

# Electrostatic Products

for Accelerators





## ELECTROSTATIC PRODUCTS

Over the years Danfysik has designed and delivered a wide range of Electrostatic Products for accelerators, ranging from quadrupole singlets, doublets or triplets for ion implanters, and beam scanning systems for small accelerators to large electrostatic dipole analyzers for spectrometers.

In this brochure you will find examples of some of the products, which - in most cases created as tailor made to our customers' specifications - have turned into a kind of standard product. They are illustrating the capabilities of Danfysik in this field, and we hope that it will inspire you to ask us if you have any plans or needs for Electrostatic devices for particle accelerators.



One of the large electrostatic dipoles for the Recoil Mass Spectrometer for the Holifield Heavy Ion Research facility at ORNL, USA, being lowered into the vacuum chamber before the high voltage conditioning test at the DANFYSIK plant.

In this brochure you will find data for:

- A wide range of Electrostatic Energy Analyzers
- Electrostatic Quadrupoles
- Electrostatic Extraction and Lens Systems
- Electrostatic Beam Scanning Systems

## ELECTROSTATIC ANALYZERS

The Electrostatic Analyzers listed on this and next page are a listing of custom built analyzers designed and delivered from Danfysik over the later years.

Detailed information is available for the specific products, and we are prepared to work out proposals for any special request within this field of high performance Electrostatic Analyzers.

Customer	NSC New Delhi	Univ. of Utrecht	FZR Rossendorf	DF Std.equip.	ORNL
DF order No.	IND 533	HOL 3555	GER 3574	-	USA 3267
Model No.	-	-	-	260	-
Manuf. year	1990	1993	1994	-	1994
Application	RMS	C14	-	-	RMS
Plate separation (d)	150 mm	43.5 mm	20 mm	5 mm	100 mm
Bending radius (R)	4000 mm	435 mm	2000 mm	500 mm	6000 mm
Bending angle	20°	90°	30°	90°	20°
Plate height	500 mm	160 mm	100 mm	50 mm	500 mm
Effective length	1396 mm	683 mm	1047 mm	785 mm	2094 mm
Plate material	Titanium	Stainless steel	Aluminium	Aluminium	Titanium
Plate shape	Cylindrical	Spherical	Cylindrical	Cylindrical	Cylindrical
Field strength	30kV/cm	4.6kV/cm	40kV/cm	40kV/cm	50V/cm
Voltage	± 225kV	± 10kV	± 40kV	± 10kV	± 250kV

Customer	DF Std.equip.	LLNL	ANSTO	NRL	Univ. of Arizona
DF order No.	-	UUSA 4720	AUR 4895	USA 6177	USA 6729
Model No.	262	263	-	-	-
Manuf. year	-	1995	1995	1996	1997
Application	-	AMS	AMS	TE-AMS	AMS
Plate separation (d)	20 mm	100 mm	25 mm	41 mm	40 mm
Bending radius (R)	2000 mm	750 mm	2500 mm	2200 mm	2000 mm
Bending angle	57°	90°	90°	30°	70°
Plate height	100 mm	240 mm	175 mm	164 mm	150 mm
Effective length	1990 mm	1178 mm	3927 mm	1152 mm	2688 mm
Plate material	Aluminium	Stainless steel	Aluminium	Titanium	Aluminium
Plate shape	Cylindrical	Spherical	Spherical	Spherical	Spherical
Field strength	40kV/cm	2kV/cm	64kV/cm	48.8kV/cm	35kV/cm
Voltage	± 40kV	± 10kV	± 80kV	± 100kV	± 70kV

Customer	Inst. of Physics	LLNL	Univ. of Helsinki
DF order No.	IND 6831	USA 6596	FIN 11572
Model No.	-	265	-
Manuf. year	1997	1999	2000
Application	AMS	AMS	AMS
Plate separation (d)	40mm	50mm	30mm
Bending radius (R)	3200mm	4375mm	2000mm
Bending angle	15°	45°	30°
Plate height	200mm	200mm	150mm
Effective length	838mm	2291mm	1047mm
Plate material	Aluminium	Stainless steel	Titanium
Plate shape	Cylindrical	Cylindrical	Cylindrical
Field strength	25kV/cm	50kV/cm	66.7kV/cm
Voltage	± 50kV	± 125kV	± 100kV



A large spherical electrostatic analyzer delivered to the US Naval Research Laboratory for applications in Accelerator Mass Spectrometry.





Large spherical electrostatic analyzer for AMS and RMS.  
Delivered to ANSTO in Australia in 1996.

## ELECTROSTATIC ENERGY ANALYZER 260

This Electrostatic Energy Analyzer is designed for high resolution energy analysis of charged particles with energies in the 0-1 MeV range.

Typical applications are:

- Beam foil spectroscopy
- Measurement of the energy of multiply scattered charged particles
- Atomic fine structure measurements by measuring energy losses
- Measurement of particle energy as a function of scattering angle.

The analyzer is of the single focussing type with  $90^\circ$  deflection of the analyzed particles.

The analyzer consists of 2 cylindrical plates with a radial separation of 5 mm and a mean radius of 500 mm.

The analyzing field is terminated by properly located slotted shielding plates.

The cylinder segments of the analyzer are machined out of annealed solid aluminium, and they have a T-profile in order to obtain a high rigidity for these elements, which have been given a second annealing treatment before the final precision machining.

High precision adjustable slits are located at the focal points of the analyzer. The width of these slits can be adjusted by means of micrometer screws which are located on the outside of the vacuum chamber. The novel design of the slits ensures the highest degree of parallelism between the slit edges.

The different parts of the complete analyzer system are mounted on a rigid aluminium base plate, which is precision machined for maximum flatness.

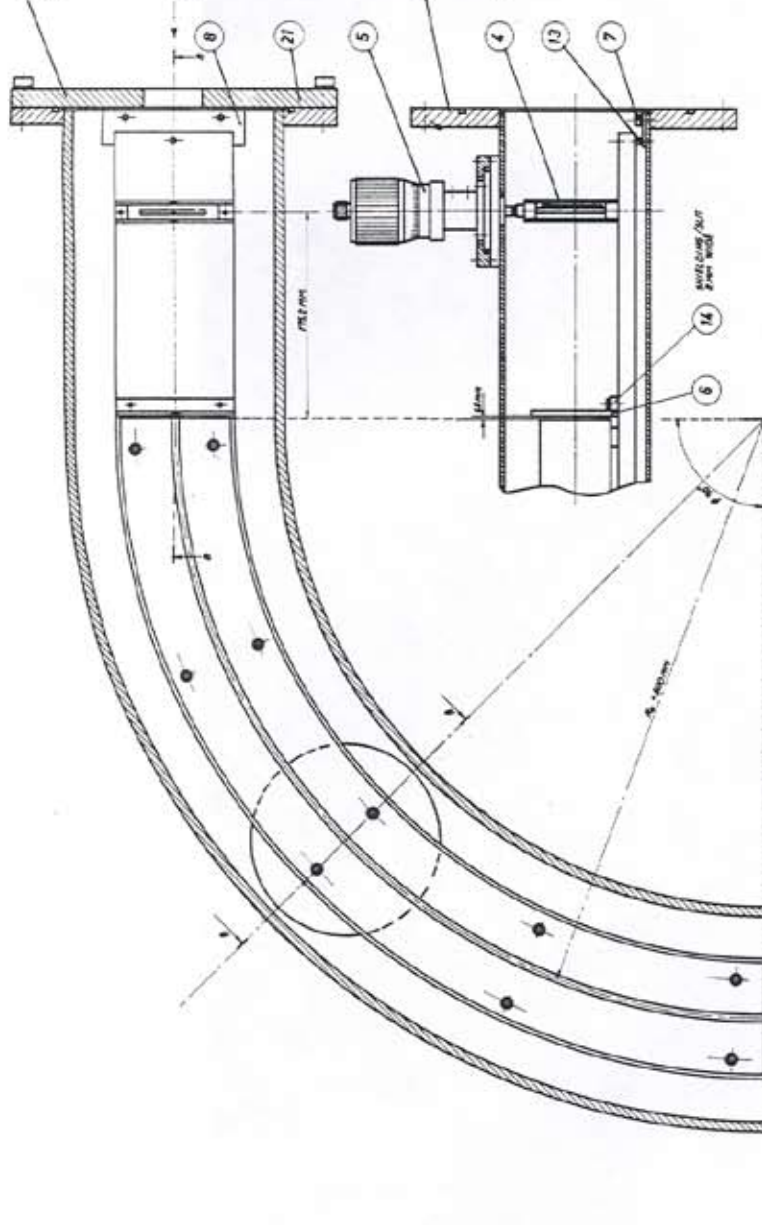
The vacuum chamber of the analyzer is made of non-magnetic stainless steel and is equipped with standard flanges at both ends and a centrally located flange for connection to a high vacuum pump.

A calibrated symmetrical high voltage supply can be delivered with the analyzer.



ENTRANCE (AND EXIT) FLANGES  
ON ALL MACHINES ACCORDING TO  
CUSTOMER SPECIFICATIONS

BEAM DIRECTION  
(ONLY IN REVERSE)



DEFLECTION PLATE ASSY  
BELOW FLANGE A - 400mm  
BELOW FLANGE B - 400mm  
FLANGE DISTANCE - 400mm  
PLATE MANUFACTURE EQUIPMENT

VACUUM CHAMBER

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F

SECTION G-G

SECTION H-H

SECTION I-I

SECTION J-J

SECTION K-K

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# ELECTROSTATIC DEFLECTOR/ANALYZER 262

Ref. Assembly dwg. No. 14726E.

## SPECIFICATIONS:

Type:	Cylindrical plate electrostatic condenser
Effective angle of deflection:	$\varphi = 57^\circ$
Mean bending radius:	$R_o = 2000 \text{ mm}$
Plate separation:	$d = 20 \text{ mm}$
Plate height:	$h = 100 \text{ mm}$
Max. electrical field:	$\varepsilon = 40 \text{ kV/cm}$
Max. voltage on plates:	$\pm 40 \text{ kV}$
Max beam rigidity:	$E/q = 4.0 \text{ MV}$
Object and image distances for symmetrical operation:	$l_o = l_i = 1667 \text{ mm}$
Acceptance angle in deflecting plane for symmetric operation:	$\pm 4.5 \text{ mrad}$
Energy dispersion:	$2000 \text{ mm}$
First order resolving power for 1 mm object and image slits:	$\frac{\Delta E}{E} = 0.5\%$

Aluminum deflector plates

All stainless steel chamber with two alignment ports and pumping flange.

Helium leak tested to  $10^{-9}$  torr l./sec.



## ELECTROSTATIC QUADRUPOLES

The following pages show Electrostatic Quadrupole Lenses in the standard product line from Danfysik.

	Model 727	Model 728	Model 729
Application		200kV Implanter	
Aperture	50 mm	70 mm	60 mm
Singlet Mechanical Length Effective Length	190 mm 215 mm	- -	- -
Doublet Effective Length	215-115-215 mm	-	-
Triplet Effective Length	215-115-215-115-215	135-25-235-25-135	130-20-180-20-130
Gradient	9kV/cm <sup>2</sup>	1kV/cm <sup>2</sup>	3.3kV/cm <sup>2</sup>
Max. Voltage	± 28kV	± 10kV	± 15kV
Singlet Version	Dwg 12662B	Dwg 12698A	Dwg 12811

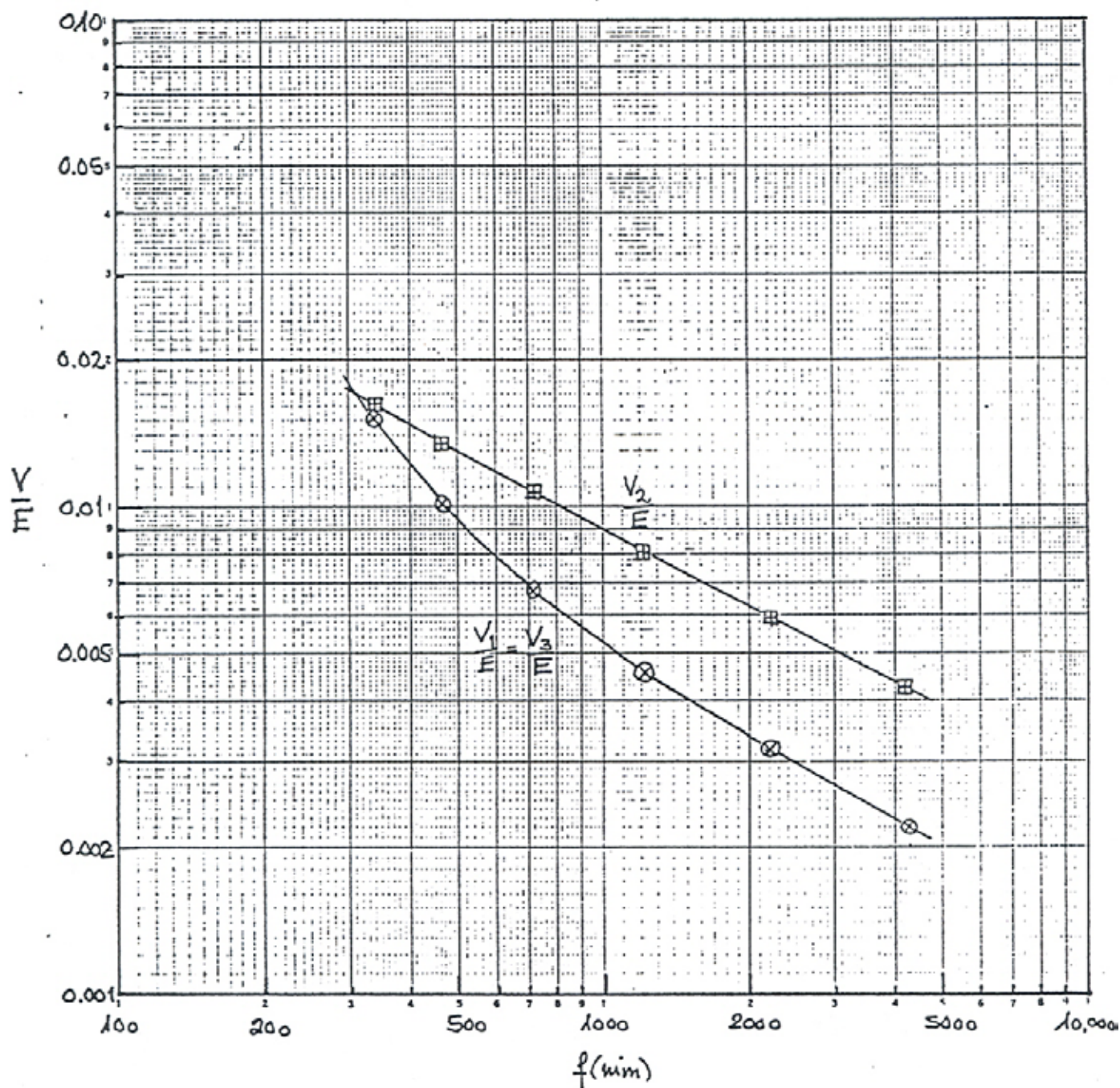
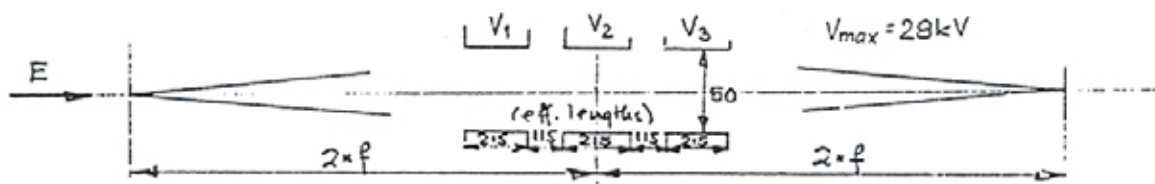
Dimensions shown above may be revised in order to match specific mechanical length properties in the beam lines.

The Electrostatic Quadrupole Lenses can be delivered with or without the related high voltage supplies.

The focal properties of the lenses are shown on the attached diagrams and can be used for first considerations in order to match the beam optical data.

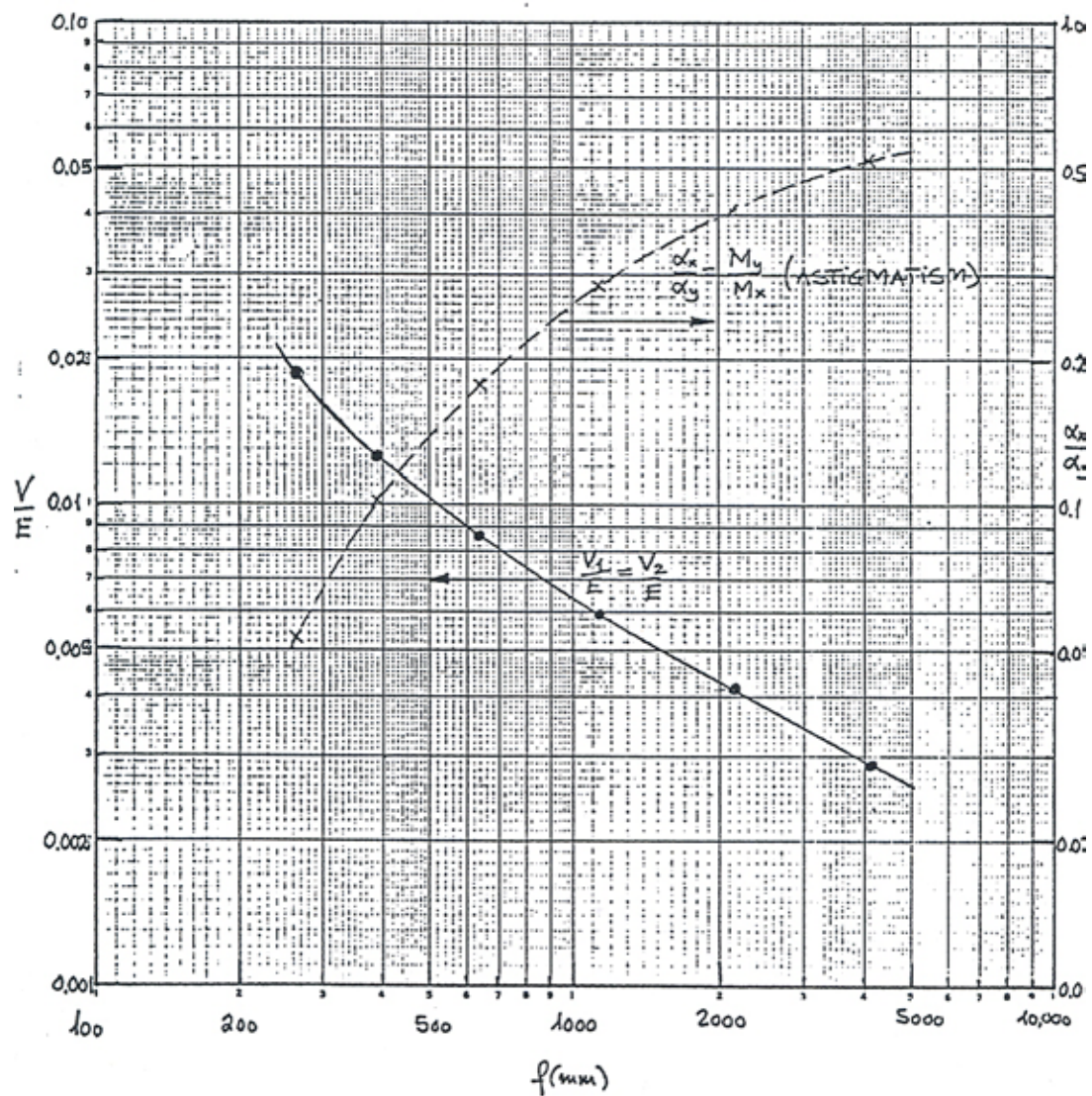


# ELECTROSTATIC QUADRUPOLE TRIPLET - MODEL 727 FOCAL PROPERTIES - SYMMETRIC FOCUSSED





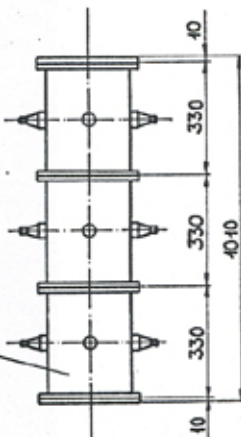
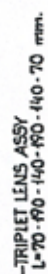
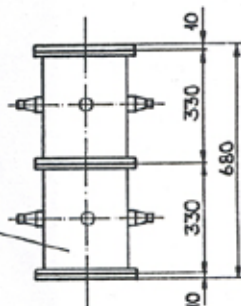
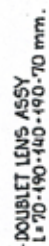
# ELECTROSTATIC QUADRUPOLE DOUBLET - MODEL 727 FOCAL PROPERTIES - SYMMETRIC FOCUSsing.






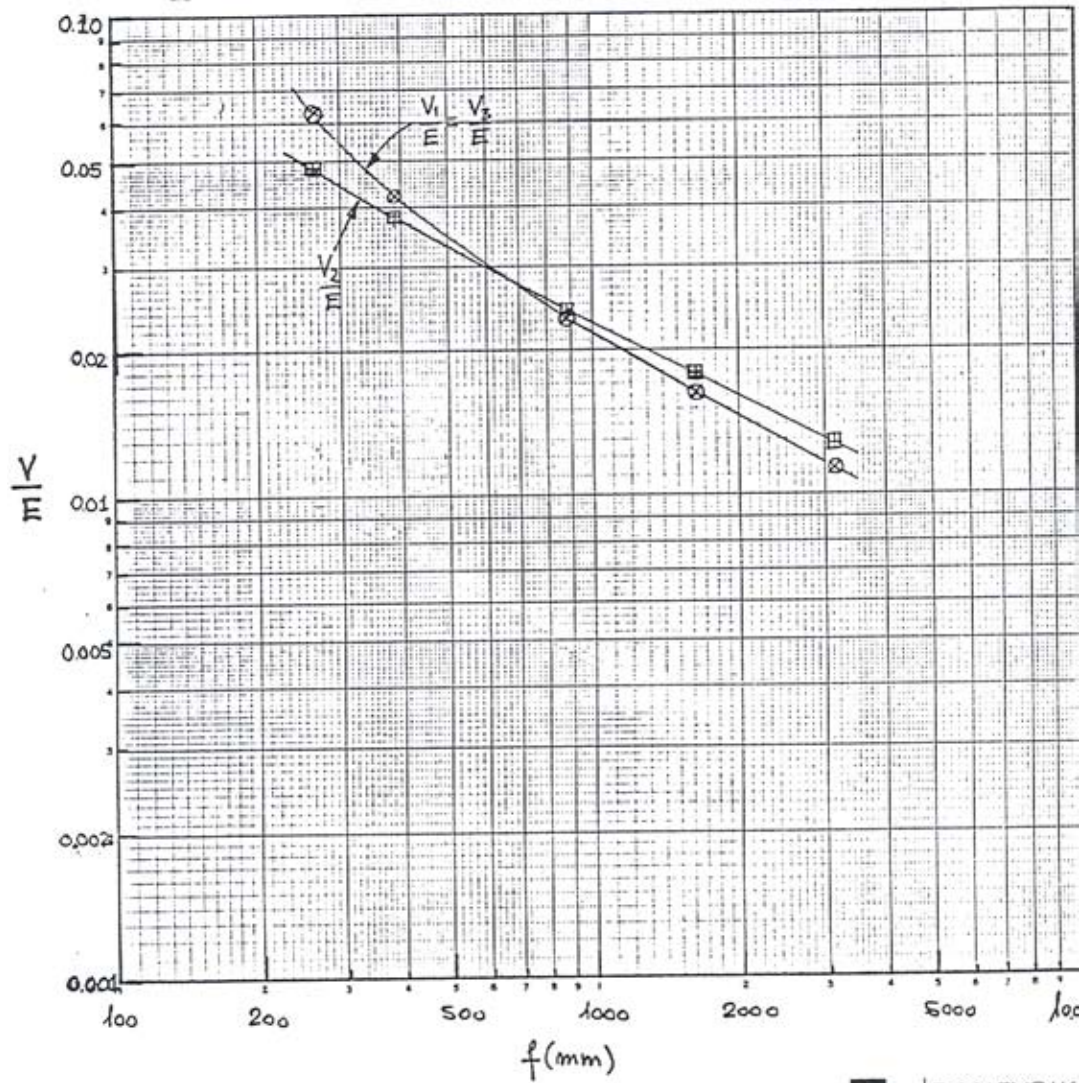
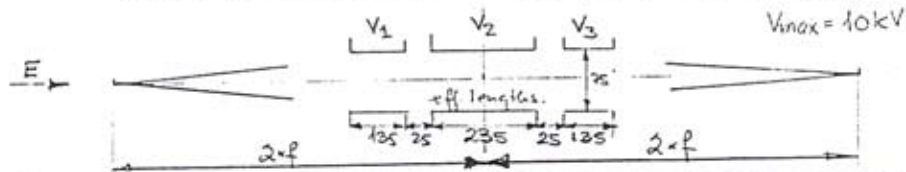
The drawing consists of two views of a cylindrical vacuum chamber:

- Top View:** Shows a circular chamber with an outer diameter of 460 and an inner diameter of 400. The chamber has four ports around its circumference. The internal structure shows four circular elements arranged in a square pattern.
- Side View:** A cross-section of the chamber showing the internal components. The total height is 330. The chamber wall thickness is 40. The internal components include:
  - CHAMBER:** The main cylindrical body.
  - END FLANGE:** The top and bottom flanges.
  - FLANGE:** The side flange.
  - OUTER ELEMENT:** The outer cylindrical component.
  - INSULATOR:** The insulating layer between the outer and center elements.
  - CENTER ELEMENT:** The central cylindrical component.
  - H.V. FEED THROUGH:** The high-voltage feedthrough on the side.
  - 4" DEPENDX:** A dimension indicating a 4-inch dependency.
  - 300:** A dimension for the internal width.
  - 20, 35, 45, 190, 55, 40:** Various segment dimensions for the internal components.

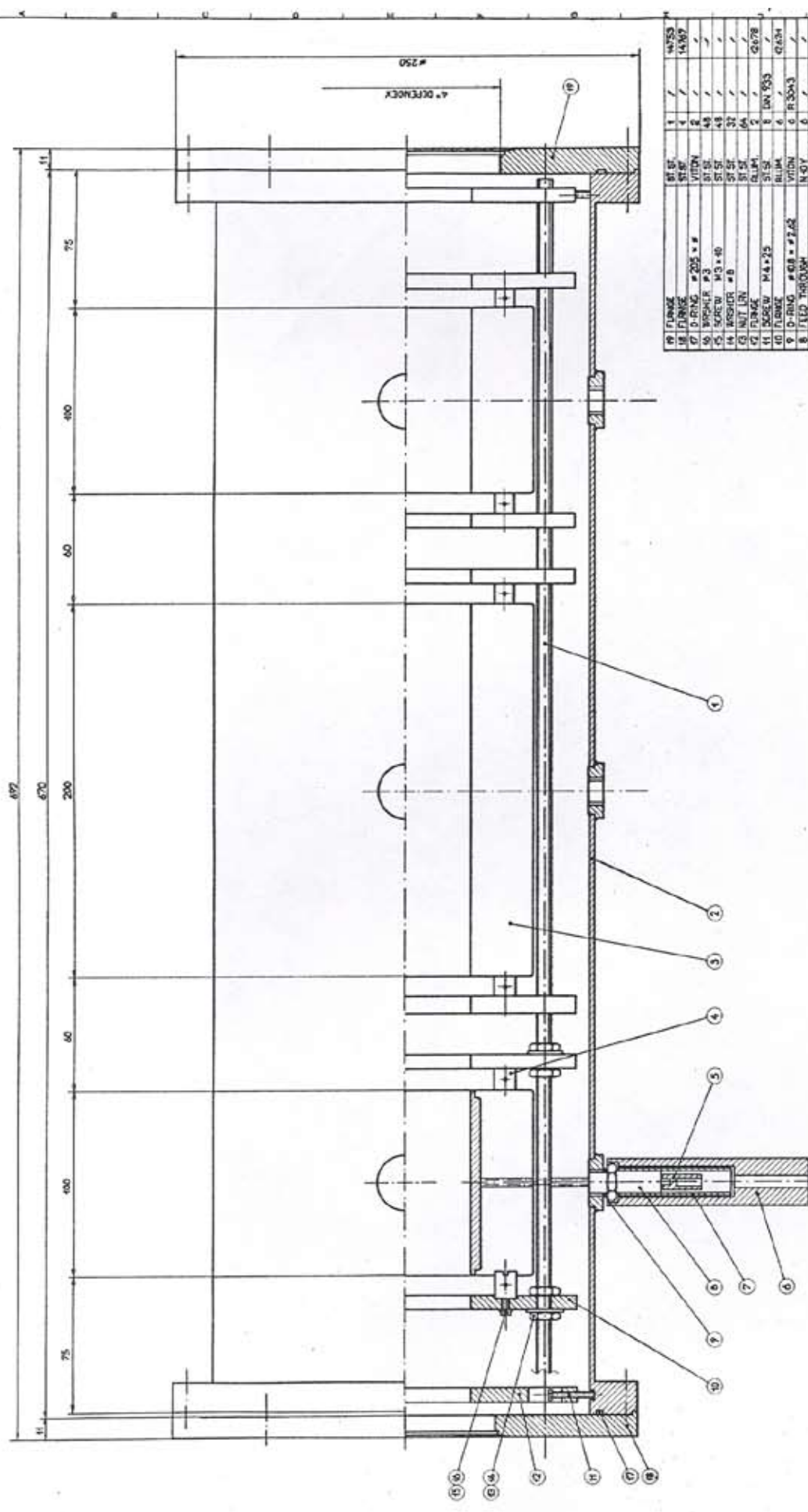


NO.	ITEM	MATERIAL	QTY	ITEM NO.	DWG. NO.
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REV. 3/2/87		782.145.040-C-0.0.0.0000			
MACHINING: /		BURN TREATMENT: /			
TOLERANCE: /					
SCALE: 1:2					
 <b>DANFOSS</b> a world of solutions		<b>QUADRIPOLE LENS 727</b> <b>ELECTROSTATIC</b>		DRAWN BY: <b>SC. 194/87S</b> DESIGN APP: <b>75</b> PROC. APP: PHOT. ENGRA. SURF. FINISHING DWG: <b>12 662 C</b> SUPPLIED BY:	
		SINGLET: $A_p = 50mm, L_{mek} = 80mm$ $g_{max} = 9 \text{ N} / \text{cm}^2, V_{max} = 28 \text{ kV}$		ORDER NO. CUST.	

# Electron Gun with Three Electrodes Focal Properties - Symmetric Focussing.



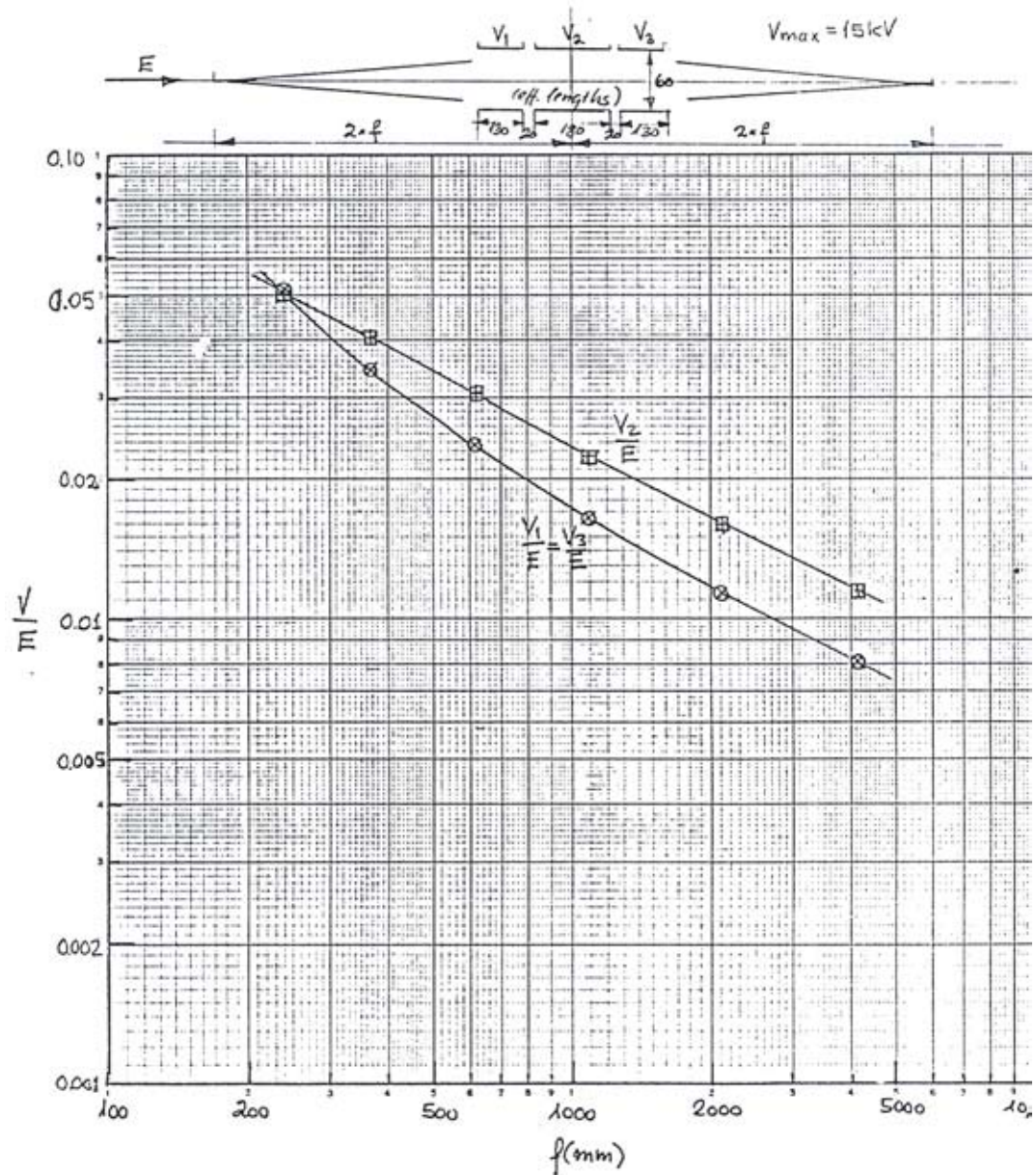




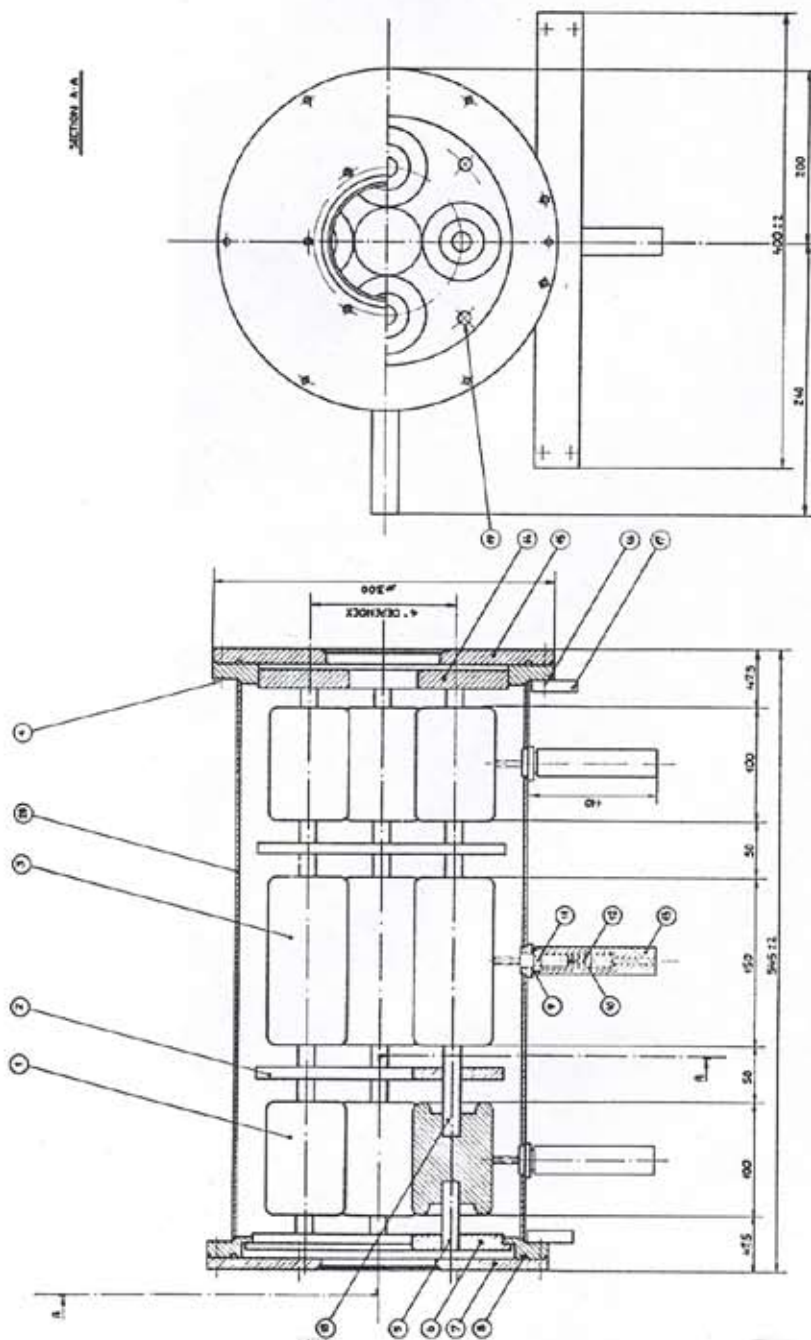
10 FLANGE	ST 5T	1	1	14553
11 FLANGE	ST 5T	1	1	14553
12 D-RING	VTDM	2	2	14553
13 BUSH	ST 5T	48	48	14553
14 SCREW	ST 5T	32	32	14553
15 WASHER	ST 5T	32	32	14553
16 NUT	ST 5T	32	32	14553
17 FLANGE	ST 5T	1	1	14553
18 SCREW	ST 5T	1	1	14553
19 FLANGE	ST 5T	1	1	14553
20 D-RING	VTDM	2	2	14553
21 TUBE	ST 5T	1	1	14553
22 INSULATOR	ST 5T	1	1	14553
23 PLUG	ST 5T	1	1	14553
24 INSULATOR	ST 5T	1	1	14553
25 DEFLECTOR	ST 5T	1	1	14553
26 CHIMBLER	ST 5T	1	1	14553
27 ROD	ST 5T	1	1	14553
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99	ST 5T	1	1	14553
100	ST 5T	1	1	14553

117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918

# ELECTROSTATIC QUADRUPOLE TRIPLET - MODEL 729 FOCAL PROPERTIES - SYMMETRIC FOCUSSED



SECTION A-A



13 CHAMBER	1	1118
19 SEAL	1	1118
18 INSULATOR	4	1118
17 BAR	8	1118
16 SEAL	8	1118
15 FLANGE	8	1118
14 FLANGE	8	1118
13 INSULATOR	8	1118
12 SEAL	8	1118
11 FLANGE	8	1118
10 FLANGE	8	1118
9 SEAL	8	1118
8 FLANGE	8	1118
7 FLANGE	8	1118
6 FLANGE	8	1118
5 FLANGE	8	1118
4 FLANGE	8	1118
3 FLANGE	8	1118
2 FLANGE	8	1118
1 FLANGE	8	1118
0 FLANGE	8	1118
11 FLANGE	8	1118
10 FLANGE	8	1118
9 FLANGE	8	1118
8 FLANGE	8	1118
7 FLANGE	8	1118
6 FLANGE	8	1118
5 FLANGE	8	1118
4 FLANGE	8	1118
3 FLANGE	8	1118
2 FLANGE	8	1118
1 FLANGE	8	1118
0 FLANGE	8	1118

11 FLANGE	8	1118
10 FLANGE	8	1118
9 FLANGE	8	1118
8 FLANGE	8	1118
7 FLANGE	8	1118
6 FLANGE	8	1118
5 FLANGE	8	1118
4 FLANGE	8	1118
3 FLANGE	8	1118
2 FLANGE	8	1118
1 FLANGE	8	1118
0 FLANGE	8	1118
11 FLANGE	8	1118
10 FLANGE	8	1118
9 FLANGE	8	1118
8 FLANGE	8	1118
7 FLANGE	8	1118
6 FLANGE	8	1118
5 FLANGE	8	1118
4 FLANGE	8	1118
3 FLANGE	8	1118
2 FLANGE	8	1118
1 FLANGE	8	1118
0 FLANGE	8	1118

QUADRUPOLE LENS 729  
ELECTROSTATIC TRIPLET  
Ap = 60mm, L = 100-150-100  
Smax = 2.34V/cm, Vmax = 15kV  
12811

## ELECTROSTATIC BEAM SCANNING SYSTEMS

With many years of experience in the field of building Ion Implanters for research application, DANFYSIK has developed a number of devices at the first range designed for the implanters, but later turned to standard products with a long list of proven applications.

The Sweep System Assy, Model 781 is designed for 200kV Ion Implanters and applied in connection with ion implantation in silicon wafers. The formula for calculating the dimensional beam scanning capacity is shown on dwg. 12699B.

The Model 781 can be powered from a DANFYSIK Beam Sweep Amplifier. The latest version, Model 731, is a high performance double amplifier with  $\pm 2\text{kV}$  output voltage at a frequency up to 1 kHz and with a linearity better than 1%.

The amplifier is equipped with analog input ports, which can be used in the case where special scanning profiles are requested, i.e. irregular output voltage signals are needed. In these cases we recommend a pair of Wavetech generators which can be programmed for individual waveforms and controlled via a serial RS232C interface port.





## **ELECTROSTATIC EXTRACTION AND LENS SYSTEMS**

The Ion Implanters and Isotope Separators delivered from DANFYSIK over the years are equipped with mainly two models of ion sources.

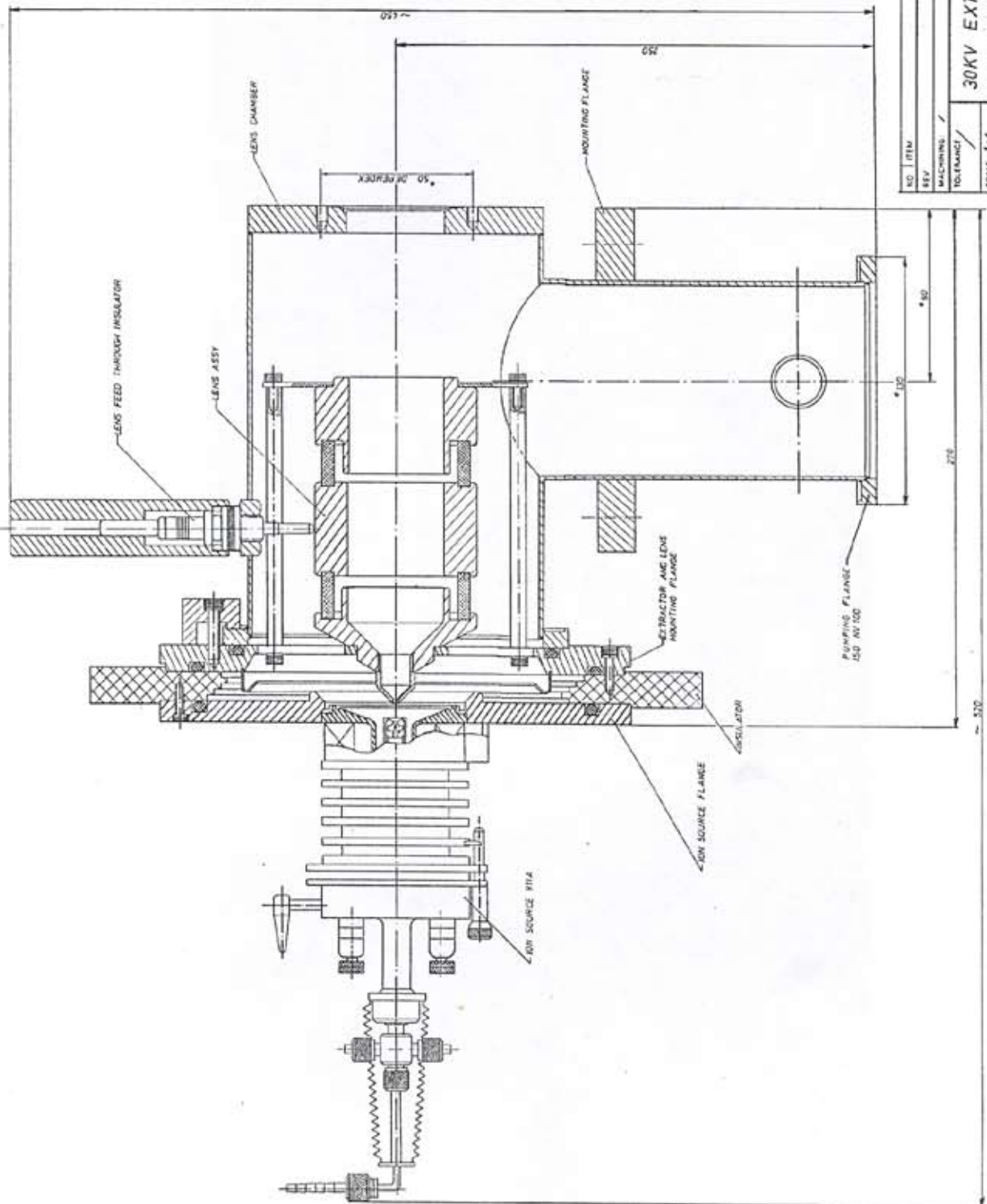
The high temperature ion source Model 911 is used in the Ion Implanter Series 1080, and the "Extraction and Lens System, Model 788" is forming the first stage of acceleration and focusing in this implanter series.

A dimensional drawing of Model 788 is shown on the next page.


The high current source "CHORDIS" Model 920 is used in the 1090 implanter series, and the extraction system is in this case an integral part of the ion source, which operates with an acceleration potential up to 50kV.

Various dedicated extraction and lens systems have been designed and produced over the years, and we are quite prepared to offer extraction and lens systems on the basis of special requirements.

1 2 3 4 5 6 7 8



REF PLST P 1208  
NOTE: 40W SOURCE 8114 IS NOT INCLUDED  
IN THE A331.

NO	ITEM	MATERIAL	QTY	ITEM NO	DWG NO
887					
MACHINING: /					
SURF. TREATMENT: /					
TOLERANCE: /					
SCALE: 1:1					
<div> <div>30KV EXTRACTION AND LENS SYSTEM WITH VACUUM CHAMBER, 788</div> <div>  <div>DANFYSIK</div> <div>precision vacuum</div> </div> </div>					
<div> <div> <div>DESIGNED BY: 11-382-300</div> <div>DESIGN APP: 8-685-E</div> <div>PROD. APP: 78-1-2-R</div> <div>PROD. ENGR:</div> <div>SUPERSEEDING:</div> <div>DWG:</div> <div>12808</div> </div> <div>SUPERSEDED BY:</div> </div>					

