



BEAM HANDLING COMPONENTS

National Electrostatics Corp.

Electrostatic Quadrupole Lenses

APPLICATIONS

NEC has designed and built many electrostatic quadrupole lenses to meet specific optics requirements. All use the highest-quality insulators, all metal and ceramic construction, and are typically equipped with NEC or ConFlat all-metal vacuum flanges.

Some housings have been designed for use in accelerator pressure tanks, and some models have additional ports for vacuum pump attachments or for steering voltage feedthroughs.

Since a quadrupole singlet acts as a converging lens in one plane and as a diverging lens in the other, the focusing properties of the triplet are specified in terms of these two planes, the CDC, or converging-diverging-converging plane and the DCD, or diverging-converging-diverging plane.

Because the lens strength is different in each of these planes, quadrupole lenses are in general astigmatic, but the excitation of each of the quadrupole singlets may be adjusted such that stigmatic operation is obtained.

Most are operated as a symmetric triplet, i.e., the four elements of the first singlet are physically identical to those of the third singlet, and may also have the same voltage on elements in the same median plane.

One special case is the offset quadrupole triplet, which allows independent adjustment of the axis of its three elements with respect to the housing axis. It is used to select charge states in the terminal of tandem accelerators.

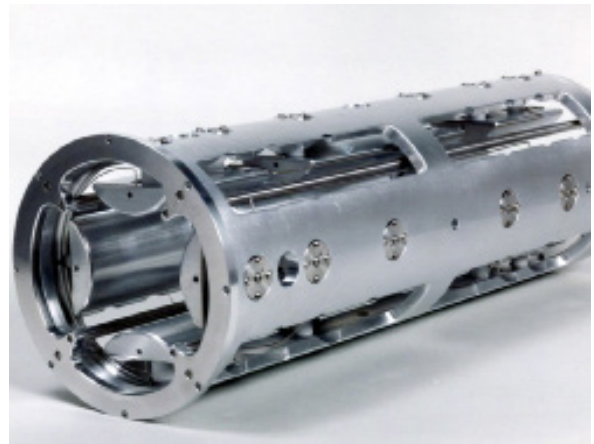
In addition to standard doublet and triplet models, NEC has built quadruplet quadrupole, steering quadrupole, and offset quadrupole lenses.

ACCESSORIES

NEC can also provide power supplies, control and any necessary supports for the quadrupole lenses.

SPECIFICATIONS

NEC has manufactured a wide range of electrostatic quadrupole lenses with varying numbers of elements, aperture sizes, voltage ratings and overall lengths. Below is a chart listing specifications for a few of these lenses. Custom lenses designed based on customer needs are also available.



The highest-quality insulators and all metal and ceramic construction are used. Shown without vacuum housing.

Units: mm, unless otherwise specified

Model No.	EQT 44-50	EQT 64-20	EQT 76-20	EQT83-15	EQD 38-20
Part Number	2EA036520	2EA029150	2EA029140	2EA025750	2EA036000
No. of Element Groups	3	3	3	3	2
Aperture diameter*	44	64	76	83	38.1
Actual Element Length	1st & 3rd: 133.4 middle: 266.7	1st & 3rd: 50 middle: 100	1st & 3rd: 50 middle: 100	1st & 3rd: 120 middle: 222.25	196.9
Effective Element Length, estimates	1st & 3rd: 152.6 middle: 281.0	1st & 3rd: 75.1 middle: 115	1st & 3rd: 78.4 middle: 115	1st & 3rd: 155.5 middle: 247.7	213.68
Actual Axial Separation	28.6	30	30	50.8	25.4
Effective Axial Separation (estimated)	14.3	15	15	25.4	12.7
Rated Feedthrough voltage	50 kV in SF ₆ , 25kV in air	20kV in air	20kV in air	15kV in air	20kV in air

*Quadrupole aperture is defined by the maximum diameter tube that can be fitted through the quadrupole elements in the center.

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