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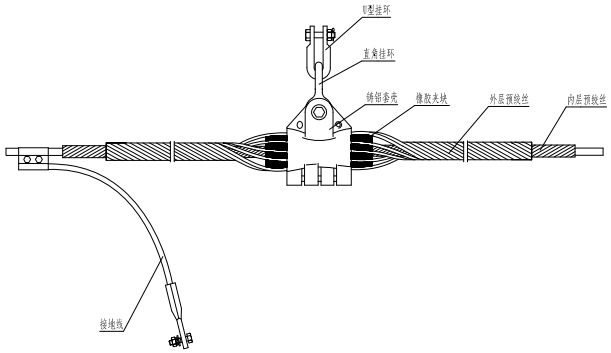
Optical fiber composite overhead ground wire（OPGW）

Part 1 Optical fiber composite overhead ground wire (OPGW) with performed helical fittings

1.OPGW performed helical suspension clamp



Composition: inner twisted wire、Outer twisted wire、Rubber block and cast aluminum shell.

Uses： To play a supportive role, the optical fiber composite overhead ground wire (OPGW) are hung on a straight line on the tower.

Features: **a** Suspension and OPGW cable has a larger contact area, stress distribution uniform, no stress concentration points, play better on cable protection, at the same time enhancing the stiffness of cables at hanging point location.

b There is a good dynamic stress capacity, can provide sufficient grip strength (14 ~ 18% RTS) in order to maintain OPGW cables in the long run under the conditions of unbalanced load for safe operation.

c. Suspension of overhanging angle to meet the 15 ° ~ 18 °

d. The structure coupled with flexible rubber clip block, enhanced self-damping to reduce abrasion.

e. rounded end processing, increased corona voltage.

f. high-quality aluminum alloy material to enhance the mechanical properties of the clamp and corrosion resistance, significantly extended service life.

Technical requirements: meet the DL / T 766-2003 optical fiber composite overhead ground wire (OPGW) with the preformed helical fittings technical requirements and test methods.

Order Notes: a. According to the diameter of OPGW cable parameters such as selection of suitable Suspension.

b. the number of configurations as follows: 1 set / line tower.

c. The lay direction of inner twisted wire is opposite with lay direction of the outer twist wire, the standard configuration: Lay direction for OPGW outer twisted wire is right, If left, it should be specified in the order contract.

d. According the mount point on the tower, select the appropriate link fittings (such as the U-screws, U-type hanging ring, UB clevis etc.).

e. Clamp Strength is divided into 70kN, 100kN , 120KN and so on.

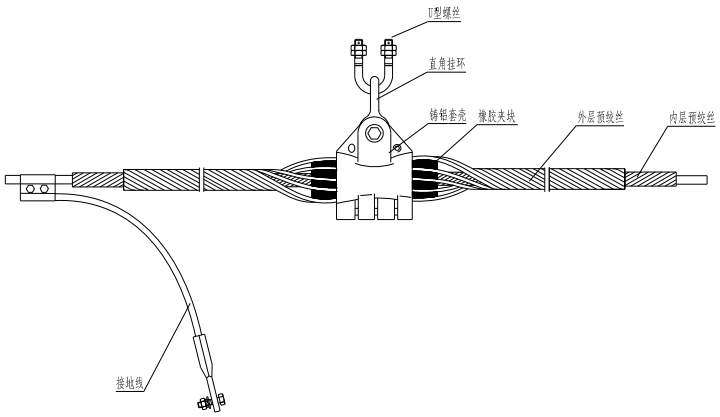
OPGW preformed helical suspension clamp parameter table:

Model	For cable diameter（mm）	Pre-twisted wire length of the inner （mm）	Pre-twisted wire length of the outer （mm）	☒Clamp quality （kg）
OXC-**	7.8-9.7	1600	1000	4.12
OXC-**	9.8-11.5	1800	1200	4.26
OXC-**	11.6-14.1	2000	1400	4.76
OXC-**	14.2-16.1	2200	1600	5.57
OXC-**	16.2-20.0	2600	2000	7.62

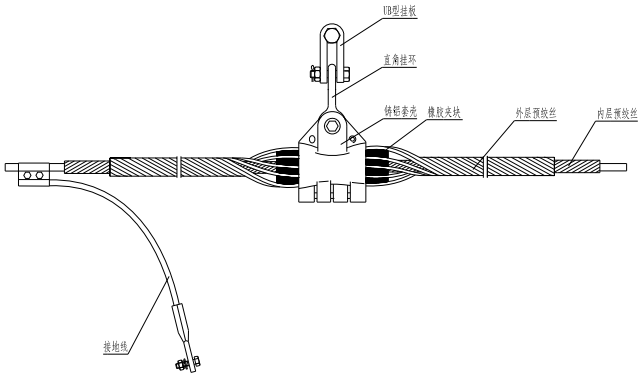
Note :**-- on behalf of Cable diameter (mm)

OPGW preformed helical suspension clamp hanging model:

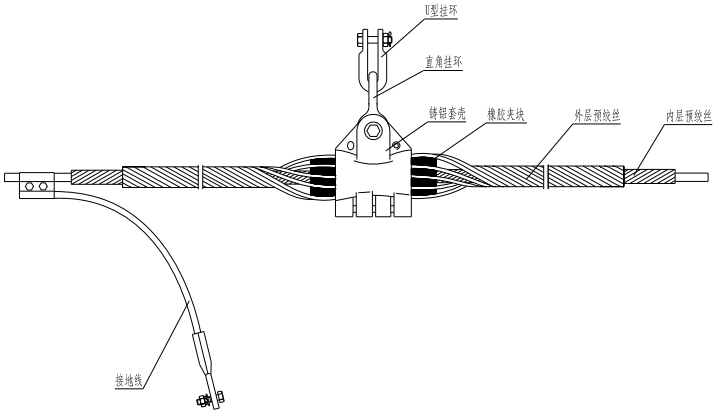
U screw type-



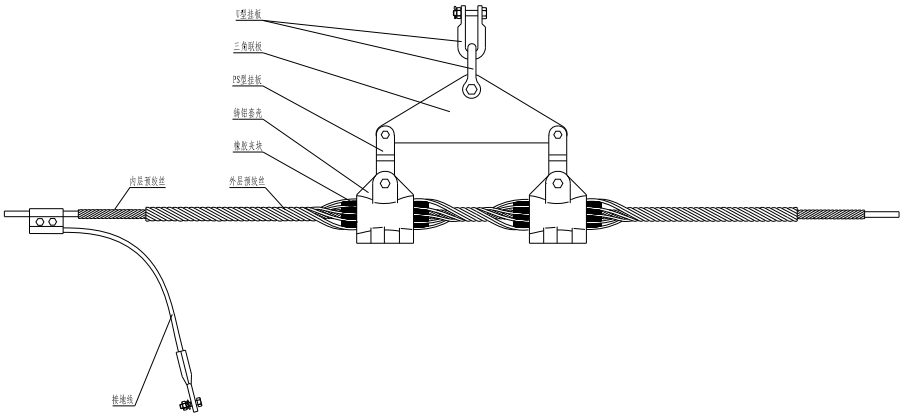
UB hanging plate



U-hang ring



2. OPGW preformed double Suspension



Composition: inner twisted wire, the outer twisted wire, two sets of rubber clip block, two sets of cast aluminum shell and connecting fittings.

Uses: play a supportive role, the optical fiber composite overhead ground wire (OPGW) are hung on a straight line on the tower.

Features: a. Suspension OPGW cable with a larger contact area, stress distribution uniform, no stress concentration points, play better on cable protection, at the same time enhancing the stiffness of cables at hanging point location.

b. there is a better dynamic stress capacity, can provide sufficient grip strength (20% RTS) to maintain OPGW cables in the long run

under the conditions of unbalanced load for safe operation.

c. Suspension of overhanging angle to meet the 30 ° ~ 36 °.

d. The structure coupled with flexible rubber clip block, enhanced self-damping to reduce abrasion.

e. rounded end processing, increased corona voltage.

f. high-quality aluminum alloy material to enhance the mechanical properties of the clamp and corrosion resistance, significantly extended service life.

Technical requirements: meet the DL / T 766-2003 optical fiber composite overhead ground wire (OPGW) with the preformed helical fittings technical requirements and test methods.

Ordering Information:

a. According to the diameter of OPGW cable parameters such as selection of suitable Suspension. Dual-Suspension is mainly used for large cross rivers, high drop in the valley, heavy ice and other special places.

b. the number of configurations as follows: 1 set / line tower.

c. The lay direction of inner twisted wire is opposite with lay direction of the outer twist wire, the standard configuration: Lay direction for OPGW outer twisted wire is right, If left, it should be specified in the order contract.

d. According the mount point on the tower, select the appropriate link fittings (such as the U-screws, U-type hanging ring, UB clevis etc.).

e. Clamp strength is divided into 100kN, 120kN, 160KN and so on.

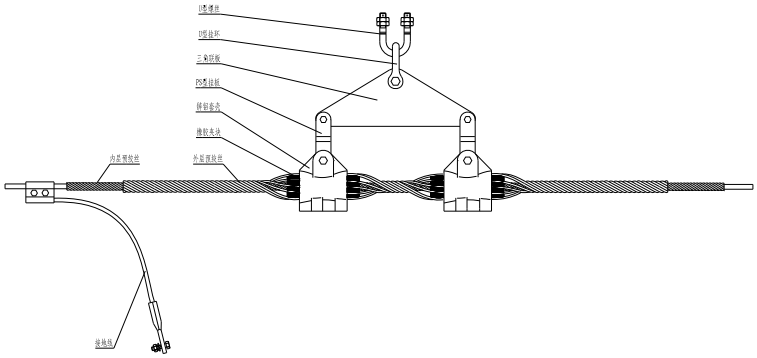
OPGW preformed helical suspension clamp Model Parameter table:

Model	applicable cable diameter （mm）	inner layer twisted wire length(mm)	outer layer twisted wire length(mm)	Center distance （mm）	clamp quality （kg）
OSXC-**	9.80-14.10	2260	1660	460	12.25
OSXC-**	14.20-16.10	2360	1760	560	13.92
OSXC-**	16.20-20.00	2660	2060	660	17.32

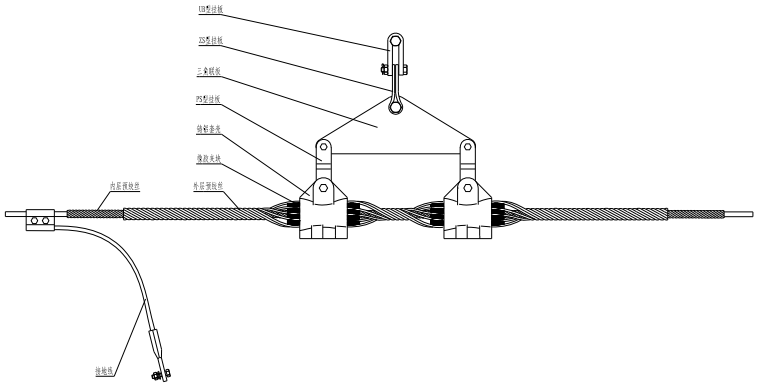
Note :**-- on behalf of Cable diameter (mm)

OPGW preformed double-Suspension clamp connection method:

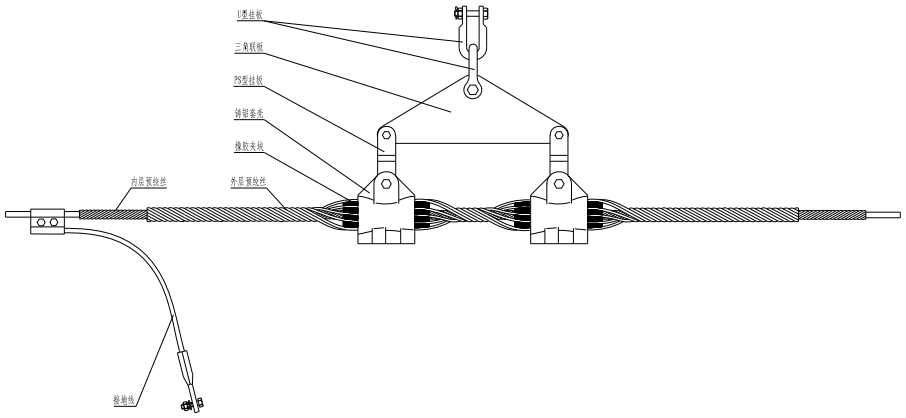
U-type screw



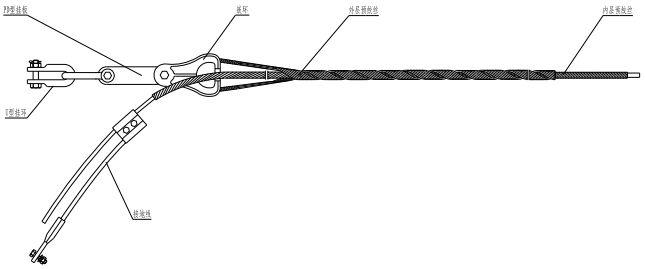
UB hanging plate



U-hang ring



3. OPGW the preformed helical tension Clamp



Composition: inner twisted wire, the outer twisted wire, thimble, PD-type clevis, U-type hanging ring.

Purposes: to afford the whole tension, make the optical fiber composite overhead ground wire (OPGW) connect to tension tower.

Features: a. uniform stress distribution, no stress concentration points, well protect fiber optic cable.

b. under the premise of not more than the lateral compressive strength of fiber optic cable the fiber, the clamp have greater holding power, able to withstand greater tension.

c. The holding force not less than fiber optic cable rated tensile strength (RTS) 95%, not damage OPGW cable at the same time.

d. high-quality aluminum-clad steel material, improve the mechanical properties of the clamp and corrosion resistance.

Technical requirements: meet the DL / T 766-2003 optical fiber composite overhead ground wire (OPGW) with the preformed helical fittings technical requirements and test methods.

Ordering Information:

a. According to OPGW cable rated tensile strength and diameter to select the appropriate Clamp.

b. the number of configurations: one set / Terminal Tower (including gantry); 2 sets / Tension tower.

c. The lay direction of inner twisted wire is opposite with lay direction of the outer twist wire, the standard configuration: Lay direction for OPGW outer twisted wire is right, If left, it should be specified in the order contract.

d. The clamp afford a full tension, it was proposed to use one-time.

e. provide the model type for the first tower connected with the fittings.

f. Clamp strength is divided into 70kN, 100kN, 120kN and so on.

OPGW preformed helical tension clamp Specification Model Parameter table:

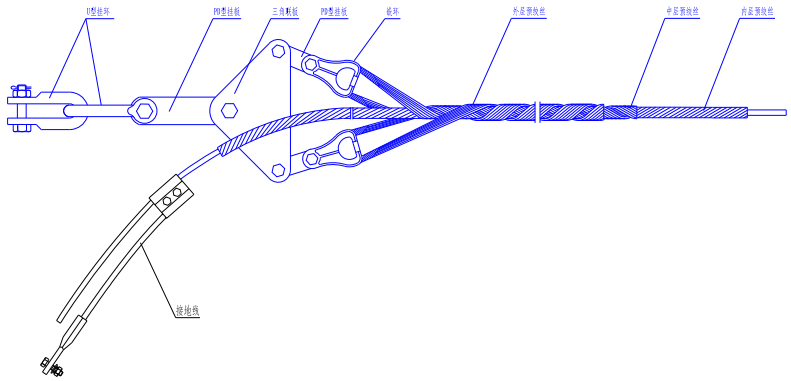
Model	Scope		The scope of the inner twisted wire					Ou
	Minimum diameter㎜	Maximum diameter㎜	The length of twisted wire㎜	The composition of root number	Single-wire diameter㎜	Weight（kg）	The length of twisted wire㎜	The compositio root numb
ONZ-0940/60	9.0	9.4	1450	12	2.5	0.59	950	7

ONZ-0990/ 60	9.5	9.9	1450	13	2.5	0.64	950	7
ONZ-1040/ 80	10.0	10.4	1550	13	2.5	0.69	1050	7
ONZ-1090/ 80	10.5	10.9	1550	14	2.5	0.74	1050	7
ONZ-1150/ 80	11.0	11.5	1550	14	2.5	0.74	1050	7
ONZ-1190/ 100	11.6	11.9	1600	15	2.5	0.82	1100	8
ONZ-1240/ 100	12.0	12.4	1600	16	2.5	0.87	1100	8
ONZ-1290/ 100	12.5	12.9	1600	16	2.5	0.87	1100	8
ONZ-1340/ 100	13.0	13.4	1700	16	2.5	0.92	1200	7
ONZ-1390/ 100	13.5	13.9	1700	15	3.0	1.28	1200	8
ONZ-1440/ 100	14.0	14.4	1750	15	3.0	1.31	1250	8
ONZ-1490/ 100	14.5	14.9	1750	15	3.0	1.31	1250	8
ONZ-1540/ 100	15.0	15.5	1750	15	3.0	1.31	1250	8
ONZ-1590/ 100	15.5	15.9	1850	16	3.0	1.48	1350	8
ONZ-1640/ 100	16.0	16.4	1850	16	3.0	1.48	1350	8
ONZ-1690/ 100	16.5	16.9	1850	16	3.0	1.48	1350	8
ONZ-1740/ 100	17.0	17.4	1850	17	3.0	1.57	1350	8
ONZ-0940/ 80	9.0	9.4	1700	12	2.5	0.69	1200	7
ONZ-0990/ 80	9.5	9.9	1700	13	2.5	0.75	1200	7
ONZ-1040/ 100	10.0	10.4	1800	13	2.5	0.80	1300	7
ONZ-1090/ 100	10.5	10.9	1800	14	2.5	0.86	1300	7
ONZ-1150/ 100	11.0	11.5	1800	14	2.5	0.86	1300	7
ONZ-1190/	11.6	11.9	1900	15	2.5	0.97	1400	7

120								
ONZ-1240/ 120	12.0	12.4	1900	15	2.5	0.97	1400	7
ONZ-1290/ 120	12.5	12.9	1900	16	2.5	1.03	1400	7
ONZ-1340/ 120	13.0	13.4	2000	14	3.0	1.40	1500	8
ONZ-1390/ 120	13.5	13.9	2000	15	3.0	1.50	1500	8
ONZ-1440/ 120	14.0	14.4	2100	15	3.0	1.58	1600	8
ONZ-1490/ 120	14.5	14.9	2100	15	3.0	1.58	1600	8
ONZ-1540/ 120	15.0	15.5	2100	15	3.0	1.58	1600	8
ONZ-1590/ 120	15.5	15.9	2300	16	3.0	1.84	1750	8
ONZ-1640/ 120	16.0	16.4	2300	16	3.0	1.84	1750	8
ONZ-1690/ 120	16.5	16.9	2300	16	3.0	1.84	1750	8
ONZ-1740/ 120	17.0	17.4	2300	17	3.0	1.96	1750	8
ONZ-1440/ 160	14.0	14.4	2300	15	3.0	1.73	1750	7
ONZ-1490/ 160	14.5	14.9	2300	15	3.0	1.73	1750	7
ONZ-1540/ 160	15.0	15.4	2300	15	3.0	1.73	1750	7
ONZ-1590/ 160	15.5	15.9	2300	16	3.0	1.84	1750	7
ONZ-1640/ 160	16.0	16.4	2300	16	3.0	1.84	1750	7
ONZ-1690/ 160	16.5	16.9	2300	16	3.0	1.84	1750	7
ONZ-1740/ 160	17.0	17.4	2300	17	3.0	1.96	1750	7
ONZ-1790/ 160	17.5	17.9	2300	17	3.0	1.96	1750	7
ONZ-1840/ 160	18.0	18.4	2300	18	3.0	2.07	1750	7

Note :**-- on behalf of Cable diameter (mm)

4. OPGW preformed double tension clamp



components: the inner twisted wire, middle twisted wire, outer twisted wire, thimble, PD-type clevis, tri-angle yoke plates, U-type link.

Purposes: to afford the whole tension, make the optical fiber composite overhead ground wire (OPGW) connect to tension tower.

Features: a. uniform stress distribution, no stress concentration points, can well protect fiber optic cable.

b. In the lateral compressive strength of not more than fiber optic cable under the premise of the fiber optic cable have greater holding power, able to withstand greater tension.

c. The holding force of the fiber optic cable fiber optic cable rated tensile strength of not less than (RTS) 95%, while not damage OPGW cable.

d. high-quality aluminum-clad material, to improve the mechanical properties of the clamp and corrosion resistance.

Technical requirements: meet the DL / T 766-2003 optical fiber composite overhead ground wire (OPGW) with the pre-cutter-style fittings technical requirements and test methods.

Ordering Information:

a. across the river is mainly used for large, high drop in the valley, heavy ice and other special places. Can provide 160 ~ 300kN grip of the clamp.

b. According to OPGW cable rated tensile strength and diameter to select the appropriate Clamp,

c. the number of configurations: one set / Terminal Tower (including gantry); 2 sets / Tension tower.

d. The inner clamp to the pre-twisted wire with OPGW outer spiral twist to the contrary, the standard configuration in accordance with OPGW outer stranding to the right-hand, such as a L, should be specified in the order contract.

e. The clamp to withstand a full tension, it was proposed one-time use.

f. provide the first tower to connect only with a gold pattern.

g. Clamp intensity is divided into 160kN, 210kN, 250kN, 300kN and so on.

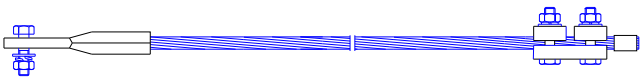
OPGW double tension Clamp Specifications Model Parameter table:

Model	Clamp grip	length of the	length of the	length of the	Clamp quality

	（kN）	Inner twisted wire（mm）	middle twisted wire（mm）	outer twisted wire（mm）	（kg）
OSNZ-160-**	160	2400	1700	1600	15.3
OSNZ-210-**	210	2500	1200	1700	21.4
OSNZ-250-**	250	2600	1900	1800	27.1
OSNZ-300-**	300	2700	2000	1900	34.9

Note :**-- on behalf of Cable diameter (mm)

5.JDX-type grounding wire



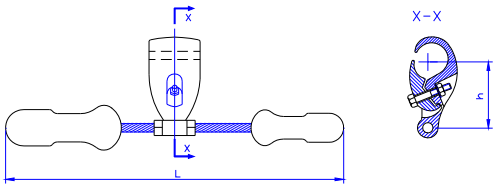
Components: multi-strand aluminum twisted wire, cast aluminum parallel groove clamp, terminals and so on.

Purpose: provide access to short-circuit current. When in the power system grounding

Grounding wire specification model parameter table:

Model	Aluminum Stranded cross-section（mm^2）	Length L (mm)	Parallel groove clamp model	quality (kg)
JDX-70/1500	70	1500	JB-2	0.76
JDX-70/2000	70	2000	JB-2	0.86
JDX-95/1500	95	1500	JB-2	0.87
JDX-95/2000	95	2000	JB-2	1.00
JDX-120/1500	120	1500	JB-3	1.24
JDX-120/2000	120	2000	JB-3	1.41
JDX-150/1500	150	1500	JB-3	1.36
JDX-150/2000	150	2000	JB-3	1.56
JDX-185/1500	185	1500	JB-4	1.63
JDX-185/2000	185	2000	JB-4	1.88

6.4D-type vibration damper



Composition: hot galvanized casting iron hammer, hot galvanized steel twisted wire, aluminum alloy clamp, stainless steel bolts.

Purposes: to eliminate or reduce the vibration when the fiber optic cable operate under the influence of kinds of factor, then protection of cables and fittings.

Features: using a typical Harrow design, the basic principles : dynamic absorbing energy, frequency protection range from 6Hz to 150Hz, and in this range it has four resonant frequencies.

Technical requirements: comply with GB / T 2336-2000 anti-vibration hammer technological conditions.

Order Information: Users must provide the following information for specific projects the company can make corresponding vibration programs:

a. line tower schedule.

b. topography, landforms (plains, hills, mountains, forests, across rivers).

c. Cable specification model and relevant parameters - diameter (mm), nominal tensile strength (N), unit weight (kg / m) and so on.

Damper Specifications Model and Parameter table:

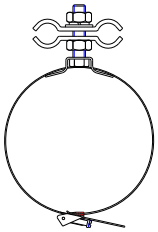
Model	Aluminum clip Specifications	Clamping range (mm)	Total length (mm)	Clamp Length （mm）	Clamp Height (mm)	Quality (kg)
4D30	27	27.0-22.5	383	52	70	2.5
	23.4	23.4-19.5			72	
	20.3	20.3-16.5			73	
4D20	23.4	23.4-19.5	330	52	72	1.4
	20.3	20.3-16.5			73	
	18	18.0-15.0			65	
4D10	18	18.0-15.0			65	1.0
	16	16.0-13.3			63	
	14	14.0-12.2			62	
Note: 4D10, 4D20, 4D30-type anti-vibration hammer in accordance with applicable cable diameter and select the appropriate size of the aluminum clip.						

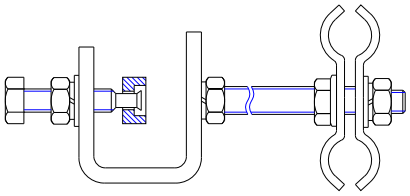
Armor rod for anti-vibration hammer: In order to avoid the damage when anti-vibration hammer clamp gripping the OPGW cable, coupled with aluminum alloy armor rod, protection cable, at the same time the system play a role in anti-vibration .

Specifications Model representation: HXT-Length (mm)-**。

**-- On behalf of Cable diameter (mm).

7.OPGW downlead clamp





Steel rod type downlead clamp for pole

hot-dip galvanized downlead clamp for Tower-type

Usage: In the fiber optical cable terminal and following-tower area, fix the fiber optic cable on the pole downleading from pole and tower, keep them not move, avoid cable abrasion. As usual install one at intervals of 1.5 meters.

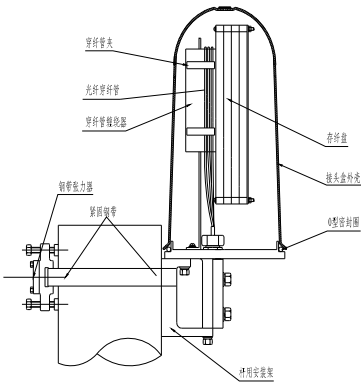
Downlead clamp Specifications Model and Parameter table:

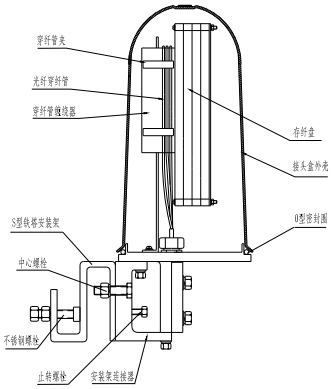
Model	Structure type	available cable diameter (mm)	Quality (kg)	Remark
OYDZ-0100	hot-dip galvanizing	6.9-10.0	0.8	Tower used
OYDZ-0130	hot-dip galvanizing	10.1-13.0	0.8	Tower used
OYDZ-0160	hot-dip galvanizing	13.1-16.0	0.8	Tower used
OYDZ-0190	hot-dip galvanizing	16.1-19.0	0.8	Tower used
OYDZ-0220	hot-dip galvanizing	19.1-22.0	0.8	Tower used
OYGD-0100	Steel Strip	6.9-10.0	0.55	Pole used
OYGD-0130	Steel Strip	10.1-13.0	0.55	Pole used
OYGD-0160	Steel Strip	13.1-16.0	0.55	Pole used
OYGD-0190	Steel Strip	16.1-19.0	0.55	Pole used
OYGD-0220	Steel Strip	19.1-22.0	0.55	Pole used

Note: 1, letters and numbers meaning: O-OPGW fiber optic cable used; Y-downlead clamp clamp; DZ-type hot-dip galvanizing; GD-steel strip type "-" after the application of cable diameter.

2, manufacture according to 300mm pole diameter for steel strip downlead clamp standard in the table. if the users have special requirements, please mark the pole diameter.

8.OJTH-G / T-type splice closure





Usage: Suitable for OPGW cable connection protection, has the function for direct connections and divergence connection, which can out of 4 cable, installed in the overhead pole, tower.

Structural features:

a. Joint Box using aluminum alloy shell, resist-corrosion, high mechanical strength.

b. Joint box seals with seal ring and silicone, simple operation, open repeatedly, easy maintenance.

c. can make joint box connect ground according to the requirements ,equipped with the special fixture of towers and pole.

Technical parameters:

a. fiber radius of curvature ≥ 43mm.

b. fiber length of the plate to stay ≥ 1500mm.

c. additional attenuation of optical disks to stay≤ 0.01dB.

d. the maximum capacity of fiber optic≤ 144-core optical fiber.

e. suitable temperature range -40 ℃ ~ +80 ℃.

f. flattening performance 2000N/100mm.

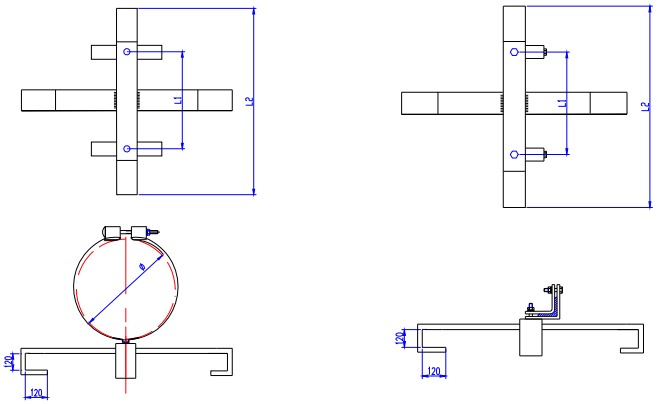
g. Weight 6.7kg. h. Overall dimensions 480mm (H) × 200mm (φ).

Ordering Information:

a.OPGW fibers. b. in and out

c. divided into pole used and tower used. If pole used, it need to provided the pole diameter.

9.OYLJ-G / T-type cable rack



Usage: Put the rest cable when OPGW cable splice. As usual, one joint box is equipped with one cable rack.

Ordering Information: Divided into pole-used and tower-used, If pole used, it need to provided the pole diameter.

Cable rack Specifications Model and Parameter table:

Model	The length of fixed part L1（mm）	The total length L2 (mm)	Quality（kg）	Remarks
OYLJ-G	500	900		Pole used
OYLJ-T	500	900		Towers used