

SPECIFICATION

For

FD-0.6/1KV-CVV

0.6/1(1.2)kV

PVC Insulated PVC Sheathed

Flame Retardant Control Cable

(0.6/1(1.2)kV, Cu/PVC/FR-PVC)

BY



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Rev.	Date	Description
0	26/5/2020	Issued specification
1	7/6/2022	- Correct the value in Table 1 - Cancel cable code "0010"
2	27/2/2024	Update specification
3	26/3/2024	Change marking on cable
4	12/12/2024	Update specification

APP. _____

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CUSTOMER

Customer Document	Rev.

Remark:

This document is based on the Customer Document for the structure and properties of electric wire and cable only. If there are different points, will be shown in deviation table.

1. Scope

This specification covers 1000V copper conductor polyvinyl chloride (PVC) insulated polyvinyl chloride (PVC) sheathed flame retardant control cable.

The cable shall be in accordance with IEC 60502-1 : 2021.

- Flame retardant test requirements per IEC 60332-1.
- Flame propagation test requirements per IEC 60332-3-24; Category C.

2. Conductor

The conductor shall be flexible stranded uncoated annealed copper conductor in accordance with IEC 60228 : 2004, Class 5.

For size 1.5 to 4 mm² : The direction of lay shall be left-hand (S) lay.

For size 6 and 10 mm² : The direction of lay shall be right-hand (Z) lay.

3. Insulation

The insulation shall be polyvinyl chloride (PVC/A) compound meet the requirements of IEC 60502-1 : 2021.

The average thickness of the insulation shall be not less than that given in Table 1.

The minimum thickness shall not fall below 90% of the nominal value in Table 1 by more than 0.1 mm.

4. Cabling

The individual insulated cores shall be cabled together with suitable non-hygroscopic filler to give the completed cable a substantially circular cross section.

The direction of lay shall be left-hand (S) lay in the outer layer.

A suitable binder tape shall be applied helically over the cabled core.

5. Core Identification

The cores shall be identified by color or numerals printed on the insulation, as follows :

2-cores : blue, brown

3-cores : brown, black, grey

4-cores : blue, brown, black, grey

For 5-cores to 30-cores :

The cores shall be identified by the arabic numerals printed longitudinally and continuously on the surface of black insulation.

6. Sheath

The sheath shall be sunlight resistant and flame retardant polyvinyl chloride (PVC/ST1) compound meet the requirements of IEC 60502-1 : 2021.


The average thickness of the sheath shall be not less than that given in Table 1.

The minimum thickness shall not fall below 80% of the nominal value in Table 1 by more than 0.2 mm.

The color of the sheath shall be black.

7. Marking on Cable

The marking items shall be marked by printed at intervals not exceeding 1 meter with suitable means throughout the length of cable.

1. Manufacturer's name and/or trade mark "  YAZAKI.....: TYE"
2. Year of manufacture
3. Flame retardant "FD"
4. Rated circuit voltage "0.6/1KV"
5. Type of conductor "CU"
6. Type of insulation and sheath "PVC/PVC"
7. Type of cable "CONTROL CABLE"
8. Number of cores and size of conductor
9. The continuous reel length marking (in figure) shall be made on the sheath at every 1 meter

8. Test and Properties

The cable shall be meet the requirements in Test and Inspection and Table 1, when tested in accordance with IEC 60502-1 : 2021, IEC 60228 : 2004, IEC 60332-1 and IEC 60332-3-24; Category C.


Remark: Sunlight resistant test meet the requirement of TIS 293-2541.

9. Packing

The cable shall be placed on non-returnable wooden reels.

The reels shall be covered with suitable covering to provide the cable with physical protection during transportation and during ordinary storage and handling operations.

Each reel shall be clearly marked as follows.

1. Designation "FD-0.6/1KV-CVV"
2. Number of cores and size of conductor
3. Cable length
4. Net and gross weight
5. Manufacturer's name and/or trade mark " **YAZAKI** "
6. Rolling direction of reel

Test and Inspection

Routine Tests

- Maximum conductor resistance, Ohm/km specified in Table 1
- AC test voltage for 5 minutes, kV3.5

Sample Tests

- Construction.....specified in Table 1

Type Tests

- Flame retardant tested according to IEC 60332-1.
- Flame propagation test according to IEC 60332-3-24; Category C

Definition concerning the tests

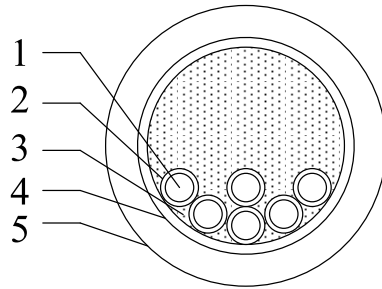
Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

Sample tests: Tests made by the manufacturer on samples of completed cable or components taken from a completed cable, at a specified frequency, so as to verify that the finished product meets the specified requirements.

Type tests: Tests made before supplying, on a general commercial basis, a type of cable covered by this standard, in order to demonstrate satisfactory performance characteristics to meet the intended application.

Cable structure

Cross-sectional (Not scale)



No.	Structure	Material
1	Conductor	Flexible stranded annealed copper
2	Insulation	Polyvinyl chloride (PVC/A) compound
3	Filler	Non-hygroscopic
4	Binder Tape	Spun bond tape or suitable tape
5	Sheath	Flame retardant polyvinyl chloride (PVC/ST1) compound

Application: For supervisory electrical equipment, station control circuits, outdoor, suitable installation in the dry or wet cable trenches. Maximum conductor temperature of 70°C for normal operation and 160°C for short circuit conditions.

Table 1

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
2	1.5	Flexible	1.55	0.8	1.8	12.0	13.3	140	300
2	2.5	Flexible	2.00	0.8	1.8	12.5	7.98	169	300
2	4	Flexible	2.60	1.0	1.8	14.5	4.95	238	300
2	6	Flexible	3.40	1.0	1.8	16.0	3.30	304	300
2	10	Flexible	4.60	1.0	1.8	18.5	1.91	449	300
3	1.5	Flexible	1.55	0.8	1.8	12.0	13.3	162	300
3	2.5	Flexible	2.00	0.8	1.8	13.0	7.98	204	300
3	4	Flexible	2.60	1.0	1.8	15.0	4.95	290	300
3	6	Flexible	3.40	1.0	1.8	17.0	3.30	389	300
3	10	Flexible	4.60	1.0	1.8	19.5	1.91	575	300
4	1.5	Flexible	1.55	0.8	1.8	13.0	13.3	192	300
4	2.5	Flexible	2.00	0.8	1.8	14.0	7.98	245	300
4	4	Flexible	2.60	1.0	1.8	16.5	4.95	358	300
4	6	Flexible	3.40	1.0	1.8	18.5	3.30	483	300
4	10	Flexible	4.60	1.0	1.8	21.0	1.91	728	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
5	1.5	Flexible	1.55	0.8	1.8	14.0	13.3	228	300
5	2.5	Flexible	2.00	0.8	1.8	15.5	7.98	288	300
5	4	Flexible	2.60	1.0	1.8	18.0	4.95	433	300
5	6	Flexible	3.40	1.0	1.8	20.0	3.30	589	300
5	10	Flexible	4.60	1.0	1.8	23.5	1.91	886	300
6	1.5	Flexible	1.55	0.8	1.8	15.0	13.3	263	300
6	2.5	Flexible	2.00	0.8	1.8	16.5	7.98	337	300
6	4	Flexible	2.60	1.0	1.8	19.5	4.95	502	300
6	6	Flexible	3.40	1.0	1.8	22.0	3.30	690	300
6	10	Flexible	4.60	1.0	1.8	25.5	1.91	1053	300
7	1.5	Flexible	1.55	0.8	1.8	15.0	13.3	281	300
7	2.5	Flexible	2.00	0.8	1.8	16.5	7.98	363	300
7	4	Flexible	2.60	1.0	1.8	19.5	4.95	546	300
7	6	Flexible	3.40	1.0	1.8	22.0	3.30	755	300
7	10	Flexible	4.60	1.0	1.8	25.5	1.91	1159	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
8	1.5	Flexible	1.55	0.8	1.8	16.5	13.3	324	300
8	2.5	Flexible	2.00	0.8	1.8	17.5	7.98	419	300
8	4	Flexible	2.60	1.0	1.8	21.0	4.95	637	300
8	6	Flexible	3.40	1.0	1.8	23.5	3.30	880	300
8	10	Flexible	4.60	1.0	1.8	27.5	1.91	1350	300
9	1.5	Flexible	1.55	0.8	1.8	17.5	13.3	364	300
9	2.5	Flexible	2.00	0.8	1.8	19.0	7.98	468	300
9	4	Flexible	2.60	1.0	1.8	22.5	4.95	718	300
9	6	Flexible	3.40	1.0	1.8	25.5	3.30	996	300
9	10	Flexible	4.60	1.0	1.8	30.0	1.91	1540	300
10	1.5	Flexible	1.55	0.8	1.8	18.5	13.3	399	300
10	2.5	Flexible	2.00	0.8	1.8	20.0	7.98	516	300
10	4	Flexible	2.60	1.0	1.8	24.0	4.95	791	300
10	6	Flexible	3.40	1.0	1.8	27.0	3.30	1086	300
10	10	Flexible	4.60	1.0	1.8	32.0	1.91	1694	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
11	1.5	Flexible	1.55	0.8	1.8	18.5	13.3	415	300
11	2.5	Flexible	2.00	0.8	1.8	20.0	7.98	542	300
11	4	Flexible	2.60	1.0	1.8	24.0	4.95	821	300
11	6	Flexible	3.40	1.0	1.8	27.0	3.30	1155	300
11	10	Flexible	4.60	1.0	1.9	32.0	1.91	1797	300
12	1.5	Flexible	1.55	0.8	1.8	19.0	13.3	442	300
12	2.5	Flexible	2.00	0.8	1.8	21.0	7.98	590	300
12	4	Flexible	2.60	1.0	1.8	25.0	4.95	897	300
12	6	Flexible	3.40	1.0	1.8	28.0	3.30	1262	300
12	10	Flexible	4.60	1.0	2.0	33.5	1.91	1982	300
13	1.5	Flexible	1.55	0.8	1.8	20.0	13.3	476	300
13	2.5	Flexible	2.00	0.8	1.8	22.0	7.98	632	300
13	4	Flexible	2.60	1.0	1.8	26.0	4.95	970	300
13	6	Flexible	3.40	1.0	1.9	30.0	3.30	1362	300
13	10	Flexible	4.60	1.0	2.0	35.5	1.91	2135	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor strands (No./mm)	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
14	1.5	Flexible	1.55	0.8	1.8	20.0	13.3	481	300
14	2.5	Flexible	2.00	0.8	1.8	22.0	7.98	648	300
14	4	Flexible	2.60	1.0	1.8	26.0	4.95	999	300
14	6	Flexible	3.40	1.0	1.9	30.0	3.30	1408	300
14	10	Flexible	4.60	1.0	2.0	35.5	1.91	2216	300
15	1.5	Flexible	1.55	0.8	1.8	20.5	13.3	517	300
15	2.5	Flexible	2.00	0.8	1.8	22.5	7.98	696	300
15	4	Flexible	2.60	1.0	1.8	27.0	4.95	1068	300
15	6	Flexible	3.40	1.0	1.9	31.0	3.30	1523	300
15	10	Flexible	4.60	1.0	2.1	37.0	1.91	2402	300
16	1.5	Flexible	1.55	0.8	1.8	21.0	13.3	537	300
16	2.5	Flexible	2.00	0.8	1.8	23.0	7.98	727	300
16	4	Flexible	2.60	1.0	1.8	27.5	4.95	1115	300
16	6	Flexible	3.40	1.0	1.9	31.5	3.30	1590	300
16	10	Flexible	4.60	1.0	2.1	37.5	1.91	2513	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
17	1.5	Flexible	1.55	0.8	1.8	22.0	13.3	594	300
17	2.5	Flexible	2.00	0.8	1.8	24.0	7.98	786	300
17	4	Flexible	2.60	1.0	1.8	29.0	4.95	1221	300
17	6	Flexible	3.40	1.0	2.0	33.5	3.30	1755	300
17	10	Flexible	4.60	1.0	2.2	40.0	1.91	2758	300
18	1.5	Flexible	1.55	0.8	1.8	22.0	13.3	595	300
18	2.5	Flexible	2.00	0.8	1.8	24.0	7.98	797	300
18	4	Flexible	2.60	1.0	1.8	29.0	4.95	1231	300
18	6	Flexible	3.40	1.0	2.0	33.5	3.30	1769	300
18	10	Flexible	4.60	1.0	2.2	40.0	1.91	2800	300
19	1.5	Flexible	1.55	0.8	1.8	22.0	13.3	613	300
19	2.5	Flexible	2.00	0.8	1.8	24.0	7.98	823	300
19	4	Flexible	2.60	1.0	1.8	29.0	4.95	1275	300
19	6	Flexible	3.40	1.0	2.0	33.5	3.30	1832	300
19	10	Flexible	4.60	1.0	2.2	40.0	1.91	2904	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
20	1.5	Flexible	1.55	0.8	1.8	22.5	13.3	646	300
20	2.5	Flexible	2.00	0.8	1.8	24.5	7.98	867	300
20	4	Flexible	2.60	1.0	1.9	30.0	4.95	1362	300
20	6	Flexible	3.40	1.0	2.0	34.5	3.30	1939	300
21	1.5	Flexible	1.55	0.8	1.8	23.0	13.3	671	300
21	2.5	Flexible	2.00	0.8	1.8	25.0	7.98	905	300
21	4	Flexible	2.60	1.0	1.9	30.5	4.95	1421	300
21	6	Flexible	3.40	1.0	2.0	35.0	3.30	2024	300
22	1.5	Flexible	1.55	0.8	1.8	24.5	13.3	714	300
22	2.5	Flexible	2.00	0.8	1.8	26.5	7.98	962	300
22	4	Flexible	2.60	1.0	1.9	32.0	4.95	1508	300
22	6	Flexible	3.40	1.0	2.1	37.0	3.30	2163	300
23	1.5	Flexible	1.55	0.8	1.8	24.5	13.3	734	300
23	2.5	Flexible	2.00	0.8	1.8	26.5	7.98	990	300
23	4	Flexible	2.60	1.0	1.9	32.0	4.95	1556	300
23	6	Flexible	3.40	1.0	2.1	37.0	3.30	2237	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
24	1.5	Flexible	1.55	0.8	1.8	25.5	13.3	766	300
24	2.5	Flexible	2.00	0.8	1.8	28.0	7.98	1033	300
24	4	Flexible	2.60	1.0	2.0	34.0	4.95	1641	300
24	6	Flexible	3.40	1.0	2.2	39.5	3.30	2354	300
25	1.5	Flexible	1.55	0.8	1.8	25.5	13.3	789	300
25	2.5	Flexible	2.00	0.8	1.8	28.0	7.98	1065	300
25	4	Flexible	2.60	1.0	2.0	34.0	4.95	1694	300
25	6	Flexible	3.40	1.0	2.2	39.5	3.30	2432	300
26	1.5	Flexible	1.55	0.8	1.8	25.5	13.3	812	300
26	2.5	Flexible	2.00	0.8	1.8	28.0	7.98	1098	300
26	4	Flexible	2.60	1.0	2.0	34.0	4.95	1749	300
26	6	Flexible	3.40	1.0	2.2	39.5	3.30	2512	300
27	1.5	Flexible	1.55	0.8	1.8	26.0	13.3	832	300
27	2.5	Flexible	2.00	0.8	1.8	28.5	7.98	1127	300
27	4	Flexible	2.60	1.0	2.0	35.0	4.95	1793	300
27	6	Flexible	3.40	1.0	2.2	40.5	3.30	2577	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor type	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20°C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
28	1.5	Flexible	1.55	0.8	1.8	27.0	13.3	896	300
28	2.5	Flexible	2.00	0.8	1.8	29.5	7.98	1211	300
28	4	Flexible	2.60	1.0	2.1	36.5	4.95	1939	300
29	1.5	Flexible	1.55	0.8	1.8	27.0	13.3	888	300
29	2.5	Flexible	2.00	0.8	1.8	29.5	7.98	1204	300
29	4	Flexible	2.60	1.0	2.1	36.5	4.95	1933	300
30	1.5	Flexible	1.55	0.8	1.8	27.0	13.3	911	300
30	2.5	Flexible	2.00	0.8	1.8	29.5	7.98	1237	300
30	4	Flexible	2.60	1.0	2.1	36.5	4.95	1988	300