC539221**	**OC539320**
resolution		752 x 480	752 x 480	752 x 480	752 x 480	752 x 480
lens		10 mm	16 mm	10 mm	16 mm	10 mm
process interface	TCP/IP (Ethernet)	x	x	x	x	x
	RS485			x	x	
identification	matrix code			x	x	x
	barcode			x	x	x
	text					x
position tracking	on contours	x	x			
	on edges					
	on circles					
	on lines of text					x
geometry	distance	x	x			
	circle	x	x			
	angle					
	count edges					
	point position					
feature comparison	count the contour points	x	x			
	comparisons of contours	x	x			x
	brightness	x	x			
	contrast					
	area size					
	count areas					
	pattern comparison					

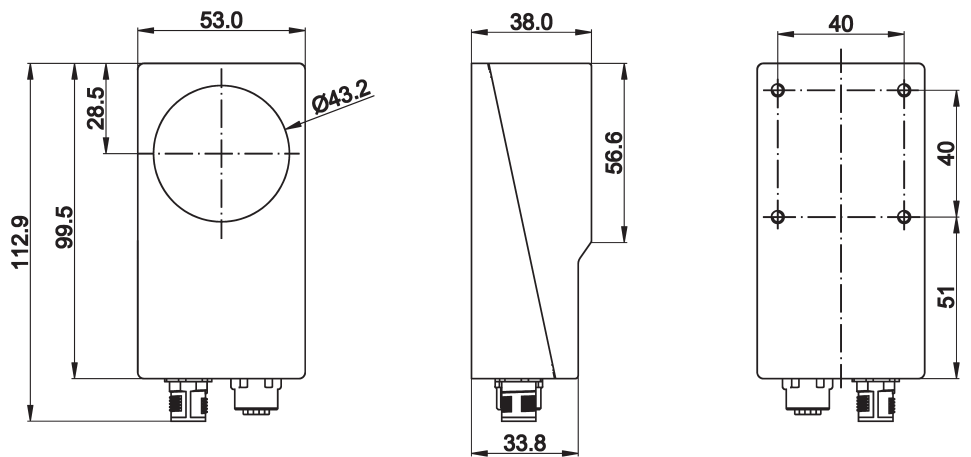| article-no.		OC538420	OC538421	OC538520	OC538521	
		OC539420	**OC539421**	**OC539520**	**OC539521**	
resolution		752 x 480	752 x 480	752 x 480	752 x 480	
lens		10 mm	16 mm	10 mm	16 mm	
process interface	TCP/IP (Ethernet)	x	x	x	x	
	RS485					
identification	matrix code			x	x	
	barcode			x	x	
	text			x	x	
position tracking	on contours	x	x	x	x	
	on edges	x	x	x	x	
	on circles	x	x	x	x	
	on lines of text	x	x	x	x	
geometry	distance	x	x	x	x	
	circle	x	x	x	x	
	angle	x	x	x	x	
	count edges	x	x	x	x	
	point position	x	x	x	x	
feature comparison	count the contour points	x	x	x	x	
	comparison of contours	x	x	x	x	
	brightness	x	x	x	x	
	contrast	x	x	x	x	
	area size	x	x	x	x	
	count areas	x	x	x	x	
	pattern comparison	x	x	x	x	

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CAMERA SENSORS
1050 IPF OPTI-CHECK

article no.	OC538E21	OC538E24
integrated LED lighting	infrared	infrared
operating range	from 50mm	from 50mm
focal length	f = 16mm	f = 12mm
measuring time (High Res./ High Speed)	50fps/100fps	50fps/100fps

TECHNISCHE DATEN

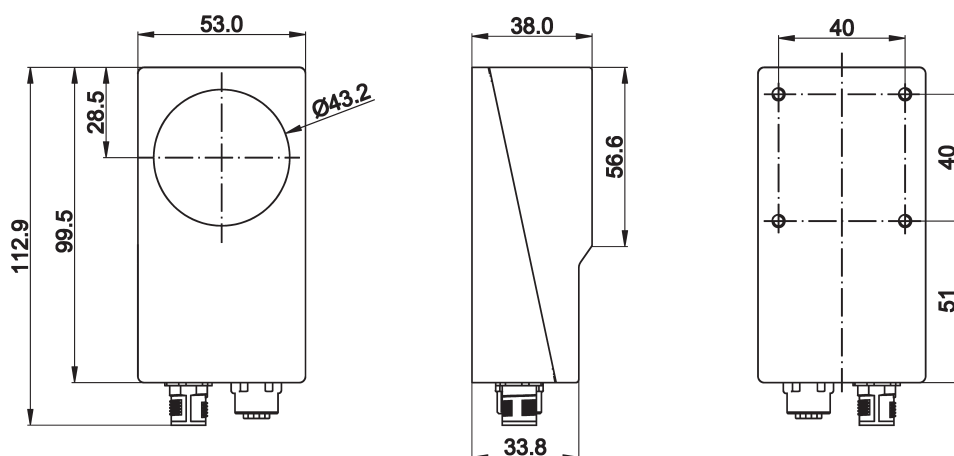|	
focal length	16mm or 12mm
resolution	752 x 480px
operating voltage	18 ... 30V DC
power consumption	typ. 5W
output (process)	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	infrared
setting	via software (included in the scope of delivery)
status display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53 x 99.5 x 38mm
material (housing)	aluminum
material (optics)	PMMA
temperature (operating)	+5 ... +50°C
humidity (operating)	0 ... 90% non-condensing
degree of protection (EN 60529)	IP67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	supply/signals: M12-connector, 12-pin
interface	Ethernet/Profinet: M12-socket, 4-pin
connection accessories	e.g. **VK205C25** (supply/signals) / e.g. **VK208F25** (Ethernet/Profinet)
accessories	adapter plate **AO000371**

article no.	OC539422	OC539522
integrated LED lighting	white	white
operating range	from 50mm	from 50mm
focal length	f = 10mm	f = 10mm
measuring time (High Res./ High Speed)	50fps/100fps	50fps/100fps

TECHNICAL DATA

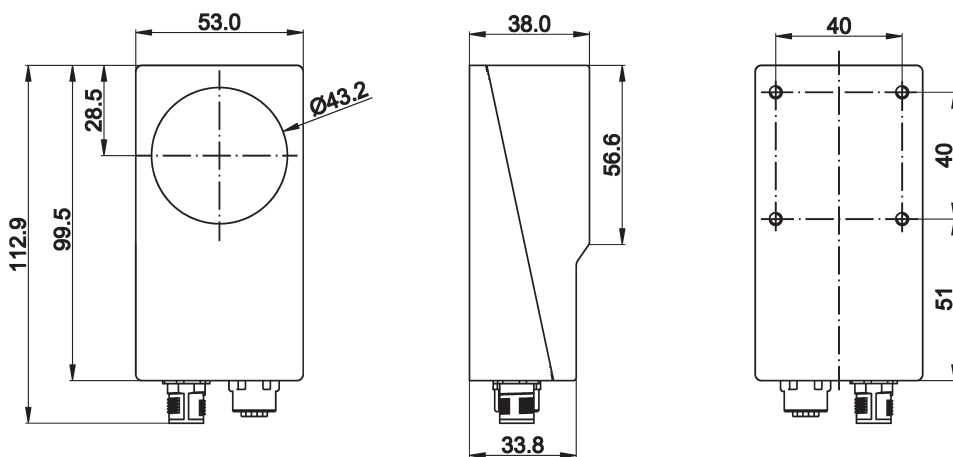|	
focal length	10mm
resolution	752 x 480px
operating voltage	18 ... 30V DC
power consumption	typ. 5W
output (process)	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	white
setting	via software (included in the scope of delivery)
status display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53 x 99.5 x 38mm
material (housing)	aluminum
material (optics)	PMMA
temperature (operating)	+5 ... +50°C
humidity (operating)	0 ... 90% non-condensing
degree of protection (EN 60529)	IP67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	supply/signals: M12-connector, 12-pin
interface	Ethernet/RS485: M12-socket, 4-pin
connection accessories	e.g. **VK205C25** (supply/signals/RS485) / e.g. **VK208F25** (Ethernet)
accessories	adapter plate **AO000371**

CAMERA SENSORS

1050 IPF OPTI-CHECK

article no.	OC539C24	OC539D21	OC539D24
integrated LED lighting	white	white	white
operating range	from 50mm	from 70mm	from 50mm
focal length	f = 12mm	f = 16mm	f = 12mm
measuring time (High Res./ High Speed)	116fps/144fps	50fps/100fps	50fps/100fps

TECHNISCHE DATEN

focal length	12mm or 16mm
resolution	752 x 480px
operating voltage	18 ... 30V DC
power consumption	typ. 5W
output (process)	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	white
setting	via software (included in the scope of delivery)
status display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53 x 99.5 x 38mm
material (housing)	aluminum
material (optics)	PMMA
temperature (operating)	+5 ... +50°C
humidity (operating)	0 ... 90% non-condensing
degree of protection (EN 60529)	IP67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	supply/signals: M12-connector, 12-pin
interface	Ethernet/Profinet: M12-socket, 4-pin
connection accessories	e.g. **VK205C25** (supply/signals) / e.g. **VK208F25** (Ethernet/Profinet)
accessories	adapter plate **AO000371**

article no.	OC539E21	OC539E24
integrated LED lighting	white	white
operating range	from 50mm	from 50mm
focal length	f = 16mm	f = 12mm
measuring time (High Res./ High Speed)	50fps/100fps	50fps/100 fps

TECHNISCHE DATEN

focal length	16mm or 12mm
resolution	752 x 480px
operating voltage	18 ... 30V DC
power consumption	typ. 5W
output (process)	pass / fail 1 ... 5, flash sync, alarm, camera ready, output enable
output current (max. load)	100mA per output
input	trigger, job selection, external teach-in, encoder (CH-A, CH-B) 500kHz
input voltage	8 ... 30V DC
transmitting element	white
setting	via software (included in the scope of delivery)
status display	5 x LED
short-circuit protection	+
reverse polarity protection	+
dimensions	53 x 99.5 x 38mm
material (housing)	aluminum
material (optics)	PMMA
temperature (operating)	+5 ... +50°C
humidity (operating)	0 ... 90% non-condensing
degree of protection (EN 60529)	IP67
vibration resistance	IEC 60068-2-6, IEC 60068-2-64
shock resistance	EN 60068-2-27
connection	supply/signals: M12-connector, 12-pin
interface	Ethernet/Profinet: M12-socket, 4-pin
connection accessories	e.g. **VK205C25** (supply/signals) / e.g. **VK208F25** (Ethernet/Profinet)
accessories	adapter plate **AO000371**

CAMERA SENSORS
1050 IPF OPTI-CHECK

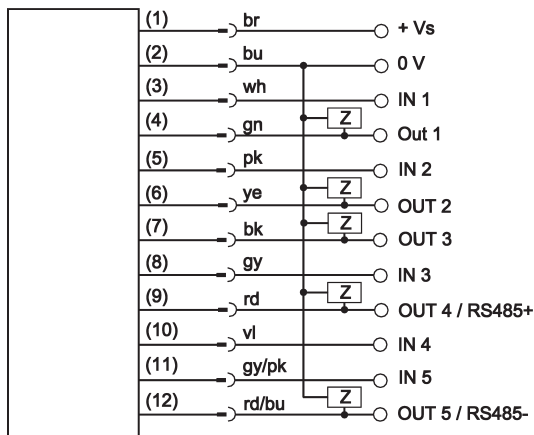| article no.	OC538120	OC539120	OC538121	OC539121	OC539220	OC539221	OC538320	OC539320
resolution	752x480px	752x480px	752x480px	752x480px	752x480px	752x480px	752x480px	752x480px
lens	10mm	10mm	16mm	16mm	10mm	16mm	10mm	10mm
process interaface								
TCP/IP (Ethernet)	x	x	x	x	x	x	x	x
Profinet								
RS485					x	x		
identification								
matrix code					x	x	x	x
barcode					x	x	x	x
text							x	x
position tracking on								
contours	x	x	x	x				
edges								
circles								
lines of text							x	x
geometry								
distance	x	x	x	x				
circle	x	x	x	x				
angle								
count edges								
point position								
edge contour								
feature comparison								
count contour points	x	x	x	x				
comparison of contours	x	x	x	x			x	x
brightness	x	x	x	x				
contrast								
area size								
count areas								
pattern comparison								

article no.	OC538420	OC539420	OC538421	OC539421	OC538520	OC539520	OC539521	
resolution	752x480px	752x480px	752x480px	752x480px	752x480px	752x480px	752x480px	
lens	10mm	10mm	16mm	16mm	10mm	10mm	16mm	
process interface								
TCP/IP (Ethernet)	x	x	x	x	x	x	x	
Profinet								
RS485								
identification								
matrix code					x	x	x	
barcode					x	x	x	
text					x	x	x	
position tracking on								
contours	x	x	x	x	x	x	x	
edges	x	x	x	x	x	x	x	
circles	x	x	x	x	x	x	x	
lines of text	x	x	x	x	x	x	x	
geometry								
distance	x	x	x	x	x	x	x	
circle	x	x	x	x	x	x	x	
angle	x	x	x	x	x	x	x	
count edges	x	x	x	x	x	x	x	
point position	x	x	x	x	x	x	x	
edge contour	x	x	x	x	x	x	x	
feature comparison								
count contour points	x	x	x	x	x	x	x	
compariosn of contours	x	x	x	x	x	x	x	
brightness	x	x	x	x	x	x	x	
contrast	x	x	x	x	x	x	x	
area size	x	x	x	x	x	x	x	
count areas	x	x	x	x	x	x	x	
pattern comparison	x	x	x	x	x	x	x	

article no.	OC538D21	OC538D24	OC538E21	OC538E24	OC539422	OC539522		
resolution	752x480px	752x480px	752x480px	752x480px	752x480px	752x480px		
lens	16mm	12mm	16mm	12mm	10mm	10mm		
process interaface								
TCP/IP (Ethernet)	x	x	x	x	x	x		
Profinet	x	x	x	x				
RS485					x	x		
identification								
matrix code			x	x		x		
barcode			x	x		x		
text			x	x		x		
position tracking on								
contours	x	x	x	x	x	x		
edges	x	x	x	x	x	x		
circles	x	x	x	x	x	x		
lines of text	x	x	x	x	x	x		
geometry								
distance	x	x	x	x	x	x		
circle	x	x	x	x	x	x		
angle	x	x	x	x	x	x		
count edges	x	x	x	x	x	x		
point position	x	x	x	x	x	x		
edge contour	x	x	x	x	x	x		
feature comparison								
count contour points	x	x	x	x	x	x		
comparison of contours	x	x	x	x	x	x		
brightness	x	x	x	x	x	x		
contrast	x	x	x	x	x	x		
area size	x	x	x	x	x	x		
count areas	x	x	x	x	x	x		
pattern comparison	x	x	x	x	x	x		

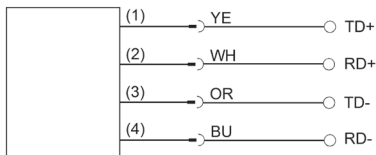| article no.	OC539C24	OC539D21	OC539D24	OC539E21	OC539E24			
resolution	752x480px	752x480px	752x480px	752x480px	752x480px			
lens	12mm	16mm	12mm	16mm	12mm			
process interface								
TCP/IP (Ethernet)	x	x	x	x	x			
profinet	x	x	x	x	x			
RS485								
identification								
matrix code	x			x	x			
barcode	x			x	x			
text	x			x	x			
position tracking on								
contours		x	x	x	x			
edges		x	x	x	x			
circles		x	x	x	x			
lines of text	x	x	x	x	x			
geometry								
distance		x	x	x	x			
circle		x	x	x	x			
angle		x	x	x	x			
count edges		x	x	x	x			
point position		x	x	x	x			
edge contour		x	x	x	x			
feature comparison								
count contour points		x	x	x	x			
compariosn of elontours	x	x	x	x	x			
brightness		x	x	x	x			
contrast		x	x	x	x			
area size		x	x	x	x			
count areas		x	x	x	x			
pattern comparison		x	x	x	x			

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connection

M12-connector, 12-pin

(1)	br	+ Vs
(2)	bu	0 V
(3)	wh	IN 1
(4)	gn	Out 1
(5)	pk	IN 2
(6)	ye	OUT 2
(7)	bk	OUT 3
(8)	gy	IN 3
(9)	rd	OUT 4 / RS485+
(10)	vl	IN 4
(11)	gy/pk	IN 5
(12)	rd/bu	OUT 5 / RS485-

assignment

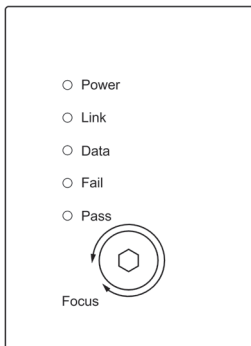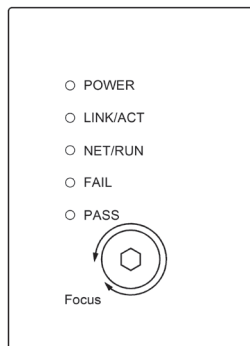| PIN	color	assignment	open cable end
1	brown	PWR	18 ... 30V DC
2	blue	Ground	0 V
3	white	IN 1	trigger
4	green	OUT 1	digital output 1
5	pink	IN 2	digital input 2
6	yellow	OUT 2	digital output 2
7	black	OUT 3	digital output 3
8	gray	IN 3	digital input 3
9	red	OUT 4	digital output 4 / RS485+
10	violet	IN 4	digital input 4
11	gray/pink	IN 5	digital input 5
12	red/blue	OUT 5	digital output 5 / RS485+

M12-connector, 4-pin

(1)	YE	TD+
(2)	WH	RD+
(3)	OR	TD-
(4)	BU	RD-

assignment

PIN	color	assignment
1	yellow	TD+
2	white	RD+
3	orange	TD-
4	blue	RD-

LED status display Ethernet

○ Power
○ Link
○ Data
○ Fail
○ Pass

Focus

LED status displays Profinet

○ POWER
○ LINK/ACT
○ NET/RUN
○ FAIL
○ PASS

Focus

Power	LED yellow	operation
Link/ACT	LED yellow	network
Data/NET RUN	LED orange	data
Fail	LED red	no test
Pass	LED green	test passed

field of view lens = 10mm

object distance	max. inspection field of view
50mm	26mm x 17mm
100mm	50mm x 32mm
200mm	98mm x 62mm
300mm	145mm x 93mm

field of view lens = 16mm

object distance	max. inspection field of view
70mm	18mm x 11mm
100mm	26mm x 17mm
200mm	55mm x 35mm
300mm	84mm x 54mm

ACCESSORIES

article no.	description
AO000371	adapter plate for installation on tripods
AO000388	mounting plate
AO000389	mounting bracket
AO000522	mounting bracket 53 with heat sink for Profinet devices

We will be pleased to supply the matching cable socket for your devices with connector. Please refer to the list in catalog chapter „accessories" under „cable sockets **ipf**-SENSORFLEX®" or search our website for www.ipf-electronic.com for „VK".

Warning: Never use these devices in applications where the safety of a person depends on their functionality.

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