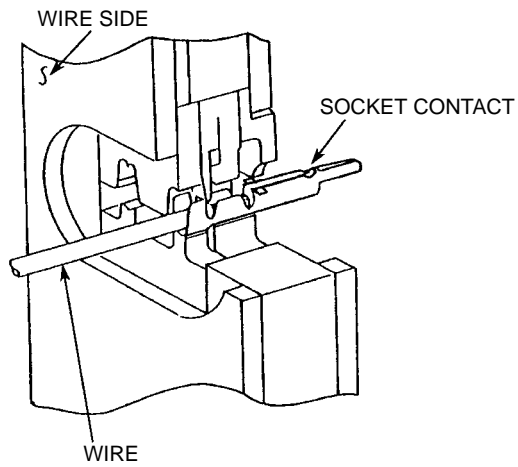


Chart 2-14 (Cont'd)

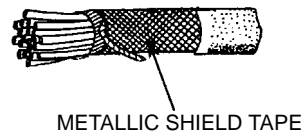
Step

Procedure

- 7 Recheck that the wire position is as shown in step 5 before crimping the socket contact (see illustration below).



- 8 Wind the metallic shield tape over the braided shield.



- 9 Set the cable into the plug case as shown in figure below. Then, fix the cable using the cable clamper and two screws.

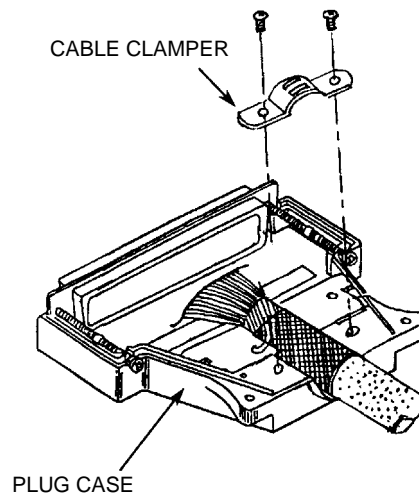


Chart 2-14 (Cont'd)

Step	Procedure
10	Referring to circle A, fix the drain wire with screw.
11	Referring to circle B, insert each wire to the specified position (Refer Interface Terminals and Jacks for IDU in Section II OPERATING EQUIPMENT.). Insert the socket contacts into the upper and lower row positions while taking care that the socket contacts are inserted the right way.

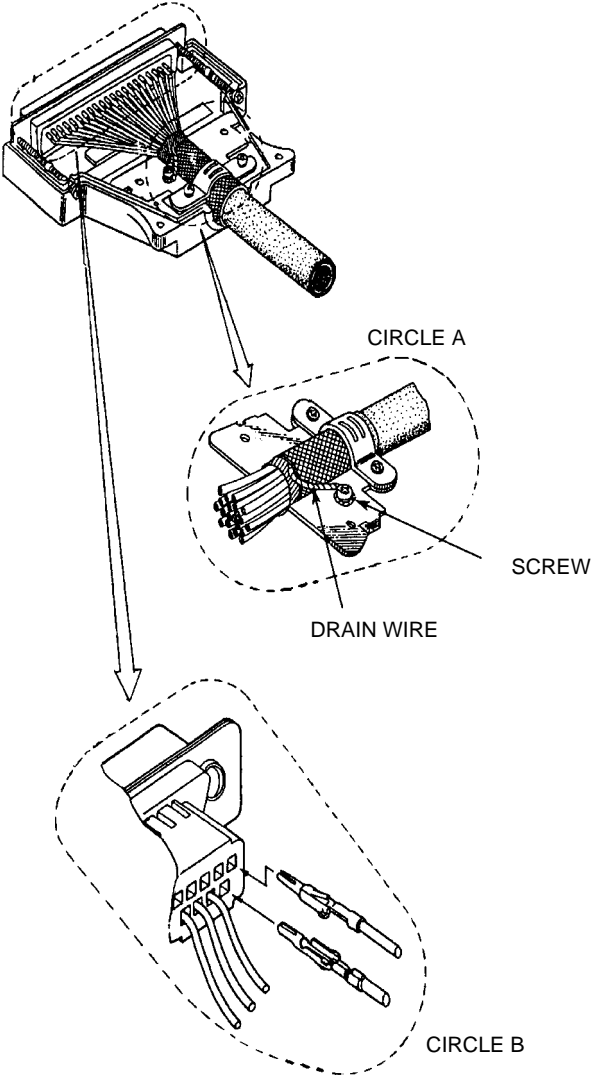


Chart 2-14 (Cont'd)

Step	Procedure
12	Fix the plug case with two screws, as shown in the figure.

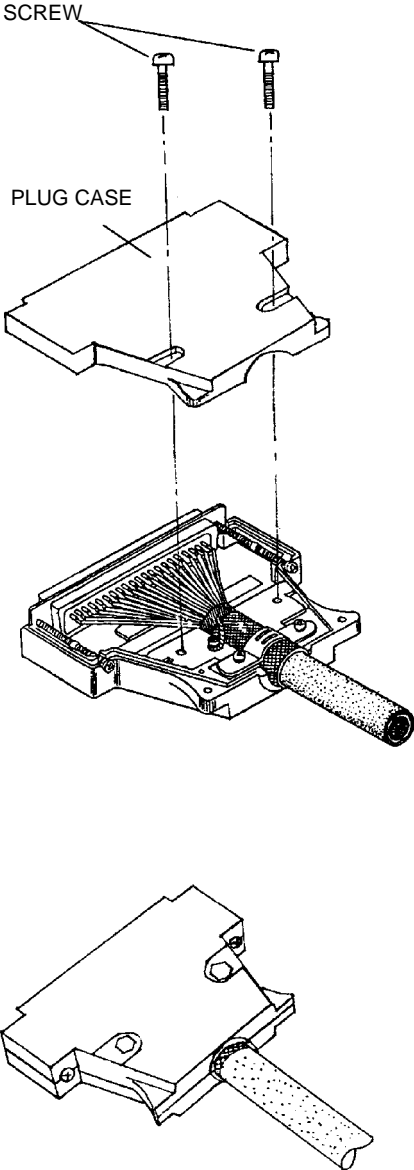


Chart 2-15 Terminating IF Coaxial Cable with TNC-P Connector (L Angle Type) (HIROSE made) used for IDU IF IN/OUT

Step	Procedure
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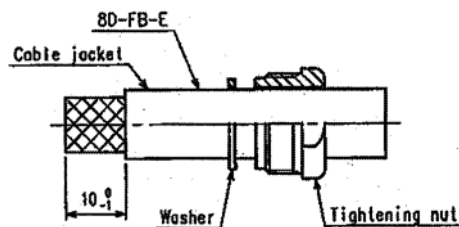
Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

- 1 Pass the tightening nut, the washer and the gasket on the cable in the order shown in the figure.
Then, strip the cable jacket in the diameter shown in the figure.
[Applicable cable : 8D-FB-E]

Note: Be careful of insertion direction for the gasket and the tightening nut.

Note: Be careful not to damage the outer conductor.

Note: Do not reuse the gasket because the clamp deforms it after tightening.



- 2 Insert the clamp to clamp the stripped cable jacket end. Open the end of the outer conductor a little,
- 3 Insert the hood between the plastic tape with aluminium foil and the outer conductor,

Note: Use the insertion stick to open the hole of about $\phi 9$. No gap is allowed in between the clamp, the outer conductor and the hood.

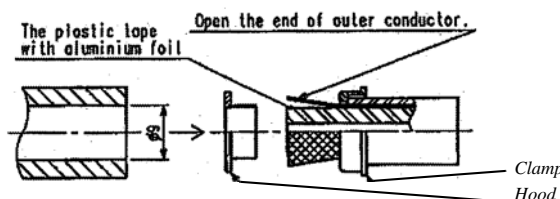


Chart 2-15 (Cont'd)

Step	Procedure
4	After inserting the hood, cut off the plastic tape with aluminium foil and the dielectric at A-surface,
5	Cut off the part of the outer conductor exceeding the clamp rim with a knife,
6	Check that distance between the tip of the center conductor and A-surface is 6 to 7 mm, If it is more than 7 mm, cut the center conductor to correct length,

Note: Be careful not to damage the center conductor,

Note: Chamfer at the tip of the center conductor,

Note: There shall be no evidence of deviation or deformation or burr at the tip of the center conductor.

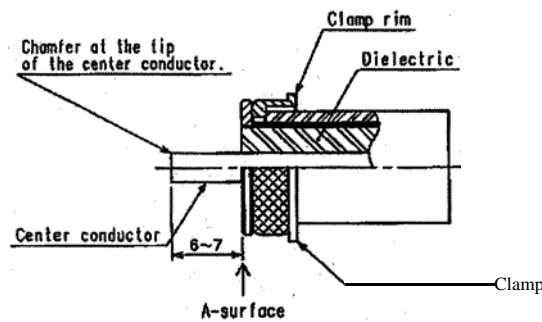
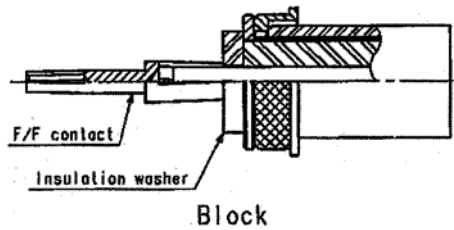


Chart 2-15 (Cont'd)

Step	Procedure
7	Insert the insulation washer over the center conductor, and engage it with the F/F contact,
	<i>Note: No gap is allowed in between the F/F contact, the insulation washer, and the dielectric.</i>
	<i>Note: The assembly unit after the completion of this process is called "block".</i>



- 8 Combine the convex part of the clamp to the concave part of the gasket, Then insert this block to the shell,

Note: Insert the hood until it hits the B-surface.

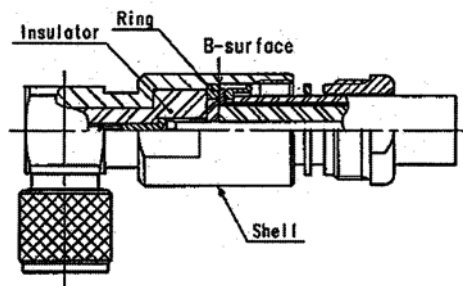
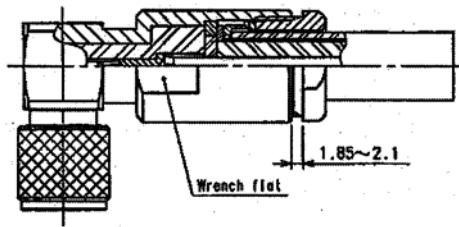


Chart 2-15 (Cont'd)

Step	Procedure
9	Tighten the tightening nut sufficiently until the gasket is cut by the clamp and the tip of the clamp hits the washer, <i>Note: Torque for the tightening nut shall be 8 to 30N•m.</i> <i>Note: When tightening the nut, tighten with wrench at the wrench at the wrench flat.</i> <i>Note: Distance between the tightening nut and the LP shell is 1.85 to 2.1 mm for reference.</i> <i>Tighten the nut sufficiently.</i>



L-type dimension and cutting length of the cable.

Specified length L: Cutting length L-25.

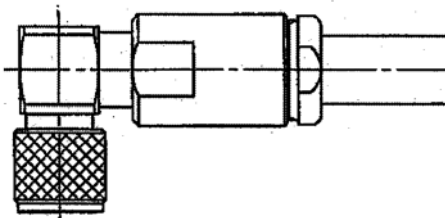
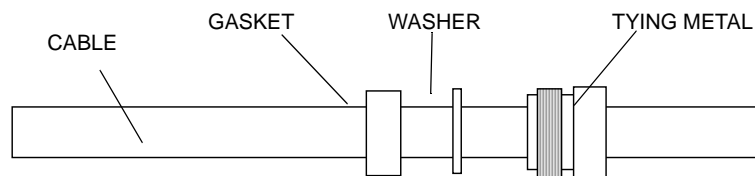


Chart 2-16 Terminating Coaxial (IF Signal) with N-P Connector (L Angle Type) used for ODU IF IN/OUT (KOMINE made)

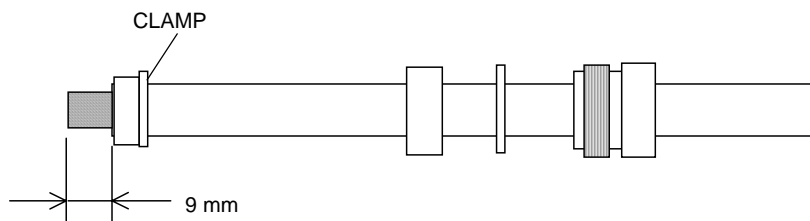
Step	Procedure
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Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

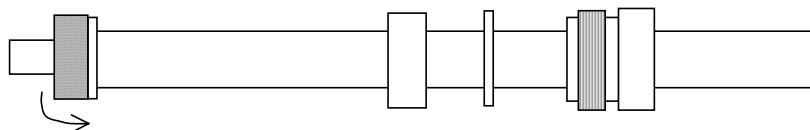
- 1 First fit the tying metal, washer and gasket on the cable.



- 2 Strip back the cable sheath, taking care not to damage the braided shield, and fit the clamp.



- 3 Fold back the braided shield (separating the strands of the braid) and trim it.



Note: Pay attention not to damage the plait.

- 4 Insert the ferrule.

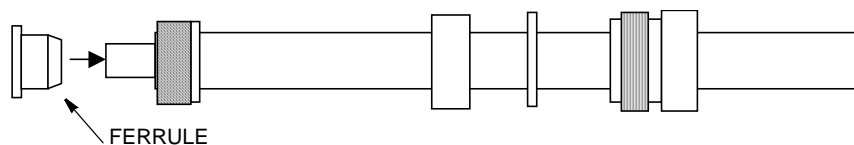
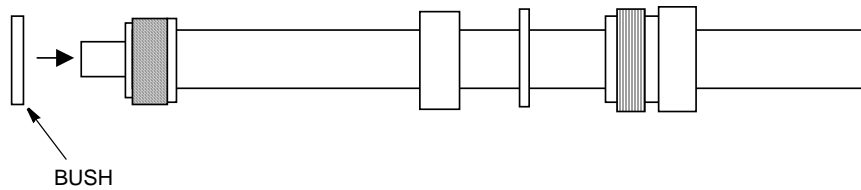


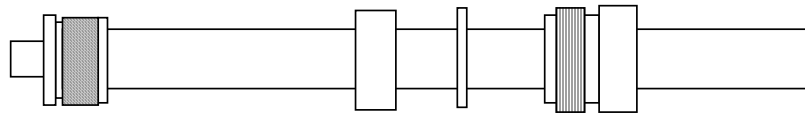
Chart 2-16 (Cont'd)

Step	Procedure
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5	Fit the bushing.
---	------------------



6	Cut the aluminium foil and inner insulator away along the bushing and retain the inner conductor.
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7	Taper the edge of the center conductor using a file as shown in the enlarged view below.
---	--

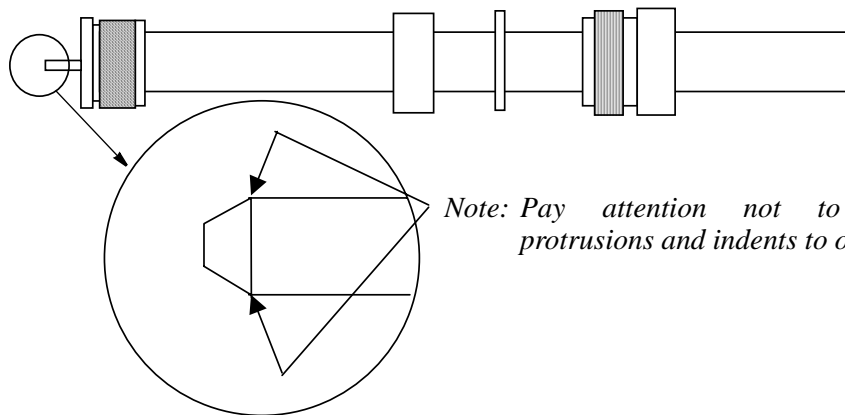
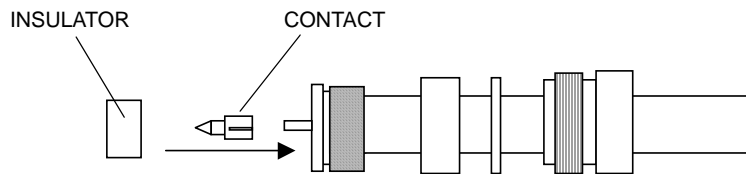


Chart 2-16 (Cont'd)

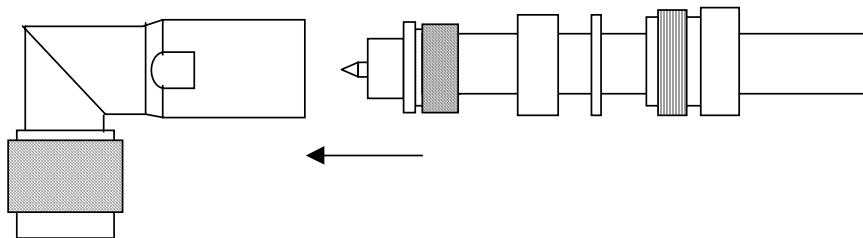
Step

Procedure

- 8 Mount the contact onto the center conductor and mount the insulator onto the contact.



- 9 Insert the cable into the shell.



- 10 Tighten the tying metal by wrench using the wrench points. (Tighten with torque of 4 to 10 N·m)

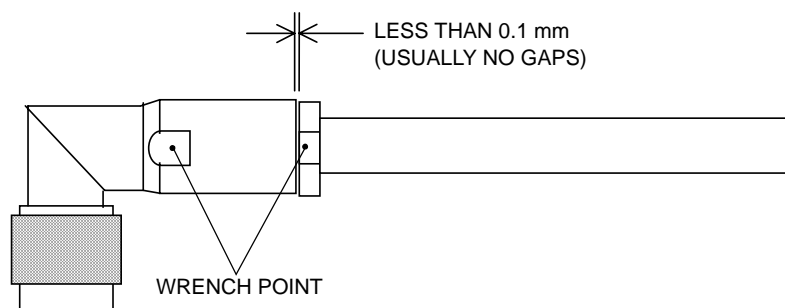


Chart 2-17 Terminating IF Coaxial Cable with N-P Connector (L Angle Type) used for the ODU IF IN/OUT (HIROSE made)

Step	Procedure
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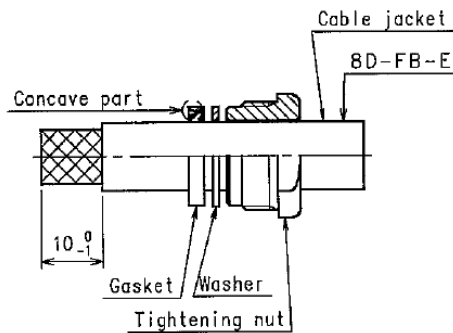
Note: It is recommended that TNC (Male) L-angle connector for the 8D-FB IF cable is used to connect it to the IDU. When the N (Male) straight connector is attached to the 5D-FB or 10D-FB IF cable, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

- 1 Pass the tightening nut, the washer and the gasket on the cable in the order shown in the figure. Then, strip the cable jacket in the diameter shown in the figure. [Applicable cable : 8D-FB-E]

Note: Be careful of insertion direction for the gasket and the tightening nut.

Note: Be careful not to damage the outer conductor.

Note: Do not reuse the gasket because the clamp deforms it after tightening.



- 2 Insert the clamp to clamp the stripped cable jacket end. Open the end of the outer conductor a little,
- 3 Insert the hood between the plastic tape with aluminium foil and the outer conductor,

Note: Use the insertion stick to open the hole of about $\phi 9$. No gap is allowed in between the clamp, the outer conductor and the hood.

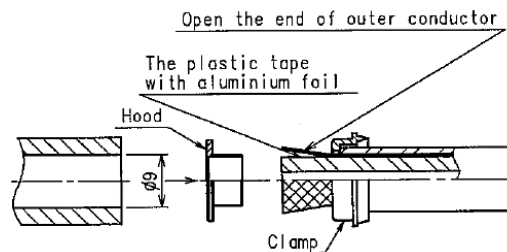


Chart 2-17 (Cont'd)

Step	Procedure
4	After inserting the hood, cut off the plastic tape with aluminium foil and the dielectric at A-surface,
5	Cut off the part of the outer conductor exceeding the clamp rim with a knife,
6	Check that distance between the tip of the center conductor and A-surface is 6 to 7 mm, If it is more than 7 mm, cut the center conductor to correct length,

Note: Be careful not to damage the center conductor,

Note: Chamfer at the tip of the center conductor,

Note: There shall be no evidence of deviation or deformation or burr at the tip of the center conductor.

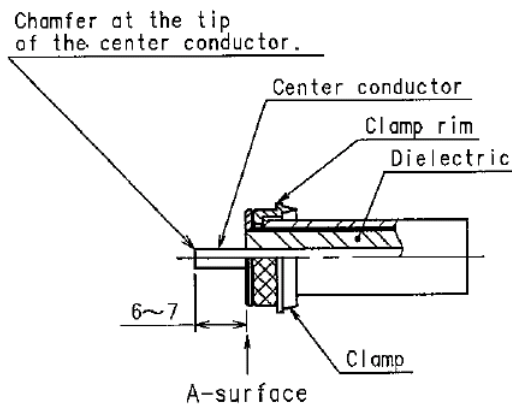
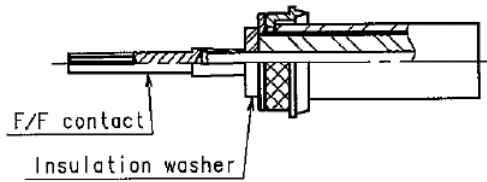


Chart 2-17 (Cont'd)

Step	Procedure
7	Insert the insulation washer over the center conductor, and engage it with the F/F contact,
	<i>Note: No gap is allowed in between the F/F contact, the insulation washer, and the dielectric.</i>
	<i>Note: The assembly unit after the completion of this process is called "block".</i>



Block

- 8 Combine the convex part of the clamp to the concave part of the gasket, Then insert this block to the shell,

Note: Insert the hood until it hits the B-surface.

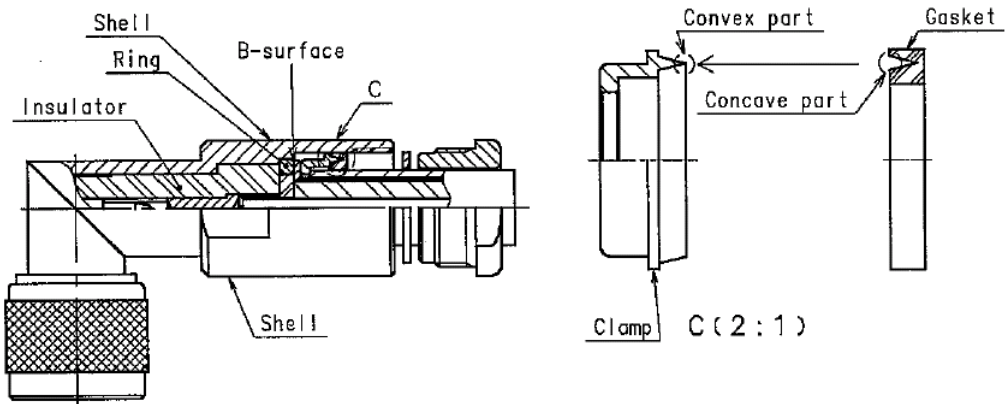
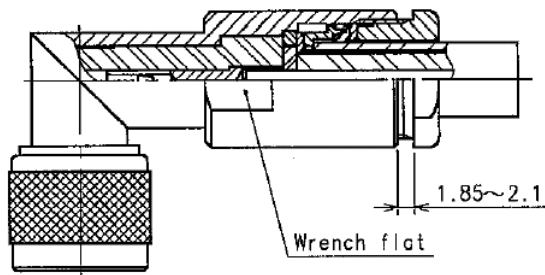


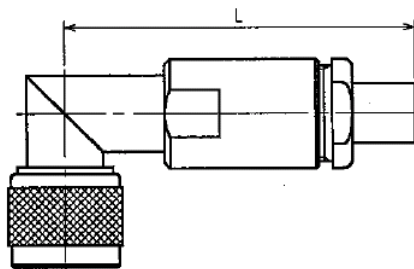
Chart 2-17 (Cont'd)

Step	Procedure
9	Tighten the tightening nut sufficiently until the gasket is cut by the clamp and the tip of the clamp hits the washer, <i>Note: Torque for the tightening nut shall be 8 to 30N•m.</i> <i>Note: When tightening the nut, tighten with wrench at the wrench at the wrench flat.</i> <i>Note: Distance between the tightening nut and the LP shell is 1.85 to 2.1 mm for reference.</i> <i>Tighten the nut sufficiently.</i>



L-type dimension and cutting length of the cable.

Specified length L: Cutting length L-25.



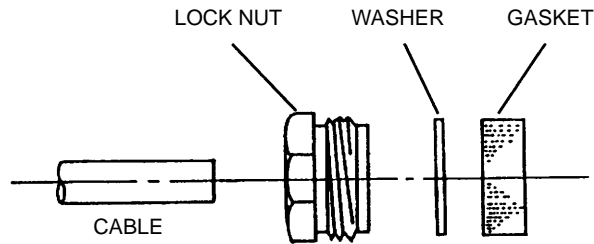
**Chart 2-18 Terminating IF Coaxial Cable
with N-P Connector (Straight Type) used for
ODU IF IN/OUT (HIROSE made)**

N-type connector is used for the ODU side.

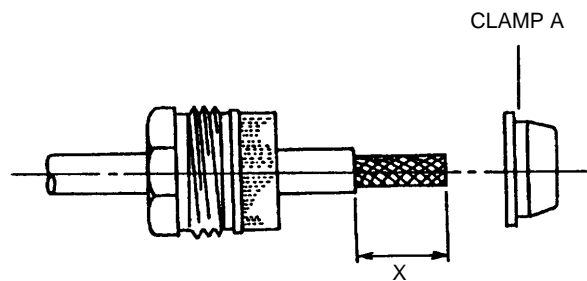
Note: When the N (Male) straight connector is attached to the IF coaxial cable for the IDU IF IN/OUT, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

Step	Procedure
------	-----------

- | | |
|---|--|
| 1 | First fit the lock nut, washer and gasket on the cable as shown. |
|---|--|



- | | |
|---|---|
| 2 | Strip back the cable sheath, taking care not to damage the braided shield, and fit clamp A. |
|---|---|



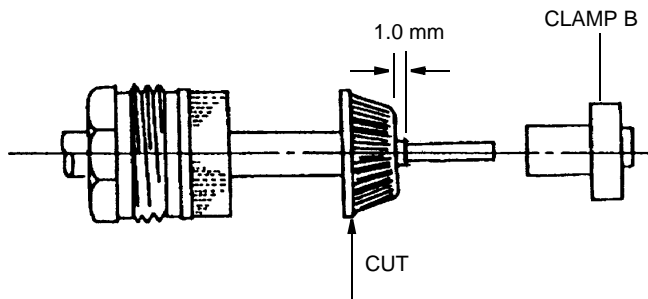
CONNECTOR	CABLE	X
N260	5D-FB	25 mm
N227	8D-FB	25 mm
N228	10D-FB	27 mm
N229	12D-FB	27 mm

- | | |
|---|---|
| 3 | Fold back the braided shield (separating the strands of the braid) and trim it. |
|---|---|

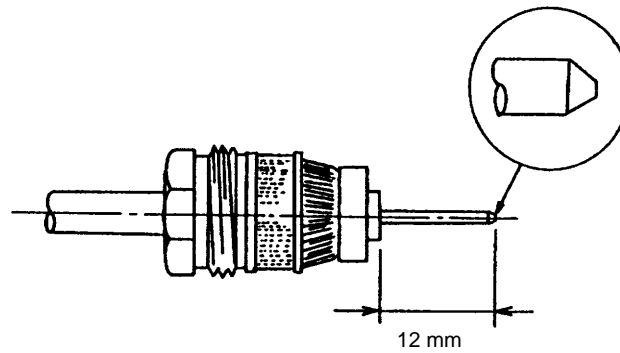
Chart 2-18 (Cont'd)

Step	Procedure
------	-----------

- | | |
|---|--|
| 4 | Cut away the insulation from the center conductor and fit clamp B. Be sure not to cut or scratch the conductor while stripping the insulation. |
|---|--|



- | | |
|---|---|
| 5 | Cut the center conductor. Taper the end of the center conductor using a file as shown in the enlarged view below. |
|---|---|



- | | |
|---|--|
| 6 | Mount the center contact onto the center conductor as shown. |
|---|--|

Note: Insert the center contact into insulator (1.5 mm).

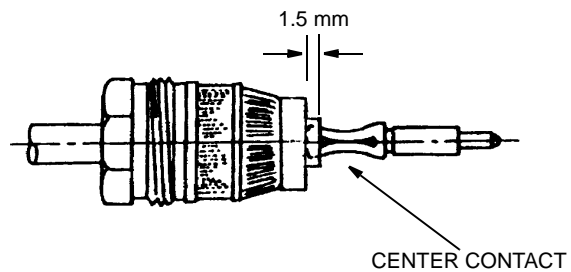
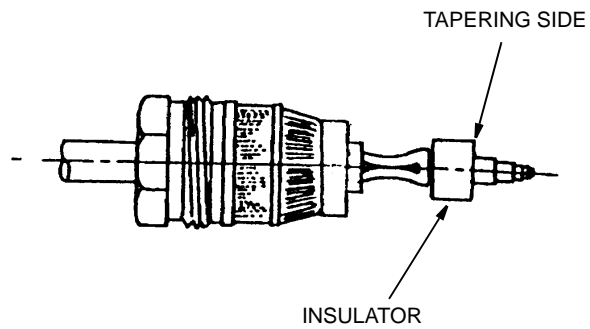


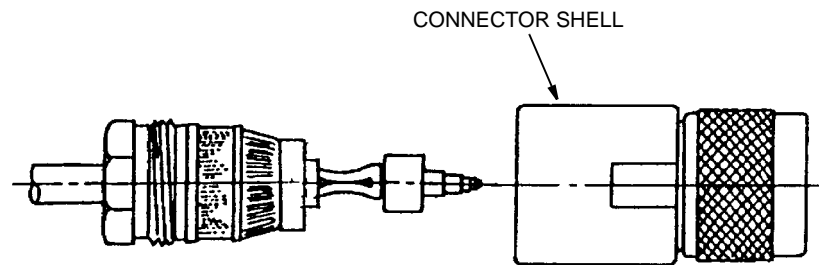
Chart 2-18 (Cont'd)

Step	Procedure
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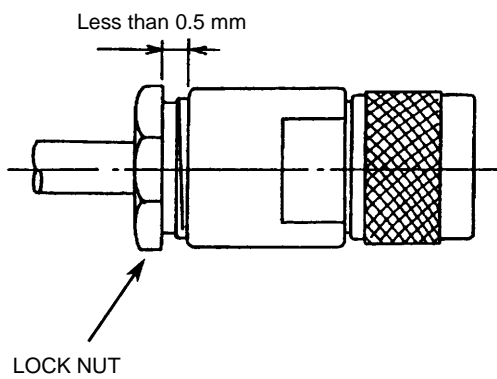
- 7 Mount the insulator onto the center contact.



- 8 Insert the cable into the connector shell.



- 9 Tighten the lock nut.



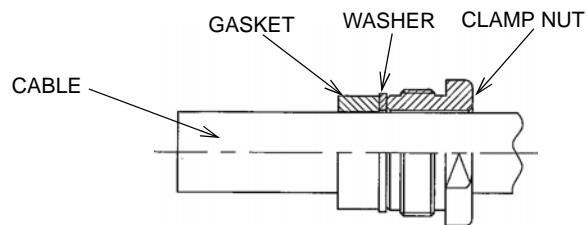
**Chart 2-19 Terminating IF Coaxial Cable
with N-P Connector (Straight Type) used for
ODU IF IN/OUT (KOMINE made)**

N-type connector is used for the ODU side.

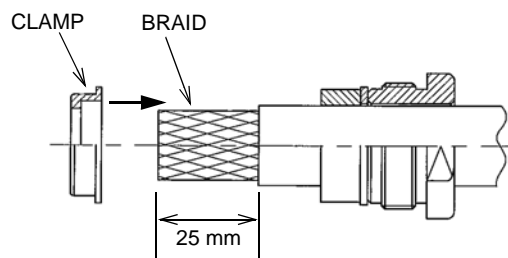
Note: When the N (Male) straight connector is attached to the IF coaxial cable for the IDU IF IN/OUT, use of the TNC (Male) - N (Female) (NJ-TNCP-LA) L-angle adapter is needed.

Step	Procedure
------	-----------

- | | |
|---|---|
| 1 | The clamp nut, the washer and the gasket are inserted in the cable, |
|---|---|



- | | |
|---|---|
| 2 | Strip the cable as below and disentangle the braid and insert the clamp in the cable, |
|---|---|



Do not scratch the braid wire.

- | | |
|---|--|
| 3 | Turn the braid on the clamp inserted and cut the braid according to the paragraph, |
|---|--|

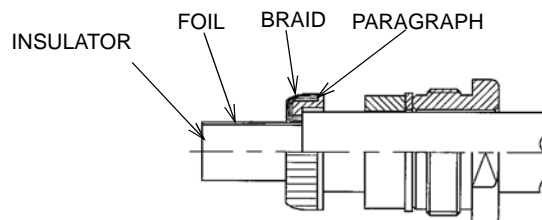
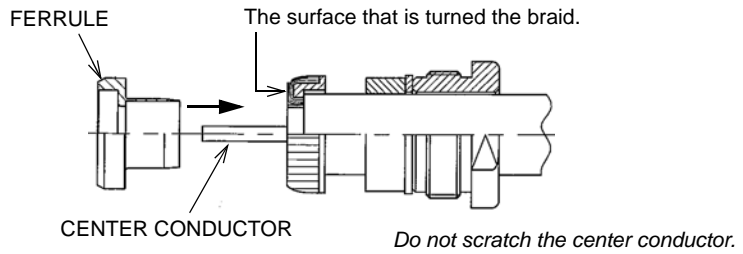


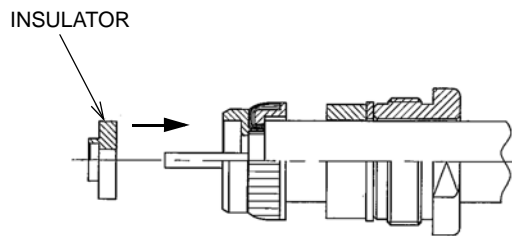
Chart 2-19 (Cont'd)

Step	Procedure
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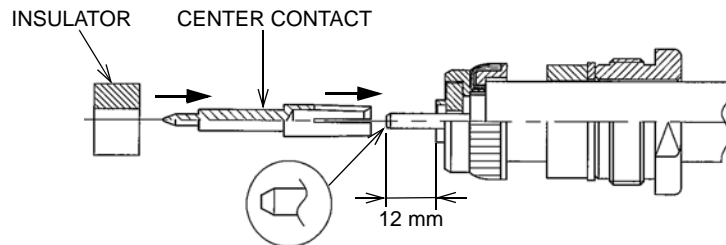
- | | |
|---|---|
| 4 | Cut the cable-insulator according to the surface that is turned the braid and insert the ferrule, |
|---|---|



- | | |
|---|-----------------------|
| 5 | Insert the insulator, |
|---|-----------------------|



- | | |
|---|--|
| 6 | Cut the center-conductor as following size. Process the tip of center-conductor like a taper with a file. (<i>Do not have a curve and burr.</i>) Insert the center-contact in the center-conductor and insert the insulator in the center-contact, |
|---|--|



Processing chart of the tip of the center-conductor.

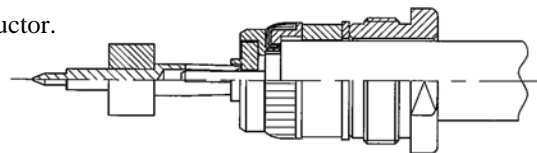
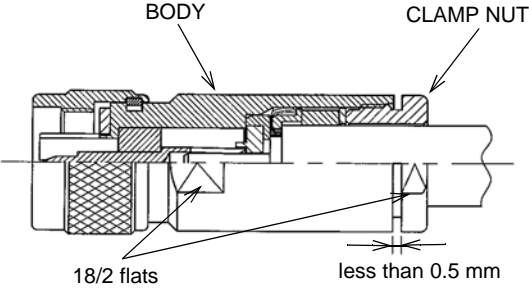


Chart 2-19 (Cont'd)

Step	Procedure
7	<p>Connector body is fit to the cable. Fit in the cable end into the body and screw the clamp nut by your hand first and tighten it with a torque wrench.</p> <p>Confirm the space that it is less than 0.5 mm between the body and the clamp nut.</p>

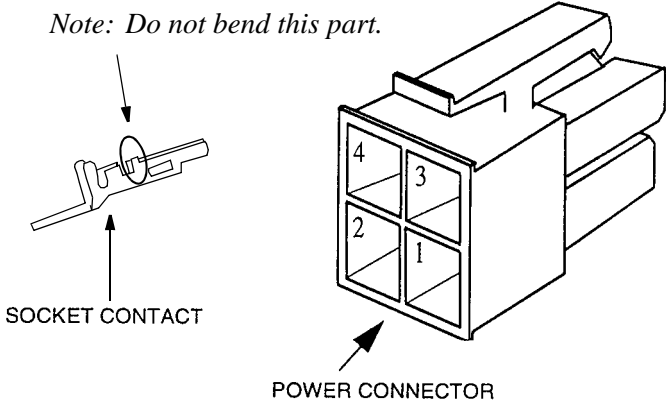


Tightening torque is more than 9.8 N•m (100kgf•cm)

Note: Use torque wrench.

Chart 2-20 Terminating Power Supply Cables with Molex Connector

Step	Procedure
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- 1 Remove 3.0 to 3.5 mm of insulation.

CABLE

AWG#18-24

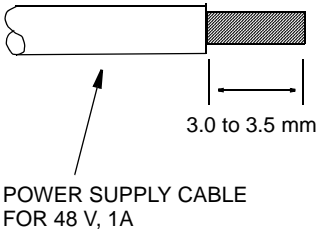
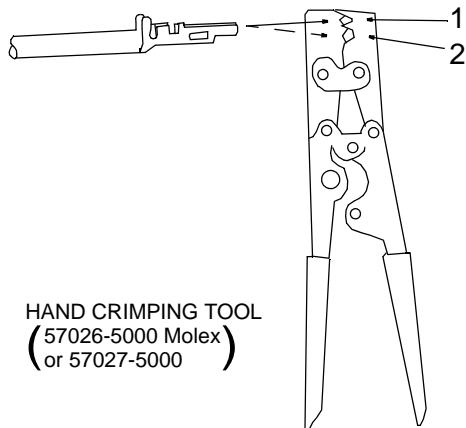


Chart 2-20 (Cont'd)

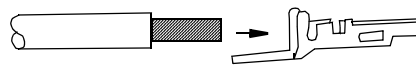
Step	Procedure
------	-----------

2	Set the socket contact to position 1 or 2 of the hand crimping tool.
---	--



HAND CRIMPING TOOL TYPE	OUTSIDE DIAMETER OF CABLE	SET POSITION
57026-5000	φ 1.5 to 1.8	1
	φ 1.8 to 2.2	2
57027-5000	φ 2.3 to 2.6	1
	φ 2.6 to 3.1	2

3	Squeeze the handle of the hand crimping tool, insert cable into socket contact.
---	---



4	The cable should fit, so insulation and bare wire are arranged as shown.
---	--

5	Squeeze the handle of the hand crimping tool until the ratchet is released.
---	---

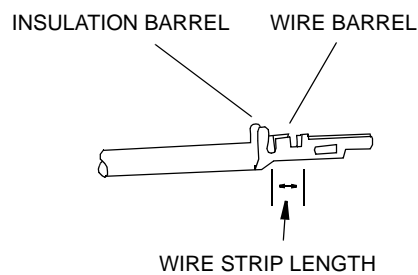


Chart 2-20 (Cont'd)

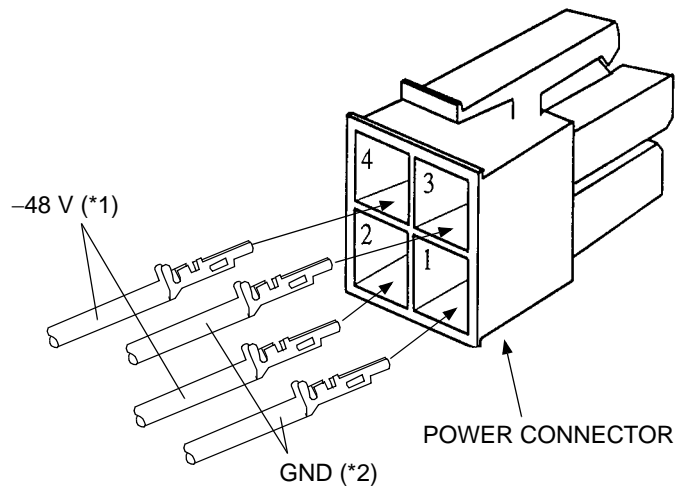
Step	Procedure
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- 6 Twist cables for the power supply,



Note: Twist power cables to suppress inductive interference signals.

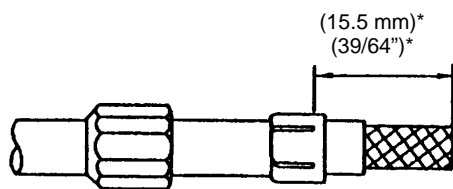
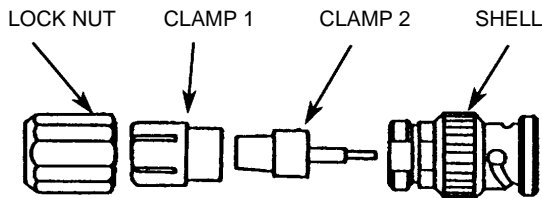
- 7 Insert the socket contacts into the power connector until they lock.



*Note : For H3040 DC-DC CONV,
 (*1): -20 to -60 V (or 0 V)
 (*2): 0 V (or +20 to +60V)*

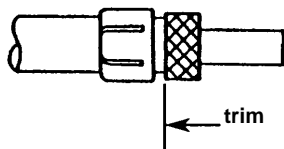
**Chart 2-21 BNC Connector for 3C-2V Coaxial Cable
Assembling, Solder Type**

The following explains how to assemble BNC solder type as an example.

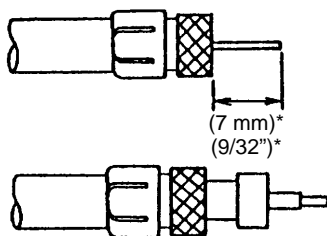


Step 1. Slide the lock nut onto the cable. Strip the cable sheath, taking care not to damage the braided shield wires, and fit CLAMP 1.

*Note *:Stripping measurements vary depend on the BNC*

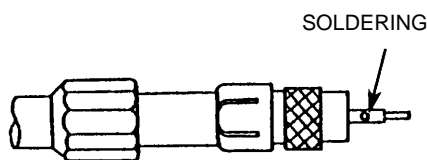


Step 2. Fold back the braided shield wire around the CLAMP 1 (without separating the strands of the braid) and trim it.



Step 3. Cut away the insulator from the centre conductor and fit CLAMP 2. (Be sure not to cut or scratch the conductor while stripping the insulation.)

*Note *:Stripping measurements vary depend on the BNC*



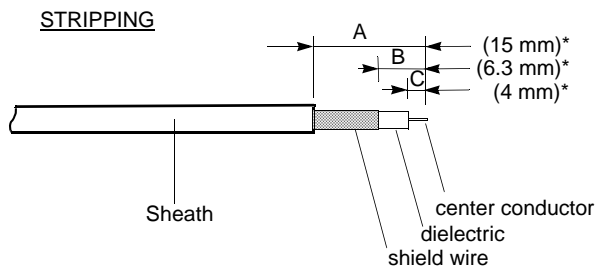
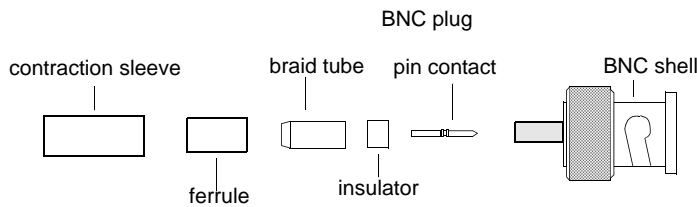
Step 4. Solder the pin contact to center conductor. Use a knife to remove excess solder.



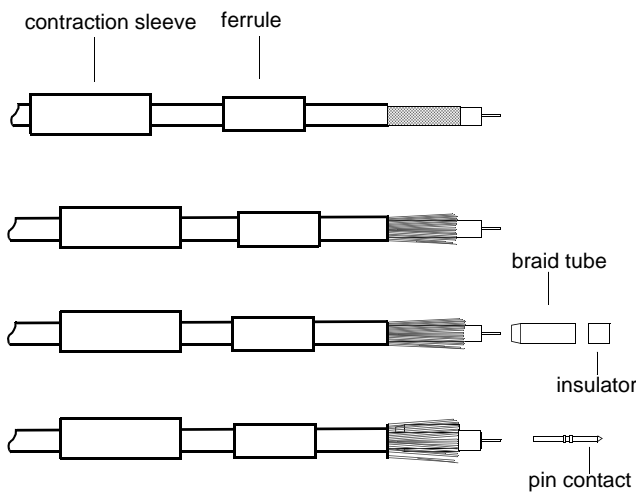
Step 5. Insert the connectorized cable into the BNC shell and fasten the lock nut with a wrench.

**Chart 2-22 BNC Connector for 3C-2V Coaxial Cable
Assembling, Crimping Type**

The following explains how to assemble BNC crimping type as an example.



Note: Stripping measurements vary depending on the BNC type.*



Step 1. Strip coaxial cable as illustrated left, (taking care not to damage braided shield wire),

Step 2. Cut braided shield wire (without unravel the strands of braid) and trim it,

Step 3. Cut dielectric, (be sure not to cut or scratch the centre conductor while stripping the dielectric),

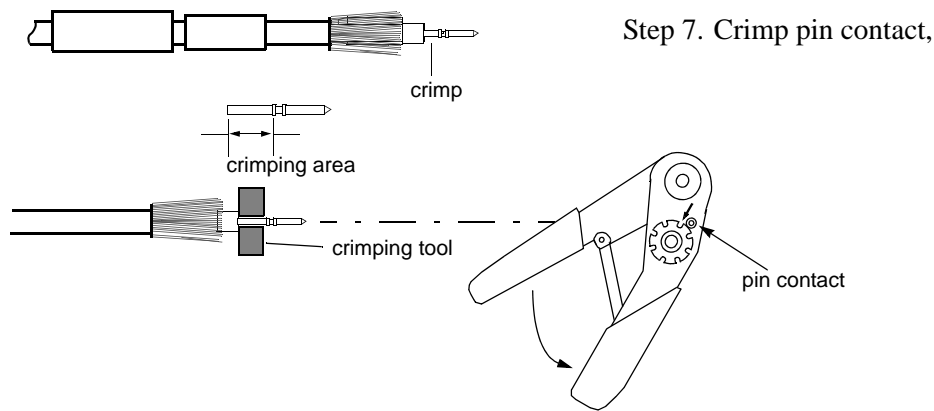
Step 4. Slide contraction sleeve and ferrule onto the cable,

Step 5. Fan braided shield wire,

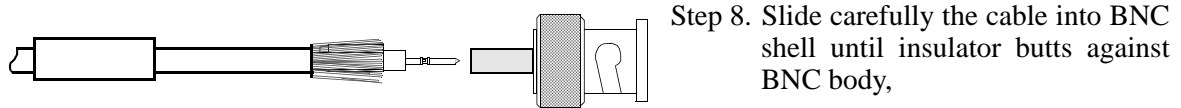
Step 6. Slide braid tube and insulator among braided shield wire and dielectric,

Step 6. Slide pin contact until it bottoms against the centre conductor,

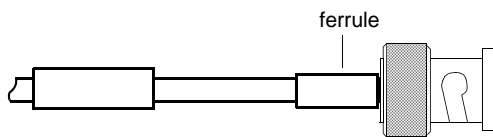
Chart 2-22 (Cont'd)



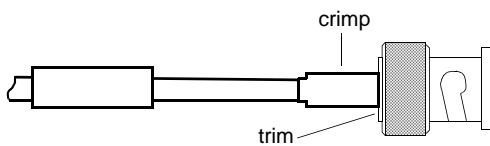
Step 7. Crimp pin contact,



Step 8. Slide carefully the cable into BNC shell until insulator butts against BNC body,



Step 9. Slide ferrule over shield wire until it bounds against the BNC shell body,



Step 10. Crimp ferrule as close as possible to the BNC shell body and trim the excess of braid,

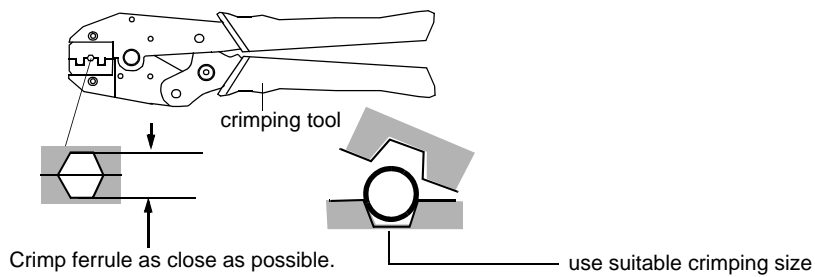
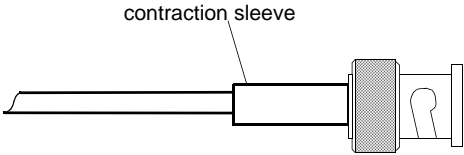
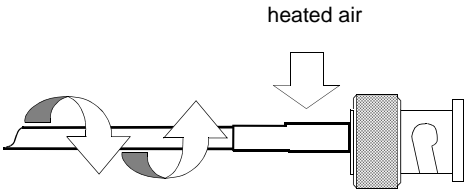


Chart 2-22 (Cont'd)



Step 11. Position contraction sleeve over ferrule and BNC,

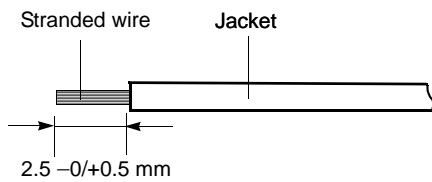


Step 12. Heat contraction sleeve until it contracts.

Chart 2-23 D-Sub High Density Crimp Contacts Assembly

The following explains how to assemble high density crimp contacts used for HARTING hand crimp tool as an example.

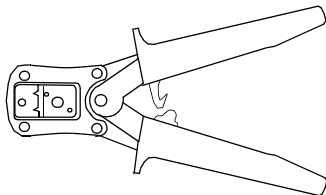
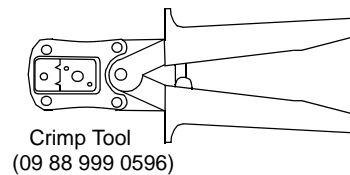
Crimping/inserting contacts process



Applicable wire size : 0.14 - 0.22 mm² (AWG26 - 24),
stranded, maximum insulation: ϕ 1.38 mm

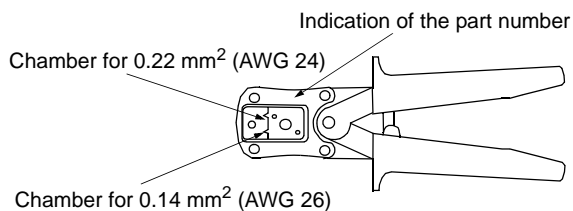
Stamped male contacts : 09 56 000 8175 (Level S4),
High density male connectors : 09 56 300 5601 (#44)

Step 1. Strip the jacket for 2.5 -0/+0.5 mm as shown left and check if stranded wire is not damaged,



Step 2. Place the handles in the open position as shown left,

Note: When the handles are in close position, squeeze handles completely until safety ratchet is released.



Step 3. Select the suitable chamber for the selected wire,

Step 4. Insert contact in the selected chamber,

Step 5. Insert the prepared wire in the contact,

Step 6. Squeeze the handles together completely until the safety ratchet clicks to open,

Step 7. Take out the crimped contacts from the chamber. Check if it should not be scratched or transformed.

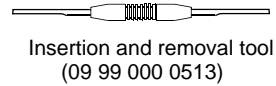
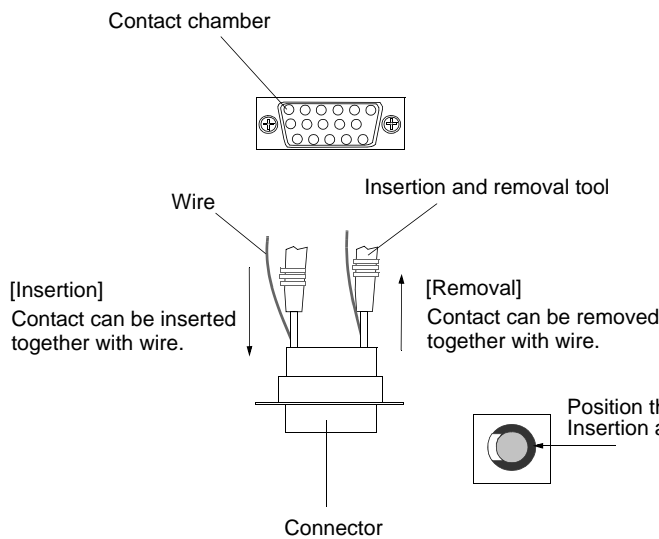
Chart 2-23 (Cont'd)

Step 8. After crimping the stranded wire to the contact using a hand tool, insert the contact into the contact chamber with the tool, working from the wiring side,

Step 9. You can here the contacts snap home, audible “click”,

Step 10. Check if they are securely in place with giving the wire a gentle pull.

Removing crimp contacts



Step 1. Position the tool from the wiring side as shown left and insert into the contact chamber. The contact can then easily be removed from the wiring side together with itself and reinserted in a different chamber.

2.9 Wiring and Forming

Chart 2-24 Wiring and Forming

- 1 Connect cables for, signal interface, power supply, IF IN/OUT and ground to the proper connector of the IDU.
 - (1) Connect ground cable to the ground terminal
 - (2) Connect IF cable to IF IN/OUT connector.
 - (3) Connect power supply cable to SELV connector.
 - (4) Connect OC-3 NLite E, Aux. signal cables to proper connectors.
 - (5) Connect XIF coaxial cables to opposite IDU. (XPIC configuration only.)
 - (6) Connect XPIC CTRL cables to opposite IDU. (XPIC configuration only.)

Note: When disconnect cables, perform it in revers steps.

- 2 Fix the cables using cable binder to the rack as like as indicated position.

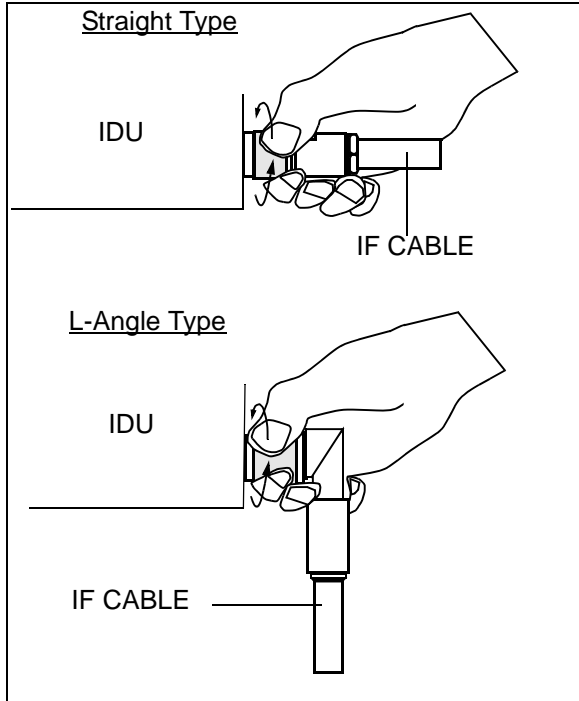
Notes: 1. Do not cross the cables on front of indicators and power switch used for maintenance.

2. Take suitable bend radius to wiring the IF cable. (e.g. 10D-FB: 70 cm)

3. For the IF cable connection, it is recommended to use adapter. (Applicable adapters are listed table below).

Table 2-6 IF Cable Adapter

IF Cable	Adapter	
	TNC(P) - N(J)	TNC(P) - TNC(J)
5D-FB	√	
8D-FB	√	√
10D-FB	√	

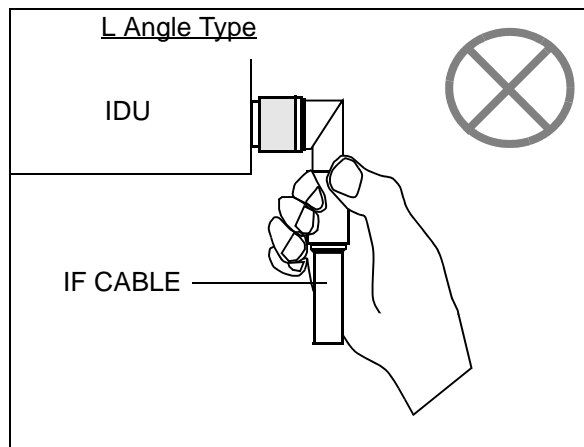


Caution

Tighten the TNC-male connector of IF cable to the IDU with engage connector nut only using fingers and holding the cable with another hand.

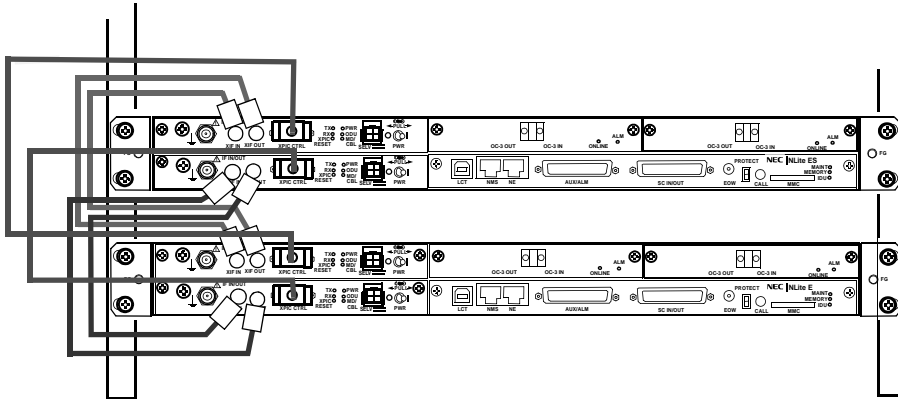
Tighten the engage connector nut only for the L-angle connector also.

*(Tightening Torque : 0.3 to 0.5 N•m
(3 to 5kg•cm))*



If rotate other parts of the L-angle connector as illustrated left, it can cause connector damage.

NLite E SONET



- (1) *Connect XIF cable to between XIF IN (Main Master) and XIF OUT (Sub Master), and XIF OUT (Main Master) and XIF IN (Sub Master).*
- (2) *Connect XPIC CTRL cables to between XPIC CTRL (Main Master) and XPIC CTRL (Sub Master).*

Fig. 2-8 Cable Wiring for the XPIC System

2.10 SONET OC-3 NLite E Frame Grounding

In mounting the IDU and ODU, perform frame grounding. The location of the frame grounding in each IDU and ODU is shown in Fig. 2-8, and the connection for frame grounding is shown in Fig. 2-9.

Note: Connect the Frame Ground (G) terminal on the IDU to the mounting rack with the earth cable. In addition, connect the mounting rack to the indoor earth terminal with the earth cable and connect the G terminal on the ODU to the ground (refer to Fig. 2-9).

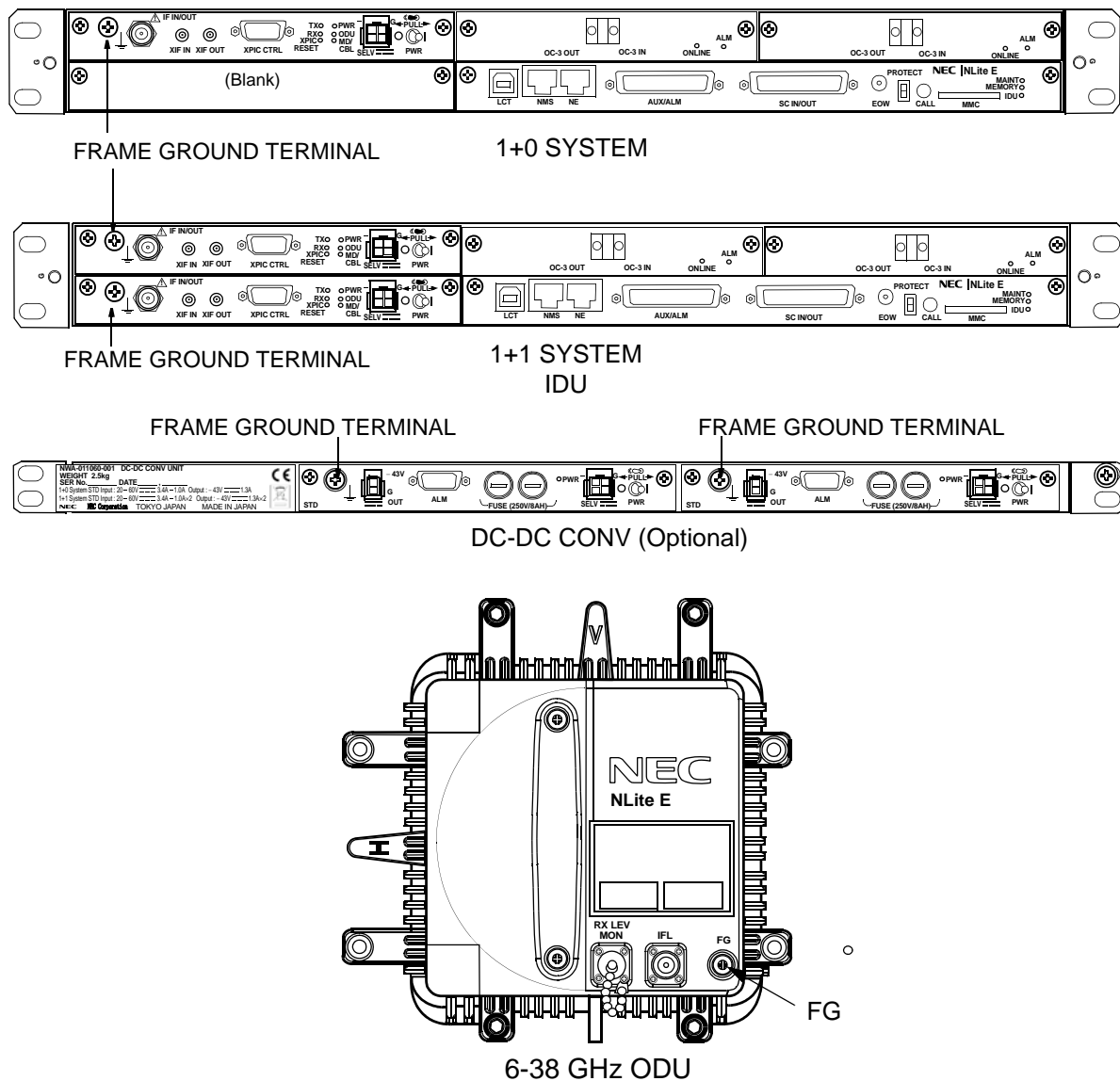
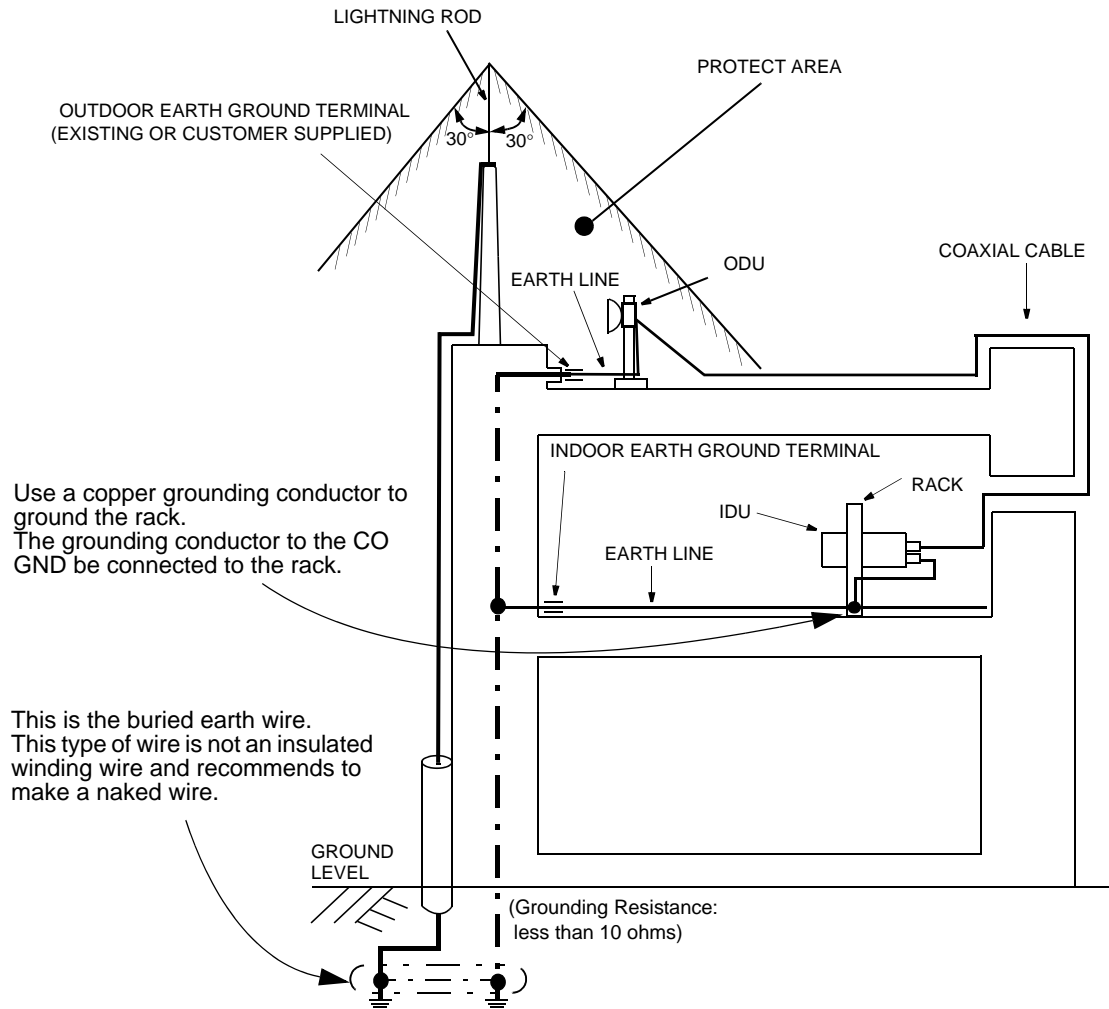


Fig. 2-10 Location of Frame Ground

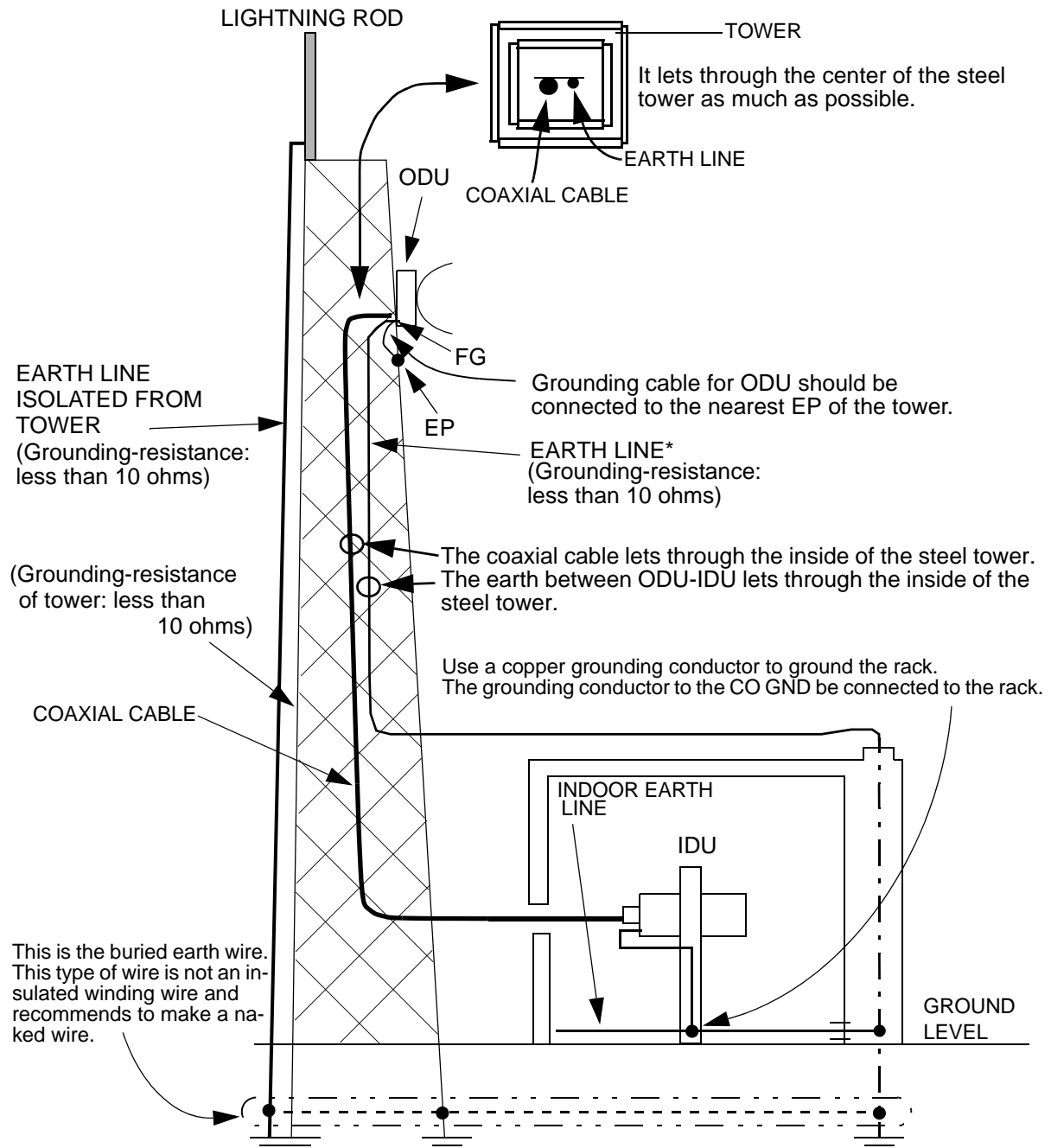


- Cautions:**
1. Install the ODU within the area protected by lightning rod.
 2. To avoid surge currents caused by lightning circulating in the equipment earth system, connect the equipment earth system (frame ground) to ground of the lightning rod at ground level.

Note: Frame Ground terminal of the IDU (5 mm square cable (means more than 2.5 mm diameter cable (AWG #10) is recommended to apply for the earth grounding. The proper press fix terminal tool shall be used.)

This connection is an example.

Fig. 2-11 Connection for Frame Grounding (1/2)



Notes: * NEC recommends that frame ground of ODU should be connected to earth line as NEC's standard installation.

EP : Earth Ground Point of tower

FG : Frame Ground terminal of the IDU (5 mm square cable (means more than 2.5 mm diameter cable (AWG #10) is recommended to apply for the earth grounding. The proper press fix terminal tool shall be used.)

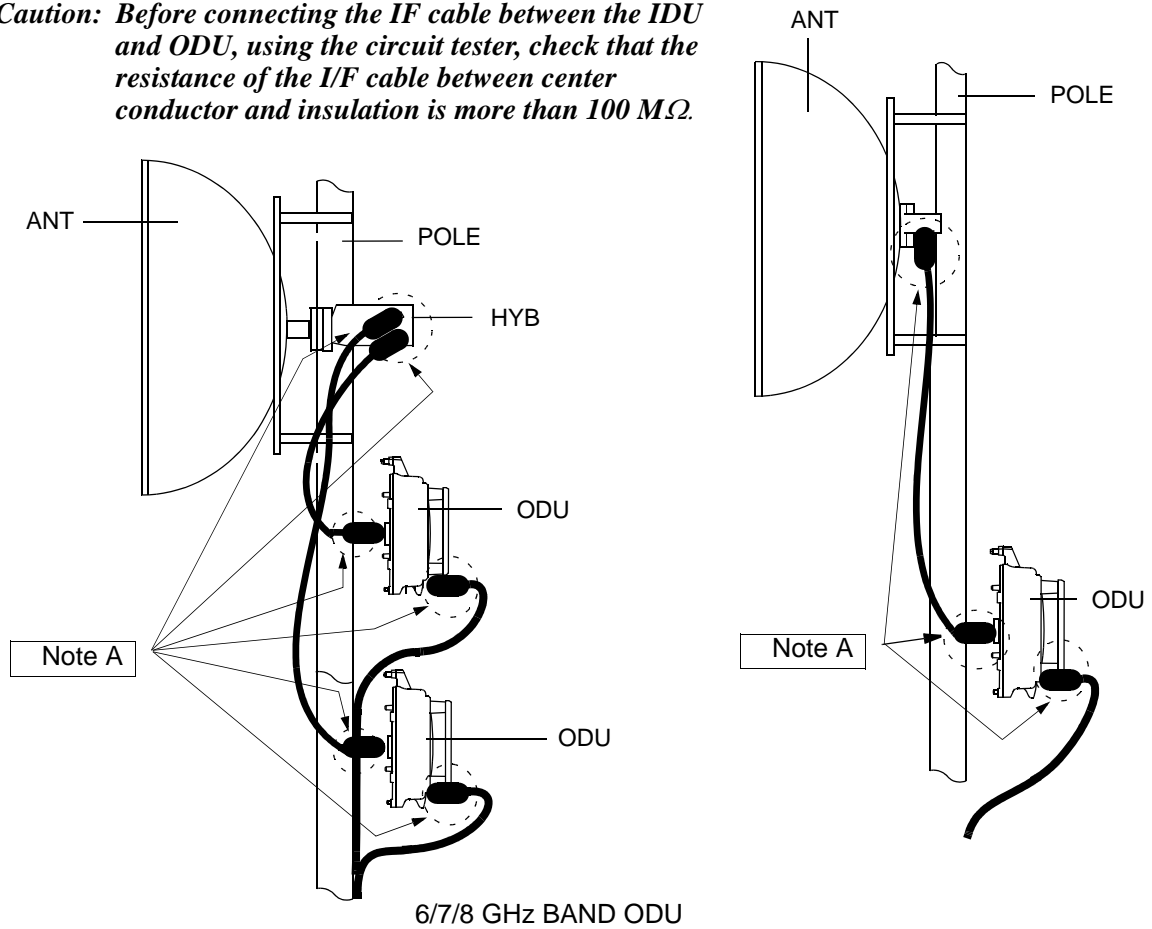
This connection is an example.

Fig. 2-11 Connection for Frame Grounding (2/2)

2.11 Waterproof Protection

After cable connection, the following parts should be wrapped by self-bonding tape for waterproof (see Fig. 2-10).

Caution: Before connecting the IF cable between the IDU and ODU, using the circuit tester, check that the resistance of the I/F cable between center conductor and insulation is more than 100 MΩ.



Note A
 These parts should be wrapped the self-bonding tape tightly, twice or more around the IF cable connector and IF IN/OUT connector of the ODU for waterproof.

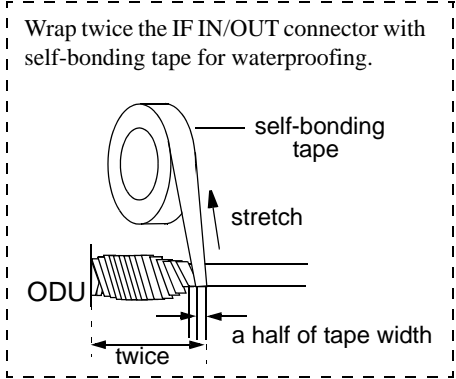
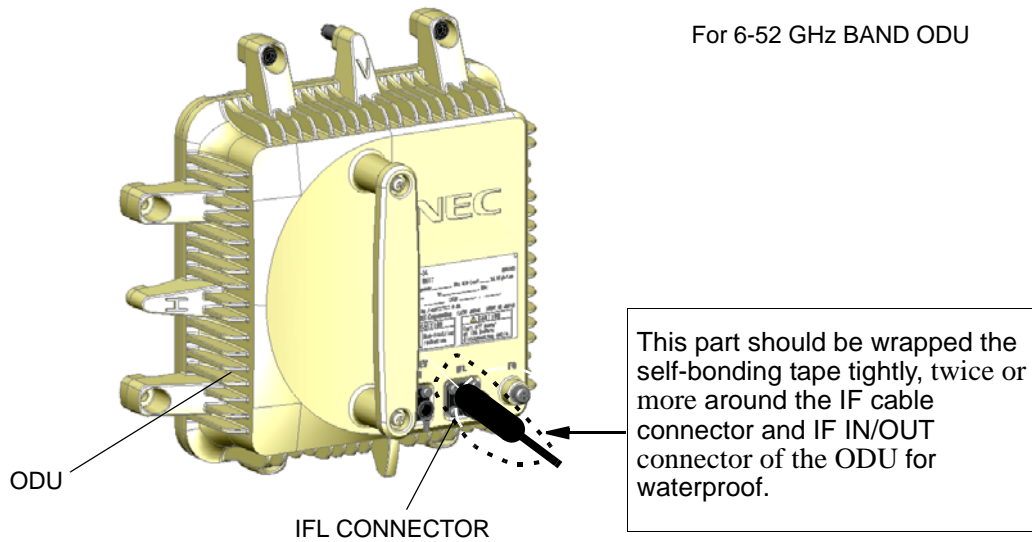
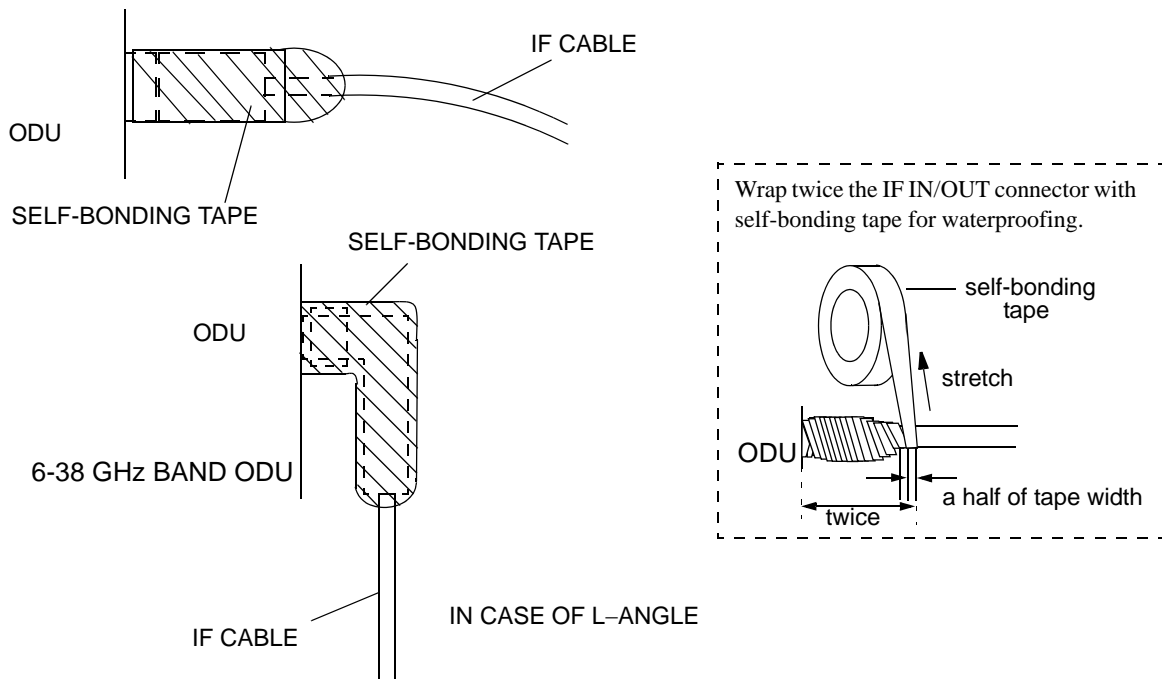


Fig. 2-12 Location of Connector for Waterproof (1/2)



Caution: Before connecting the IF cable between the IDU and ODU, using the circuit tester, check that the resistance of the I/F cable between center conductor and insulation is more than 100 MΩ.



Note: The self-bonding tape should be prepared by customer.

Fig. 2-12 Location of Connector for Waterproof (2/2)

3. INITIAL LINE UP

This NLite E Section explains instructions for the initial lineup of the equipment. Included is information on start-up, shut-down, IDU and ODU equipment setting, antenna orientation and lineup test between two stations.

When the NLite E Monitor is used for RX LEV monitoring, connect the X0818 NLite E Monitor to the ODU. The NLite E Monitor operates on a dry battery (6F22/9V).

- Notes:*
- 1. Insert the battery with correct polarity.*
 - 2. When the NLite E Monitor will not be used for extended periods of time, remove the battery to avoid damage from battery leakage and corrosion.*
 - 3. When the NLite E Monitor will be connected to the ODU, control corresponding ODU to Antenna Alignment mode using LCT in Maintenance ON.*

3.1 Start-up

The procedure for starting the equipment is shown in Chart 3-1.

Warning: 1. *The –48 V DC is superimposed on the centre conductor of the IF coaxial cable between the MODEM and the ODU. Connecting test equipment directly to this terminal may damage it and touching the coaxial cable core may cause electrical shock.*

2. *Do not disconnect the IF cable between the MODEM and the ODU in operating condition, to avoid damaging the NLite E , turn the IDU power OFF before connecting/disconnecting the IF cable.*

3. *Do not allow open or short circuit of ODU TX output with the TX power on conditions. Perform the TX Mute control in the Maintenance mode or turn the PWR switch off at the IDU before disconnecting cable or feeder from the ODU TX output.*

4. *After turning ON the equipment, wait at least 1 minute before turning it OFF again. Repeatedly turning the power ON and OFF within a short interval may cause the NLite E to fail.*

Caution: 1. *In a system using the OPTICAL OC-3 INTFC, do not stare at the laser beam or look at it directly with optical instruments. Otherwise, it may hurt your eyes (Class 1 Laser Product).*

2. *Be careful top surface above MODEM of the IDU is hot in operation.*

3. *When replacing the MODEM, OC-3 INTFC or DC-DC CONV (optional) turn off the PWR switch and disconnect all cables connected to the module which is to be replaced.*

4. *When dismantling the () INTFC, turn off the PWR switch on the MODEM and disconnect all cables connected to the () INTFC.*

5. *In the SONET XPIC system, the system parameter setup must be performed at the Master station first, then at the Sub Station.*

6. *In the SONET XPIC system, the Main Master and Sub Master channels must be connected to one dual polarized antenna.*

Chart 3-1 Start-up

Caution: Do not apply a voltage to the equipment that varies sharply. The equipment may operate improperly.

Caution: Do not remove/connect the IF cable with the IDU power ON. Turn the IDU power OFF before connecting/disconnecting the IF cable, or equipment may be damaged.

Apparatus:
 Suitable Screwdriver
 Digital Multimeter

Step	Procedure
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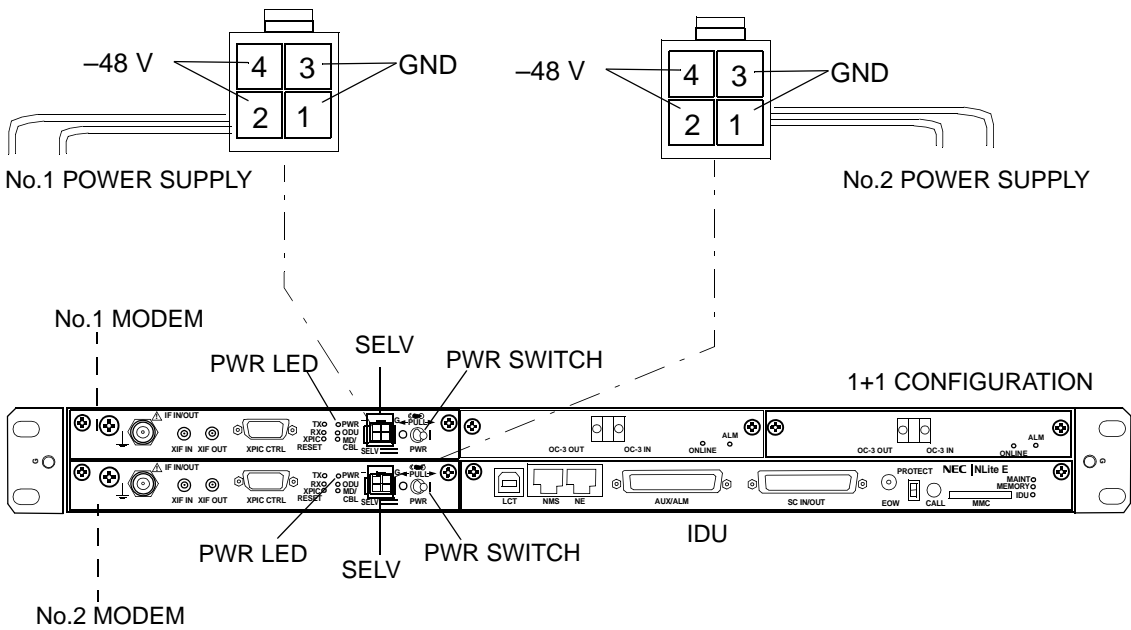
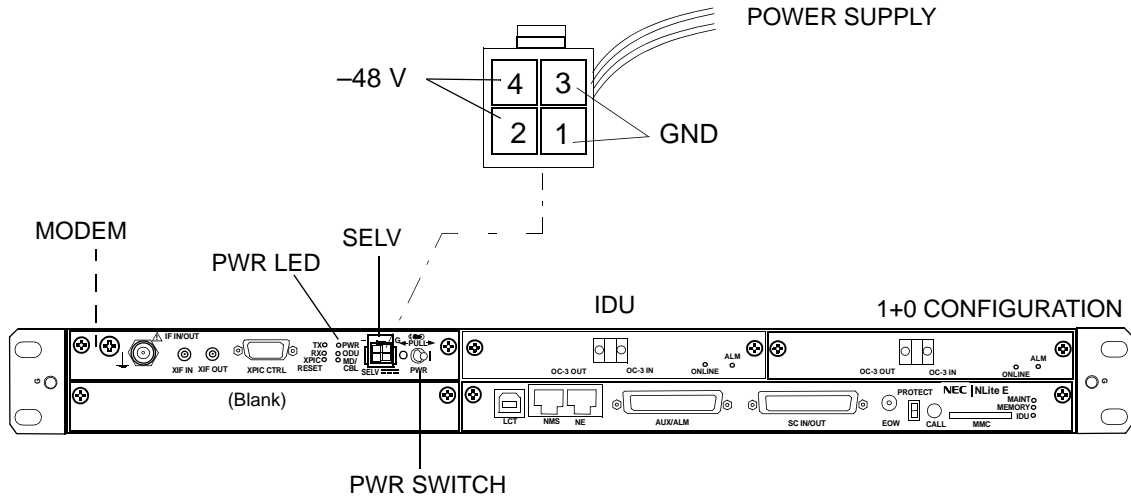
Notes: 1 The ODU power is supplied from the IDU

1+0 SYSTEM

- 1 Check that the IF cable between the MODEM and the ODU is firmly connected,
- 2 Before connecting the power cable connector to the MODEM, check that the SELV input voltage is -48V (allowable range; within -40.5 to -57 V) with the digital multimeter, (see Fig. 3-1),
- 3 Pull out the PWR switch lever and turn on,
- 4 Confirm that the PWR indicator on the MODEM is ON.

1+1 SYSTEM

- 1 Check that the IF cable between the No.1 MODEM and the No. 1 ODU is connected,
- 2 Before connecting the power cable connector to the No.1 MODEM, check that the SELV input voltage is -48V (allowable range, within -40.5 to -57 V) with the digital multimeter, (see Fig. 3-1),
- 3 Pull out the PWR switch lever and turn on, (see Fig. 3-1),
- 4 Confirm that the PWR indicator on the No.1 MODEM is ON.
- 5 Repeat steps 1 to 3 for No.2 MODEM,
- 6 Confirm that PWR indicator on the No.2 MODEM is ON.



Caution: The NLite E operates only negative voltage (-48 V). Therefore, the power supply system for the existing equipment which is used floating power supply (-20 to -60 V/ +20 to +60 V) must not be connected to the NLite E.

Fig. 3-1 DC Power cable Connection and Power ON/OFF (1/2)

Chart 3-1 (Cont'd)

Step	Procedure
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Note: 1 The ODU power is supplied from the IDU

DC Power Connection-2 (DC-DC CONV)
1+0 SYSTEM

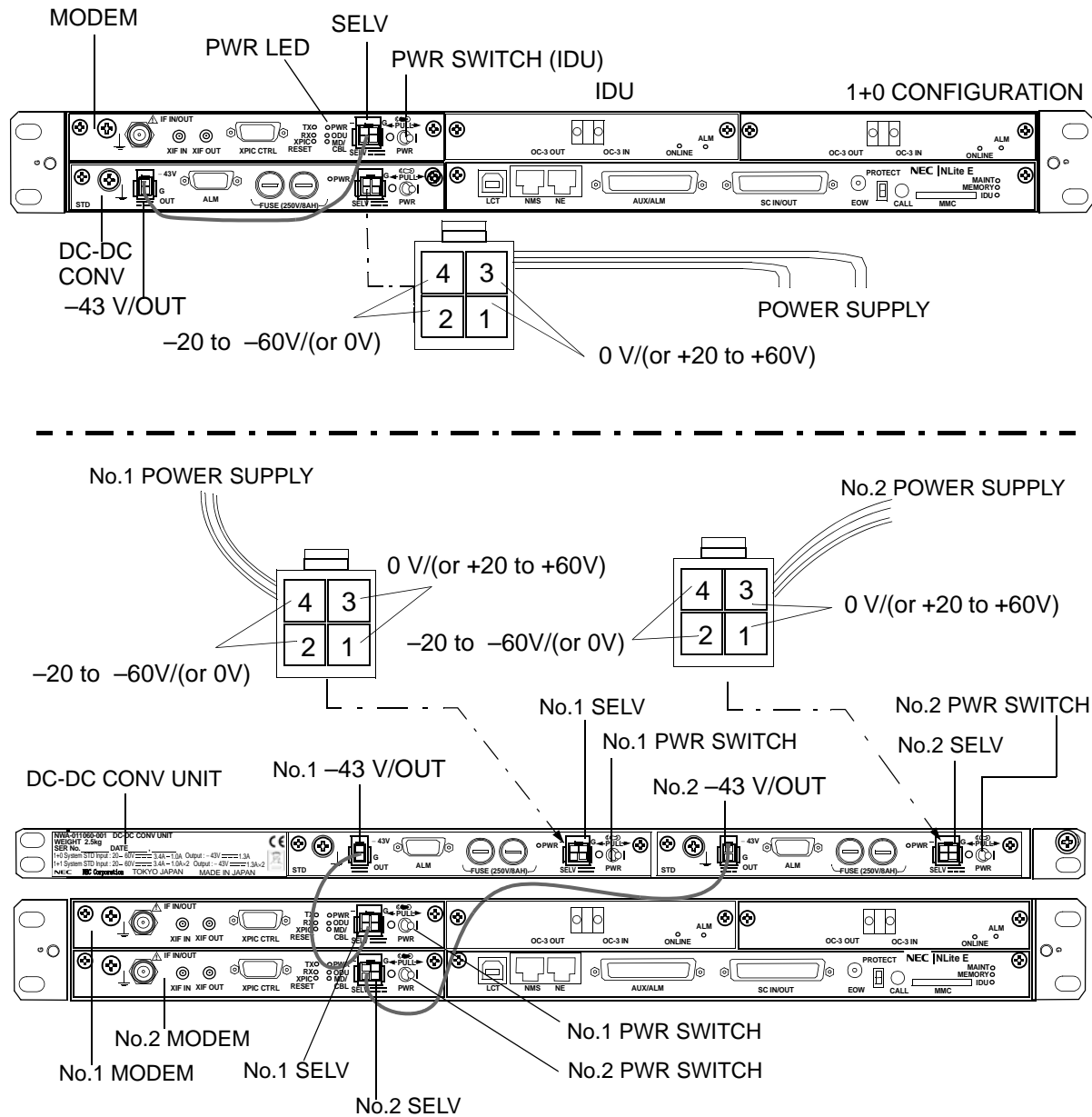
- 1 Check that the IF cable between the MODEM and the ODU is connected,
- 2 Connect the power cable to -43 V/OUT of the DC DC CONV and SELV of the MODEM as shown in Fig 3-1 (2/2),
- 3 Before connecting the power cable connector to the SELV of the DC-DC CONV, check that the rated input voltage is -24V/-48V (allowable range; within -20 to -60 V) or +24V/+48V (allowable range; within +20 to +60 V) with the digital multimeter, (see Fig. 3-1),
- 4 Pull out the PWR switch lever of the DC-DC CONV and turn on,
- 5 Confirm that the PWR indicator on the DC-DC CONV is ON,
- 6 Pull out the PWR switch lever of the MODEM and turn on,
- 7 Confirm that the PWR indicator on the MODEM is ON.

1+1 SYSTEM

- 1 Check that the IF cable between the No.1 MODEM and the No. 1 ODU, is connected,
- 2 Connect the power cable to -43 V/OUT of the No.1 DC DC CONV and SELV of the No.1 MODEM as shown in Fig 3-1 (2/2),
- 3 Before connecting the power cable connector to the SELV of the DC-DC CONV, check that the rated input voltage is -24V/-48V (allowable range; within -20 to -60 V) or +24V/+48V (allowable range; within +20 to +60 V) with the digital multimeter, (see Fig. 3-1),
- 4 Pull out the PWR switch lever of the No.1 DC-DC CONV and turn on,
- 5 Confirm that the PWR indicator on the No.1 DC-DC CONV is ON,

Chart 3-1 (Cont'd)

Step	Procedure
6	Pull out the PWR switch lever of the No.1 MODEM and turn on,
7	Confirm that the PWR indicator on the No.1 MODEM is ON,
8	Repeat steps 1 to 7 for No.2 MODEM,
9	Confirm that PWR indicator on the No.2 MODEM is ON.



Caution: The NLite E operates only negative voltage (-48 V). Therefore, the power supply system for the existing equipment which uses a floating power supply (-20 to -60 V/ +20 to +60 V) must not be connected to the NLite E.

Fig. 3-1 DC Power cable Connection and Power ON/OFF (2/2)

3.2 Shut-down

The shut-down procedures for the equipment is shown in Chart 3-2.

Warning: *After turning ON the equipment, wait at least 1 minute before turning it OFF again. Repeatedly turning the power ON and OFF with in a short interval may cause the IDU/ODU to fail.*

Chart 3-2 Shut-down

Step	Procedure
1+0 SYSTEM	
1	Pull out the PWR switch lever on the MODEM and turn off the PWR switch (see Fig. 3-1),
2	Confirm that all LED indicators on the IDU are OFF.
1+1 SYSTEM	
<i>Note: When turn OFF the IDU and ODU in 1+1 configuration, turn OFF power for standby side first, then working side.</i>	
<i>When turn OFF the IDU and ODU in working channel only, switchover the working to standby channel with TX and RX SW using LCT. (see Chart 3-8)</i>	
1	Pull out the PWR switch lever on the corresponding MODEM is to be shut down, then turn off (see Fig. 3-1).
2	Confirm that the PWR indicator on the MODEM is OFF.
3	Pull out the PWR switch lever on the other MODEM, then turn off the PWR switch. (see Fig. 3-1).
4	Confirm that all LED indicators on the IDU are OFF.

3.3 Initial Setting

The initial setup of the IDU/ODU is performed using the PC according to Table 3-1.

For the details operation of the PC setup for connecting LCT, refer to the NLite E LCT Operation Manual in Section IV Appendix.

Table 3-1 Initial Setup Items

Setup Order	Setup Item	LCT
1.	Equipment Setup	Chapter 3
2.	Date and Time	Chapter 6.3
3.	Provisioning	Chapter 7
4.	Relay/House Keeping	Chapter 7

Note: The “Equipment Setup” must be set properly every items before “Provisioning” setup.

The “Provisioning” setup must be performed based on the “Equipment Setup”.

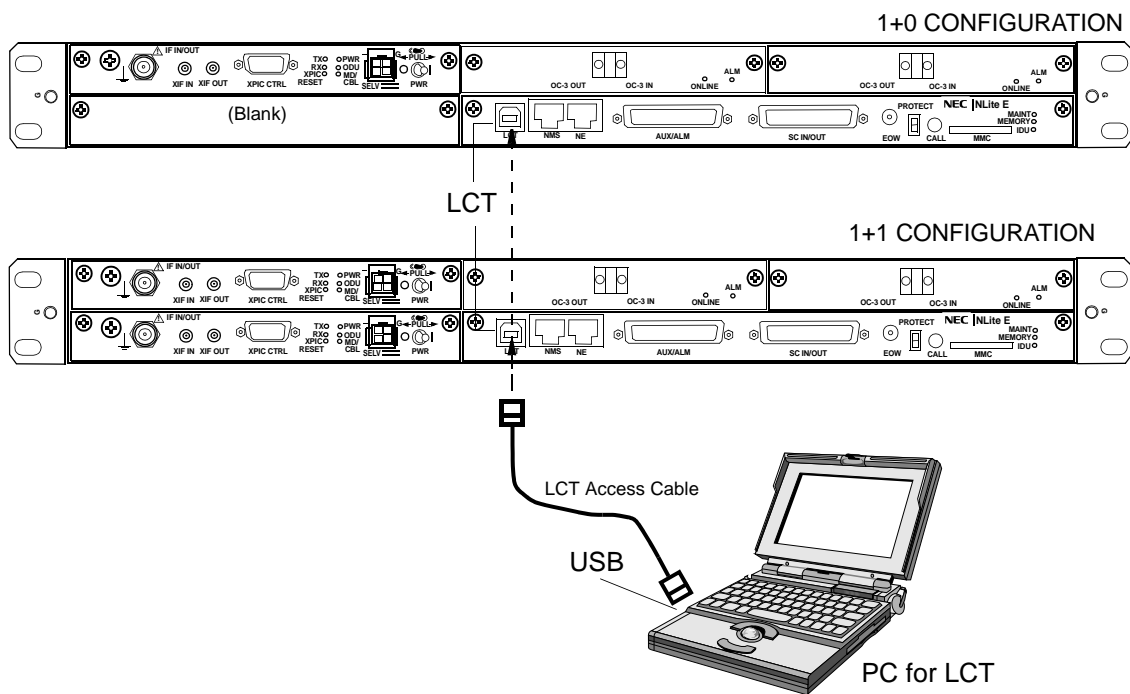


Fig. 3-2 LCT Connection

3.3.1 Equipment Setup

In initial lineup, the “Equipment Setup” must be performed using LCT.

Chart 3-3 Equipment Setup

Refer to the NLite E LCT Operation Manual in Section IV Appendix. for the details of “3. Equipment Setup”.

The Equipment Setup items to be setup for the SONET systems are as follows:

Equipment Setup Items for SONET Systems

- User Interface
- Redundancy Setting
- INTFC
- INTFC Main (WORK) *1
- INTFC SUB (PROT) *1
- XPIC Usage *2
- APS Function *3
- Modulation Scheme
- Transmission Capacity
- TX RF Frequency
- RX RF Frequency *5
- Frame ID
- TX Power Control
- LAN Port Usage *4
- LAN Capacity *4
- TX Start Frequency
- TX Stop Frequency
- Frequency Step
- Shift Frequency
- Upper/Lower
- Sub Band

Notes: *1 For SONET only.

*2 When the SONET XPIC is configured, set Main Master and Sub Master. Set to Not Used in other configurations.

The TX/RX frequency for the Main Master and Sub Master channels must be set to the same values. The Main Master and Sub Master channels must be connected to one dual polarized antenna. The reference local frequency and the action control of the ATPC/MTPC are applied from the Main Master channel to the Sub Master channel.

*3 For SONET APS only.

*4 For LAN transmission only.

*5 There is two types ODU for the RX RF Frequency setup mode.

Type 1. When the transmitting frequency is set, the receiving frequency is automatically assigned.

Type 2. When the transmitting frequency is set, the receiving frequency is automatically assigned and assignment of it in manual is also available.

3.3.2 Provisioning Setup for SONET

In initial lineup, the “Provisioning” Setup must be performed using LCT.

Chart 3-4 Provisioning Setup (SONET)

Refer to the NLite E LCT Operation Manual in Section IV Appendix. for details of the “7. Provisioning Setup”.

The Provisioning Setup items to be setup for SONET systems are as follows:

Provisioning Setup for SONET system

- BER Threshold Setting
- Sub Interface *1
- SC Assignment
- LAN Port Setting *2
- OC-3 Setting
- TX Power Control*3
- Condition for TX/RX SW
- Condition for APS
- Relay Setting
- TCN Threshold(15min)
- TCN Threshold(1day)
- PMON Select
- Others *3

*Note: *1:For LAN transmission only.*

**2:For LAN transmission only.*

**3:Set to required TX power level in MTPC mode when it is going to perform the Antenna Orientation.*

**4:Optional items*

3.4 Antenna Orientation

After the initial setup has been completed, an antenna orientation will be performed between two stations according to the procedures in Chart 3-6.

Chart 3-5 Antenna Orientation

Apparatus :

Digital Multimeter with test leads or X0818 NLite E Monitor

Wrench

Headset

Step	Procedure
1	Connect the PC to the LCT port on the NLite E IDU using USB cable, (see Fig. 3-2)
2	At each station, set “Maintenance1” from Maintenance in LCT Menu,

LCT MENU

Alarm/Status
Equipment Setup
Inventory
AUX I/O
Maintenance
Provisioning
Metering
PMON(History)

Maintenance1
Maintenance2

Note: In Maintenance “On” condition, every external Alarm outputs, excluding Maintenance/PS/CPU (IDU) ALM, are masked and remote control can not be performed.

3 Click and select for the following control items in “Maintenance1”,

Note: Retain the present status for other control items.

Note: When the TX power control mode is set to ATPC, set it to MTPC and required level for the NLite E link on the “Equipment Setup” and “Provisioning”.

Chart 3-5 (Cont'd)

Step	Procedure
	<ul style="list-style-type: none"> • TX SW Manual Control: Fix No.1 or No.2 (in 1+1 configuration) • RX SW Manual Control: Fix No.1 or No.2 (which is the same side fixed by TX SW in 1+1 configuration) • TX Power Control: MTPC in Equipment Setup (at opposite site) Required level in Provisioning • CW Control: When the Antena Alignment Mode is not selected, set manually to On. (at opposite site) • XPIC Control Local: Fix Forced Reset in XPIC configuration. • Antenna Alignment Mode: Select On (in 1+0 configuration) (Set No.1 or No.2 which is the same side fixed by TX SW and RX SW in 1+1 configuration)

--- Maintenance 1 ---

Item	Value	Setting	
Maintenace	On	<input type="radio"/> Off <input checked="" type="radio"/> On	Set
TX SW Manual Control	No.1	<input type="radio"/> Auto <input checked="" type="radio"/> No.1 <input type="radio"/> No.2	Set
RX SW Manual Control	No.1	<input type="radio"/> Auto <input checked="" type="radio"/> No.1 <input type="radio"/> No.2	Set
RX SW Maintenace Mode	Manual		
MTPC Manual Control(No.1)	On	<input type="radio"/> Off <input checked="" type="radio"/> On	Set
MTPC Manual Control(No.2)	On	<input type="radio"/> Off <input checked="" type="radio"/> On	Set
TX Mute Control(No.1)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
TX Mute Control(No.2)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
CW Control(No.1)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
CW Control(No.2)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
IF Loopback (No.1)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
IF Loopback (No.2)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
Main Loopback (Near End)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
Main Loopback (Far End)	Off	<input checked="" type="radio"/> Off <input type="radio"/> On	Set
Linearizer Control(No.1)	Auto	<input checked="" type="radio"/> Auto <input type="radio"/> Forced Reset	Set
Linearizer Control(No.2)	Auto	<input checked="" type="radio"/> Auto <input type="radio"/> Forced Reset	Set
XPIC Control Local(No.1)	Auto	<input checked="" type="radio"/> Auto <input type="radio"/> Forced Reset	Set
XPIC Control Local(No.2)	Auto	<input checked="" type="radio"/> Auto <input type="radio"/> Forced Reset	Set
XPIC Control Remote(No.1)	Auto	<input checked="" type="radio"/> Auto <input type="radio"/> Forced Reset	Set
XPIC Control Remote(No.2)	Auto	<input checked="" type="radio"/> Auto <input type="radio"/> Forced Reset	Set
--- Offline Maintenance ---			
DADE Adjust	...	<input checked="" type="radio"/> DADE <input type="radio"/> Offset DADE <input type="radio"/> DADE Off	Set
RF SUB Band Select (No.1)	...	A ▼	Set
RF SUB Band Select (No.2)	...	A ▼	Set
Antenna Alignment Mode(No.1)	On	<input type="radio"/> Off <input checked="" type="radio"/> On	Set
Antenna Alignment Mode(No.2)	On	<input type="radio"/> Off <input checked="" type="radio"/> On	Set

Note: In Antenna Alignment Mode “On” condition, controls between IDU and ODU are restricted.

Chart 3-5 (Cont'd)

Step	Procedure
4	At receiving station, remove a cap from the RX LEV MON jack,
5	At each station connect the digital multimeter or NLite E Monitor to the RX LEV MON jack on the ODU,
<p><i>Note: In order to measure exact performance of AGC V, it is mandatory required to set Antenna Alignment Mode to ON. The AGC voltage indication is not guaranteed outside Antenna Alignment Mode.</i></p> <p><i>It is necessary to set to Antenna Alignment Mode when monitor the RX level with the NLite E Monitor unit.</i></p>	
6	At each station, adjust the azimuth and elevation angle of the antenna alternately so that the measured voltage becomes maximum,
<p><i>Note: The relation of the RX INPUT LEVEL versus RX LEVEL MON(V) is shown below.</i></p>	

RX LEVEL MON vs RX INPUT LEVEL (Typical)

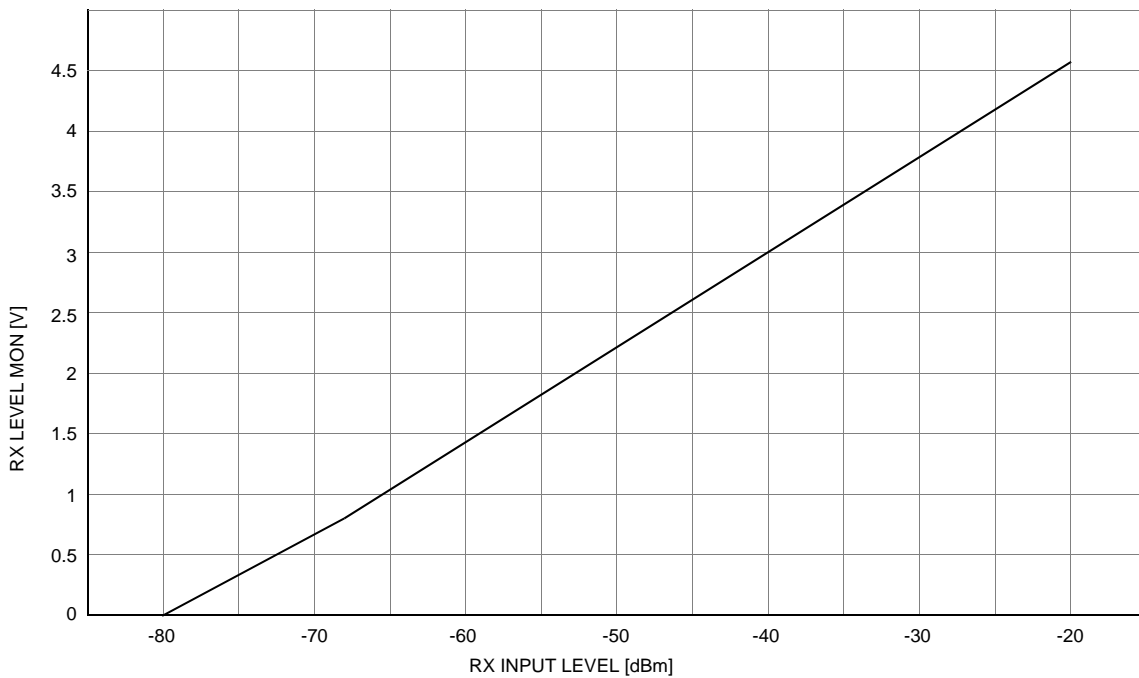
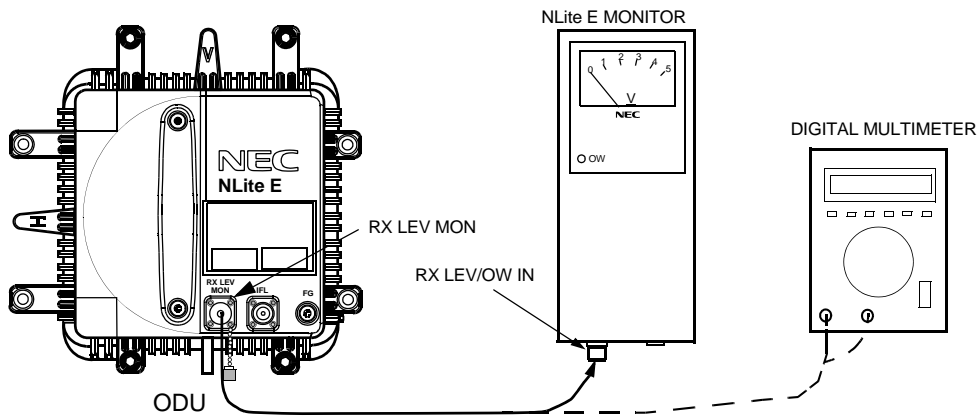


Chart 3-5 (Cont'd)

Step	Procedure
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- Notes 1: It is necessary to set to the Antenna Alignment Mode using PC for LCT when monitor the RX level with the NLite E MONITOR unit.
- 2: The RX LEV MON terminal on the ODU (conformed to IEC61169-24).
- 3: The RX LEV MON terminal must be capped for waterproof.

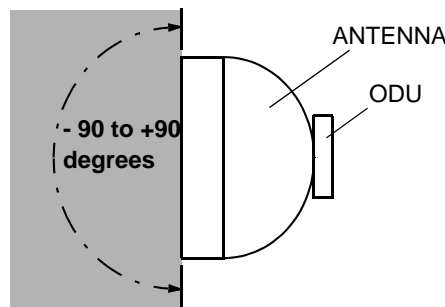
Fig. 3-3 Antenna Orientation Test Setup

Note: The fixed bolts and nuts to be used for the antenna orientation differ with antenna bracket types, refer to antenna bracket shown in Fig. 3-4 (1/4) to (4/4).

Safety Guideline for Microwave Radiation Hazard

The Microwave and Millimeter-wave that NLite E series are transmitting is at a very small radiation level and never has been reported to effect human health. Advanced countries concerned about health hazards have started to regulate the radiation levels. The operator should not work near the parabolic antenna during RF transmission. The area in front of and to the side of the antenna show high radiation levels. Please see below figure and calculation sample 1.

The front side of antenna presents a high power density in the antenna beam area. Therefore, the user of this system should pay attention not to radiate the beam against humans at any time. (Please refer below calculation sample 2)



Hazard Area of Radiation

In addition, the Power density and Field strength level is calculated by equation below.

$$\text{Power density } S \text{ (mW/cm}^2\text{)} = \frac{10^{\left(\frac{P+G-30}{10}\right)} \times K}{40 \times \pi \times R^2}$$

Where:

- P = Output power of ODU (dBm),
- G = Antenna Gain (dBi),
(in consideration of the angle from antenna)
- K = Reflection factor =2.56 (given),
- R = Distance between Human and Antenna (m)

Calculation example 1, (90 degree side of antenna)

- NLite E = 18 GHz/+23 dBm,
- Antenna diameter = 0.6 m,
- 0 degree antenna gain = 39 dBi,
- 90 degrees side antenna gain = -24 dBi, (90 degrees attenuation = -63 dB),
- Distance = 0.1 m

$$\text{Power density } S \text{ (mW/cm}^2\text{)} = 0.0016 \leq 0.01$$

Calculation example 2, (0 degree, front side of antenna)

- NLite E = 7 GHz/+27 dBm,
- Antenna diameter = 1.8 m,
- 0 degree antenna gain = 40 dBi,
- Distance = 100 m

$$\text{Power density } S \text{ (mW/cm}^2\text{)} = 0.01$$