PC series

Pericentric lenses for 360° top and lateral view with just one camera

KEY ADVANTAGES

Just one camera
No need for multiple cameras placed around and over the object.

Fast image analysis
No image matching software is needed as the picture is not segmented.

Single point of view
No perspective effects typical of multi-image systems.

Smooth on-line integration
Inspected parts pass unobstructed in the free space below the lens.

PC pericentric lenses are unique optics designed to perform complete inspection of objects up to 60 mm in diameter, quickly and reliably.

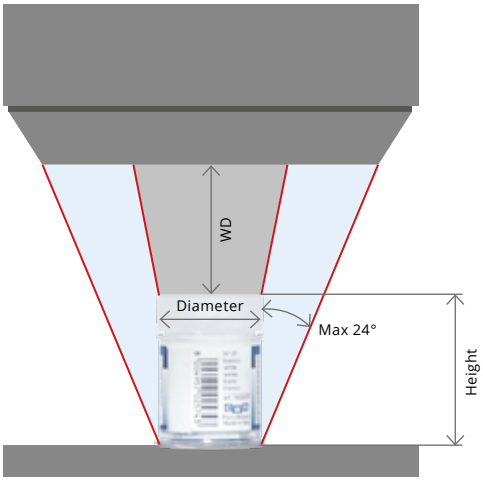
The innovative design allows one camera to see **the top and lateral surfaces** of an object in perfect focus all in one image. This allows you to greatly simplify the layout of the vision system, with no need for multiple cameras, lenses or mirrors.

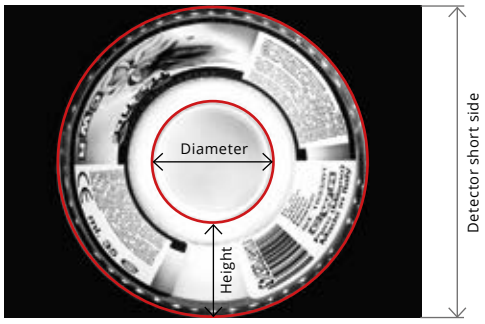
The term pericentric comes from the specific path of the light rays: the lateral surface of the object appears to be wrapped around the top face, making the PC series ideal for cylindrical objects which are very common in the beverage and pharmaceutical industry.

Typical applications include bottleneck thread inspection, and data matrix reading - the code will always be properly imaged regardless of its position.

Sample images taken with PC optics

FULL RANGE OF COMPATIBLE PRODUCTS		
	Area scan cameras	p. 180-185
DEDICATED COMPATIBLE OBLIQUE RINGLIGHTS		
	LTRN 210x20 for PC xx030XS LTRN 245x25 for PC xx030HP	p. 122-124
DEDICATED CLAMPING MECHANICS FOR PCxx030XS		
	CMHO080	p. 200





$$\mathbf{r}\ (\%) = \frac{\text{Side view height (px)}}{\text{Detector short side (px)}} * 100$$

Unwrapped image.

PC optics are designed to work with 1/3", 1/2" and 2/3" detectors. These detectors ensure the most appropriate optical magnification factor to achieve the field depth required by high resolution 3D pericentric imaging.

The image of the top of the object and its sides are inscribed into the short side of the camera detector.

The smaller the object diameter, the larger the object height which can be inspected, while short objects can be inspected over a larger diameter.

The tables below show possible combinations of object diameters and heights along with the appropriate working distance and recommended F-number; the "r" parameter for each configuration is also listed.

The "r" parameter is the ratio between the side view height (the circular crown thickness) and the detector short side.
It provides information about side view resolution. The higher the "r" value, the higher the resolution that can be achieved in the side view.

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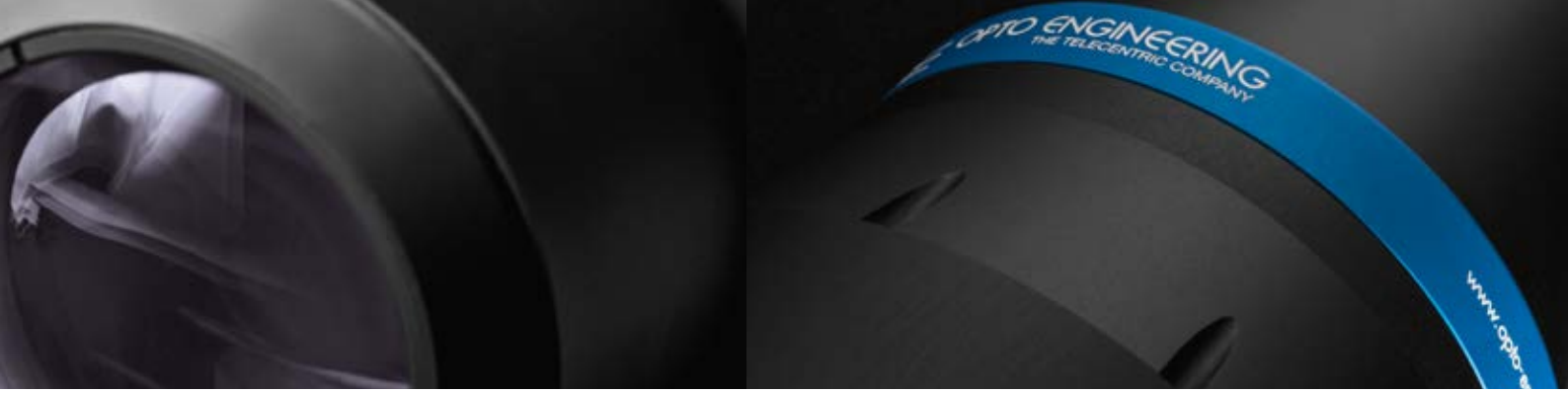
EXTENDED RANGE

Compact PC xx030XS lenses for inspection of objects with diameter down to 7.5 mm.

Part number		PC 13030HP	PC 12030HP	PC 13030XS	PC 12030XS	PC 23030XS
Detector type		**1/3"**	**1/2"**	**1/3"**	**1/2"**	**2/3"**
Image circle	Ø (mm)	3.6	4.8	3.6	4.8	6.6
Field of view	**(diam x height)**					
Min	(mm x mm)	20 x 60	20 x 60	7.5 x 5	10 x 5	15 x 5
Typical	(mm x mm)	30 x 30	30 x 30	30 x 30	30 x 30	30 x 30
Max	(mm x mm)	60 x 20	60 x 20	55 x 20	55 x 15	55 x 12
Optical specifications						
Wavelength range	(nm)	450 .. 650	450 .. 650	450 .. 650	450 .. 650	450 .. 650
Working distance	(mm)	20 .. 80	20 .. 80	20 .. 85	20 .. 80	20 .. 80
CTF @ 50 lp/mm	(%)	> 30	> 25	> 40	> 30	> 25
F/#		4-16	4-16	4-16	4-16	4-16
Mechanical specifications						
Diameter (max)	(mm)	197	197	116	116	116
Length	(mm)	448	448	378	378	378
Weight	(g)	6800	6800	2950	2950	2950
Mount		C	C	C	C	C



Field of view selection chart

PC 13030HP field of view

Diam.	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r
(mm)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)
20	7	79	16	10	13	79	8	20	20	65	16	26	30	61	12	30	40	55	14	34	60	25	16	37
25	8	71	4	17	17	63	12	21	25	55	16	26	38	40	14	30	50	30	16	30				
30	10	65	4	13	20	55	8	19	30	42	12	25	45	35	12	29								
40	13	52	6	12	27	43	12	20	40	27	12	25												
50	17	36	6	13	33	20	8	15																
60	20	23	4	11																				

PC 12030HP field of view

Diam.	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r
mm	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)
20	7	76	16	10	13	70	24	15	20	65	24	28	30	55	16	32	40	45	24	32	60	27	24	35
25	8	72	12	11	17	63	12	18	25	54	16	28	38	40	16	32	50	29	16	32				
30	10	66	12	11	20	56	12	19	30	45	16	25	45	30	16	35								
40	13	54	6	11	27	36	16	20	40	27	24	23												
50	17	32	12	13	33	20	16	18																
60	20	22	12	11																				

PC 13030XS field of view

Diam.	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r
(mm)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)
7.5	5	85	16	19																				
10	5	84	16	14	10	77	16	20																
15	5	75	6	10	10	70	8	15	15	65	16	20	20	60	16	22	25	54	16	24	32	45	16	28
20	10	62	8	12	20	52	14	18	30	42	14	22	40	32	16	26								
25	5	62	6	6	15	52	12	15	25	42	12	19	35	32	12	24	45	22	12	27				
30	10	52	4	9	20	42	8	17	30	32	8	20	40	22	16	23	50	12	16	27				
35	5	48	4	7	15	38	4	12	25	28	8	16	35	18	8	20	42	10	12	22				
40	10	38	4	9	20	28	4	13	30	20	8	16	37	10	16	19								
45	5	34	6	7	15	30	6	9	25	20	8	12	35	10	16	15								
50	5	25	4	8	15	20	6	9	25	10	8	13												
55	10	20	6	6	20	10	8	10																

PC 12030XS field of view

Diam.	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r
mm	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)
10	5	82	18	18												
15	5	73	16	14	15	63	16	23								
20	5	66	16	9	10	61	16	14	20	51	16	22				
25	10	56	12	10	20	46	16	18	30	36	16	23				
30	10	48	8	10	20	38	16	15	30	28	16	20	40	18	16	24
35	5	48	12	5	15	38	12	12	25	28	12	17	35	18	16	21
40	10	37	14	8	20	27	16	13	30	17	16	17				
45	10	32	8	7	20	22	8	12	30	12	16	16				
50	10	25	10	7	20	15	16	12								
55	5	23	16	5	15	13	16	10								

PC 23030XS field of view

Diam.	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r	Height	WD	F/#	r
mm	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)	(mm)	(mm)		(%)
15	5	78	8	12	15	68	16	19								
20	10	62	16	12	20	52	16	18								
25	10	57	8	10	20	47	12	16	30	37	16	21				
30	15	45	8	12	25	35	12	17	35	25	16	20	45	13	16	23
35	10	45	16	8	15	40	16	11	25	30	16	15				
40	10	38	12	8	20	30	12	13	30	20	16	17				
45	10	33	16	7	20	23	16	11								
50	10	25	16	5	20	15	16	11								
55	12	12	16	6												