

Nikon Rayfact

Tochigi Nikon Industrial Lens

TOCHIGI NIKON CORPORATION
Marketing Sec.
Industrial Equipment Dept.

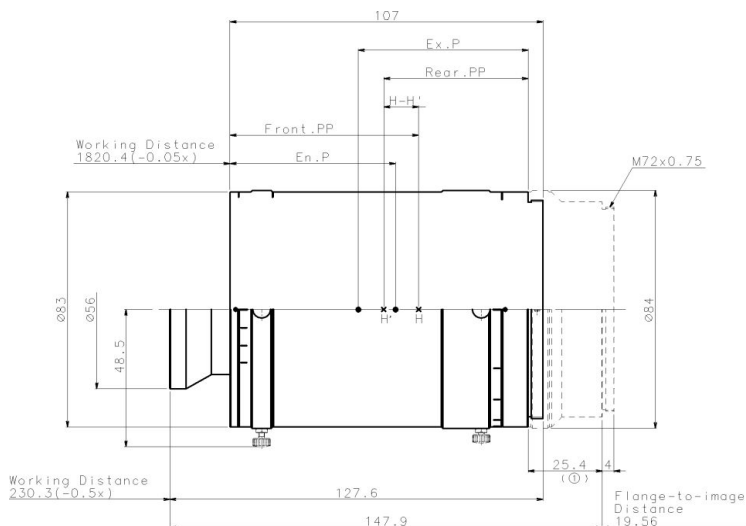
▪ Features

- MJ90 : Variable magnification range of 0.05x – 0.5x.
- MJ95 : Variable magnification of 0.5x – 1.0x.
- Image size ϕ 82mm
- High performance in all range of magnification.
- Adjustable diaphragm, Diaphragm opening position at F4.
- Aperture ring lockable screw and focus lockable screw for easy use.
- Unit sales with a wide range of mounts to fit in your camera.
- RoHS compliant.

▪ Applications

- Image receiving process by both line and area sensor cameras.
- Printed materials inspection.
- Fine pattern inspection – e.g. PCB.
- Fine pattern inspection and detecting defects – e.g. TAB, sheets.
- FPD inspection.

NikonRavfactMJ90mmF4



Specifications

Model	Refer to the following table					
Magnification range	-0.05x ~ -0.5x					
Magnification scale	-0.05x	-0.1x	-0.2x	-0.3x	-0.4x	-0.5x
Focal length	89.8mm	90.0mm	90.4mm	90.8mm	91.2mm	91.6mm
F Number (∞)	F4					
NA (Diaphragm open)	0.006	0.011	0.021	0.029	0.036	0.042
Reference wavelength	546.07nm(e-line)					
Wavelength range	400 ~ 700nm					
Picture angle	47.2°	45.6°	42.3°	39.4°	36.7°	34.5°
Image size	82mm φ					
Object Size	1640.0mm	820.0mm	410.0mm	273.3mm	205.0mm	164.0mm
Distortion ※1	+0.47%	+0.31%	+0.14%	+0.06%	+0.05%	+0.07%
Relative illumination ※1	42.2%	45.0%	49.9%	54.0%	57.6%	60.7%
Aperture scale	4.5,6,8,11(With a diaphragm lock, a click stop)					
Object-to-image distance	1967.3mm	1069.6mm	634.2mm	496.3mm	432.3mm	397.7mm
Working distance	1820.4mm	922.6mm	487.2mm	348.0mm	274.4mm	230.3mm
Mount size	Refer to the following table					
Flange-to-image distance	Refer to the following table					
Back focus	Refer to the following table					
Attachment size	M52(P=0.75)					
Diameter/length	Refer to the following table					
Weight	Refer to the following table					

※1 Highest image height (Y'=41mm) at F5.6

※2 Diaphragm scales indicated with indexes. No numeric indication.

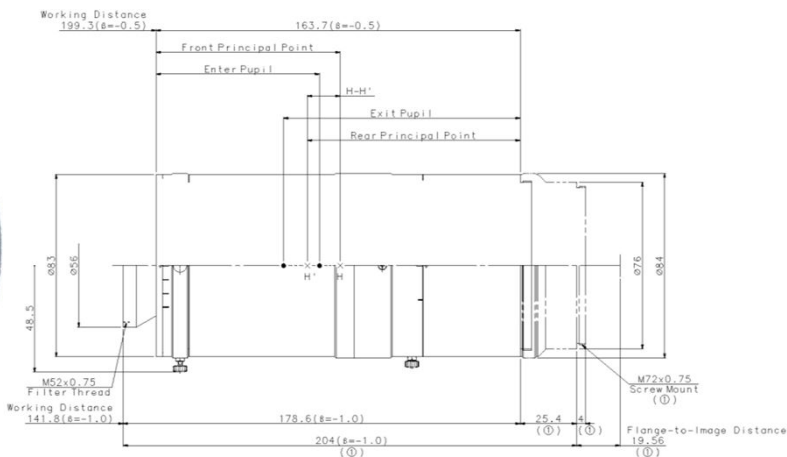
Model	Camera Mount	Diameter/length ※3	Weight
1) OVM05042MN-M72D1	M72(M.B.f=19.56mm)	84mm φ × 131.3mm ~ 151.9mm	Approximately 900g
2) OVM05042MN-M72D2	M72(M.B.f=6.56mm)	84mm φ × 144.3mm ~ 164.9mm	Approximately 930g
3) OVM05042MN-M72T	M72(M.B.f=28.8mm)	84mm φ × 122.2mm ~ 142.6mm	Approximately 880g
4) OVM05042MN-M72N	M72(M.B.f=31.8mm)	84mm φ × 119.1mm ~ 139.7mm	Approximately 870g
5) OVM05042MN-NMT	M84.5 × P0.5(M.B.f=41mm)	93mm φ × 110.4mm ~ 130.9mm	Approximately 870g
6) OVM05042MN-FMT	F Mount(M.B.f=46.5mm)	84mm φ × 104.9mm ~ 125.4mm	Approximately 860g
7) OVM05042MN-VMT	V Mount Equivalency(M.B.f=15mm)	100mm φ × 141.9mm ~ 162.5mm	Approximately 970g
8) OVM05042MN-BMT	Screw flange end(M.B.f=9mm)	102mm □ × 137.9mm ~ 158.4mm	Approximately 1020g
9) OVM05042MN-M95E	M95(M.B.f=9.4mm)	100mm φ × 137.5mm ~ 158.0mm	Approximately 940g

※3 Dimension excludes protrusion of screws or other convex part.

		-0.05x	-0.1x	-0.2x	-0.3x	-0.4x	-0.5x
Entrance Pupil	d	56.6mm	51.8mm	42.3mm	32.7mm	23.2mm	13.6mm
	φ	22.2mm	22.2mm	22.2mm	22.2mm	22.3mm	22.3mm
Exit Pupil	d	-58.0mm	-63.0mm	-73.2mm	-83.4mm	-93.7mm	-104.0mm
	φ	24.6mm	24.6mm	24.8mm	24.9mm	25.0mm	25.2mm
Front Principal Point [Front.PP]		64.5mm	60.0mm	51.0mm	41.9mm	32.9mm	23.9mm
Rear Principal Point [Rear.PP]		-49.3mm	-54.1mm	-63.6mm	-73.2mm	-82.8mm	-92.4mm
Nodal point distance [HH']		11.9mm	12.2mm	12.7mm	13.2mm	13.8mm	14.4mm

※ Entrance pupil En.P and principal point H at the front tip point of the lens (φ 83mm).

※ Exit pupil Ex.P, rear principal point H' at the mount side.



Specifications

Model	Refer to the following table					
Magnification range	-0.5x~-1.0x					
Magnification scale	-0.5x	-0.6x	-0.7x	-0.8x	-0.9x	-1.0x
Focal length	93.9mm	94.3mm	94.7mm	95.1mm	95.5mm	95.9mm
F Number (∞)	F4					
NA (Diaphragm open)	0.041	0.047	0.051	0.055	0.059	0.062
Reference wavelength	546.07nm(e-line)					
Wavelength range	400~700nm					
Picture angle	33.5°	31.6°	29.9°	28.4°	27.0°	25.7°
Image size	82mm φ					
Object Size	164.0mm	136.7mm	117.1mm	102.5mm	91.1mm	82.0mm
Distortion ※1	-0.20%	-0.15%	-0.10%	-0.04%	+0.02%	+0.08%
Relative illumination ※1	61.9%	64.7%	67.5%	69.9%	72.0%	73.9%
Aperture scale	4.5,6.8,11(With a diaphragm lock, a click stop)					
Object-to-image distance	408.0mm	386.6mm	374.5mm	368.1mm	365.4mm	365.3mm
Working distance	199.3mm	177.9mm	165.8mm	159.4mm	152.0mm	141.8mm
Mount size	Refer to the following table					
Flange-to-image distance	Refer to the following table					
Back focus	Refer to the following table					
Attachment size	M52(P=0.75)					
Diameter/length	Refer to the following table					
Weight	Refer to the following table					

※1 Highest image height (Y'=41mm) at F5.6.

※2 Diaphragm scales indicated with indexes. No numeric indication.

Model	Camera Mount	Diameter/length ※3	Weight
1) OVM10062MN-1-M72D1	M72(M.B.f=19.56mm)	84mm φ × 193.1mm~208.0mm	Approximately 1230g
2) OVM10062MN-1-M72D2	M72(M.B.f=6.56mm)	84mm φ × 206.1mm~221.0mm	Approximately 1260g
3) OVM10062MN-1-M72T	M72(M.B.f=28.8mm)	84mm φ × 180.9mm~195.8mm	Approximately 1210g
4) OVM10062MN-1-M72N	M72(M.B.f=31.8mm)	84mm φ × 180.9mm~195.7mm	Approximately 1200g
5) OVM10062MN-1-NMT	M84.5 × P0.5(M.B.f=41mm)	84mm φ × 172.2mm~187.1mm	Approximately 1200g
6) OVM10062MN-1-VMT	V Mount Equivalency(M.B.f=15mm)	100mm φ × 203.7mm~218.6mm	Approximately 1300g
7) OVM10062MN-1-BMT	Screw flange end(M.B.f=9mm)	102mm □ × 199.7mm~214.6mm	Approximately 1350g
8) OVM10062MN-1-M95E	M95(M.B.f=9.4mm)	100mm φ × 193.3mm~214.2mm	Approximately 1270g

※3 Dimension excludes protrusion of screws or other convex part.

		-0.5x	-0.6x	-0.7x	-0.8x	-0.9x	-1.0x
Entrance Pupil	d	73.5mm	63.4mm	53.3mm	43.2mm	33.1mm	23.0mm
	φ	22.5mm	22.5mm	22.5mm	22.4mm	22.4mm	22.3mm
Exit Pupil	d	-106.4mm	-117.2mm	-128.0mm	-138.8mm	-149.7mm	-160.6mm
	φ	25.2mm	25.3mm	25.4mm	25.4mm	25.5mm	25.6mm
Front Principal Point [Front.PP]		83.1mm	73.5mm	63.9mm	54.3mm	44.7mm	35.1mm
Rear Principal Point [Rear.PP]		-95.7mm	-105.8mm	-116.1mm	-126.3mm	-136.5mm	-146.8mm
Nodal point distance[HH']		15.1mm	15.6mm	16.2mm	16.9mm	17.5mm	18.2mm

※ Entrance pupil En.P and principal point H at the front tip point of the lens (φ 83mm).

※ Exit pupil Ex.P, rear principal point H' at the mount side.

※ Image side : [+], Object side : [-]

*Specifications unless any specific instructions are stated is at the standard magnification.

*Specifications are subject to change without prior notice.