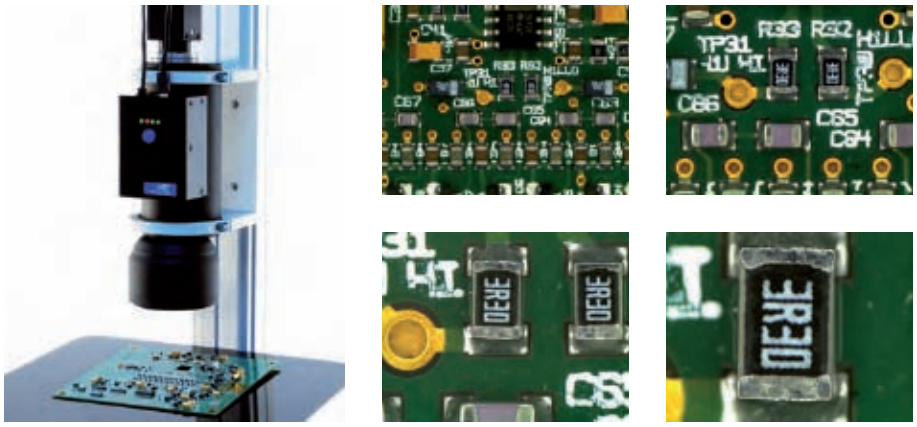
# 8X Bi-telecentric Zoom lenses with motorized control

**TCZR Series** is a leading edge optical solution for imaging and measurement applications requiring both the flexibility of zoom lenses and the accuracy of fixed optics.

By means of a very accurate mechanism, these lenses ensure unequaled magnification, focusing and image center stability when switching from a magnification to another, thus avoiding recalibration at any given time.

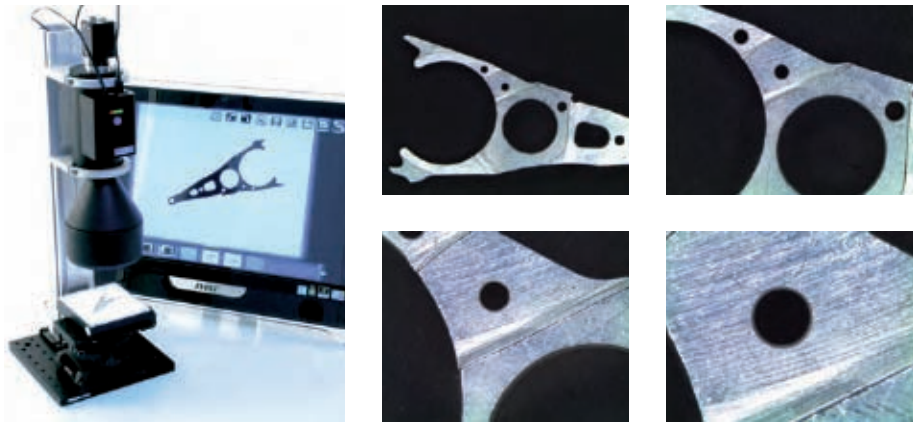
4 different magnifications, featuring a total range of 8x, can be selected either by means of the onboard control keyboard or via computer through a specific remote control software.

Bitelecentricity, high resolution and low distortion make these zooms able to perform the same measurement tasks as a fixed magnification telecentric lens.



Electronic board images taken with TCZR036 at 4 different magnifications

TCZR Series can be coupled with LTCL and LTRN illuminator series



Hard disk arm images taken with TCZR072 at 4 different magnifications

## KEY ADVANTAGES

1. **Perfect Magnification constancy:** no need of re-calibration, after zooming
2. **Perfect Parfocality:** no need of refocusing when changing magnification
3. **Bi-telecentricity:** very accurate measurement is possible
4. **Image Center Stability:** each magnification maintains its FOV center
5. **Full Motorization control:** zoom magnification is set either manually or via software

# TCZR SERIES

## MULTI MAG OPTICS






Follow the pictures to get TCZR optics properly focused.
First of all, set the lens exactly at its nominal working distance, as listed on the specs sheet.
Switch on the 24 V power supply and wait until the system has been re-set.
Select the maximum lens magnification ( i.e. 1x for TCZR072 and 2x for TCZR036).
Mount the camera and, while observing a resolution pattern, rotate it until you obtain the best image resolution.
Measure the gap between the camera interface and the lens C-mount and insert the most appropriate number of spacers.
With the camera assembled, adjust the image phase by unscrewing the C-mount set-screws; once you find the right phase, lock the screws.

You are now ready to switch the lens to any available magnification: just touch the button and follow the LED colour code indicating the target zoom position.

| | | detector type | | | | | optical specifications | | | | | | dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1/4" | 1/3" | 1/2" | 1/1.8" | 2/3" | | | | | | | | | |
| part number | magn. | w x h | w x h | w x h | w x h | w x h | w.d. (1) | F/N (2) | telecentricity (3) | dist. | field depth (4) | CTF @ 50 lp/mm | mount | length | diameter |
| | | 3,6 x 2,7 | 4,8 x 3,6 | 6,4 x 4,8 | 7,13 x 5,37 | 8,8 x 6,6 | | | | | | | | | |
| | (x) | (mm) (mm) | (mm) (mm) | (mm) (mm) | (mm) (mm) | (mm) (mm) | (mm) | | (deg) | (%) | (mm) | % | | (mm) | (mm) |
| | | object field of view (mm x mm) | | | | | | | | | | | | | |
| TC ZR 036 | 0,250 | 14,4 x 10,8 | 19,2 x 14,4 | 25,6 x 19,2 | 28,5 x 21,5 | 35,2 x 26,4 | 68,0 | 12 | < 0,05 | < 0,05 | 11,0 | > 40 | C | 218,0 | 79 |
| | 0,500 | 7,2 x 5,4 | 9,6 x 7,2 | 12,8 x 9,6 | 14,3 x 10,7 | 17,6 x 13,2 | … | … | … | < 0,04 | 2,8 | > 35 | … | … | … |
| | 1,000 | 3,6 x 2,7 | 4,8 x 3,6 | 6,4 x 4,8 | 7,1 x 5,4 | 8,8 x 6,6 | … | … | … | < 0,04 | 0,7 | > 40 | … | … | … |
| | 2,000 | 1,8 x 1,4 | 2,4 x 1,8 | 3,2 x 2,4 | 3,6 x 2,7 | 4,4 x 3,3 | … | … | … | < 0,08 | 0,2 | > 35 | … | … | … |
| TC ZR 072 | 0,125 | 28,8 x 21,6 | 38,4 x 28,8 | 51,2 x 38,4 | 57,0 x 43,0 | 70,4 x 52,8 | 153,5 | 12 | < 0,05 | < 0,1 | 45,0 | > 35 | C | 284,0 | 116 |
| | 0,250 | 14,4 x 10,8 | 19,2 x 14,4 | 25,6 x 19,2 | 28,5 x 21,5 | 35,2 x 26,4 | … | … | … | < 0,08 | 11,0 | > 40 | … | … | … |
| | 0,500 | 7,2 x 5,4 | 9,6 x 7,2 | 12,8 x 9,6 | 14,3 x 10,7 | 17,6 x 13,2 | … | … | … | < 0,05 | 2,8 | > 40 | … | … | … |
| | 1,000 | 3,6 x 2,7 | 4,8 x 3,6 | 6,4 x 4,8 | 7,1 x 5,4 | 8,8 x 6,6 | … | … | … | < 0,07 | 0,7 | > 35 | … | … | … |

1. Working Distance: distance bewteen the front lens and the object. Set this distance within +/- 3% of the nominal value for maximum resolution and minimum distortion

2. Working F-number: the real F-number of a lens when used as a macro. Lenses with smaller apertures can be supplied on request

3. Maximum slope of principal rays inside the lens: when converted to millirad, it gives the maximum measurement error for any millimiter of object displacement

4. At the borders of the field depth the image can be still used for measurement but, to get a very sharp image, only half of the nominal field depth should be considered