

“ TAKACHIHO ”

Standard

Commutators

(Version:2013/11)

TAKACHIHO INDUSTRIAL CO.,LTD.

1-35-4 Takenotsuka, Adachi-ku, Tokyo, 121-0813, JAPAN

TEL:81-3-5686-5491 FAX:81-3-5686-5494

E-mail:tkh@takachiho-ind.co.jp

URL:<http://www.takachiho-ind.co.jp/>

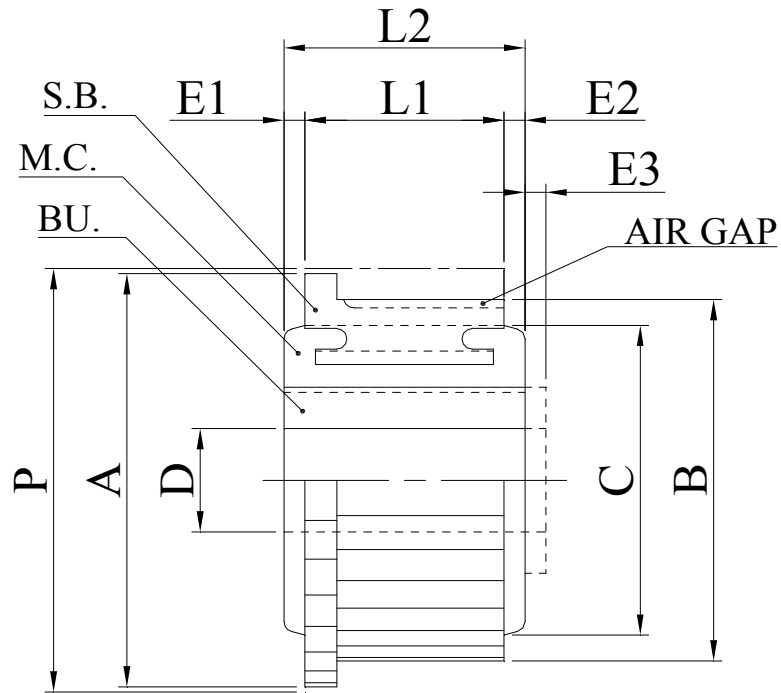


REGISTRATION
No. Q0995
ISO 9001:2008

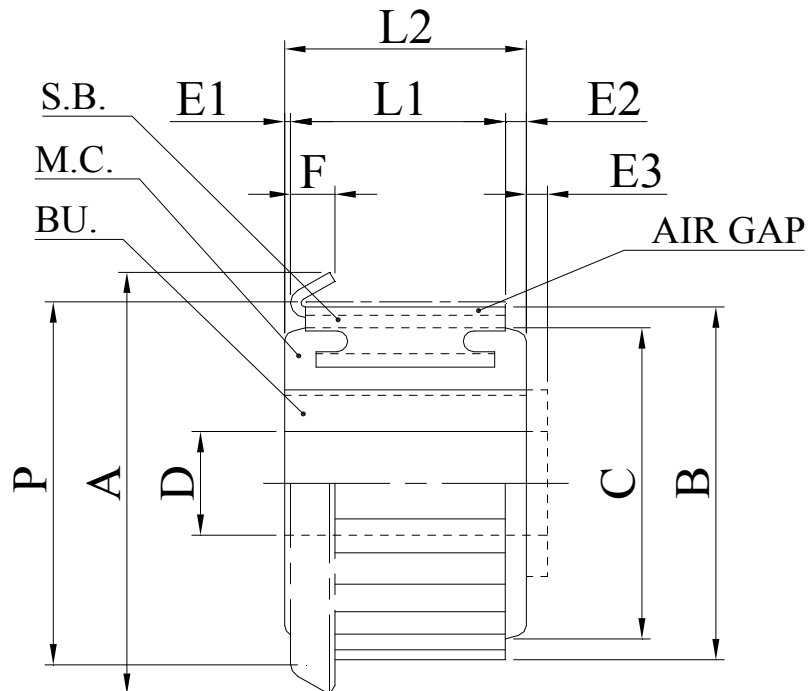


Types of Commutators - 1

TSC type



FC type



Codes:

S.B. : Segment Bar

S.M. : Segment Mica

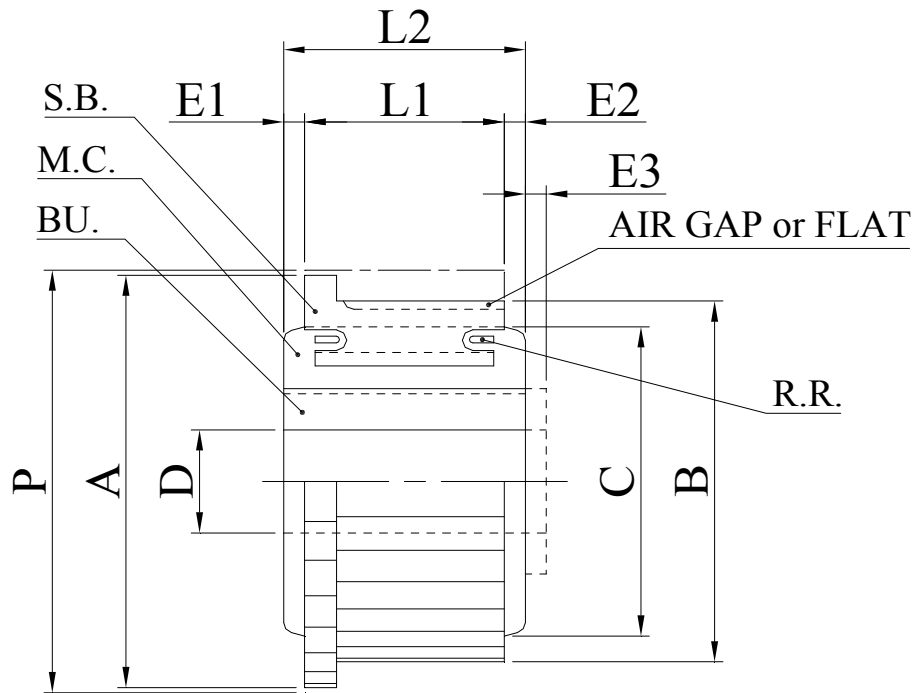
M.C. : Molding Compound

B.U. : Bushing

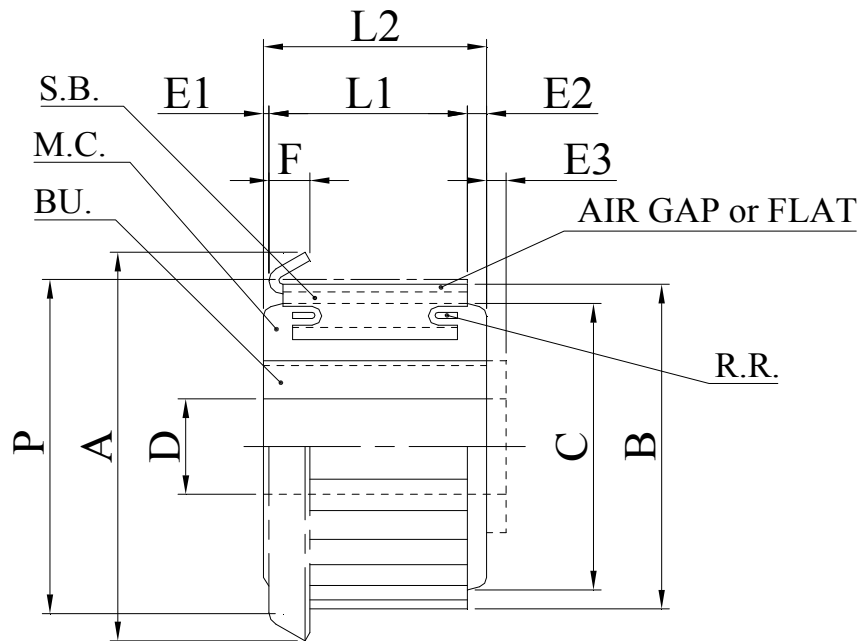
R.R. : Reinforce Ring

Types of Commutators - 2

CR type



UR type



(Segment Mica Type : UNDER CUT or FLAT)

Codes:

S.B. : Segment Bar

S.M. : Segment Mica

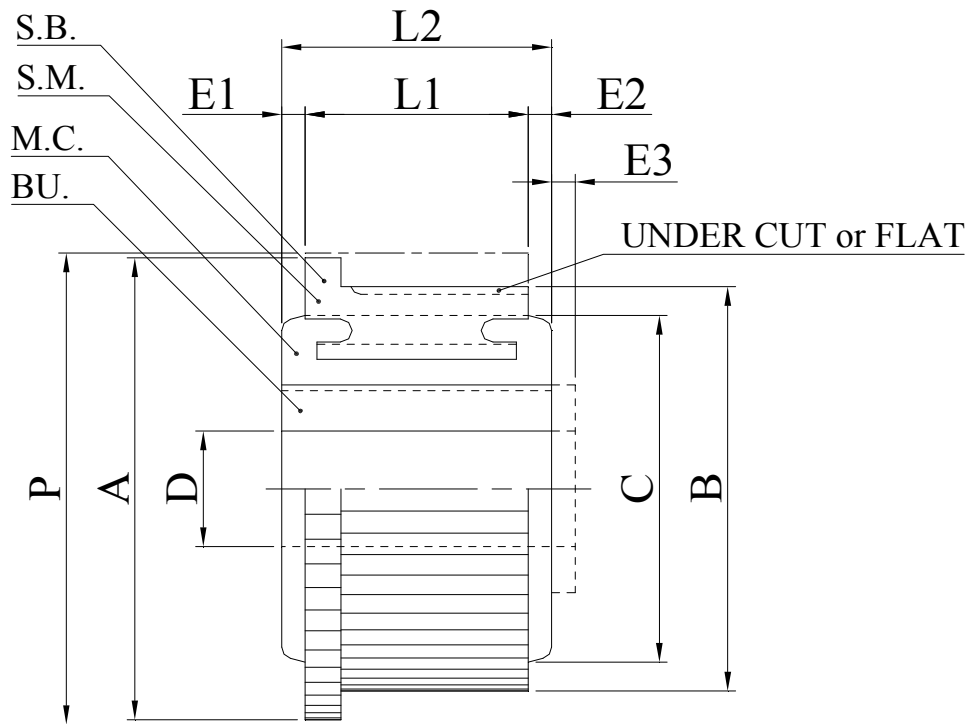
M.C. : Molding Compound

B.U. : Bushing

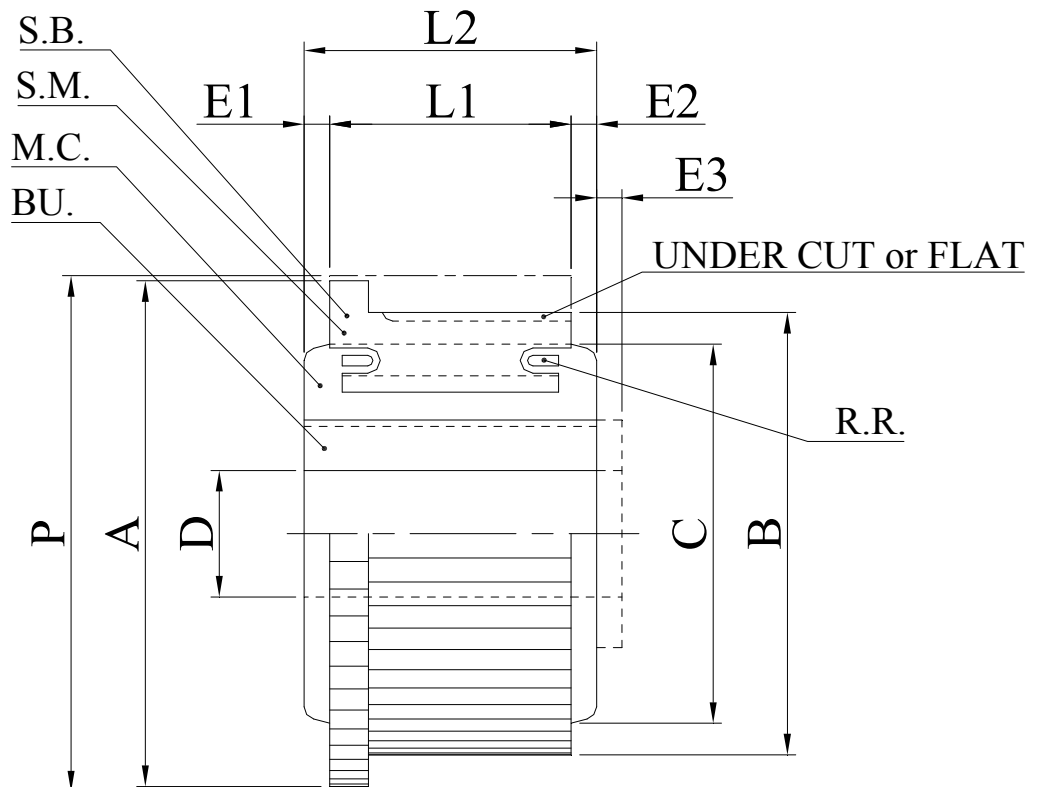
R.R. : Reinforce Ring

Types of Commutators - 3

TS type



TSR type

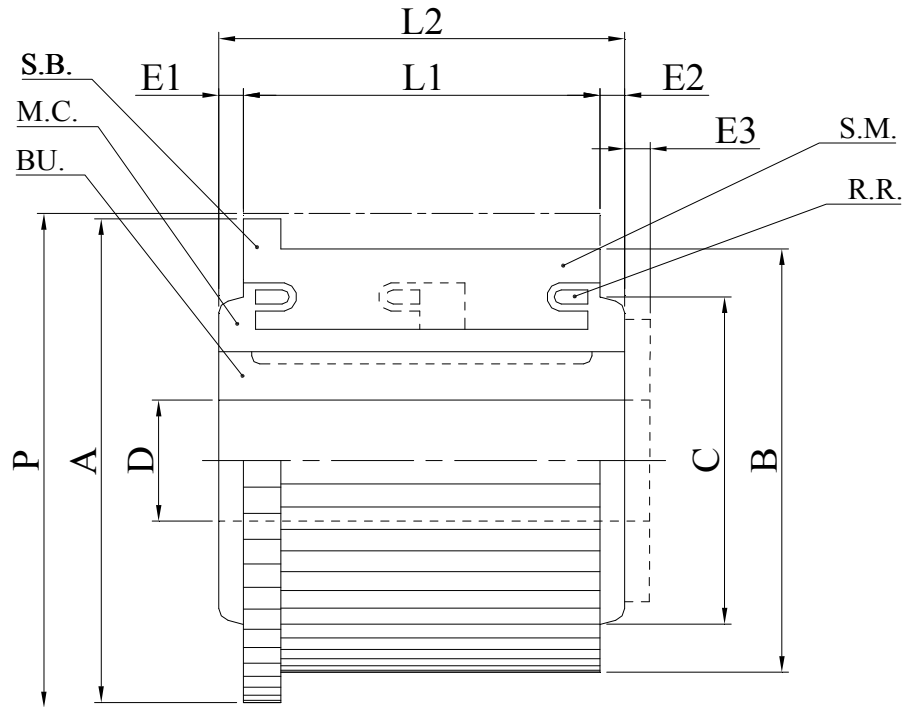


Codes:

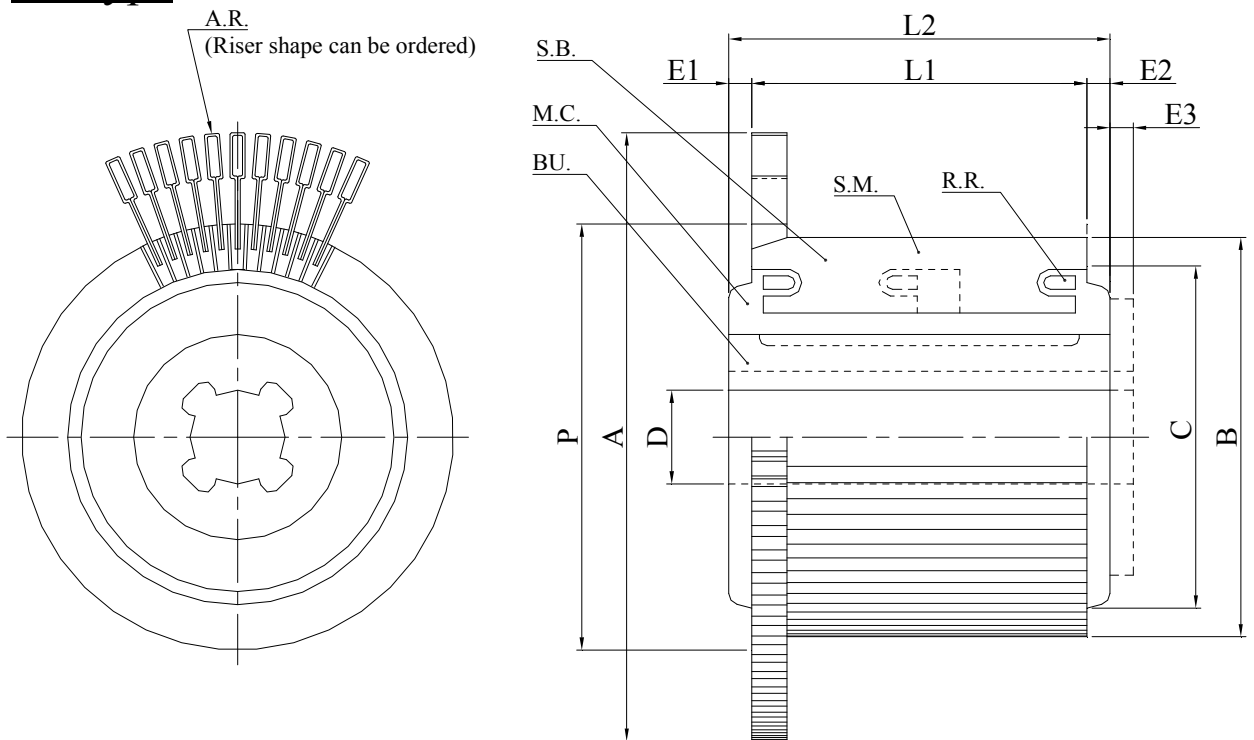
- S.B. : Segment Bar
- S.M. : Segment Mica
- M.C. : Molding Compound
- B.U. : Bushing
- R.R. : Reinforce Ring

Types of Commutators - 4

R type



AR type



Codes:

- S.B. : Segment Bar
- S.M. : Segment Mica
- M.C. : Molding Compound
- B.U. : Bushing
- R.R. : Reinforce Ring

List of "TAKACHIHO" Standard Commutators

1/9

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
13 - 1	13	17.27	6.48	17.27	9.53	11.93	TSC	28 - 1	28	28.50	11.50	30.50	18.00	22.00	TS
13 - 2	13	18.80	8.00	24.00	13.00	14.00	FC	28 - 2	28	28.50	13.70	30.50	18.00	22.00	TS
14 - 1	14	30.00	9.53	37.00	21.00	21.80	FC	28 - 3	28	32.30	14.00	32.30	20.50	24.00	TS
14 - 2	14	36.50	15.00	38.00	24.50	28.00	TS	28 - 4	28	32.50	10.00	33.00	18.00	21.50	TS
15 - 1	15	20.00	8.00	21.40	12.50	16.00	TSC	28 - 5	28	34.00	13.00	35.00	25.00	30.50	TS
15 - 2	15	26.30	11.00	31.20	14.50	15.00	FC	28 - 6	28	38.50	13.00	39.00	21.50	27.00	TS
15 - 3	15	34.50	16.00	41.00	34.00	36.00	TS	28 - 7	28	75.40	28.60	75.40	35.10	39.10	TS
15 - 4	15	35.00	16.00	40.00	24.50	26.50	TS	29 - 1	29	29.30	12.58	46.50	21.80	25.10	CR
15 - 5	15	36.30	16.00	40.00	34.00	36.00	TSC	29 - 2	29	29.30	12.58	49.30	21.80	25.10	CR
15 - 6	15	36.30	16.00	41.00	34.00	36.00	TS	29 - 3	29	33.20	16.50	47.80	20.20	30.00	CR
16 - 1	16	32.00	12.00	42.50	21.00	22.00	FC	29 - 4	29	33.20	16.50	49.50	20.00	30.00	CR
16 - 2	16	32.70	12.70	42.60	27.60	29.00	FC	29 - 5	29	44.30	16.85	63.50	58.00	61.00	TS
16 - 3	16	34.50	11.50	40.00	28.00	30.00	TS	29 - 6	29	54.50	19.50	76.00	38.00	45.50	TSR
16 - 4	16	34.50	12.00	40.00	28.00	30.00	TS	29 - 7	29	57.50	26.00	62.00	22.00	28.00	TS
18 - 1	18	36.50	18.00	46.00	26.00	30.00	TS	29 - 8	29	81.00	35.00	104.00	57.00	63.00	R
19 - 1	19	34.50	14.00	47.90	43.00	49.50	CR	29 - 9	29	90.70	35.00	112.00	67.00	78.00	R
20 - 1	20	47.60	19.05	57.40	29.30	33.10	TS	29 - 10	29	90.70	35.00	118.00	67.00	78.00	R
21 - 1	21	28.50	13.70	38.80	21.50	27.50	CR	30 - 1	30	20.50	8.00	21.00	12.50	16.00	TSC
21 - 2	21	30.20	12.50	40.50	24.80	28.00	CR	30 - 2	30	35.50	16.00	40.00	24.50	26.50	TS
21 - 3	21	33.20	16.50	44.00	20.90	30.40	CR	30 - 3	30	35.50	16.00	40.00	29.00	31.00	TS
21 - 4	21	34.50	16.10	41.00	27.00	29.00	TS	30 - 4	30	85.50	28.00	93.00	58.00	63.00	R
21 - 5	21	34.50	16.10	44.20	28.00	28.50	FC	31 - 1	31	25.20	16.00	25.50	7.30	9.30	TS
21 - 6	21	50.30	16.00	58.70	37.50	41.00	TS	31 - 2	31	25.50	15.28	25.50	6.50	8.40	TSC
21 - 7	21	50.50	16.00	58.70	29.50	33.00	TS	32 - 1	32	31.50	12.00	38.00	19.00	20.00	FC
21 - 8	21	56.50	21.00	62.00	40.00	46.00	TS	32 - 2	32	31.50	12.00	38.00	19.00	20.00	FC
21 - 9	21	70.70	28.00	94.00	67.00	75.00	R	32 - 3	32	31.50	15.00	38.00	19.00	20.00	FC
22 - 1	22	25.50	9.00	29.40	17.00	18.80	FC	32 - 4	32	32.70	12.70	38.60	27.60	29.00	FC
24 - 1	24	23.80	9.50	29.00	15.50	18.00	FC	32 - 5	32	34.50	12.50	36.50	19.00	23.00	TS
24 - 2	24	26.90	8.00	31.70	14.20	13.90	FC	32 - 6	32	34.50	14.70	36.50	19.00	23.00	TS
24 - 3	24	27.50	12.00	28.50	17.00	20.00	TSC	32 - 7	32	35.00	12.50	38.70	22.00	27.30	TS
24 - 4	24	28.30	12.00	34.50	18.00	18.50	FC	32 - 8	32	36.50	14.00	38.00	24.50	28.00	TS
24 - 5	24	28.50	12.00	29.20	17.00	21.00	TSR	32 - 9	32	36.50	14.00	38.00	24.50	32.00	TS
24 - 6	24	28.50	12.00	30.50	18.00	22.00	TSR	32 - 10	32	36.50	15.00	38.00	24.50	28.00	TS
24 - 7	24	36.50	14.00	38.00	24.50	28.00	TS	32 - 11	32	37.00	12.00	38.50	30.00	35.50	TSR
24 - 8	24	50.80	19.05	50.80	30.00	30.00	TSC	32 - 12	32	37.00	12.00	39.00	24.50	30.00	TSR
24 - 9	24	51.00	18.90	59.00	31.50	35.00	TS	32 - 13	32	38.80	14.50	39.00	24.50	30.00	TSR
25 - 1	25	33.20	16.50	49.00	20.00	30.00	CR	32 - 14	32	40.50	18.00	42.00	20.00	26.00	TS
25 - 2	25	34.10	12.00	41.00	16.00	17.00	FC	32 - 15	32	40.50	14.50	43.00	26.00	32.00	TS
25 - 3	25	35.20	14.00	49.00	20.00	24.00	TS	32 - 16	32	43.20	17.00	50.00	22.50	25.50	FC
25 - 4	25	70.70	28.00	91.00	57.00	65.00	R	33 - 1	33	40.20	16.50	57.80	20.00	30.00	CR
25 - 3	25	70.70	28.00	94.00	47.00	55.00	R	33 - 2	33	44.50	17.50	63.00	29.00	33.00	TS
25 - 5	25	70.70	28.00	94.00	57.00	65.00	R	33 - 3	33	52.00	25.00	63.00	38.50	42.50	TS
25 - 6	25	71.00	25.00	87.00	60.00	68.00	R	33 - 4	33	70.50	28.00	87.50	60.00	72.00	TS
25 - 7	25	90.70	35.00	112.00	67.00	78.00	R	33 - 5	33	70.70	28.00	87.00	47.00	55.00	R
26 - 1	26	18.80	8.00	22.00	13.00	15.00	TSC	33 - 6	33	70.70	28.00	87.00	57.00	65.00	R
26 - 2	26	25.20	10.00	29.00	16.00	17.00	FC	33 - 7	33	70.70	28.00	94.00	47.00	55.00	R
26 - 3	26	30.30	13.10	36.00	30.50	33.50	TS	33 - 8	33	70.70	28.00	94.00	57.00	65.00	R
26 - 4	26	30.30	13.10	36.00	24.50	27.50	TSC	33 - 9	33	76.70	28.60	94.50	67.60	77.20	TS
26 - 5	26	31.00	13.10	36.00	16.00	18.00	TSC	33 - 10	33	91.00	33.00	117.00	65.00	69.50	TS
27 - 1	27	35.40	11.62	45.80	30.80	35.30	CR	33 - 11	33	91.00	33.00	117.00	74.00	78.50	TS
27 - 2	27	36.85	16.50	49.50	28.50	32.80	CR	33 - 12	33	101.00	35.00	130.00	99.00	113.00	R
27 - 3	27	25.50	9.00	25.50	12.00	16.00	TS	34 - 1	34	57.90	18.70	57.90	33.00	39.40	TS

*No.31-1,2:Material of Segment Bar is Silver(same coin use)

TAKACHIHO INDUSTRIAL CO.,LTD.

Version:2013/11

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
34 - 2	34	72.00	30.00	81.00	41.00	51.00	R	46 - 2	46	78.50	21.00	82.00	54.00	59.00	R
36 - 1	36	36.50	12.00	38.20	20.00	24.50	TSC	48 - 1	48	40.50	12.00	44.00	25.00	29.00	TS
36 - 2	36	38.20	13.00	39.00	21.50	27.00	TS	48 - 2	48	40.50	14.00	44.00	25.00	29.00	TS
36 - 3	36	40.20	15.00	41.00	34.00	36.00	TSR	48 - 3	48	40.50	15.00	44.00	28.00	32.00	TS
36 - 4	36	40.30	14.00	44.00	20.00	24.00	TS	48 - 4	48	40.50	16.00	44.00	18.00	22.00	TS
36 - 5	36	40.30	16.00	44.00	30.00	34.00	TS	48 - 5	48	45.50	13.50	48.50	29.50	34.00	TS
36 - 6	36	40.30	18.00	44.00	30.00	34.00	TS	48 - 6	48	45.50	16.00	48.50	30.00	34.00	TS
37 - 1	37	70.70	28.00	87.00	57.00	65.00	R	48 - 7	48	45.50	17.00	48.50	17.00	21.00	TS
37 - 2	37	74.45	28.53	92.00	44.20	50.50	TS	48 - 8	48	50.80	19.05	50.80	30.00	30.00	TS
37 - 3	37	81.00	30.00	101.50	57.00	63.00	R	48 - 9	48	51.00	18.00	55.00	20.00	26.00	TS
37 - 4	37	81.00	35.00	101.50	47.00	53.00	R	48 - 10	48	61.00	20.00	64.00	21.00	28.00	TS
37 - 5	37	81.50	32.00	101.50	50.50	56.50	R	48 - 11	48	62.50	20.00	67.00	21.00	28.00	TS
37 - 6	37	90.70	35.00	112.00	57.00	68.00	R	49 - 1	49	65.50	25.00	80.00	26.00	31.00	R
37 - 7	37	90.70	35.00	112.00	67.00	78.00	R	49 - 2	49	66.00	23.00	80.00	41.00	46.00	R
37 - 8	37	90.70	35.00	118.00	57.00	68.00	R	49 - 3	49	70.70	28.00	87.00	57.00	65.00	R
37 - 9	37	120.70	42.00	149.00	77.00	88.00	R	49 - 4	49	70.70	29.00	87.00	32.00	38.00	TS
38 - 1	38	57.90	25.00	66.50	36.60	42.90	TS	49 - 5	49	81.00	30.00	101.50	57.00	63.00	R
39 - 1	39	30.30	13.10	36.00	24.50	27.50	TSC	49 - 6	49	81.00	30.00	110.00	57.00	63.00	R
40 - 1	40	70.70	28.00	91.00	57.00	65.00	R	49 - 7	49	90.70	35.00	106.00	57.00	68.00	R
40 - 2	40	85.70	30.00	100.00	80.00	90.00	R	49 - 8	49	90.70	35.00	118.00	57.00	68.00	R
41 - 1	41	41.50	19.80	58.00	26.70	30.50	CR	49 - 9	49	104.70	35.00	122.00	67.00	78.00	R
41 - 2	41	44.00	19.05	46.00	20.60	23.00	TS	49 - 10	49	104.70	35.00	128.00	67.00	78.00	R
41 - 3	41	61.50	25.00	67.00	30.00	34.00	TS	49 - 11	49	120.70	42.00	149.00	67.00	78.00	R
41 - 4	41	63.00	20.00	84.00	37.00	43.00	TS	49 - 12	49	128.30	41.00	164.00	85.70	100.50	R
41 - 5	41	70.50	30.00	76.00	30.00	34.00	TS	49 - 13	49	131.00	38.00	158.00	57.00	77.00	R
41 - 6	41	70.70	28.00	94.00	42.00	50.00	R	50 - 1	50	40.30	13.00	42.00	20.00	24.00	TS
41 - 7	41	73.00	28.00	85.00	45.00	51.00	R	50 - 2	50	40.50	14.00	44.00	20.00	24.00	TS
41 - 8	41	81.00	35.00	101.50	35.00	41.00	R	50 - 3	50	59.00	20.00	62.00	34.00	40.00	TS
41 - 9	41	81.00	35.00	101.50	57.00	63.00	R	50 - 4	50	90.70	35.00	112.00	67.00	78.00	R
41 - 10	41	90.70	35.00	106.00	57.00	68.00	R	51 - 1	51	40.50	14.00	44.00	14.00	18.00	TS
41 - 11	41	90.70	35.00	118.00	67.00	78.00	R	51 - 2	51	57.90	18.70	57.90	33.00	39.40	TS
41 - 12	41	100.00	40.00	106.00	49.00	51.00	R	51 - 3	51	57.90	25.00	57.90	33.00	39.40	TS
41 - 13	41	104.70	35.00	128.00	67.00	78.00	R	51 - 4	51	57.90	18.70	66.50	33.00	39.40	TS
41 - 14	41	106.00	40.00	138.00	79.00	93.00	R	51 - 5	51	72.00	30.00	81.00	41.00	51.00	R
41 - 15	41	120.70	42.00	149.00	67.00	78.00	R	52 - 1	52	130.50	45.00	156.00	95.00	105.00	R
41 - 16	41	120.70	42.00	149.00	77.00	88.00	R	53 - 1	53	81.00	30.00	101.50	57.00	61.50	R
42 - 1	42	34.50	15.00	38.00	24.50	28.00	TS	53 - 2	53	81.00	30.00	101.50	57.00	63.00	TS
42 - 2	42	50.80	15.88	50.80	30.00	30.00	TS	53 - 3	53	86.00	30.00	107.00	57.00	63.00	R
42 - 3	42	50.80	19.05	50.80	30.00	30.00	TS	53 - 4	53	90.70	35.00	106.00	57.00	68.00	R
42 - 4	42	51.00	14.25	63.00	39.50	43.50	TS	53 - 5	53	100.50	35.00	124.00	57.00	63.00	R
42 - 5	42	86.20	19.05	95.00	29.10	31.10	FC	52 - 6	53	100.50	35.00	124.00	79.00	85.00	R
43 - 1	43	101.00	32.00	126.00	57.00	67.00	R	53 - 7	53	112.00	38.00	132.00	60.00	70.00	R
43 - 2	43	101.00	32.00	128.00	57.50	67.50	TS	53 - 8	53	112.00	38.00	132.00	85.00	95.00	R
44 - 1	44	51.80	15.80	66.70	33.50	34.00	TS	53 - 9	53	120.70	42.00	149.00	67.00	78.00	R
44 - 2	44	81.00	29.00	92.00	26.00	30.00	TS	53 - 10	53	141.00	39.70	172.00	85.00	95.00	R
45 - 1	45	44.50	21.80	62.00	30.20	34.00	CR	54 - 1	54	62.50	25.00	67.00	31.00	38.00	TS
45 - 2	45	70.70	28.00	87.00	47.00	55.00	R	54 - 2	54	131.00	54.00	162.00	150.00	178.00	R
45 - 3	45	70.70	28.00	94.00	47.00	55.00	R	55 - 1	55	75.40	28.60	75.40	22.80	26.80	TS
45 - 4	45	81.00	30.00	101.50	57.00	63.00	R	55 - 2	55	81.40	28.60	88.50	28.70	33.50	TS
45 - 5	45	90.70	35.00	118.00	57.00	68.00	R	55 - 3	55	115.00	45.00	138.00	95.00	138.00	R
45 - 6	45	90.70	35.00	118.00	67.00	78.00	R	56 - 1	56	75.40	28.60	75.40	35.10	38.60	TS
46 - 1	46	45.50	19.00	48.50	30.00	34.00	TS	56 - 2	56	115.00	40.00	138.00	88.00	131.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
56 - 3	56	115.00	40.00	138.00	95.00	107.00	R	63 - 9	63	75.30	31.50	87.50	45.00	57.00	R
56 - 4	56	115.00	40.00	138.00	95.00	138.00	R	63 - 10	63	75.30	31.50	87.50	45.00	57.00	TS
56 - 5	56	115.00	40.00	138.00	95.00	154.00	R	63 - 11	63	75.50	28.00	80.00	34.50	45.00	R
56 - 6	56	115.50	40.00	138.00	88.00	131.00	R	63 - 12	63	75.70	31.50	87.50	45.00	57.00	R
57 - 1	57	53.50	22.00	54.70	23.00	27.00	TSC	63 - 13	63	77.22	36.30	85.70	35.70	46.70	TS
57 - 2	57	53.50	23.00	55.00	23.00	27.00	TS	63 - 14	63	80.30	31.50	90.00	45.00	56.00	TS
57 - 3	57	57.50	19.50	62.00	22.00	28.00	TS	63 - 15	63	80.30	31.50	100.00	45.00	57.00	R
57 - 4	57	57.50	19.50	62.00	35.00	41.00	TS	63 - 16	63	80.30	31.50	100.00	45.00	57.00	TS
57 - 5	57	57.90	25.00	57.90	33.00	39.40	TS	63 - 17	63	80.30	32.00	100.00	58.00	70.00	TS
57 - 6	57	62.40	20.00	67.00	22.00	26.50	TS	63 - 18	63	85.30	34.00	100.00	80.00	92.00	R
57 - 7	57	62.50	23.00	67.00	31.00	38.00	TS	63 - 19	63	90.50	32.00	101.50	50.00	64.00	R
57 - 8	57	71.00	22.00	85.00	35.00	41.00	R	63 - 20	63	90.70	35.00	112.00	57.00	68.00	R
57 - 9	57	74.42	28.60	92.00	46.50	56.00	TS	63 - 21	63	96.00	33.00	117.00	140.00	150.00	R
57 - 10	57	75.00	28.00	93.50	37.00	43.00	R	63 - 22	63	100.30	35.00	108.00	60.00	70.00	R
57 - 11	57	76.40	25.00	88.90	38.90	48.40	TS	63 - 23	63	100.30	35.00	108.00	80.00	90.00	R
57 - 12	57	76.40	30.15	88.90	38.90	48.40	TS	63 - 24	63	100.30	35.00	118.00	60.00	70.00	TS
57 - 13	57	76.40	30.15	94.20	38.90	48.40	TS	63 - 25	63	100.30	35.00	118.00	80.00	90.00	TS
57 - 14	57	82.00	32.00	101.50	47.00	53.00	R	63 - 26	63	120.30	35.00	142.00	80.00	90.00	R
57 - 15	57	85.40	25.00	93.00	26.00	32.50	TS	63 - 27	63	120.70	35.00	142.00	100.00	110.00	R
57 - 16	57	91.00	39.00	114.00	55.20	62.00	TS	64 - 1	64	50.50	17.00	53.00	20.00	24.00	TSC
57 - 17	57	101.00	35.00	124.00	47.00	53.00	R	64 - 2	64	75.70	25.00	87.50	21.00	33.00	R
57 - 18	57	101.00	35.00	124.00	57.00	63.00	R	65 - 1	65	70.70	28.00	87.00	37.00	45.00	R
57 - 19	57	101.00	42.00	124.00	61.00	84.00	R	65 - 2	65	70.70	28.00	87.00	57.00	65.00	R
57 - 20	57	104.70	35.00	134.00	57.00	68.00	R	65 - 3	65	81.00	32.00	104.00	47.00	51.50	R
57 - 21	57	104.70	35.00	134.00	67.00	78.00	R	65 - 4	65	120.70	42.00	145.00	67.00	78.00	R
57 - 22	57	106.00	40.00	130.00	79.00	93.00	R	65 - 5	65	151.00	40.00	177.00	57.00	73.00	R
57 - 23	57	113.00	40.00	142.00	57.00	72.00	R	65 - 6	65	151.00	40.00	190.00	57.00	74.00	R
57 - 24	57	116.00	40.00	152.00	57.00	72.00	R	65 - 7	65	175.70	55.00	215.00	75.00	93.00	R
60 - 1	60	85.50	28.00	93.00	58.00	63.00	R	66 - 1	66	81.50	28.60	81.50	32.10	40.00	TS
60 - 2	60	161.00	53.00	203.60	160.00	180.00	AR	66 - 2	66	120.70	42.00	145.00	67.00	78.00	R
61 - 1	61	47.00	16.00	52.00	25.00	29.00	TS	66 - 3	66	120.70	42.00	145.00	77.00	88.00	R
61 - 2	61	48.50	15.50	51.00	14.00	18.50	TS	68 - 1	68	57.90	18.70	66.50	33.00	39.40	TS
61 - 3	61	81.00	32.00	101.50	47.00	53.00	R	69 - 1	69	50.50	18.00	54.00	20.00	26.00	TS
61 - 4	61	86.00	30.00	108.00	57.00	63.00	R	69 - 2	69	75.50	28.00	80.00	34.50	45.00	R
61 - 5	61	86.00	32.00	108.00	47.00	53.00	R	69 - 3	69	81.00	28.00	85.00	40.00	46.00	R
61 - 6	61	90.70	35.00	106.00	42.00	53.00	R	69 - 4	69	90.70	35.00	118.00	47.00	58.00	R
61 - 7	61	90.70	35.00	106.00	57.00	68.00	R	69 - 5	69	90.70	35.00	118.00	57.00	68.00	R
61 - 8	61	90.70	35.00	110.00	57.00	68.00	R	69 - 6	69	101.00	35.00	124.00	47.00	53.00	R
61 - 9	61	90.70	35.00	118.00	57.00	68.00	R	70 - 1	70	120.50	32.00	128.00	32.00	37.00	R
61 - 10	61	91.00	35.00	108.00	62.00	72.00	TS	71 - 1	71	96.00	38.00	96.00	70.00	80.00	R
61 - 11	61	106.00	40.00	130.00	57.00	67.00	R	71 - 2	71	127.00	31.75	127.00	25.40	33.30	TS
61 - 12	61	106.00	40.00	130.00	57.00	71.00	R	72 - 1	72	37.50	14.00	37.80	12.00	16.00	TSC
61 - 13	61	106.00	38.00	132.00	57.00	67.00	R	72 - 2	72	51.00	18.00	55.00	20.00	26.00	TS
61 - 14	61	132.00	38.00	159.00	57.00	67.00	R	72 - 3	72	51.00	20.00	55.00	20.00	26.00	TS
63 - 1	63	40.00	16.00	48.50	30.00	34.00	TS	72 - 4	72	51.00	20.00	55.00	24.00	30.00	TS
63 - 2	63	44.00	19.05	61.70	25.40	28.40	TS	72 - 5	72	51.00	21.00	55.00	20.00	26.00	TS
63 - 3	63	45.50	17.00	48.50	17.00	21.00	TS	72 - 6	72	61.00	20.00	66.00	25.00	32.00	TS
63 - 4	63	60.30	18.00	65.00	26.00	30.00	TS	72 - 7	72	61.00	25.00	66.00	23.00	30.00	TS
63 - 5	63	60.50	18.00	66.00	29.50	38.00	R	72 - 8	72	61.00	25.00	66.00	25.00	32.00	TS
63 - 6	63	64.20	28.00	77.00	35.00	41.00	TS	72 - 9	72	61.00	25.00	66.00	34.00	41.00	TS
63 - 7	63	70.40	24.00	72.00	32.00	40.00	TSC	72 - 10	72	62.50	23.00	67.00	23.00	30.00	TS
63 - 8	63	71.00	20.00	90.00	27.00	32.00	TS	72 - 11	72	74.00	25.00	85.00	30.00	36.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
72 - 12	72	75.50	28.00	80.00	34.50	45.00	R	81 - 10	81	156.00	57.00	190.00	110.00	126.00	R
72 - 13	72	83.00	35.00	93.50	35.00	41.00	TS	81 - 11	81	161.00	60.00	172.00	60.00	91.00	R
72 - 14	72	86.00	35.00	93.50	35.00	41.00	TS	81 - 12	81	161.00	60.00	190.00	100.00	116.00	R
72 - 15	72	93.50	38.00	93.50	70.00	80.00	R	81 - 13	81	171.00	67.00	217.60	76.00	101.00	R
73 - 1	73	104.00	35.00	123.00	42.00	56.00	R	81 - 14	81	171.00	67.00	217.60	150.00	175.00	R
73 - 2	73	105.50	40.00	132.00	57.00	71.00	R	83 - 1	83	75.40	28.60	75.40	22.80	26.80	TS
73 - 3	73	200.70	60.00	243.00	80.00	103.00	R	84 - 1	84	100.00	36.00	110.00	47.50	52.00	R
74 - 1	74	121.50	52.00	142.00	90.00	100.00	R	84 - 2	84	101.00	37.00	101.50	32.00	55.00	R
75 - 1	75	50.50	23.00	58.00	25.00	29.50	TS	84 - 3	84	104.60	36.30	115.00	40.00	52.80	R
75 - 2	75	58.00	20.00	60.50	30.00	36.00	TSC	84 - 4	84	104.60	36.30	115.00	53.00	65.80	R
75 - 3	75	60.00	21.00	61.50	22.00	28.00	TS	84 - 5	84	104.60	36.30	115.00	78.00	90.80	R
75 - 4	75	65.50	21.00	66.50	30.00	37.00	TS	84 - 6	84	115.70	44.00	118.00	63.00	73.00	R
75 - 5	75	65.50	21.00	80.00	45.00	49.00	TSR	84 - 7	84	272.00	102.00	370.00	200.00	240.00	AR
75 - 6	75	71.00	20.00	76.00	25.00	29.00	R	84 - 8	84	272.00	102.00	370.00	280.00	320.00	AR
75 - 7	75	71.00	20.00	79.00	25.00	29.00	R	85 - 1	85	88.00	30.00	89.00	27.00	33.00	TS
75 - 8	75	77.00	30.00	78.50	45.00	50.00	TSC	85 - 2	85	202.00	72.00	228.00	108.00	143.00	R
75 - 9	75	77.00	25.00	79.00	26.80	31.50	TS	87 - 1	87	80.50	32.00	101.50	58.00	68.00	R
75 - 10	75	77.00	29.00	79.00	26.80	31.50	TS	87 - 2	87	82.50	26.00	86.00	45.00	57.00	R
75 - 11	75	77.00	28.00	80.00	70.00	80.00	R	87 - 3	87	83.00	28.00	93.00	70.00	76.00	R
75 - 12	75	77.00	30.00	80.00	70.00	80.00	R	87 - 4	87	101.00	38.00	112.00	40.00	50.00	R
75 - 13	75	77.00	30.00	80.00	45.00	50.00	TS	87 - 5	87	101.00	42.00	112.00	40.00	66.00	R
75 - 14	75	77.22	36.30	98.80	35.70	46.70	TS	87 - 6	87	101.00	47.00	112.00	40.00	66.00	R
75 - 15	75	80.50	48.00	81.00	20.00	26.00	R	87 - 7	87	110.70	42.00	112.00	40.00	50.00	R
75 - 16	75	81.00	28.00	101.00	100.00	120.00	R	87 - 8	87	110.70	40.00	119.00	45.00	65.00	R
75 - 17	75	91.00	35.00	101.00	45.00	51.00	TS	87 - 9	87	114.00	45.00	138.00	50.00	56.00	R
75 - 18	75	95.30	33.00	110.00	40.00	50.00	R	87 - 10	87	114.00	45.00	138.00	85.00	91.00	R
75 - 19	75	96.70	33.00	112.00	80.00	90.00	R	87 - 11	87	115.50	45.00	130.00	50.00	63.00	R
75 - 20	75	97.00	34.00	99.00	61.00	71.00	R	87 - 12	87	115.70	35.00	130.00	40.00	50.00	R
75 - 21	75	101.00	35.00	105.00	60.00	70.00	R	87 - 13	87	115.70	42.00	130.00	63.00	73.00	R
75 - 22	75	101.00	33.00	112.00	63.00	73.00	R	87 - 14	87	115.70	44.00	130.00	80.00	90.00	R
75 - 23	75	120.30	35.00	142.00	70.00	80.00	R	87 - 15	87	116.00	44.00	130.00	63.00	73.00	R
75 - 24	75	126.00	42.00	155.00	95.00	110.00	R	87 - 16	87	116.00	45.00	141.00	50.00	63.00	R
75 - 25	75	131.00	48.00	156.00	50.00	88.00	R	87 - 17	87	116.00	45.00	141.00	85.00	98.00	R
75 - 26	75	161.00	60.00	188.00	90.00	106.00	R	87 - 18	87	118.00	35.00	130.00	90.00	100.00	R
75 - 27	75	171.00	52.00	217.60	120.00	160.00	R	87 - 19	87	125.70	44.00	142.00	63.00	73.00	R
75 - 28	75	175.50	80.00	197.00	120.00	140.00	R	87 - 20	87	128.00	60.00	152.00	90.00	115.00	R
76 - 1	76	79.20	25.00	88.10	33.00	39.40	TS	87 - 21	87	128.40	51.36	153.20	53.00	69.00	R
76 - 2	76	81.50	29.00	93.50	40.00	50.00	R	87 - 22	87	128.40	51.36	153.20	78.50	94.50	R
78 - 1	78	113.00	36.00	120.00	40.00	46.00	R	87 - 23	87	130.70	49.00	156.00	50.00	60.00	R
80 - 1	80	47.30	12.00	50.00	22.00	24.00	TSC	87 - 24	87	131.00	48.00	158.00	70.00	108.00	R
80 - 2	80	70.50	30.00	87.00	41.00	54.00	R	87 - 25	87	132.00	51.36	153.20	53.00	72.30	R
80 - 3	80	80.50	30.00	87.00	45.00	55.00	TSC	87 - 26	87	141.00	53.00	170.00	80.00	110.00	R
80 - 4	80	90.50	32.00	101.50	50.00	64.00	R	87 - 27	87	150.00	55.00	180.00	93.00	118.00	R
81 - 1	81	51.00	15.50	58.00	25.00	31.00	R	87 - 28	87	150.00	57.00	180.00	86.00	100.00	R
81 - 2	81	81.00	35.00	93.50	40.00	63.00	R	87 - 29	87	151.00	42.00	172.00	75.00	85.00	R
81 - 3	81	104.70	35.00	128.00	67.00	78.00	R	87 - 30	87	151.00	40.00	190.00	57.00	74.00	R
81 - 4	81	116.00	40.00	152.00	57.00	71.00	R	87 - 31	87	161.00	60.00	188.00	110.00	138.00	R
81 - 5	81	116.00	43.00	152.00	115.00	129.00	R	87 - 32	87	161.00	66.00	190.00	130.00	163.00	R
81 - 6	81	130.50	56.00	159.00	97.00	117.00	R	87 - 33	87	171.00	67.00	217.60	150.00	175.00	R
81 - 7	81	142.00	47.00	152.00	70.00	106.00	R	87 - 34	87	176.00	40.50	196.90	73.20	179.00	R
81 - 8	81	151.00	40.00	190.00	57.00	74.00	R	88 - 1	88	81.00	29.00	93.00	26.00	32.00	R
81 - 9	81	152.00	57.00	185.00	95.30	111.30	R	88 - 2	88	81.00	29.00	93.00	45.00	51.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
90 - 1	90	220.70	80.00	262.00	111.00	190.00	R	99 - 27	99	211.00	113.00	228.00	137.00	215.00	R
93 - 1	93	81.00	26.00	100.00	70.00	82.00	R	100 - 1	100	113.00	42.00	128.00	82.00	86.00	R
93 - 2	93	81.00	31.00	100.00	40.00	52.00	R	100 - 2	100	114.00	45.00	138.00	50.00	56.00	R
93 - 3	93	95.00	38.00	110.00	53.00	63.00	R	100 - 3	100	114.00	45.00	138.00	85.00	91.00	R
93 - 4	93	101.00	47.00	112.00	40.00	66.00	R	100 - 4	100	116.00	45.00	141.00	50.00	63.00	R
93 - 5	93	142.00	45.00	152.00	70.00	106.00	R	100 - 5	100	116.00	45.00	141.00	85.00	98.00	R
93 - 6	93	142.00	47.00	152.00	70.00	106.00	R	100 - 6	100	211.00	91.00	294.00	181.00	221.00	R
93 - 7	93	162.00	52.00	172.00	74.00	105.00	R	100 - 7	100	321.00	127.00	324.00	377.00	405.00	R
93 - 8	93	162.00	52.00	172.00	95.00	138.00	R	101 - 1	101	111.20	77.78	127.00	40.50	45.00	R
93 - 9	93	162.00	79.00	172.00	74.00	105.00	R	101 - 2	101	116.00	77.78	127.00	40.50	56.00	R
93 - 10	93	174.00	70.00	228.00	135.00	160.00	R	102 - 1	102	201.00	85.00	286.00	172.00	197.00	AR
93 - 11	93	181.00	65.00	197.00	90.00	110.00	R	102 - 2	102	271.00	102.00	370.00	200.00	240.00	AR
93 - 12	93	181.00	55.00	207.00	60.00	80.00	R	105 - 1	105	71.00	20.00	76.00	25.00	31.50	R
93 - 13	93	201.00	85.00	260.00	252.00	277.00	AR	105 - 2	105	104.60	36.30	115.00	40.00	52.80	R
95 - 14	93	205.50	95.00	205.50	215.00	235.00	R	105 - 3	105	104.60	36.30	115.00	53.00	65.80	R
95 - 1	95	79.20	25.00	94.20	33.00	39.40	TS	105 - 4	105	104.60	36.30	121.40	53.00	65.80	R
95 - 2	95	92.50	29.00	96.00	40.00	50.00	R	105 - 5	105	104.60	36.30	121.40	78.00	90.80	R
95 - 3	95	95.50	36.00	101.00	60.00	70.00	R	105 - 6	105	118.00	35.00	130.00	63.00	73.00	R
96 - 1	96	95.50	38.00	95.50	75.00	85.00	R	105 - 7	105	141.00	64.50	152.00	40.00	76.00	R
96 - 2	96	100.50	35.00	110.00	35.00	39.50	R	105 - 8	105	142.00	47.00	152.00	70.00	106.00	R
96 - 3	96	125.50	50.00	132.00	70.00	80.00	R	105 - 9	105	142.00	60.00	152.00	40.00	76.00	R
96 - 4	96	132.00	50.00	132.00	70.00	80.00	R	105 - 10	105	142.00	64.00	152.00	40.00	76.00	R
97 - 1	97	70.50	28.00	80.00	25.00	29.00	TS	105 - 11	105	160.50	70.00	161.00	137.00	154.00	R
97 - 2	97	74.00	40.50	80.00	60.00	62.00	R	105 - 12	105	160.50	70.00	161.00	146.00	156.00	R
97 - 3	97	151.00	40.00	190.00	57.00	74.00	R	105 - 13	105	160.50	70.00	171.00	80.00	90.00	R
97 - 4	97	160.50	70.00	171.00	147.00	167.00	R	105 - 14	105	160.50	70.00	171.00	137.00	157.00	R
99 - 1	99	71.00	20.00	80.00	25.00	29.00	R	105 - 15	105	162.00	78.00	172.00	95.00	138.00	R
99 - 2	99	91.00	28.00	112.00	80.00	90.00	R	105 - 16	105	185.00	72.00	197.00	105.00	143.00	R
99 - 3	99	96.50	39.00	108.00	29.00	33.50	R	105 - 17	105	241.00	90.00	294.00	200.00	220.00	R
99 - 4	99	120.70	35.00	142.00	68.00	78.00	R	108 - 1	108	141.00	50.00	141.00	85.00	95.00	R
99 - 5	99	120.70	35.00	142.00	80.00	90.00	R	108 - 2	108	141.00	50.00	141.00	120.00	130.00	R
99 - 6	99	130.50	45.00	141.00	68.00	78.00	R	108 - 3	108	141.00	55.00	141.00	105.00	115.00	R
99 - 7	99	130.50	45.00	141.00	68.00	78.00	R	108 - 4	108	201.00	90.00	286.00	172.00	197.00	AR
99 - 8	99	130.70	49.00	156.00	50.00	60.00	R	111 - 1	111	96.50	39.00	108.00	29.00	33.50	R
99 - 9	99	142.00	60.00	152.00	40.00	76.00	R	111 - 2	111	97.00	39.00	109.00	29.00	34.00	R
99 - 10	99	142.00	64.50	152.00	70.00	106.00	R	111 - 3	111	110.50	43.00	125.00	45.00	65.00	R
99 - 11	99	150.00	55.00	180.00	80.00	103.00	R	111 - 4	111	110.50	43.00	125.00	68.00	88.00	R
99 - 12	99	150.00	55.00	180.00	120.00	143.00	R	111 - 5	111	121.50	52.00	141.00	60.00	80.00	R
99 - 13	99	150.50	48.00	161.00	80.00	90.00	R	111 - 6	111	121.50	55.00	141.00	90.00	100.00	R
99 - 14	99	150.50	50.00	162.00	70.00	80.00	R	111 - 7	111	146.00	48.00	205.00	85.00	95.00	R
99 - 15	99	151.00	40.00	190.00	57.00	74.00	R	111 - 8	111	149.40	60.30	174.50	66.00	88.60	R
99 - 16	99	152.00	60.00	162.00	95.00	105.00	R	111 - 9	111	150.50	61.00	161.00	80.00	90.00	R
99 - 17	99	161.00	65.00	207.00	93.00	113.00	R	111 - 10	111	150.50	61.00	161.00	106.00	116.00	R
99 - 18	99	161.00	65.00	207.00	133.00	153.00	R	111 - 11	111	151.00	59.00	168.00	101.00	175.00	R
99 - 19	99	162.00	52.00	172.00	95.00	138.00	R	111 - 12	111	156.00	48.00	162.00	70.00	104.00	R
99 - 20	99	162.00	60.00	172.00	95.00	138.00	R	111 - 13	111	156.00	54.00	162.00	70.00	104.00	R
99 - 21	99	162.00	72.00	172.00	74.00	105.00	R	111 - 14	111	157.00	54.00	180.00	93.00	118.00	R
99 - 22	99	171.00	57.00	206.00	90.00	115.00	R	111 - 15	111	171.00	67.00	171.00	120.00	145.00	R
99 - 23	99	171.00	57.00	206.00	140.00	165.00	R	111 - 19	111	171.00	53.00	195.00	50.00	70.00	R
99 - 24	99	171.00	67.00	217.60	106.00	131.00	R	111 - 20	111	171.00	57.00	206.00	106.00	131.00	R
99 - 25	99	171.00	67.00	217.60	150.00	175.00	R	111 - 21	111	171.00	67.00	217.60	46.00	71.00	R
99 - 26	99	172.70	57.00	213.70	108.00	212.60	R	111 - 22	111	171.00	67.00	217.60	76.00	101.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
111 - 23	111	171.00	67.00	217.60	150.00	175.00	R	117 - 25	117	241.00	90.00	283.00	160.00	180.00	R
111 - 24	111	180.00	79.00	197.00	106.00	151.00	R	118 - 1	118	90.50	29.00	97.00	26.00	30.00	TS
111 - 25	111	181.00	92.00	198.00	137.00	215.00	R	122 - 1	122	143.00	76.00	161.00	41.00	60.00	R
111 - 26	111	195.00	76.00	197.00	150.00	188.00	R	122 - 2	122	143.00	76.00	179.00	82.00	96.00	R
111 - 27	111	201.00	72.00	216.00	115.00	148.00	R	123 - 1	123	95.50	38.00	110.00	29.00	36.50	R
111 - 28	111	201.00	85.00	286.00	135.00	160.00	AR	123 - 2	123	97.00	35.50	110.00	29.00	40.00	R
111 - 29	111	201.00	85.00	286.00	172.00	197.00	AR	123 - 3	123	130.50	56.00	159.00	61.00	81.00	R
111 - 30	111	202.00	72.00	228.00	108.00	143.00	R	123 - 4	123	130.50	56.00	159.00	97.00	117.00	R
113 - 31	111	240.00	90.00	243.00	130.00	150.00	R	123 - 5	123	141.00	55.00	161.00	86.00	106.00	R
113 - 32	111	240.00	90.00	243.00	150.00	170.00	R	123 - 6	123	141.00	50.00	162.00	90.00	110.00	R
114 - 33	111	241.00	90.00	293.00	160.00	180.00	R	123 - 7	123	153.00	62.00	174.00	73.00	81.00	R
114 - 34	111	271.00	100.00	336.00	185.00	205.00	R	123 - 8	123	156.00	54.00	162.00	70.00	104.00	R
113 - 1	113	103.00	35.50	118.00	28.50	40.00	R	123 - 9	123	156.00	54.00	162.00	115.00	149.00	R
113 - 2	113	115.00	40.00	139.00	30.00	40.00	R	123 - 10	123	161.00	67.00	190.00	90.00	118.00	R
114 - 1	114	160.50	70.00	161.00	174.00	191.00	R	123 - 11	123	171.00	67.00	188.00	115.00	143.00	R
114 - 2	114	162.00	52.00	172.00	95.00	138.00	R	123 - 12	123	174.00	70.00	228.00	65.00	90.00	R
114 - 3	114	171.00	67.00	217.60	150.00	175.00	R	123 - 13	123	174.00	70.00	228.00	95.00	120.00	R
114 - 4	114	171.00	68.00	217.60	106.00	131.00	R	123 - 14	123	174.00	70.00	228.00	135.00	160.00	R
114 - 5	114	261.00	95.00	365.00	172.00	202.00	AR	123 - 15	123	181.00	69.00	198.00	137.00	215.00	R
114 - 6	114	261.00	95.00	365.00	252.00	282.00	AR	123 - 16	123	185.50	75.00	197.00	90.00	110.00	R
114 - 7	114	291.00	125.00	410.00	260.00	295.00	AR	123 - 17	123	190.00	58.00	194.00	106.00	144.00	R
115 - 1	115	128.40	51.36	153.20	53.00	69.00	R	123 - 18	123	190.50	80.00	190.50	106.00	126.00	R
115 - 2	115	128.40	51.36	153.20	78.50	94.50	R	123 - 19	123	190.50	80.00	190.50	140.00	160.00	R
115 - 3	115	141.00	48.00	170.00	63.00	93.00	R	123 - 20	123	190.50	82.00	190.50	106.00	126.00	R
115 - 4	115	176.00	40.50	196.85	98.60	210.80	R	123 - 21	123	201.00	72.00	216.00	80.00	113.00	R
115 - 5	115	201.00	70.00	227.50	160.00	180.00	R	123 - 22	123	201.00	72.00	216.00	115.00	148.00	R
116 - 1	116	150.00	55.00	180.00	80.00	103.00	R	123 - 23	123	201.00	77.00	228.00	140.00	173.00	R
116 - 2	116	150.00	55.00	180.00	120.00	143.00	R	123 - 24	123	201.00	85.00	286.00	135.00	160.00	AR
117 - 1	117	73.00	56.00	74.00	10.00	14.00	TS	123 - 25	123	226.70	65.00	274.00	95.00	115.00	R
117 - 2	117	109.50	77.77	127.00	28.60	33.10	R	123 - 26	123	241.00	90.00	293.00	160.00	180.00	R
117 - 3	117	110.40	77.78	127.50	28.60	33.10	R	123 - 27	123	245.00	80.50	262.00	139.00	159.00	R
117 - 4	117	111.20	40.00	127.50	28.60	33.10	R	123 - 28	123	261.00	95.00	365.00	172.00	202.00	AR
117 - 5	117	142.00	47.00	152.00	40.00	76.00	R	123 - 29	123	261.00	95.00	365.00	209.00	239.00	AR
117 - 6	117	142.00	47.00	152.00	70.00	106.00	R	123 - 30	123	275.00	89.00	293.00	139.00	159.00	R
117 - 7	117	142.00	60.00	152.00	40.00	76.00	R	124 - 1	124	321.00	127.00	324.00	392.00	420.00	R
117 - 8	117	142.00	64.50	152.00	40.00	76.00	R	124 - 2	124	330.00	135.00	428.00	250.00	280.00	AR
117 - 9	117	142.00	64.50	152.00	70.00	106.00	R	124 - 3	124	382.00	145.00	488.00	195.00	230.00	AR
117 - 10	117	146.00	47.00	180.00	150.00	164.00	R	125 - 1	125	100.00	38.00	120.00	35.00	63.00	R
117 - 11	117	160.50	70.00	171.00	63.00	80.00	R	125 - 2	125	121.00	45.00	140.00	50.00	60.00	R
117 - 12	117	160.50	70.00	171.00	75.00	95.00	R	125 - 3	125	140.00	50.00	172.00	82.00	118.00	R
117 - 13	117	162.00	52.00	172.00	95.00	138.00	R	125 - 4	125	152.00	53.00	170.00	50.00	81.00	R
117 - 14	117	162.00	60.00	172.00	95.00	138.00	R	126 - 1	126	162.00	52.00	172.00	95.00	138.00	R
117 - 15	117	162.00	79.00	172.00	74.00	105.00	R	126 - 2	126	174.00	70.00	228.00	135.00	160.00	R
117 - 16	117	162.00	79.00	172.00	95.00	138.00	R	126 - 3	126	182.00	55.00	260.00	185.00	220.00	AR
117 - 17	117	227.00	90.00	260.00	150.00	235.00	R	126 - 4	126	271.00	100.00	336.00	185.00	205.00	R
117 - 18	117	241.00	70.00	283.00	120.00	140.00	R	126 - 5	126	275.00	89.00	293.00	207.00	227.00	R
117 - 19	117	241.00	70.00	283.00	160.00	180.00	R	126 - 6	126	300.00	113.00	300.80	280.00	300.00	R
117 - 20	117	241.00	75.00	283.00	120.00	140.00	R	129 - 1	129	160.50	70.00	161.00	122.00	132.00	R
117 - 21	117	241.00	75.00	283.00	160.00	180.00	R	129 - 2	129	160.50	70.00	171.00	80.00	90.00	R
117 - 22	117	241.00	80.00	283.00	160.00	180.00	R	129 - 3	129	171.00	57.00	206.00	70.00	95.00	R
117 - 23	117	241.00	80.00	283.00	200.00	220.00	R	129 - 4	129	171.00	57.00	206.00	90.00	115.00	R
117 - 24	117	241.00	90.00	283.00	120.00	140.00	R	129 - 5	129	171.00	57.00	206.00	140.00	165.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
129 - 6	129	171.00	67.00	217.60	46.00	71.00	R	135 - 36	135	201.00	85.00	286.00	98.00	123.00	AR
129 - 7	129	171.00	67.00	217.60	76.00	101.00	R	135 - 37	135	201.00	85.00	286.00	135.00	160.00	AR
129 - 8	129	171.00	67.00	217.60	106.00	131.00	R	135 - 38	135	251.00	107.00	335.00	190.00	210.00	AR
129 - 9	129	180.00	59.00	197.00	106.00	151.00	R	135 - 39	135	261.00	95.00	365.00	172.00	202.00	AR
129 - 10	129	180.00	79.00	197.00	106.00	151.00	R	135 - 40	135	271.00	100.00	336.00	185.00	205.00	R
129 - 11	129	185.00	70.00	197.00	105.00	143.00	R	136 - 1	136	131.00	48.00	156.00	47.00	57.00	R
129 - 12	129	185.00	70.00	197.00	150.00	188.00	R	136 - 2	136	131.00	48.00	156.00	70.00	80.00	R
129 - 13	129	202.00	59.00	228.00	108.00	143.00	R	136 - 3	136	201.00	85.00	286.00	135.00	160.00	AR
129 - 14	129	202.00	72.00	228.00	108.00	143.00	R	136 - 4	136	201.00	85.00	286.00	172.00	197.00	AR
129 - 15	129	261.00	95.00	365.00	172.00	202.00	AR	138 - 1	138	201.00	85.00	260.00	172.00	197.00	AR
131 - 1	131	162.00	52.00	172.00	95.00	138.00	R	138 - 2	138	205.50	95.00	205.50	215.00	235.00	R
131 - 2	131	162.00	79.00	172.00	74.00	105.00	R	138 - 3	138	240.50	100.00	240.50	215.00	235.00	R
131 - 3	131	162.00	79.00	172.00	95.00	138.00	R	138 - 4	138	241.00	100.00	310.00	180.00	200.00	AR
132 - 1	132	291.00	124.00	380.00	211.00	231.00	AR	138 - 5	138	245.00	78.00	308.00	180.00	200.00	R
132 - 2	132	321.00	127.00	324.00	377.00	405.00	R	138 - 6	138	251.00	107.00	334.00	190.00	210.00	AR
132 - 3	132	321.00	128.00	324.00	297.00	325.00	R	138 - 7	138	271.00	100.00	336.00	185.00	205.00	R
134 - 1	134	166.00	85.00	172.00	50.00	81.00	R	138 - 8	138	271.00	100.00	336.00	230.00	250.00	R
135 - 1	135	104.00	50.00	112.00	30.00	45.50	R	138 - 9	138	291.00	125.00	410.00	215.00	250.00	AR
135 - 2	135	114.00	45.00	130.00	50.00	56.00	R	138 - 10	138	291.00	125.00	410.00	260.00	295.00	AR
135 - 3	135	114.00	45.00	138.00	50.00	56.00	R	139 - 1	139	142.00	60.00	152.00	40.00	76.00	R
135 - 4	135	118.00	50.00	127.00	42.00	67.00	R	139 - 2	139	142.00	64.50	152.00	70.00	106.00	R
135 - 5	135	120.00	60.00	132.00	42.00	67.00	R	140 - 1	140	321.00	127.00	324.00	297.00	325.00	R
135 - 6	135	120.00	60.00	142.00	84.00	101.00	R	140 - 2	140	321.00	127.00	324.00	337.00	365.00	R
135 - 7	135	125.00	55.00	152.00	78.00	108.00	R	140 - 3	140	332.00	133.00	428.00	254.00	289.00	AR
135 - 8	135	128.00	43.00	152.00	65.00	90.00	R	140 - 4	140	382.00	145.00	488.00	347.00	382.00	AR
135 - 9	135	128.00	43.00	152.00	115.00	140.00	R	140 - 5	140	382.00	146.00	490.00	284.00	314.00	AR
135 - 10	135	130.50	45.00	141.00	57.00	67.00	R	141 - 1	141	201.00	85.00	286.00	98.00	123.00	AR
135 - 11	135	130.50	43.00	156.00	57.00	67.00	R	141 - 2	141	205.50	95.00	205.50	105.00	125.00	R
135 - 12	135	130.50	45.00	156.00	68.00	78.00	R	141 - 3	141	205.50	95.00	205.50	140.00	160.00	R
135 - 13	135	132.00	77.78	142.00	42.00	67.00	R	141 - 4	141	240.50	100.00	240.50	150.00	170.00	R
135 - 14	135	132.00	45.00	158.00	57.00	67.00	R	141 - 5	141	321.00	128.00	324.00	222.00	250.00	R
135 - 15	135	149.00	80.00	162.00	48.00	81.00	R	144 - 1	144	188.50	80.00	189.50	105.00	125.00	R
135 - 16	135	152.00	48.00	162.00	55.00	75.00	R	144 - 2	144	190.50	75.00	194.00	145.00	165.00	R
135 - 17	135	156.00	54.00	162.00	70.00	104.00	R	144 - 3	144	197.00	71.00	197.00	80.00	100.00	R
135 - 18	135	156.00	54.00	162.00	115.00	149.00	R	145 - 1	145	128.40	51.36	153.20	53.00	69.00	R
135 - 19	135	161.00	50.00	172.00	60.00	91.00	R	145 - 2	145	132.00	51.36	153.20	53.00	72.30	R
135 - 20	135	161.00	60.00	172.00	60.00	91.00	R	145 - 3	145	132.00	51.36	153.20	78.50	97.80	R
135 - 21	135	161.00	67.00	207.00	63.00	83.00	R	145 - 4	145	146.00	47.00	188.00	75.00	115.00	R
135 - 22	135	161.00	67.00	207.00	93.00	113.00	R	145 - 5	145	147.00	50.00	188.00	65.00	85.00	R
135 - 23	135	171.00	57.00	206.00	70.00	95.00	R	145 - 6	145	150.50	61.00	161.00	80.00	90.00	R
135 - 24	135	171.00	57.00	206.00	90.00	115.00	R	145 - 7	145	150.50	61.00	171.00	80.00	90.00	R
135 - 25	135	171.00	57.00	206.00	140.00	165.00	R	145 - 8	145	156.00	51.00	188.00	68.50	85.50	R
135 - 26	135	171.00	67.00	217.60	46.00	71.00	R	145 - 9	145	156.00	51.00	188.00	72.00	89.00	R
135 - 27	135	171.00	67.00	217.60	76.00	101.00	R	145 - 10	145	156.00	51.00	188.00	75.00	92.00	R
135 - 28	135	171.00	67.00	217.60	106.00	131.00	R	145 - 11	145	160.50	70.00	161.00	100.00	117.00	R
135 - 29	135	172.00	52.00	217.60	95.00	135.00	R	145 - 12	145	171.00	57.00	206.00	70.00	95.00	R
135 - 30	135	174.00	70.00	228.00	135.00	160.00	R	145 - 13	145	171.00	57.00	206.00	90.00	115.00	R
135 - 31	135	185.00	63.00	197.00	70.00	108.00	R	145 - 14	145	171.00	57.00	206.00	140.00	165.00	R
135 - 32	135	185.00	63.00	197.00	106.00	144.00	R	145 - 15	145	171.00	67.00	217.60	46.00	71.00	R
135 - 33	135	195.00	76.00	197.00	150.00	188.00	R	145 - 16	145	171.00	67.00	217.60	76.00	101.00	R
135 - 34	135	201.00	77.00	228.00	140.00	173.00	R	145 - 17	145	171.00	67.00	217.60	106.00	131.00	R
135 - 35	135	201.00	78.00	228.00	95.00	115.00	R	145 - 18	145	201.00	70.00	207.00	60.00	80.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
145 - 19	145	201.00	70.00	227.50	120.00	140.00	R	159 - 3	159	227.00	90.00	260.00	120.00	205.00	R
145 - 20	145	201.00	70.00	228.00	70.00	90.00	R	159 - 4	159	251.00	107.00	334.00	190.00	210.00	AR
147 - 1	147	97.00	35.50	120.00	29.00	40.00	R	159 - 5	159	271.00	100.00	336.00	105.00	125.00	R
147 - 2	147	152.00	58.00	172.00	55.00	96.00	R	159 - 6	159	291.00	124.00	380.00	177.00	197.00	AR
147 - 3	147	166.00	58.00	180.00	75.00	103.00	R	162 - 1	162	251.00	105.00	334.00	190.00	210.00	AR
147 - 4	147	180.00	68.00	190.00	70.00	100.00	R	162 - 2	162	251.00	107.00	334.00	211.00	231.00	AR
147 - 5	147	181.00	68.00	190.00	90.00	120.00	R	162 - 3	162	261.00	95.00	365.00	172.00	202.00	AR
147 - 6	147	200.00	68.00	207.00	80.00	110.00	R	162 - 4	162	261.00	95.00	365.00	209.00	239.00	AR
147 - 7	147	201.00	72.00	216.00	80.00	113.00	R	162 - 5	162	261.00	95.00	365.00	252.00	282.00	AR
147 - 8	147	201.00	73.00	216.00	115.00	148.00	R	162 - 6	162	271.00	100.00	336.00	185.00	205.00	R
147 - 9	147	201.00	77.00	228.00	115.00	148.00	R	162 - 7	162	321.00	128.00	324.00	337.00	365.00	R
147 - 10	147	201.00	85.00	260.00	135.00	160.00	AR	162 - 8	162	330.00	135.00	428.00	250.00	280.00	AR
147 - 11	147	201.00	85.00	286.00	98.00	123.00	AR	162 - 9	162	331.00	122.00	406.00	230.00	250.00	R
147 - 12	147	202.00	72.00	228.00	108.00	143.00	R	162 - 10	162	332.00	133.00	428.00	254.00	289.00	AR
147 - 13	147	271.00	100.00	336.00	105.00	125.00	R	162 - 11	162	332.00	135.00	428.00	240.00	275.00	AR
147 - 14	147	271.00	100.00	336.00	185.00	205.00	R	162 - 12	162	332.00	136.00	430.00	250.00	280.00	AR
150 - 1	150	227.00	90.00	260.00	150.00	235.00	R	162 - 13	162	371.00	150.00	374.00	295.00	315.00	R
150 - 2	150	240.50	99.00	240.50	180.00	200.00	R	162 - 14	162	401.00	160.00	404.00	307.00	335.00	R
150 - 3	150	251.00	107.00	334.00	211.00	231.00	AR	162 - 15	162	401.00	160.00	404.00	420.00	420.00	R
150 - 4	150	261.00	95.00	365.00	209.00	239.00	AR	165 - 1	165	151.00	59.00	168.00	101.00	175.00	R
150 - 5	150	261.00	95.00	365.00	252.00	282.00	AR	165 - 2	165	171.00	67.00	217.60	46.00	71.00	R
150 - 6	150	271.00	100.00	336.00	185.00	205.00	R	165 - 3	165	171.00	67.00	217.60	76.00	101.00	R
150 - 7	150	272.00	102.00	370.00	200.00	240.00	AR	165 - 4	165	171.00	67.00	217.60	106.00	131.00	R
150 - 8	150	321.00	127.00	324.00	297.00	325.00	R	165 - 5	165	171.00	67.00	217.60	150.00	175.00	R
150 - 9	150	321.00	128.00	324.00	337.00	365.00	R	165 - 6	165	181.00	92.00	197.00	137.00	215.00	R
150 - 10	150	331.00	122.00	406.00	230.00	250.00	R	165 - 7	165	195.00	76.00	197.00	150.00	188.00	R
151 - 1	151	128.00	30.00	130.00	30.00	40.00	R	165 - 8	165	201.00	70.00	228.00	120.00	140.00	R
152 - 1	152	145.00	60.00	172.00	80.00	90.00	R	165 - 9	165	201.00	85.00	260.00	135.00	160.00	AR
152 - 2	152	160.50	70.00	161.00	137.00	154.00	R	165 - 10	165	201.00	85.00	260.00	172.00	197.00	AR
152 - 3	152	171.00	70.00	206.00	85.00	105.00	R	165 - 11	165	201.00	85.00	286.00	98.00	123.00	AR
152 - 4	152	171.00	70.00	206.00	98.00	118.00	R	168 - 1	168	180.00	62.00	197.00	106.00	151.00	R
152 - 5	152	171.00	70.00	206.00	115.00	135.00	R	168 - 2	168	190.50	79.00	190.50	140.00	160.00	R
152 - 6	152	171.00	70.00	206.00	150.00	170.00	R	168 - 3	168	202.00	72.00	228.00	108.00	143.00	R
152 - 7	152	181.00	67.00	260.00	220.00	250.00	AR	168 - 4	168	251.00	114.00	280.00	155.00	188.00	R
152 - 8	152	201.00	85.00	286.00	135.00	160.00	AR	171 - 1	171	151.00	80.00	172.00	77.00	108.00	R
152 - 9	152	201.00	85.00	286.00	172.00	197.00	AR	171 - 2	171	151.00	80.00	172.00	84.00	117.00	R
152 - 10	152	291.00	125.00	410.00	215.00	250.00	AR	171 - 3	171	179.00	72.00	197.00	66.00	115.00	R
153 - 1	153	261.00	95.00	365.00	172.00	202.00	AR	171 - 4	171	180.00	62.00	197.00	106.00	151.00	R
153 - 2	153	271.00	125.00	397.00	200.00	240.00	AR	171 - 5	171	271.00	100.00	336.00	105.00	125.00	R
155 - 1	155	160.50	70.00	161.00	100.00	117.00	R	171 - 6	171	271.00	100.00	336.00	185.00	205.00	R
155 - 2	155	160.50	70.00	171.00	123.00	143.00	R	171 - 7	171	275.00	115.00	367.00	160.00	180.00	AR
155 - 3	155	160.50	72.00	172.00	55.00	98.00	R	173 - 1	173	160.50	70.00	171.00	123.00	143.00	R
155 - 4	155	162.00	79.00	188.00	74.00	105.00	R	174 - 1	174	271.00	100.00	336.00	185.00	205.00	R
155 - 5	155	171.00	57.00	206.00	90.00	115.00	R	174 - 2	174	291.00	124.00	380.00	211.00	231.00	AR
155 - 6	155	171.00	57.00	206.00	129.50	165.00	R	174 - 3	174	300.00	114.00	300.80	210.00	230.00	R
155 - 7	155	171.00	72.00	206.00	140.00	165.00	R	174 - 4	174	321.00	127.00	324.00	262.00	290.00	R
155 - 8	155	182.00	85.00	243.00	105.00	125.00	R	174 - 5	174	321.00	128.00	324.00	297.00	325.00	R
155 - 9	155	200.00	74.00	243.00	152.00	175.00	R	174 - 6	174	331.00	114.00	335.00	222.00	250.00	R
156 - 1	156	115.00	35.00	139.00	30.00	40.00	R	174 - 7	174	331.00	120.00	406.00	230.00	250.00	R
156 - 2	156	116.00	78.00	139.00	30.00	40.00	R	175 - 1	175	160.50	70.00	171.00	80.00	90.00	R
159 - 1	159	201.00	72.00	216.00	80.00	113.00	R	175 - 2	175	160.50	70.00	171.00	100.00	110.00	R
159 - 2	159	201.00	77.00	228.00	115.00	148.00	R	175 - 3	175	160.50	70.00	171.00	150.00	160.00	R

List of "TAKACHIHO" Standard Commutators

(Dimensions in Millimeters)

No.	SB/n	B	D	A	L1	L2	Type	No.	SB/n	B	D	A	L1	L2	Type
175 - 4	175	171.00	57.00	206.00	70.00	95.00	R	200 - 6	200	291.00	122.00	383.00	155.00	190.00	AR
175 - 5	175	171.00	57.00	206.00	90.00	115.00	R	200 - 7	200	321.00	128.00	324.00	297.00	325.00	R
175 - 6	175	201.00	85.00	260.00	98.00	123.00	AR	200 - 8	200	355.00	129.00	404.00	275.00	303.00	R
175 - 7	175	201.00	85.00	260.00	135.00	160.00	AR	205 - 1	205	205.50	95.00	205.50	105.00	125.00	R
175 - 8	175	201.00	85.00	260.00	172.00	197.00	AR	205 - 2	205	240.50	99.00	240.50	112.00	132.00	R
175 - 9	175	241.00	90.00	294.00	160.00	180.00	R	205 - 3	205	240.50	99.00	240.50	150.00	170.00	R
180 - 1	180	241.00	85.00	241.00	120.00	140.00	R	205 - 4	205	261.00	95.00	365.00	172.00	202.00	AR
180 - 2	180	402.00	178.00	550.00	344.00	379.00	AR	205 - 5	205	261.00	95.00	365.00	252.00	282.00	AR
181 - 1	181	130.00	30.00	140.00	30.00	40.00	R	205 - 6	205	275.00	89.00	293.00	139.00	159.00	R
184 - 1	184	201.00	85.00	286.00	98.00	123.00	AR	207 - 1	207	401.00	160.00	404.00	307.00	335.00	R
184 - 2	184	201.00	85.00	286.00	135.00	160.00	AR	207 - 2	207	401.00	160.00	404.00	347.00	375.00	R
184 - 3	184	201.00	85.00	286.00	172.00	197.00	AR	210 - 1	210	240.50	99.00	240.50	180.00	200.00	R
184 - 4	184	202.00	72.00	228.00	108.00	143.00	R	210 - 2	210	271.00	100.00	336.00	185.00	205.00	R
184 - 5	184	205.50	95.00	205.50	140.00	160.00	R	210 - 3	210	275.00	89.00	293.00	139.00	159.00	R
184 - 6	184	227.00	90.00	260.00	150.00	235.00	R	210 - 4	210	321.00	127.00	324.00	262.00	290.00	R
184 - 7	184	240.50	100.00	240.50	180.00	200.00	R	210 - 5	210	331.00	120.00	406.00	230.00	250.00	R
184 - 8	184	241.00	98.00	300.00	180.00	210.00	R	210 - 6	210	331.00	135.00	428.00	250.00	280.00	AR
184 - 9	184	245.00	80.50	262.00	139.00	159.00	R	210 - 7	210	332.00	133.00	428.00	219.00	249.00	AR
184 - 10	184	251.00	107.00	334.00	165.00	185.00	AR	216 - 1	216	245.00	80.50	262.00	139.00	159.00	R
184 - 11	184	261.00	95.00	340.00	252.00	282.00	AR	216 - 2	216	280.50	112.00	283.00	120.00	140.00	R
184 - 12	184	261.00	95.00	365.00	172.00	202.00	AR	216 - 3	216	280.50	112.00	283.00	145.00	165.00	R
184 - 13	184	261.00	95.00	365.00	209.00	239.00	AR	216 - 4	216	282.00	100.00	282.00	120.00	140.00	R
184 - 14	184	291.00	125.00	410.00	170.00	205.00	AR	216 - 5	216	282.00	100.00	282.00	145.00	165.00	R
184 - 15	184	291.00	125.00	410.00	215.00	250.00	AR	216 - 6	216	291.00	125.00	410.00	170.00	205.00	AR
185 - 1	185	171.00	57.00	206.00	70.00	95.00	R	222 - 1	222	266.00	120.00	338.00	221.00	269.00	R
185 - 2	185	171.00	57.00	206.00	90.00	115.00	R	225 1	225	291.00	124.00	380.00	177.00	197.00	AR
185 - 3	185	171.00	57.00	206.00	140.00	165.00	R	225 2	225	401.00	160.00	404.00	232.00	260.00	R
185 - 4	185	171.00	52.00	217.60	95.00	135.00	R	225 3	225	401.00	160.00	404.00	272.00	300.00	R
185 - 5	185	201.00	70.00	228.00	70.00	90.00	R	225 4	225	401.00	160.00	404.00	307.00	335.00	R
185 - 6	185	201.00	85.00	260.00	135.00	160.00	AR	228 1	228	401.00	150.00	404.00	285.00	325.00	R
185 - 7	185	201.00	85.00	260.00	172.00	197.00	AR	230 1	230	240.50	100.00	240.50	180.00	200.00	R
185 - 8	185	201.00	85.00	286.00	98.00	123.00	AR	230 2	230	261.00	115.00	365.00	172.00	202.00	AR
185 - 9	185	222.50	75.00	242.00	143.00	163.00	R	232 1	232	291.00	124.00	380.00	177.00	197.00	AR
186 - 1	186	271.00	100.00	336.00	185.00	205.00	R	232 2	232	330.00	135.00	428.00	216.00	246.00	AR
186 - 2	186	321.00	127.00	324.00	262.00	290.00	R	232 3	232	331.00	122.00	406.00	160.00	180.00	R
186 - 3	186	321.00	128.00	324.00	297.00	325.00	R	232 4	232	331.00	135.00	430.00	250.00	280.00	AR
186 - 4	186	401.00	160.00	404.00	272.00	300.00	R	235 1	235	240.50	100.00	240.50	112.00	132.00	R
186 - 5	186	401.00	160.00	404.00	307.00	335.00	R	243 1	243	401.00	160.00	404.00	272.00	300.00	R
186 - 6	186	401.00	160.00	404.00	347.00	375.00	R	243 2	243	401.00	160.00	404.00	307.00	335.00	R
195 - 1	195	201.00	85.00	286.00	98.00	123.00	AR	243 3	243	401.00	150.00	570.00	305.00	334.00	AR
195 - 2	195	241.00	90.00	294.00	120.00	140.00	R	250 1	250	271.00	100.00	336.00	185.00	205.00	R
195 - 3	195	261.00	95.00	365.00	172.00	202.00	AR	261 1	261	401.00	160.00	404.00	272.00	300.00	R
195 - 4	195	271.00	100.00	336.00	104.00	125.00	R	264 1	264	331.00	120.00	406.00	160.00	180.00	R
195 - 5	195	331.00	120.00	406.00	160.00	180.00	R	264 2	264	332.00	133.00	428.00	185.00	220.00	AR
198 - 1	198	271.00	100.00	336.00	185.00	205.00	R	277 1	277	272.00	102.00	370.00	200.00	240.00	AR
198 - 2	198	314.00	105.50	460.00	310.00	325.00	AR	279 1	279	501.00	160.00	504.00	250.00	280.00	R
198 - 3	198	321.00	128.00	324.00	297.00	325.00	R	288 1	288	371.00	100.00	374.00	145.00	165.00	R
200 - 1	200	261.00	95.00	365.00	172.00	202.00	AR	312 1	312	550.00	246.00	554.00	350.00	380.00	R
200 - 2	200	261.00	95.00	365.00	209.00	239.00	AR	324 1	324	401.00	150.00	570.00	305.00	334.00	AR
200 - 3	200	261.00	95.00	365.00	252.00	282.00	AR	324 2	324	501.00	160.00	504.00	250.00	280.00	R
200 - 4	200	271.00	100.00	336.00	185.00	205.00	R	324 3	324	501.00	160.00	504.00	300.00	330.00	R
200 - 5	200	291.00	124.00	380.00	211.00	231.00	AR	324 4	324	550.00	186.00	554.00	270.00	300.00	R