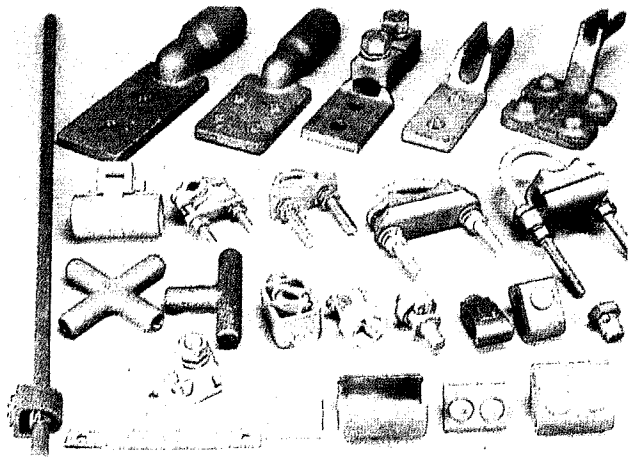


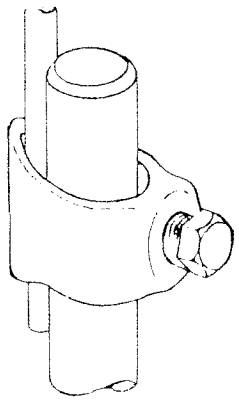
Grounding Materials

• Ground Rod with Connector

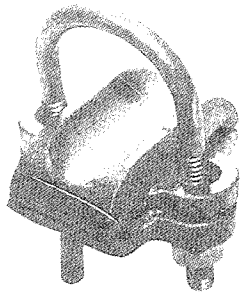
Rod Material : Copper Clad Steel / Hot Dip Galvanized Steel. / Statnless Steel

Straight Type

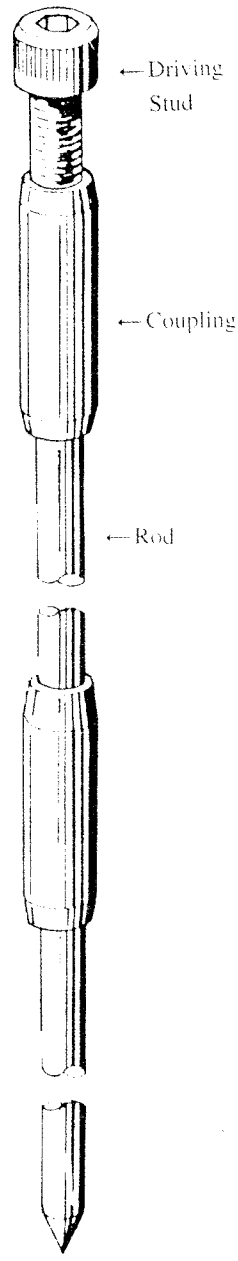
Std. Rod Connector



U-Bolt type Rod Connector



Joint Type



Catalog Number			Size
Copper Clad Steel	Hot Dip Galv'd Steel	Stainless Steel	
JWEG 1001	JWEG 1021	JWEG 1041	ø12 X 1000
JWEG 1002	JWEG 1022	JWEG 1042	ø14 X 1000
JWEG 1003	JWEG 1023	JWEG 1043	ø16 X 1500
JWEG 1004	JWEG 1024	JWEG 1044	ø16 X 1800
JWEG 1005	JWEG 1025	JWEG 1045	ø16 X 3000
JWEG 1006	JWEG 1026	JWEG 1046	ø18 X 2400
JWEG 1007	JWEG 1027	JWEG 1047	ø19 X 1800
JWEG 1008	JWEG 1028	JWEG 1048	ø19 X 2400
JWEG 1009	JWEG 1029	JWEG 1049	ø19 X 3000
JWEG 1010	JWEG 1030	JWEG 1040	ø24 X 2400
JWEG 1011	JWEG 1031	JWEG 1041	ø25 X 3000

※ Other sizes available on request

• Ground Plate *Material : Copper*

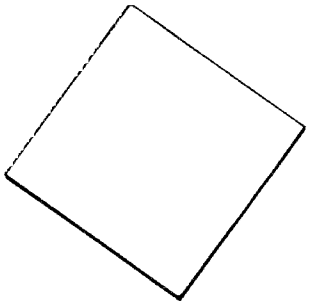


Fig 1 (Bare)

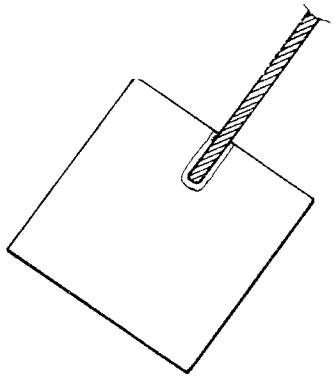


Fig 2(Electric Welding) with Lead wire

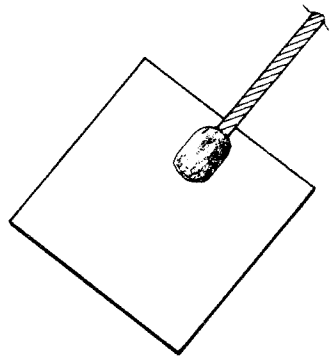
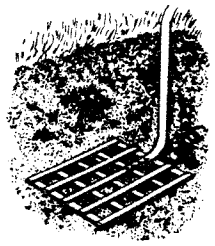


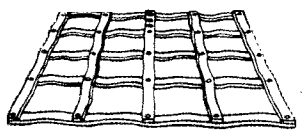
Fig 3 (Exothermic Welding) with Lead wire

Size (mm)	Catalog Number		
	Fig 1	Fig 2	Fig 3
200 x 200 x 1.5	JWEG 1051	JWEG 1061	JWEG 1071
300 x 300 x 1.5	JWEG 1052	JWEG 1062	JWEG 1072
500 x 500 x 1.5	JWEG 1053	JWEG 1063	JWEG 1073
500 x 500 x 2.0	JWEG 1054	JWEG 1064	JWEG 1074
750 x 750 x 2.0	JWEG 1055	JWEG 1065	JWEG 1075
1000 x 1000 x 2.0	JWEG 1056	JWEG 1066	JWEG 1076
1000 x 1000 x 3.0	JWEG 1057	JWEG 1067	JWEG 1077

※ Other sizes available on request

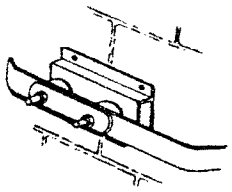
• Ground Plate *Lattice Copper*

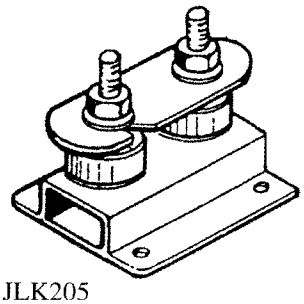




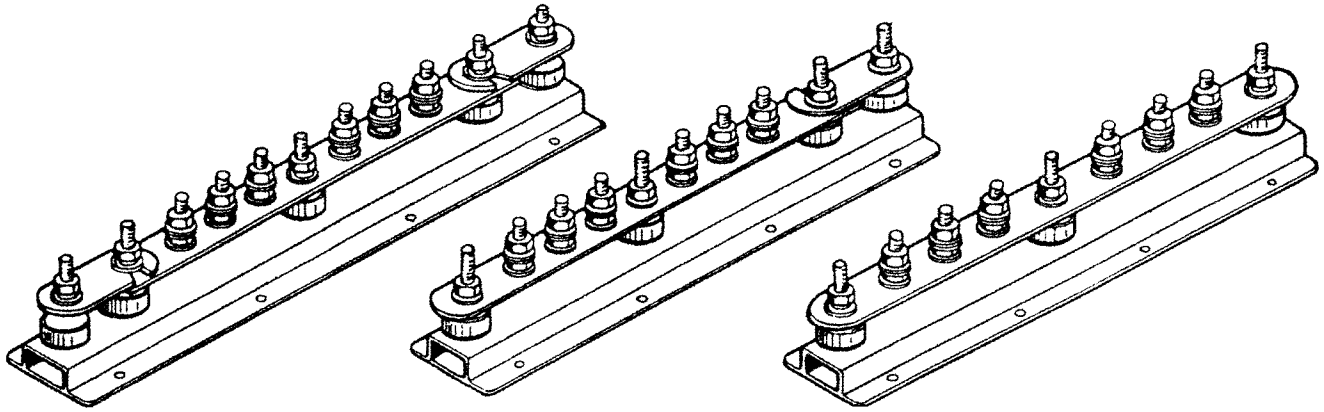
Size(mm)	Catalog Number
600 X 600 X 3	JWEG 1081
900 X 900 X 3	JWEG 1082

• Earth Bars and Disconnecting Links



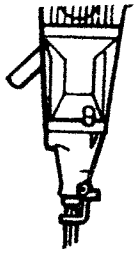


JLK205



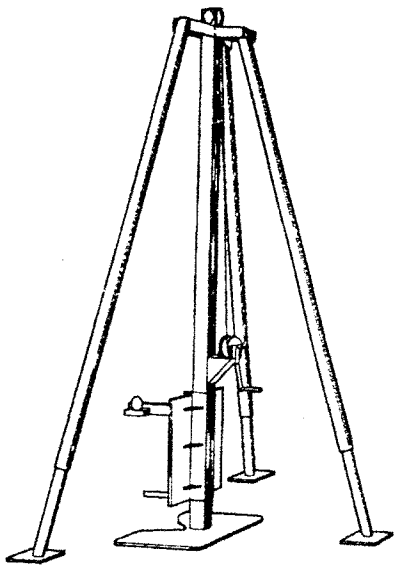
JLK207 JLK243 JLK245

• Earth Rod Hammer



Description	Cat. no.
Petrol Driven Hammer	JHM005

• Hammer Rig

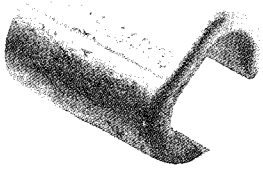


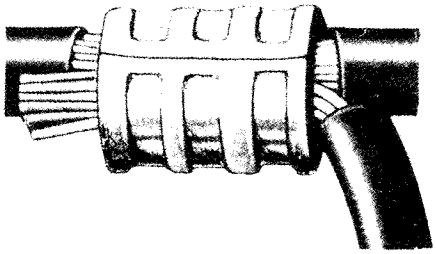
Description	Cat. no.
Hammer Rig	JHM105

Please specify length of rod to be driven and type of hammer to be used when ordering.

By mounting a hammer onto the rig, longer lengths of earth rods can be driven. For projects where large quantities of rods are required, cost savings can be achieved, for example by using single 8 foot rods rather than 2 x 4 ft which would need couplers etc. Installation time is also considerably reduced.

• 'C' Type Clamp *Material : Copper*



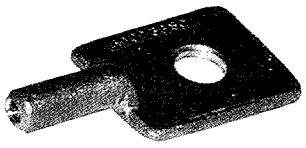


Catalog Number	Conductor(mm^2)	
	Run	Tap
JWEG 1091	300	300
JWEG 1092	240	185~240
JWEG 1093	240	95~150
JWEG 1094	185	150~185
JWEG 1095	185	70~95
JWEG 1096	185	35
JWEG 1097	150	95~150
JWEG 1098	150	35~70
JWEG 1099	95	95
JWEG 1100	95	35~70
JWEG 1101	95	25
JWEG 1102	70	35~70
JWEG 1103	70	25
JWEG 1104	35	25~35
JWEG 1105	25	25

• 'E' Type Clamp *Material : Copper*

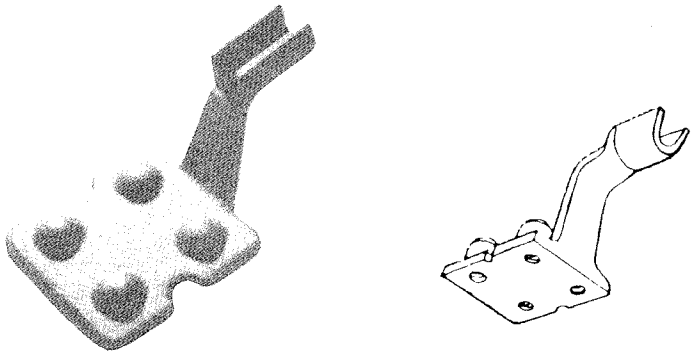
Catalog Number	Conductor(mm^2)	
	Run	Tap
JWEG 1111	16~25	16~25
JWEG 1112	35~70	16~25
JWEG 1113	35~70	35~70
JWEG 1114	70~120	35~70
JWEG 1115	70~120	70~120
JWEG 1116	150~240	16~120
JWEG 1117	150~240	70~120
JWEG 1118	150~240	150~240

• Ground Lug for Steel Tower *Material : Copper*



Catalog Number	Conductor (mm^2)
JWEG 1121	25
JWEG 1122	35
JWEG 1123	50
JWEG 1124	70
JWEG 1125	95
JWEG 1126	120
JWEG 1127	150
JWEG 1128	185
JWEG 1129	240

• Ground Pad *Material : Copper*



Catalog Number	Conductor (mm^2)
JWEG 1131	16
JWEG 1132	25
JWEG 1133	35
JWEG 1134	70
JWEG 1135	95
JWEG 1136	120
JWEG 1137	150
JWEG 1138	185
JWEG 1139	240

• Compression Terminal *Material : Tinned Copper*

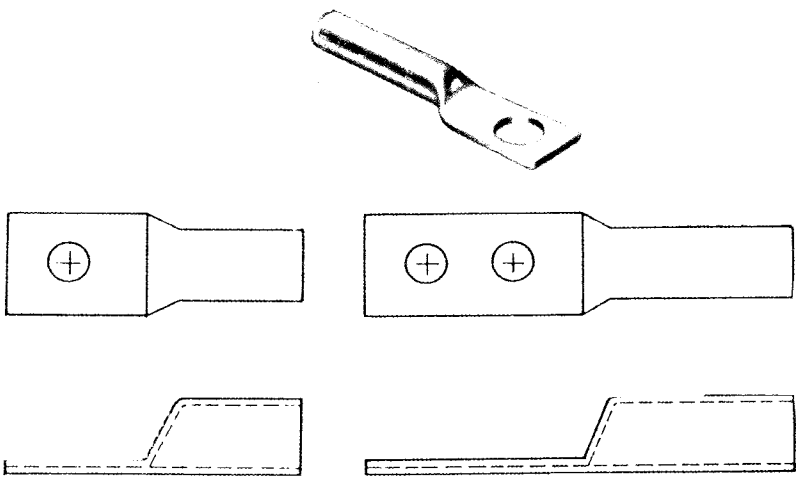
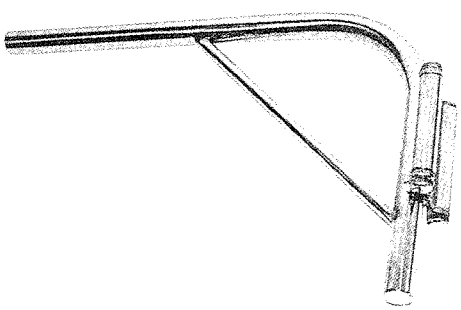


Fig 1 Fig 2

Catalog Number		Conductor (mm^2)
Fig 1	Fig 2	
JWEG 1141	JWEG 1161	10
JWEG 1142	JWEG 1162	16
JWEG 1143	JWEG 1163	25
JWEG 1144	JWEG 1164	35
JWEG 1145	JWEG 1165	50
JWEG 1146	JWEG 1166	70
JWEG 1147	JWEG 1167	95
JWEG 1148	JWEG 1168	120
JWEG 1149	JWEG 1169	150
JWEG 1150	JWEG 1170	185
JWEG 1151	JWEG 1171	240
JWEG 1152	JWEG 1172	300
JWEG 1153	JWEG 1173	400
JWEG 1154	JWEG 1174	500
JWEG 1155	JWEG 1175	630

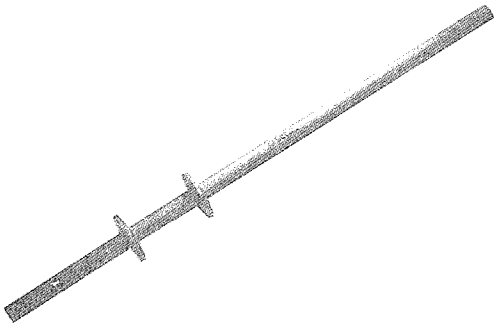
• Static Electricity Control Rod(정전기 제어봉) *Material : Stainless Copper*



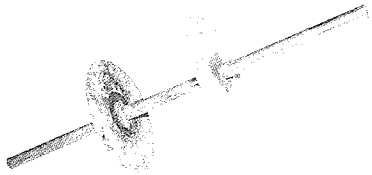
Catalog Number
JWEG 1181

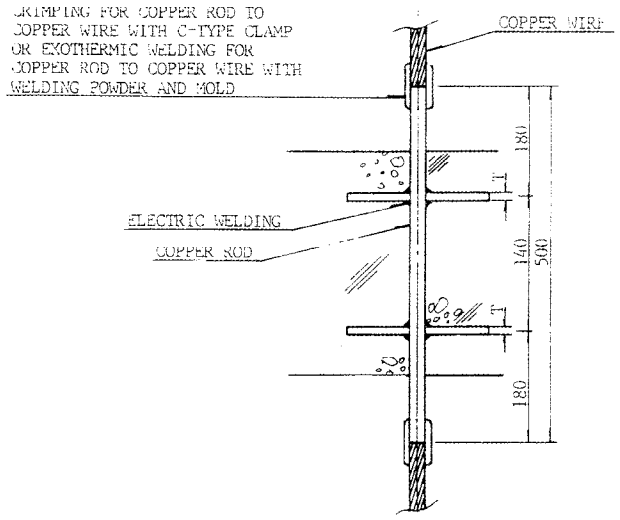
• Bronze Bolt (Still Water Rod)

Type 'A'



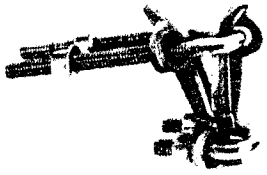
Type 'B'



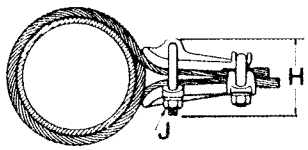


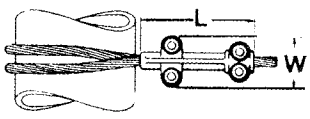
Type	Catalog Number	Dimension
A	JWEG 1191	ø24 x 500
	JWEG 1192	ø24 x 730
B	JWEG 1193	ø150 x 500 x 3T
	JWEG 1194	ø100 x 500 x 2T
	JWEG 1195	ø75 x 500 x 2T

• Bronze Bolt (Still Water Rod)



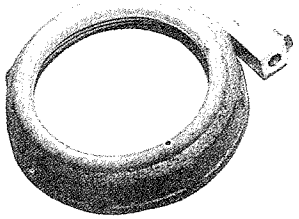
Type JGQ





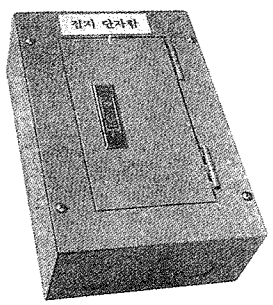
Catalog Number	Conductor		Dimension in mm			
	Tube	Cable	H	J	L	W
JWEG 1201	6" Max.	70 Sqmm² Max.	115	1/2 Inch	127	64
JWEG 1202	Above 6"		180			
JWEG 1203	6" Max.	70~120 Sqmm²	105		152	70
JWEG 1204	Above 6"		190			

• Insulated Ground Bushing



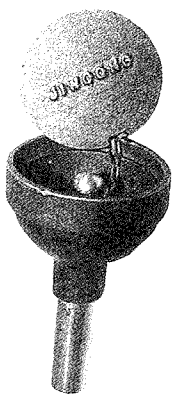
Catalog Number	Pipe Size	Ground Cable (mm^2)
JWEG 1211	3/4″	16
JWEG 1212	1″	16
JWEG 1213	1 1/2″	16
JWEG 1214	2″	16
JWEG 1215	2 1/2″	70
JWEG 1216	3″	70
JWEG 1217	4″	70
JWEG 1218	5″	70
JWEG 1219	6″	70

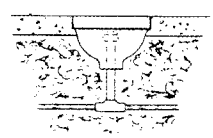
• Ground Terminal Box



Division	Catalog Number		
	Painted Steel	HDG Steel	Stainless Steel
1 CCT	JWEG 1221	JWEG 1231	JWEG 1241
2 CCT	JWEG 1222	JWEG 1232	JWEG 1242
3 CCT	JWEG 1223	JWEG 1233	JWEG 1243
4 CCT	JWEG 1224	JWEG 1234	JWEG 1244
5 CCT	JWEG 1225	JWEG 1235	JWEG 1245

• Airport Grounding Receptacle *Material : Bronze*

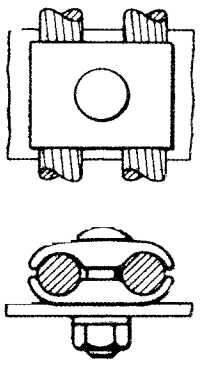




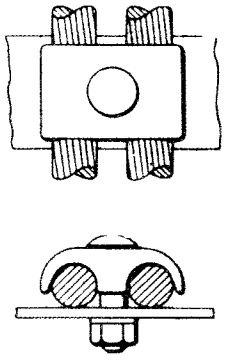
Catalog Number
JWEG 1251

• Ground Connectors *Material : Bronze*

Type JGC

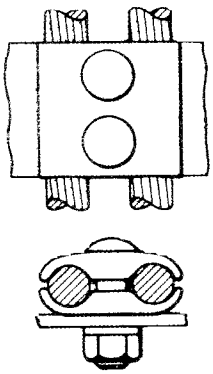


Type JGCM



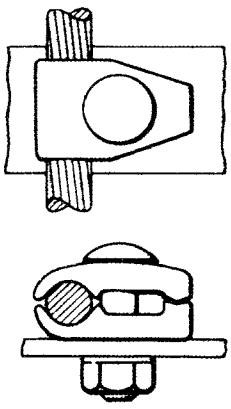
Conductor mm^2		Catalog Number	
Min.	Max.	Type JGC	Type JGCM
10	25	JWEG 1261	JWEG 1271
25	70	JWEG 1262	JWEG 1272
70	120	JWEG 1263	JWEG 1273
150	240	JWEG 1264	JWEG 1274
300	400	JWEG 1265	JWEG 1275
500	630	JWEG 1266	JWEG 1276

Type JGL

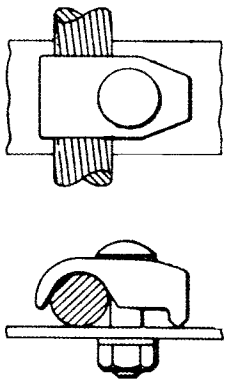


Conductor mm^2		Catalog Number
Min.	Max.	
10	25	JWEG 1281
25	70	JWEG 1282
70	120	JWEG 1283
150	240	JWEG 1284
300	400	JWEG 1285
500	630	JWEG 1286

Type JGB



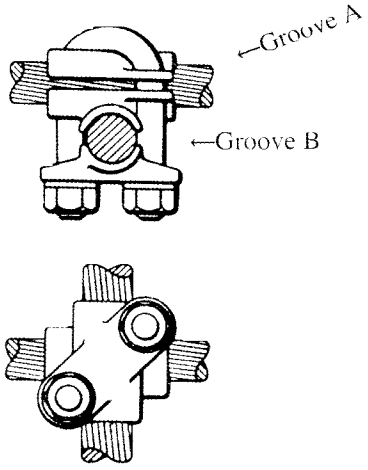
Type JGBM



Conductor mm^2		Catalog Number	
Min.	Max.	Type JGB	Type JGBM
10	25	JWEG 1291	JWEG 1301
25	70	JWEG 1292	JWEG 1302
70	120	JWEG 1293	JWEG 1303
150	240	JWEG 1294	JWEG 1304
300	400	JWEG 1295	JWEG 1305
500	630	JWEG 1296	JWEG 1306

• Ground Connectors *Material : Bronze*

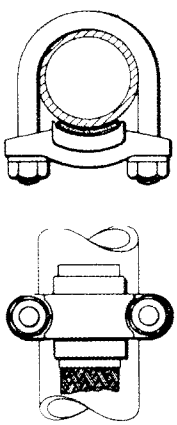
Type JGX



Conductor mm²		Catalog Number
Groove A	Groove B	
10~25	10~25	JWEG 1311
25~70	10~25	JWEG 1312
	25~70	JWEG 1313
70~120	10~25	JWEG 1314
	25~70	JWEG 1315
	70~120	JWEG 1316
150~240	10~25	JWEG 1317
	25~70	JWEG 1318
	70~120	JWEG 1319
	150~240	JWEG 1320

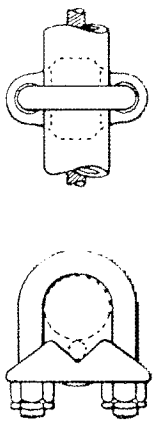
Conductor mm²		Catalog Number
Groove A	Groove B	
300~400	10~25	JWEG 1331
	25~70	JWEG 1332
	70~120	JWEG 1333
	150~240	JWEG 1334
	300~400	JWEG 1335
500~630	10~25	JWEG 1336
	25~70	JWEG 1337
	70~120	JWEG 1338
	150~240	JWEG 1339
	240~400	JWEG 1340
	500~630	JWEG 1341

Type JGG

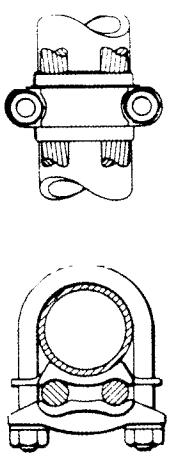


Conductor Dia		Catalog Number	
Tube	Rod	Type JGC	Type JGR
25	28~32	JWEG 1351	JWEG 1361
32	35~38	JWEG 1352	JWEG 1362
38	40~48	JWEG 1353	JWEG 1363
50	50~60	JWEG 1354	JWEG 1364
63	63~73	JWEG 1355	JWEG 1365
76	76~89	JWEG 1356	JWEG 1366
89	89~102	JWEG 1357	JWEG 1367
102	102~115	JWEG 1358	JWEG 1368
127	-	JWEG 1359	JWEG 1369

Type JGR



Type JGD

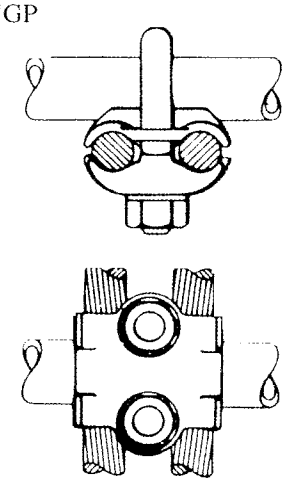


Conductor		Catalog Number
Tube Dia.	Cable mm²	
22	16~50	JWEG 1371
28	16~50	JWEG 1372
28	50~95	JWEG 1373
36	16~50	JWEG 1374
36	50~95	JWEG 1375
36	120~185	JWEG 1376
54	50~95	JWEG 1377
54	120~185	JWEG 1378
54	240~400	JWEG 1379
72	50~95	JWEG 1380
72	120~185	JWEG 1381
72	240~400	JWEG 1382
84	50~95	JWEG 1383
84	120~185	JWEG 1384
84	240~400	JWEG 1385

※ Other sizes available on request

• Ground Connectors *Material : Bronze*

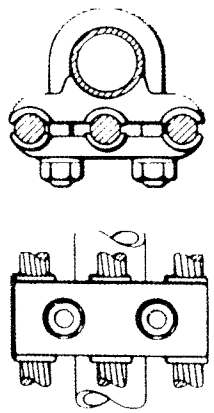
Type JGP



Conductor		Catalog Number
Tube Dia.	Cable mm²	
16~22mm	25~70	JWEG 1391
	70~120	JWEG 1392
	150~240	JWEG 1393
28mm	25~70	JWEG 1394
	70~120	JWEG 1395
	150~240	JWEG 1396
36mm	25~70	JWEG 1397
	70~120	JWEG 1398
	150~240	JWEG 1399
42mm	25~70	JWEG 1400
	70~120	JWEG 1401
	150~240	JWEG 1402

Conductor		Catalog Number
Tube Dia.	Cable mm²	
54~70mm	25~70	JWEG 1411
	70~120	JWEG 1412
	150~240	JWEG 1413
70mm	25~70	JWEG 1414
	70~120	JWEG 1415
	150~240	JWEG 1416
82mm	25~70	JWEG 1417
	70~120	JWEG 1418
	150~240	JWEG 1419
104mm	25~70	JWEG 1420
	70~120	JWEG 1421
	150~240	JWEG 1422

Type JGK



Conductor		Catalog Number
Tube Dia.	Cable mm²	
28mm	10~25	JWEG 1431
	25~70	JWEG 1432
	70~120	JWEG 1433
36mm	10~25	JWEG 1434
	25~70	JWEG 1435
	70~120	JWEG 1436
42mm	10~25	JWEG 1437
	25~70	JWEG 1438
	70~120	JWEG 1439
54mm	10~25	JWEG 1440
	25~70	JWEG 1441
	70~120	JWEG 1442

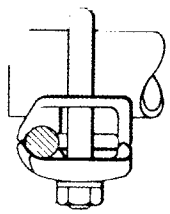
Conductor		Catalog Number
Tube Dia.	Cable mm²	
70mm	10~25	JWEG 1451
	25~70	JWEG 1452
	70~120	JWEG 1453
82mm	10~25	JWEG 1454
	25~70	JWEG 1455
	70~120	JWEG 1456
90mm	10~25	JWEG 1457
	25~70	JWEG 1458
	70~120	JWEG 1459
104mm	10~25	JWEG 1460
	25~70	JWEG 1461
	70~120	JWEG 1462

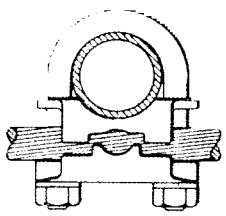
• Compression Tap Lug *Material : Copper*

Catalog Number	Conductor Range(mm²)	
	Run	Tap
JWEG 1471	240	240~25
JWEG 1472	240	150~95
JWEG 1473	185	185~150
JWEG 1474	185	95~70
JWEG 1475	185	35
JWEG 1476	150	150~95
JWEG 1477	150	95~70
JWEG 1478	150	70~35
JWEG 1479	120	120~70
JWEG 1480	120	70~35
JWEG 1481	95	95~70
JWEG 1482	95	70~35
JWEG 1483	95	35~25
JWEG 1484	70	70~35
JWEG 1485	70	35~25
JWEG 1486	35	35~25

• Ground Connectors *Material : Bronze*

Type JGAR



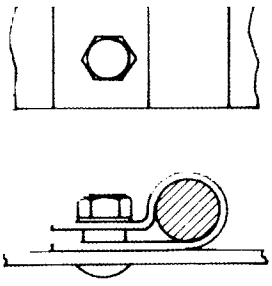


Catalog Number	Conductor		
	Tube	Rod	Cable mm²
JWEG 1491	6	13	10~25
JWEG 1492			25~70
JWEG 1493			70~120
JWEG 1494	10	16	10~25
JWEG 1495			25~70
JWEG 1496			70~120
JWEG 1497		19	150~240
JWEG 1498			300~400
JWEG 1499	13	22	10~25
JWEG 1500			25~70
JWEG 1501			70~120
JWEG 1502	19	25	150~240
JWEG 1503			300~400
JWEG 1504	25	29	10~25
JWEG 1505			25~70
JWEG 1506			70~120
JWEG 1507		32	150~240
JWEG 1508			300~400
JWEG 1509	32	35	10~25
JWEG 1510			25~70
JWEG 1511			70~120
JWEG 1512		38	150~240
JWEG 1513			300~400
JWEG 1514	35	41	10~25
JWEG 1515			25~70
JWEG 1516			70~120
JWEG 1517		48	150~240
JWEG 1518			300~400

Catalog Number	Conductor		
	Tube	Rod	Cable mm²
JWEG 1521	50	50	10~25
JWEG 1522			25~70
JWEG 1523			70~120
JWEG 1524		60	150~240
JWEG 1525			300~400
JWEG 1526	64	64	10~25
JWEG 1527			25~70
JWEG 1528			70~120
JWEG 1529		73	150~240
JWEG 1530			300~400
JWEG 1531	76	76	10~25
JWEG 1532			25~70
JWEG 1533			70~120
JWEG 1534		89	150~240
JWEG 1535			300~400
JWEG 1536	89	89	10~25
JWEG 1537			25~70
JWEG 1538			70~120
JWEG 1539		102	150~240
JWEG 1540			300~400
JWEG 1541	102	102	10~25
JWEG 1542			25~70
JWEG 1543			70~120
JWEG 1544		114	150~240
JWEG 1545			300~400
JWEG 1546	127	-	10~25
JWEG 1547			25~70
JWEG 1548			70~120
JWEG 1549			150~240

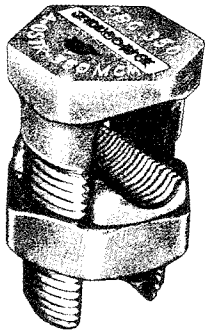
• Ground Clamps *Material : Tinned Copper*

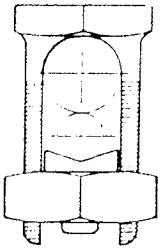
Type JGC

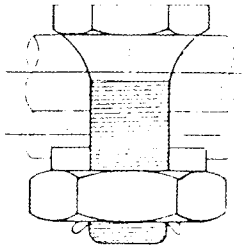


Catalog Number	Conductor(mm²)	
	Min.	Max.
JWEG 1551	10	25
JWEG 1552	25	70
JWEG 1553	70	120
JWEG 1554	150	240
JWEG 1555	240	400
JWEG 1556	400	500

• Split Bolt Connector *Material : Brass*



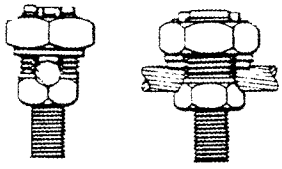




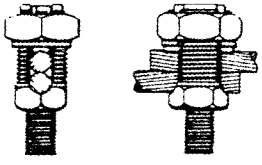
Catalog Number	Conductor Size(mm^2)	
	Run	Tap
JWEG 1561	4~16 Sol.	4~16 Sol.
JWEG 1562	6~25 Sol.	6~25 Sol.
JWEG 1563	6~35 Sol.	6~35 Sol.
JWEG 1564	10~35 Str.	10~35 Str.
JWEG 1565	35~50 Str.	35~50 Str.
JWEG 1566	35~70 Str.	35~70 Str.
JWEG 1567	50~150 Str.	50~150 Str.
JWEG 1568	95~185 Str.	95~185 Str.
JWEG 1569	150~240 Str.	150~240 Str.

• Servit Post

Type JKC



Type JK2C

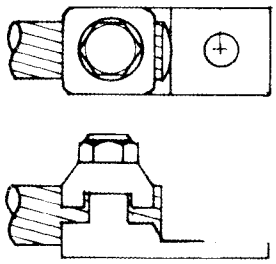


Catalog Number		Conductor Size (mm^2)	Stud Dia
Type JKC	Type JK2C		
JWEG 1571	JWEG 1581	6~25	3/8"
JWEG 1572	JWEG 1582	35~70	1/2"
JWEG 1573	JWEG 1583	95~120	5/8"
JWEG 1574	JWEG 1584	150~185	5/8"
JWEG 1575	JWEG 1585	240	3/4"

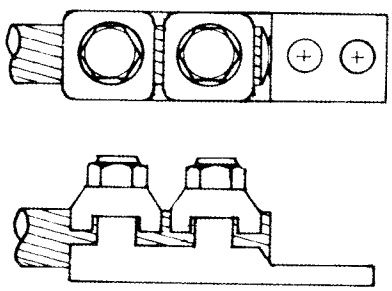
• Bolting Type Ground Connectors

Material : Copper

Type A

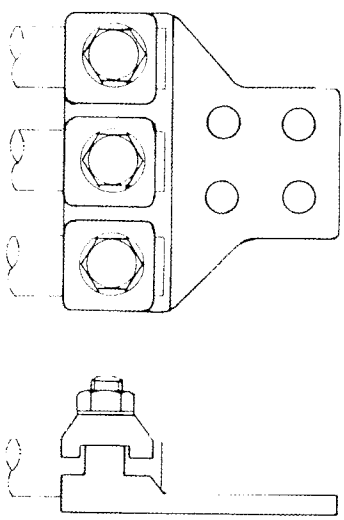


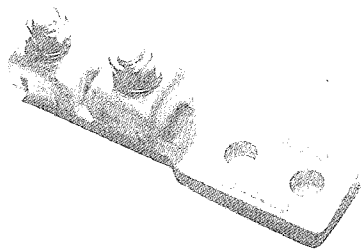
Type B



Conductor (mm^2)	Catalog Number		No. of Holes
	Type A	Type B	
4~10	JWEG 1591	JWEG 1621	1
	JWEG 1592	JWEG 1622	2
10~25	JWEG 1593	JWEG 1623	1
	JWEG 1594	JWEG 1624	2
25~50	JWEG 1595	JWEG 1625	1
	JWEG 1596	JWEG 1626	2
70~95	JWEG 1597	JWEG 1627	1
	JWEG 1598	JWEG 1628	2
95~120	JWEG 1599	JWEG 1629	1
	JWEG 1600	JWEG 1630	2
150~185	JWEG 1601	JWEG 1631	1
	JWEG 1602	JWEG 1632	2
240~300	JWEG 1603	JWEG 1633	1
	JWEG 1604	JWEG 1634	2
	JWEG 1605	JWEG 1635	4
400~500	JWEG 1606	JWEG 1636	1
	JWEG 1607	JWEG 1637	2
	JWEG 1608	JWEG 1638	4
500~630	JWEG 1609	JWEG 1639	1
	JWEG 1610	JWEG 1640	2
	JWEG 1611	JWEG 1641	4

Type C

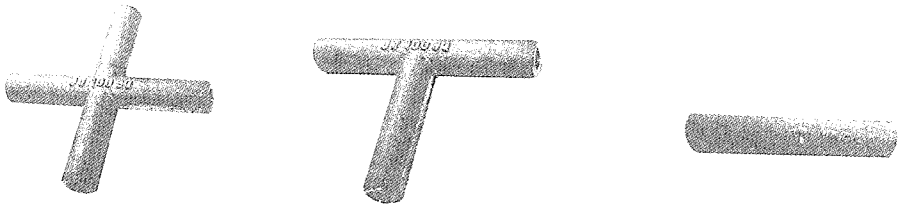




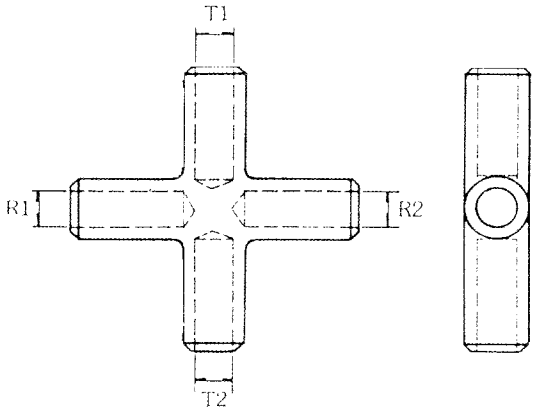
Conductor (mm^2)	Catalog Number	No. of Holes
35~50	JWEG 1651	2
70~95	JWEG 1652	2
120~150	JWEG 1653	4
185~240	JWEG 1654	4
300~400	JWEG 1655	4
500~630	JWEG 1656	4

• Compression Connector

Material : Copper

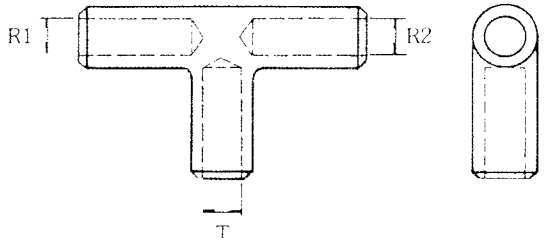


– Cross Type –



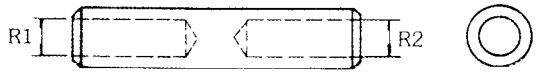
Catalog Number	Conductor Range(mm^2)			
	R1	R2	T1	T2
JWEG 1661	95	95	95	95
JWEG 1662	95	95	70	70
JWEG 1663	70	70	70	70
JWEG 1664	70	70	35	35
JWEG 1665	35	35	35	35
JWEG 1666	35	35	25	25

– Tee Type –



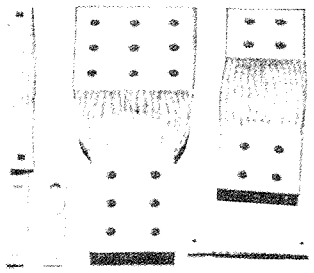
Catalog Number	Conductor Range(mm^2)		
	R1	R2	T
JWEG 1671	95	95	95
JWEG 1672	95	95	70
JWEG 1673	70	70	70
JWEG 1674	70	70	35
JWEG 1675	70	70	25
JWEG 1676	35	35	25

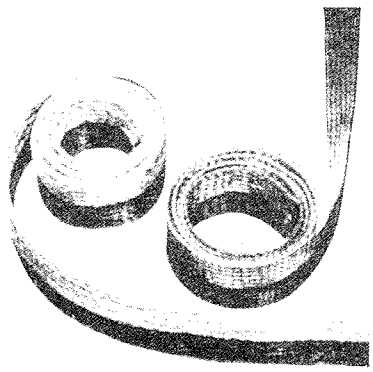
– Straight Type –



Catalog Number	Conductor Range(mm^2)	
	R1	R2
JWEG 1681	95	95
JWEG 1682	70	70
JWEG 1683	35	35
JWEG 1684	25	25

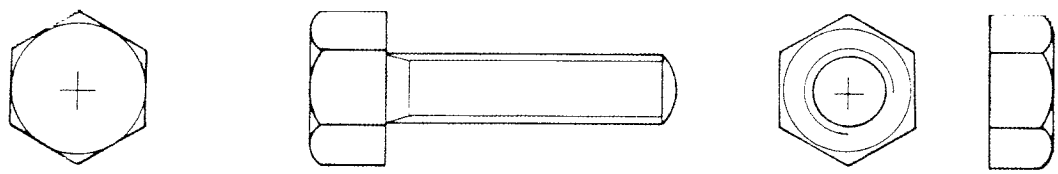
• Bonding Jumper (Flexible Copper Braid) *Material : Tinned Copper*





Catalog Number	Ampere Rating
JWEG 1691	50 A
JWEG 1692	60 A
JWEG 1693	80 A
JWEG 1694	115 A
JWEG 1695	140 A
JWEG 1696	160 A
JWEG 1697	190 A
JWEG 1698	210 A
JWEG 1699	250 A
JWEG 1700	300 A
JWEG 1701	340 A
JWEG 1702	390 A
JWEG 1703	460 A
JWEG 1704	550 A
JWEG 1705	650 A
JWEG 1706	740 A
JWEG 1707	840 A
JWEG 1708	930 A
JWEG 1709	1,000 A
JWEG 1710	1,200 A

• Hex Head Bolt, Nut, Spring Washer & Plain Washer

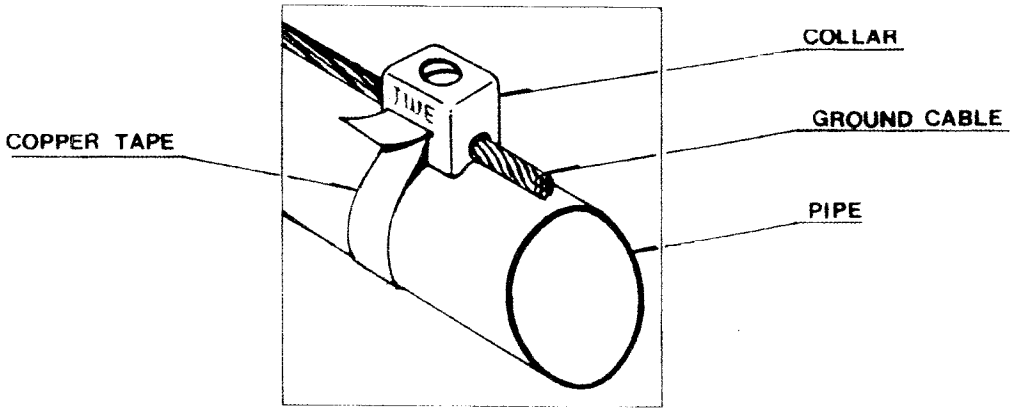


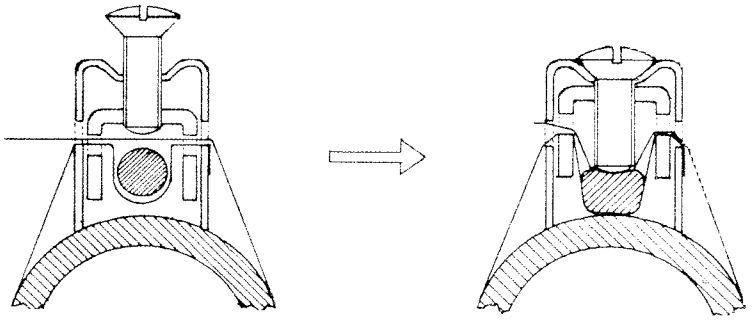
Material Size	Catalog Number				
	Silicon Bronze	Brass	Stainless Steel	HDG' Steel	Electro Galv'd Steel
M6 (1/4")	JWEG 1721	JWEG 1731	JWEG 1741	JWEG 1751	JWEG 1761
M8 (5/16")	JWEG 1722	JWEG 1732	JWEG 1742	JWEG 1752	JWEG 1762
M10 (3/8")	JWEG 1723	JWEG 1733	JWEG 1743	JWEG 1753	JWEG 1763
M12 (1/2")	JWEG 1724	JWEG 1734	JWEG 1744	JWEG 1754	JWEG 1764
M14 (9/16")	JWEG 1725	JWEG 1735	JWEG 1745	JWEG 1755	JWEG 1765
M16 (5/8")	JWEG 1726	JWEG 1736	JWEG 1746	JWEG 1756	JWEG 1766
M20 (3/4")	JWEG 1727	JWEG 1737	JWEG 1747	JWEG 1757	JWEG 1767
M25 (1")	JWEG 1728	JWEG 1738	JWEG 1748	JWEG 1758	JWEG 1768

※ Lengths are user's option

• Ground Collar *Material : Tinned Copper and Tinned Brass*

Type BF

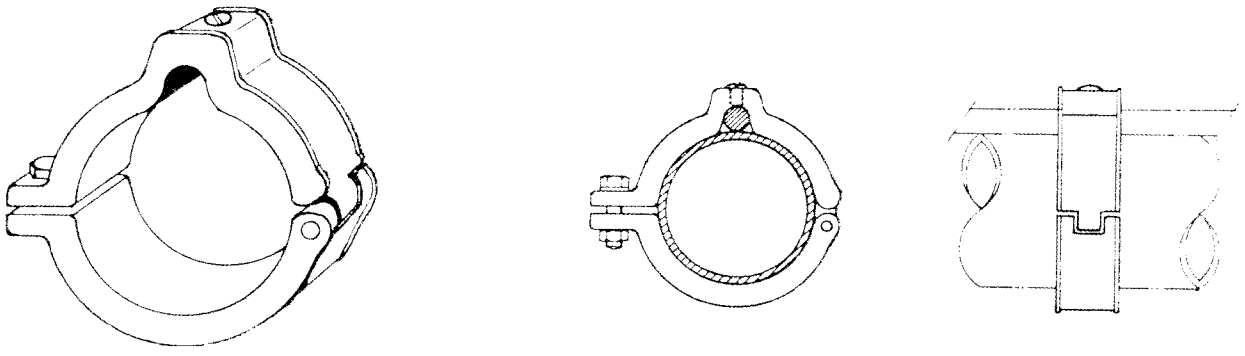




Catalog Number	Ground Cable(mm^2)	Tube (mm)
JWEG 1771	6~50	16~ø 104

• Ground Collar *Material : Tinned Copper*

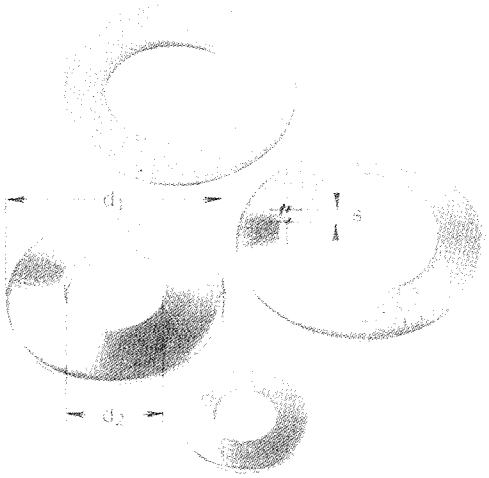
Type AC



Gnd' Cable / Tube	6~10mm^2	16~25mm^2	35~50mm^2
	Catalog Number		
ø45~ø47	JWEG 1781	JWEG 1801	JWEG 1821
48~50	JWEG 1782	JWEG 1802	JWEG 1822
51~53	JWEG 1783	JWEG 1803	JWEG 1823
54~56	JWEG 1784	JWEG 1804	JWEG 1824
57~59	JWEG 1785	JWEG 1805	JWEG 1825
60~62	JWEG 1786	JWEG 1806	JWEG 1826
63~65	JWEG 1787	JWEG 1807	JWEG 1827
66~68	JWEG 1788	JWEG 1808	JWEG 1828
69~71	JWEG 1789	JWEG 1809	JWEG 1829
72~74	JWEG 1790	JWEG 1810	JWEG 1820
75~77	JWEG 1791	JWEG 1811	JWEG 1821
78~80	JWEG 1792	JWEG 1812	JWEG 1822

Gnd' Cable / Tube	6~10mm^2	16~25mm^2	35~50mm^2
	Catalog Number		
ø81~ø83	JWEG 1831	JWEG 1851	JWEG 1871
84~86	JWEG 1832	JWEG 1852	JWEG 1872
87~89	JWEG 1833	JWEG 1853	JWEG 1873
90~92	JWEG 1834	JWEG 1854	JWEG 1874
93~95	JWEG 1835	JWEG 1855	JWEG 1875
96~98	JWEG 1836	JWEG 1856	JWEG 1876
99~101	JWEG 1837	JWEG 1857	JWEG 1877
102~104	JWEG 1838	JWEG 1858	JWEG 1878
105~107	JWEG 1839	JWEG 1859	JWEG 1879
108~110	JWEG 1840	JWEG 1860	JWEG 1880
111~113	JWEG 1841	JWEG 1861	JWEG 1881

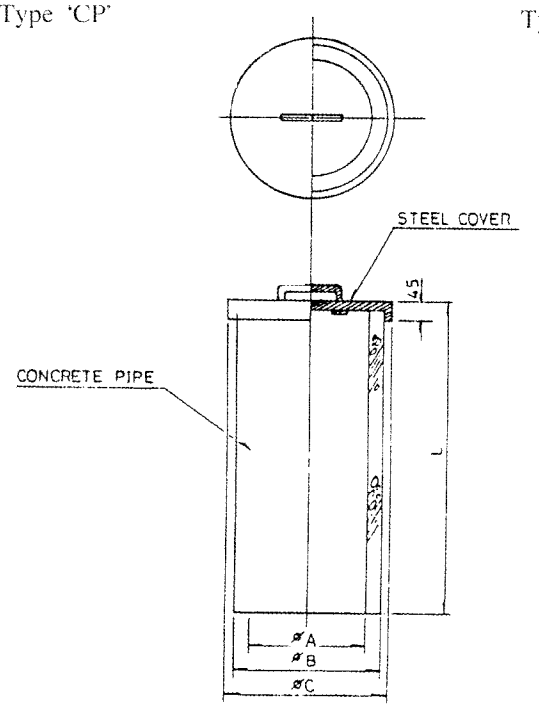
• Bimetallic Washer *Material : Al 70%. Cu 30%*



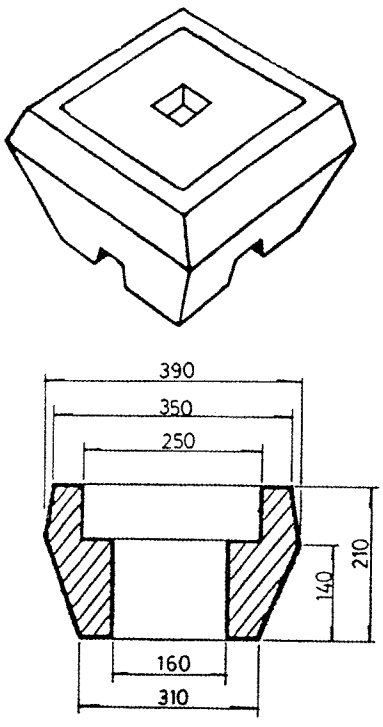
Catalog Number	Dimension in MM			Bolts	
	d1	d2	S	metr.	inch
JWEG 1891	26	11	1	M10	3/8"
JWEG 1892	30	13	2	M11	1/2"
JWEG 1893	30	17	2	M12	5/8"

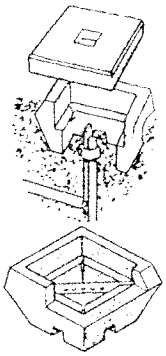
• Inspection Pit

Type 'CP'



Type 'CF'

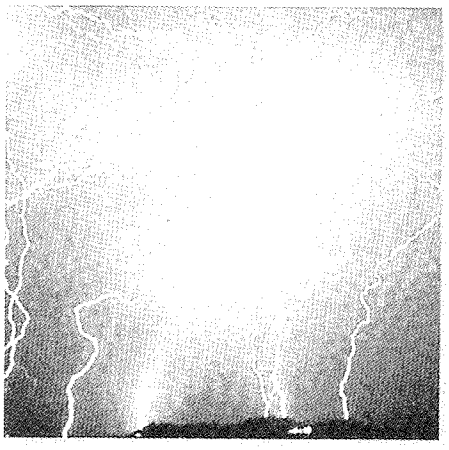




MATERIAL : CONCRETE

Type	Catalog Number	Demension in mm				Remark
		øA	øB	øC	L	
CP	JWEG 1901	300	380	394	600	with 6holes earthbar
	JWEG 1902	300	380	394	1000	
CF	JWEG 1903	-				with 5holes earthbar

• Earth Enhancing Compound for obtaining a good earth resistance (J-Earthcom)



1. What is J-Earthcom ?

J-Earthcom is the product for grounding, which has excellent ground resistance reducing effect. This product, differently, from other chemical resistance reducing materials, keeps conductivity and comes into electric contact with existing electrode. Therefore it makes electrode itself into conductor, and consequently makes the contact area between surrounding earth and ground rod large.

J-Earthcom developed by Jiwoong Electric Co., Ltd. is, made from cement and carbon - principal ingredients. Since it is mixed with inorganic matters evenly, it has features like workability and strength - the physical properties as a cement, affinity with soil, extension of elctrodes, prevention of corrosion and etc. And with the excellent conductivity, it maintains grounding effect stable in a long-term period.

2. Features of J-Earthcom

ⓐ Excellent grounding effect

J-Earthcom has an excellent grounding effect because it is easy to harmonize with soil and it can achieve large contact area with the surrounding earth by means of extending grounding area.

ⓑ Easy construction

J-Earthcom can be used in powder type or water-mixed type according to the field conditions and can be used freely according to grounding areas and construction form.

ⓒ Economical efficiency

As the efficient ground resistance reducing is possible, you can save the material cost and the construction cost, In addition, it doesn't need maintenance and repair since it doesn't corrode existing electrod and the grounding effect continues semipermanently.

ⓓ Various using methods

Since the methods of Buried wire, Mesh, Grounding rod, Boring, etc can be used singly and together, the grounding operation can be designed according to various field conditions.

ⓔ Various products

Since resistivity, strength, workability, etc can be adjusted by changing the proportion of materials, you can select the optimal product and use effectively according to the field's need.

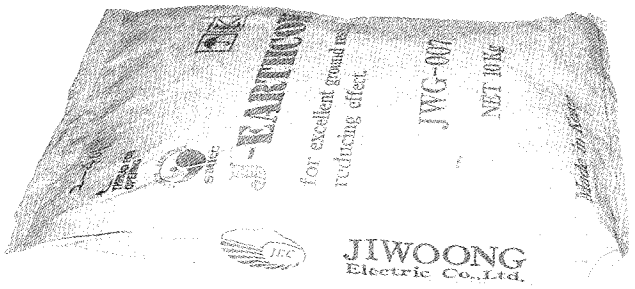
3. J-Earthcom Applications

① Grounding in power station and substation
② Grounding for utility pole of transmission line
③ Grounding for radio communication in radio relay stations and communication stations
④ Grounding for protecting electro-magnetic interference and static electricity
⑤ Grounding for power electric devices, electronic device and lightening rod
⑥ Grounding for electrode used under water
⑦ Grounding for electrode preventing electrical corrosion

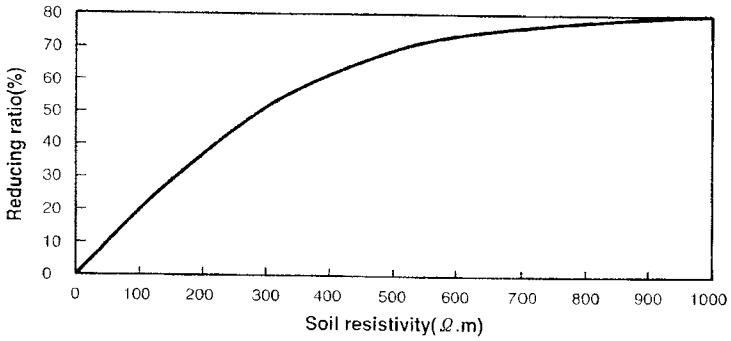
4. Physical properties of J-Earthcom

Appearances		A light-grey cement-mixed powder
Packing unit		10 Kg/1pack
Resistivity		0.1(ℓ .m)
Unit weights(Kg/㎥)		Approximately 1,170(Kg/㎥)
Strength	Compressive strength(kgf/㎠)	More than 200(kgf/㎠)
(7 days)	Flexible strength(kgf/㎠)	More than 20(kgf/㎠)

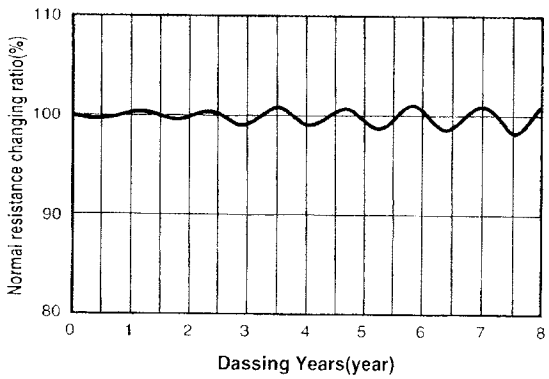
5. Packing



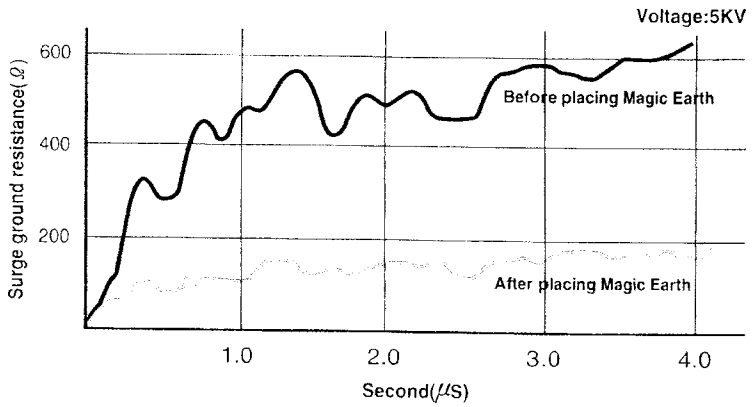
1. Ground resistance reducing effect



2. Change due to time-passing (Estimated)

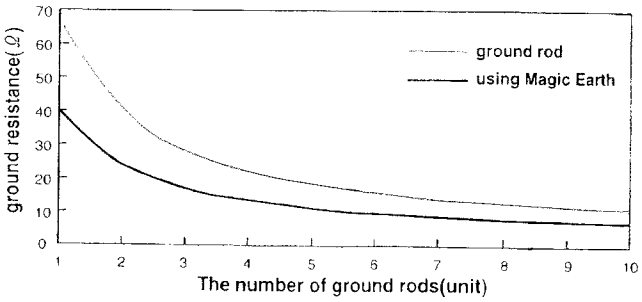


3. Surge ground resistance reducing effect

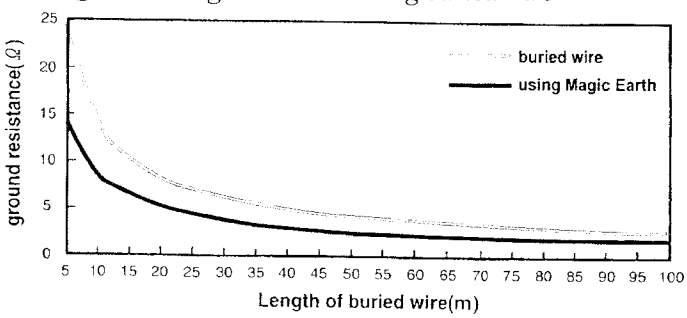


4. Comparative curves of features

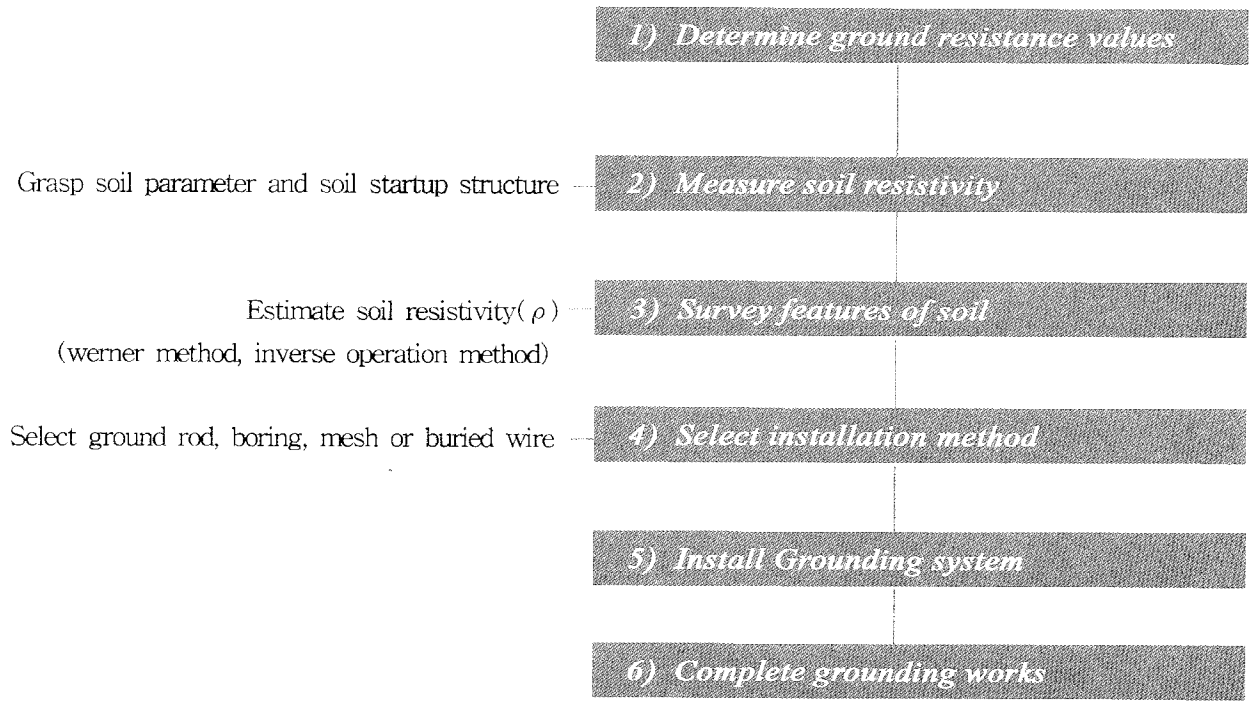
㉮ *Grounding installation using two rods in parallel*



㉯ *Grounding installation using buried wire*



1. Procedure of design and installation



2. How to use & install

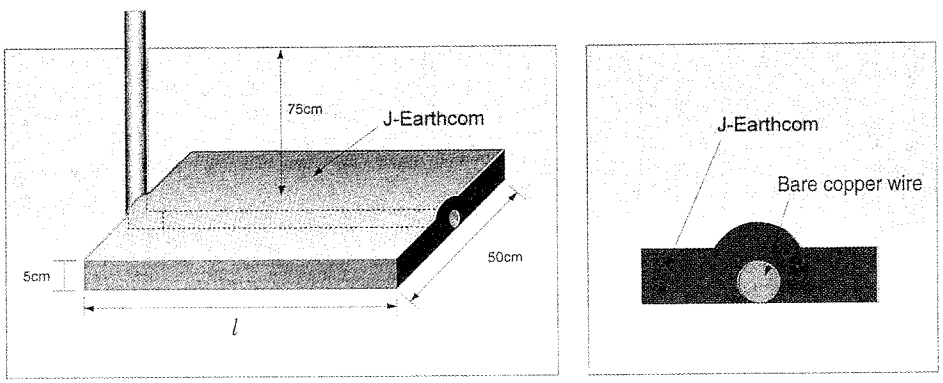
ⓐ How to use

- Prepare J-Earthcom a mixing vessel and water(4~6 ℓ)
- Mix 4~6 ℓ of water and 10kgs of J-Earthcom as evenly as possible
- Cover the grounding rod(wire)with mixed J-Earthcom
  As the grounding effect is proportioned to the grounding area, make grounding areas as thick and wide as possible.
- In conditions the use of water has some troubles, you may use powder-type product as it is. After being operated, it absorbs the moisture of soil in 2~3 days later and is hardened strongly.
  However, in case of operating powder-type product, you have to refill it up with soil and tread with step completely.

ⓑ *How to install*

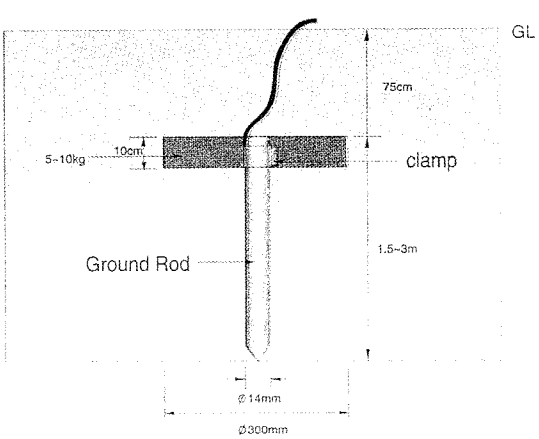
① Grounding installation using buried wire

For installation using buried wire(copper wire more than 22㎟), as shown in picture, lay buried wire on the center of underground and cover buried wire with J-Earthcom in 5-centimeters thickness sufficiently, and refill it up with soil.



② Grounding installation using ground rod

The ground rod(L:1.0~2.4m)has been used most frequently in various grounding works. The ground rod is easy to be driven. Expecially in case of using two rods in parallel, you have to drive them deep in connecting(usually 1.5meters apart)until desired ground resistance will be obtained.

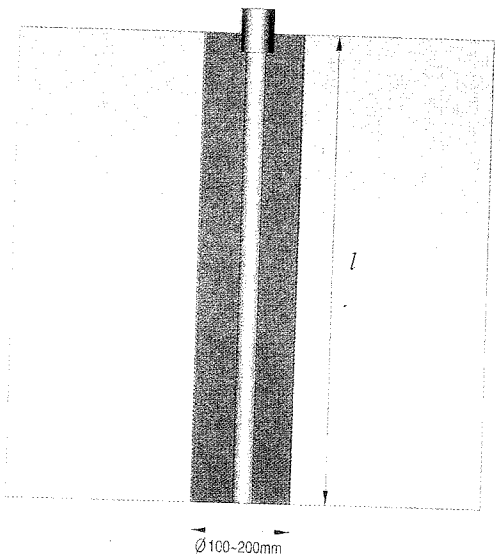


As shown in picture, you have to drive ground rod to considerable depth (to the depth as far as 75cm from ground surface) and cover its tip with J-Earthcom evenly in 10-centimeter's thickness.
(You may use water-mixed type or powder type as it is)

③ Grounding installation using boring method

The soil resistivity is changed by depth, density, moisture of soil.

So, by analyzing soil resistivity or features of soil you have to determine optimal depth, make a boring(about 5~20m's depth), insert copper wire and pour the mixture of water and J-Earthcom into empty space.

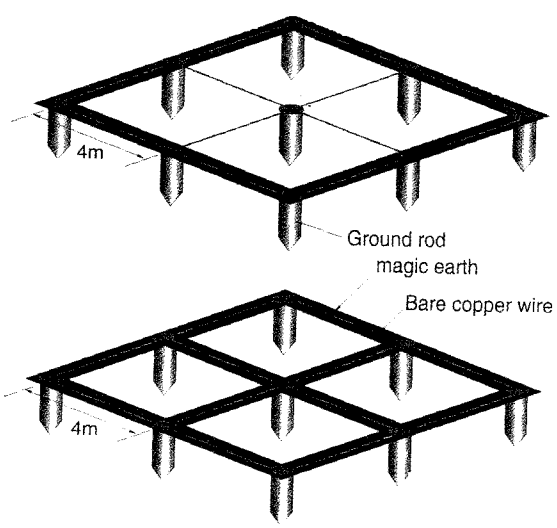


④ Grounding installation using Mesh Method

The Mesh electrode is the big ground rod made by connecting plural buried wires in a lattice.

Expecially Mesh electrode is used in fields of a power station, a substation, a communication base, a telephone office, a hospital, etc, which need low resistance. For that reason, in the basic step of building construction, the method of mixing Mesh and ground rod is used commonly.

For installation methods. the whole Mesh is installed in a same method like that of buried wire, sometimes the parts of Mesh is covered with J-Earthcom. In types of mesh there are ⓐa hollow square, ⓑthe number of Meshs, 4 ⓒthe number of Meshs, 8 ⓓthe number of Meshs, 16, and the more the number of Meshs is, the lower ground resistance is.



• Earthing Theory

Eathing Principles

The correct design and installation of a quality Earthing System will ensure the safety of both people and equipment.

A good earth should have:

- Low electrical resistance (ohms)
- Good corrosion resistance
- Ability to carry high currents repeatedly
- A reliable life of at least 30 years

Soil resistivity is a crucial factor in obtaining a 'good earth.'

Factors Affecting Soil Resistivity

(a) Physical Composition

Different soil compositions give different average resistivities:

Soil	Resistivity Ohm.m
Marshy Ground	2 - 2.7
Loam and Clay	4 - 150
Chalk	60 - 400
Sand	90 - 8000
Peat	200 Upwards
Sandy Gravel	300 - 500
Rock	1000 Upwards

Wherever possible, dry, sandy, rocky ground should be avoided: however, in many installations no choice is available.

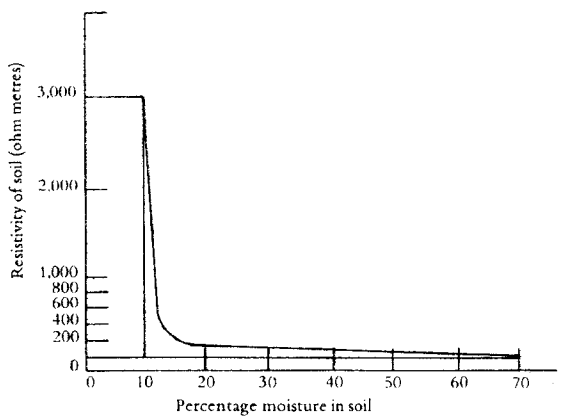
(b) Moisture

Increased moisture content of the ground can rapidly decrease its resistance.

It is especially important to consider moisture content in areas of high seasonal variation in rainfall.

This graph shows how, below 20% moisture content, the resistance of red clay soars. Wherever possible the earth electrode should be installed deep enough to reach the "water table" or "permanent moisture level."

Variation of Soil Resistivity with Moisture Content Red Clay Soil



(c) Chemical Composition

Certain minerals and salts can affect soil resistivity. Their levels can vary with time due to rainfall or flowing water.

Effect of Salt on Resistivity (Sandy loam, Moisture Content 15%)

This table shows the effect of adding salt to sandy loam.

Added Salt (Percentage by weight of moisture)	Resistivity (ohm. m)
0.0	107.0
0.1	18.0
1.0	4.6
5.0	1.9
10.0	1.3
20.0	1.0

(d) Temperature

When the ground becomes frozen, its resistivity rises dramatically. An earth that may be effective during temperate weather may become ineffective in winter.

Earth electrodes should be installed below the frost line to ensure year long performance.

Effect of Temperature on Resistivity (For Sandy Loam, 15.2% moisture)

Temperature C	F	Resistivity Ohm m
20	68	72
10	50	99
0	32 (Water)	138
0	32 (Ice)	300
-5	23	790
-15	14	3,300

Note that if your soil temperature decreases from +20°C to −5°C, the resistivity increases more than ten times.

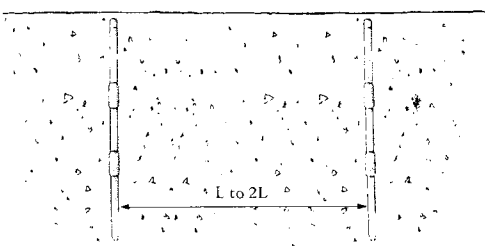
Selecting the Correct Earth Electrode

We have already shown that by reaching permanent moisture and frost free soil levels, low resistance should be achieved. Often these levels are some metres below the surface and the most economical way of reaching them is by extensible deep driven earth rod electrodes.

Jiwoong recommend the use of deep driven earth rod electrodes wherever conditions allow.

Where rocks lie just below the surface and deep driving is not possible, parallel driven shorter rods, plates, mats or buried conductors, or a combination of these can be used. However, these should still be buried as deep as possible to avoid seasonal variations and damage from agricultural machinery etc.

Often parallel rods are driven too close together; this decreases their effectiveness. The distance between rods should be greater than the rod length, L (see diagram below).



Earth Rod Electrodes

Earth rods are commonly made from the following materials:

- Copper clad steel
- Solid copper
- Galvanised steel
- Stainless steel

Jiwoong can supply all four types, but the copper clad steel cored rod is by far the most popular.

It offers the installer:

- Excellent corrosion resistance
- Ability to carry high fault currents for many years
- Much lower cost than solid copper
- A high strength rigid rod essential for deep driving