SERVICE MANUAL



Minor Surgical Luminaire (Luvis S200)

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Please read this SERVICE MENUAL before installing this equipment.

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	**“WARNING: Modification of this equipment is not allowed”**

1. INSTALL INFORMATION

1.1 INSTALLATION BY TYPE

Minor Surgical Luminaire (Luvis) is designed for use in medical clinic to illuminate the specific and sectional area of patient's body parts and assist curing and diagnosis of the patients including children and adult. Functions of family models are identical to the functions of Minor Surgical Luminaire (Luvis). The two only differ in their mounting options. The device may only be used for medical professional purpose



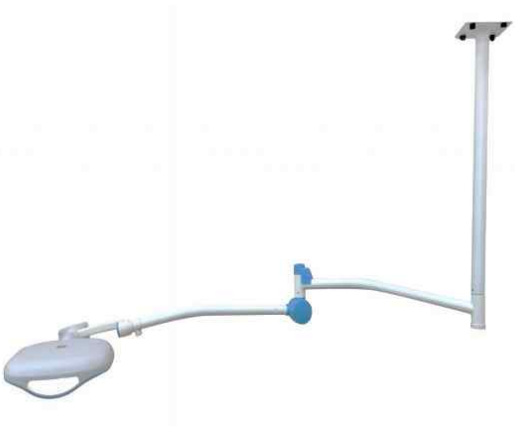
PL2S20-002B0 (Dual connection type)



PL2S30-002C0 (Wall type)



PL2S10-002A0 (Mobile type)



PL2S40-002D0 (Single ceiling type)



PL2S50-002E0 (Dual ceiling type)

MOBILE (Refer to Drawing code no: DT-S200-2-MD-1)

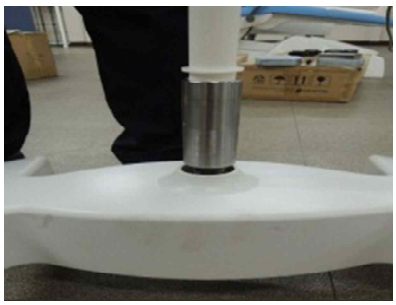
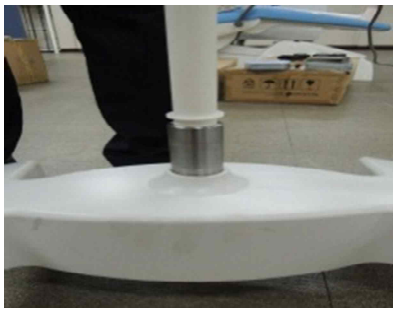
Step 1	Check the BOX components.	
Step 2	After opening the box, check that all product components are present. - HEAD ASS'Y: 1EA - FIRST HORIZONTAL ARM: 1EA - VERTICAL ARM 1: 1EA - VERTICAL ARM 2: 1EA - BASE BODY: 1EA - CASTER: 4EA - BASE WEIGHT1,2: 1EA (Total 2) - POWER CASE BKT: 1EA - SMPS: 1EA	
Step 3	Unseal the BASE BODY BOX and take the BASE BODY out.	
Step 4	Check the integrity of the BASE BODY and place it upside down on the floor.	
Step 5	Insert the CASTERs to the BASE BODY by pressing them with your hand. We recommend that you put gloves on, while working on this step.	

<table>
<tr><td>Step 6</td><td>Insert total of 4 CASTERs to the BASE BODY.
(The order does not matter.)</td><td></td></tr>
<tr><td>Step 7</td><td>While inserting the CASTERs, hold the BASE BODY firmly with your hand so that it does not wobble.</td><td></td></tr>
<tr><td>Step 8</td><td>Unseal the BASE WEIGHT 1, 2 & SMPS BOX.</td><td></td></tr>
<tr><td>Step 9</td><td>Take out the BASE WEIGHT #1, located at the very bottom of the package.</td><td></td></tr>
<tr><td rowspan="2">Step 10</td><td>Properly align the center hole of WEIGHT #1 to the pole inside the BASE BODY.</td><td></td></tr>
<tr><td>To assemble the BASE BODY, adjust the BASE WEIGHT #1 to the orientation shown in the picture.
Check the BASE WEIGHT #1’s orientation.</td><td>
X O</td></tr>
</table>

Step 11	Insert the BASE WEIGHT #1 to the BASE BODY. ⚠ Be careful with your hands, when inserting the BASE WEIGHT.	
Step 12	As shown in the picture, prepare BASE WEIGHT #1 BINDING SCREWs (M6*35 2EA).	
Step 13	As shown in the picture, insert the screws and tighten them with a WRENCH.	
Step 14	Take out the BASE WEIGHT #2 (With SMPS equipped) and prepare it as shown in the picture.	
Step 15	Properly align the center hole of the BASE WEIGHT #2 to the pole inside the BASE BODY. Then, insert the weight. ⚠ Be careful with your hands, when inserting the weight.	
Step 16	Insert the BASE WEIGHT #2 BINDING SCREWs (M6*55 6EA) into the BASE WEIGHT #2 and tighten them with a WRENCH.	

Step 17	When you tighten the screws, the order does not matter.	
Step 18	Pictures on the side demonstrate how the BASE should look like when Step 17 is completed.	
Step 19	Flip the BASE BODY back to the normal position.	
Step 20	The CASTERs under the BASE BODY should be facing the floor.	
Step 21	Take out the VERTICAL ARM 1, VERTICAL ARM 2 from its box.	

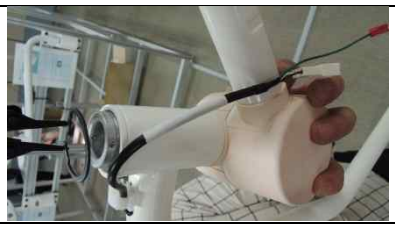
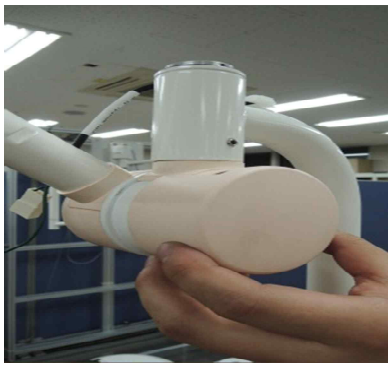
Step 22	The connection of VERTICAL ARM 1 connector and VERTICAL ARM 2 connector.	
Step 23	VERTICAL ARM 1 and VERTICAL ARM 2 then combines, Tighten the supplied knob.	
Step 24	MOBILE VERTICAL ARM assembly completion	
Step 25	Hold the VERTICAL ARM 1 so that its bottom faces the center hole of the BASE BODY. Insert its electric wiring into the hole.	

Step 26	Plug the VERTICAL ARM 1's bottom into the center hole of the BASE BODY.	
Step 27	Plug in only the half of the VERTICAL ARM 1's bottom section, as shown in the picture.	
Step 28	Lay the VERTICAL ARM 1 down sideways.	
Step 29	Using a LONG-NOSE, pull out the electric wiring from the BASE.	
Step 30	After pulling out the electric wiring, tug the wiring once. ⚠ Be careful of the wiring jamming.	 

Step 31	Raise the VERTICAL ARM 1 upright and finish plugging it to the BASE BODY. Check the assembly direction for VERTICAL ARM 1	  **O** **X**
Step 32	Prepare a LOCK WASHER (Φ25) and NUT (Φ25).	
Step 33	As shown in the picture, make them face each other.	
Step 34	Put the wire through the LOCK WASHER and NUT.	
Step 35	Tighten the LOCK WASHER and NUT with your hand to VERTUCAL ARM 1 JOINT 2 at the bottom of the base.	
Step 36	Using a LONG-NOSE, tighten the LOCK NUT sufficiently. fixed Lock washer	

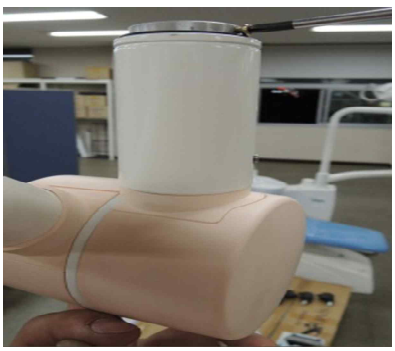
Step 37	Link the wiring connector of VERTICAL ARM 1 and SMPS to its counterparts separately. TDK: Attach a ferrite core ZCAT1730-0730 1EA.	
Step 38	Connect the SMPS EARTH and VERTICAL PE WIRE to the center hole of BASE WEIGHT 1 with a SCREW (M3*6, 2EA).	
Step 39	Prepare the POWER CASE BKT.	
Step 40	Hold the POWER CASE BKT so that it is oriented in the direction shown in the picture.	
Step 41	Make sure that the wiring does not get compressed, when assembling the POWER CASE BKT.	

Step 42	Place the POWER CASE BKT BINDING SCREWs(M3x6 4EA) on the appropriate holes and tighten them with a '+' DRIVER.	
Step 43	By holding the VERTICAL ARM, raise the assembled pieces upright.	
Step 44	⚠ Lock (ON) the 4 CASTERs under the Base so that the assembled device stays still.	
Step 45	As shown the picture, position VERTICAK ARM1 downward. ⚠ Incorrect Installation	 
Step 46	Plug the FIRST HORIZONTAL ARM into the VERTICAL ARM 1, by pushing the FIRST HORIZONTAL ARM upward from below. ⚠ All electrical wirings inside the VERTICAL ARM 1 should be taken out beforehand so that they do not interfere with the assembly.	

Step 47	While holding the plugged FIRST HORIZONTAL ARM still, broaden the SNAPRING's gap with a SNAPRING PLIER.	
Step 48	Place the broadened SNAPRING on the device, as shown in the picture.	
Step 49	Push the SNAPRING into the hole of FIRST HORIZONTAL ARM JOINT 2 so that it attaches completely to the device.	
Step 50	Push the SNAPRING further into the hole. Make sure that it goes in completely. Correct Installation Incorrect Installation	  
Step 51	Open the TENSION HOUSING COVER of the FIRST HORIZONTAL ARM.	

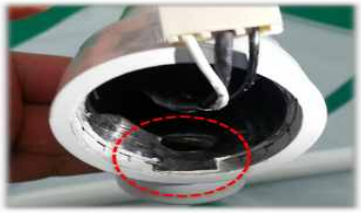
Step 52	As shown in the picture, electric wirings should be tangled inside.	
Step 53	Hold the electric wiring of the VERTICAL ARM 1.	
Step 54	Insert the electric wiring of the VERTICAL ARM 1 into the FIRST HORIZONTAL ARM JOINT 2, as shown in the picture.	
Step 55	As shown in the picture, pull the wiring of the VERTICAL ARM 1 from the bottom.	

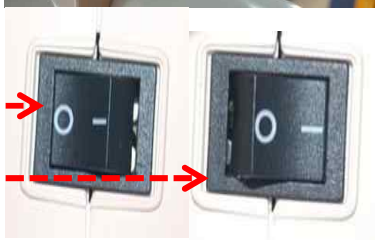
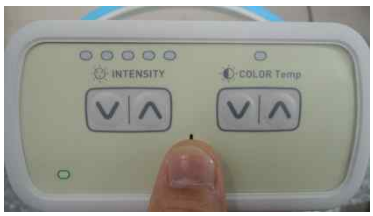
Step 56	Check if there are any problems with the wirings.	
Step 57	Link the wiring connector of VERTICAL ARM 1 and SMPS to its counterparts separately. TDK: Attach a ferrite core ZCAT1730-0730 1EA.	 
Step 58	Check the FE WIREs of both the VERTICAL ARM 1 and FIRST HORIZONTAL ARM JOINT 2.	
Step 59	Completely unscrew the SCREW and WASHER on the FIRST HORIZONTAL ARM JOINT 2 with a '+' DRIVER.	

Step 60	Put the unscrewed SCREW through the FE WIRE RING TERMINAL 2EA.	
Step 61	With a '+' driver, screw the SCREW (with two FE WIREs attached) back into the FIRST HORIZONTAL ARM JOINT 2.	
Step 62	When the FE WIREs are fixed, close the COVER of the FIRST HORIZONTAL ARM JOINT 2.	
Step 63	Insert M3 SCREWS into two SCREW DOCKING HOLEs, located at the top of the FIRST HORIZONTAL ARM JOINT 2. Then, tighten one of them.	
Step 64	Repeat the same step on the other side.	

Step 65	M3 SCREWS should be screwed in, as shown in the picture.	
Step 66	Equip the VERTICAL ARM 1 JOINT 1 CAP to the assembled device. ⚠ When equipping the CAP, push it in until there is a click.	
Step 67	Pull the equipped FIRST HORIZONTAL ARM downward with your hand. ⚠ Be cautious when lowering the FIRST HORIZONTAL ARM. Its internal SPRING TENSION may cause damage to the product or may hit a person.	
Step 68	Before attaching the HEAD ASS'Y to the FIRST HORIZONTAL ARM, link the wiring connector. ⚠ Be careful when linking the wiring connector. The wiring may get disconnected if the FIRST HORIZONTAL ARM and HEAD ASS'Y are not hold tightly and are let loose.	
Step 69	When electric wiring connecters are connected, plug the HEAD ASS'Y into the FIRST HORIZONTAL ARM. ⚠ When inserting HEAD ASSY, be careful of the short circuit caused by wiring jamming.	

Step 70	Plug the HEAD ASS'Y into the FIRST HORIZONTAL ARM completely.	
Step 71	When the HEAD ASS'Y's assembly is finished, make sure that the hole of the JOINT ARM and the FIRST HORIZONTAL ARM HEAD LOCKING KEY equipping hole are aligned, as shown in the picture. If the hole doesn't fit each other, adjust their positions.	
Step 72	Prepare the HEAD LOCKING KEY, which will keep the FIRST HORIZONTAL ARM and HEAD ASS'Y fixed.	
Step 73	Insert the HEAD LOCKING KEY, as shown in the picture.	
Step 74	Hold and rotate the JOINT ARM so that the protruding part faces the bottom. If the JOINT ARM is not rotated, the HEAD LOCKING KEY may fall off from the device. If so, the HEAD ASS'Y may detach from the device and get damaged.	
Step 75	Prepare a M5 WRENCH to adjust the HEAD ASS'Y's	

Step 76	Use the M5 WRENCH to adjust the HEAD ASS'Y's tension of left and right. ⚠ Before the JOINT ARM BOLT is screwed, it has to be adjusted as shown in the picture. (If the holes are not properly aligned, device can be damaged.)	 
Step 77	By slowly turning the JOINT ARM BOLT, adjust the tension of left and right.	
Step 78	⚠ Check the operability of the HEAD ASS'Y. If it does not stay still and slides to the side, use a M3 WRENCH to tighten the BOLT.	
Step 79	Check the attachment area of the KNOB (used for head maneuvering and focus adjusting).	
Step 80	Attach the KNOB, as shown in the picture.	

Step 81	Attach the KNOB so that it fits to the LOCKING KEY HOLE.	
Step 82	Make sure that the POWER SWITCH, located below the VERTICAL ARM 1's HANDLE, is turned off. ⚠ POWER OFF POWER ON	 
Step 83	Plug the device's POWER CORD into an ELECTRICAL OUTLET that provides AC of 100~250V. ⚠Use an ELECTRICAL OUTLET with a ground.	
Step 84	Turn ON (O) the POWER SWITCH, located below the VERTICAL ARM 1's HANDLE.	
Step 85	Press the STAND-BY S/W button of CONTROL SWITCH on the HEAD ASSY'Y.	

Step 86	Check that the CONTROL SWICTH STAND-BY INDICATOR LED is on. ⚠ If the light does not turn on, refer to 2.5 ETC. SMPS CHANGE METHOD.	
Step 87	When the LED turns on, use the focus adjustment KNOB to check any abnormality in the pattern.	
Step 88	PATTERN SIZE 180mm (Criteria)	
Step 89	PATTERN SIZE 300mm (Criteria)	
Step 90	3800K mode (LED Color: ORANGE)	

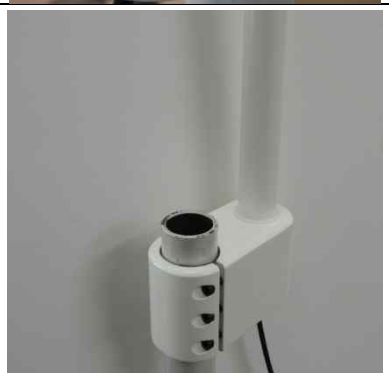
Step 91	4300K mode (LED Color: PINK)	
Step 92	4800K mode (LED Color: White)	
Step 93	Using the Intensity Control Switch, select the desired step (5 Steps). Step 1	
Step 94	Step 2	
Step 95	Step 3	

Step 96	Step 4	
Step 97	Step 5	
Step 98	The picture on the side shows the completed assembly and installation of a MOBILE type device.	

DUAL CONNECTION (Refer to Drawing code no: DT-S200-3-MD-1)

Step 1	Check the BOX components.	
Step 2	Unseal the boxes and take out the product.	
Step 3	After opening the box, check that all product components are present. - HEAD ASS'Y: 1EA - FIRST HORIZONTAL ARM: 1EA - SECOND HORIZONTAL ARM: 1EA - DUAL CONNECTOR: 1EA - EXTENSION PIPE & ARM: 1EA - SMPS 2: 1EA - SECOND HORIZONTAL ARM JOINT2: 1EA	
Step 4	Take out the DUAL CONNECTOR.	
Step 5	Unscrew all the SCREWs from the already assembled DUAL CONNECTOR, and dismantle all the parts.	 

Step 6	Put a Slip Preventing Silicon Pad on the dismantled DUAL CONNECTOR. Then, attach it to other device and assemble the parts, as shown in the pictures. ⚠ Installation must be done on a device in the form of FLOOR or PIPE. It should be able to withstand 10 Kg of weight. ⚠ Set the installation height, after checking the focus and operating range.	
Step 7	The picture on the side shows the DUAL CONNECTOR attached to a device with existing lighting equipment. ⚠ Available size for installation: Φ30~47. Other lengths can be custom-built.	
Step 8	Attach the SECOND HORIZONTAL ARM JOINT2, which is needed for installing the SECOND HORIZONTAL ARM.	
Step 9	Put in the connection wiring of SECOND HORIZONTAL ARM's into a hole on the SECOND HORIZONTAL ARM JOINT2.	

Step 10	After putting in the connection wiring, attach the SECOND HORIZONTAL ARM to the top of the SECOND HORIZONTAL ARM JOINT2.	
Step 11	The picture on the side shows the completed assembly of SECOND HORIZONTAL ARM and SECOND HORIZONTAL ARM JOINT2.	
Step 12	Insert the EXTENSION PIPE into the SECOND HORIZONTAL ARM JOINT2 which is equipped with a DUAL CONNECTOR. ⚠ If the device interferes with other lighting equipment's mobility, the EXTENSION PIPE can be installed. The default length is 180mm. ⚠ Other lengths can be custom-built.	
Step 13	Put the EXTENSION ARM BOLT into the PIPE at the bottom, as shown in the picture.	
Step 14	Attach the SECOND HORIZONTAL ARM to the EXTENSION ARM BOLT which is located at the bottom, as shown in the picture. ⚠ Be careful of scratches and pinch from the SECOND HORIZONTAL ARM's hole and the EXTENSION ARM BOLT's outer rim.	

Step 15	After attaching the SECOND HORIZONTAL ARM and EXTENSION ARM BOLT, tighten the headless bolt 2EA on the EXTENSION ARM BOLT.	
Step 16	After attaching the connection of the SMPS 2 DC OUTPUT TERMINAL, use the shrinkable tube to finish connection. (Recommended size of shrinkable tube is Φ 18.)	
Step 17	The picture on the side shows the completed assembly and installation of a DUAL CONNECTION type device. Please refer to Step 47 in 1.1 MOBILE. The assembling steps are not different from the steps in MOBILE (Step 48~96). Also apply to DUAL CONNECTION type device.	

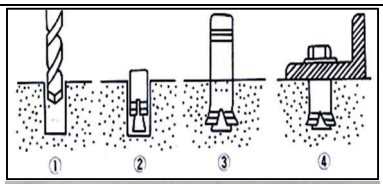
WALL (Refer to Drawing code no: DT-S200-4-MD-1)

Step 1	Check the BOX components.	
Step 2	Unseal the boxes and take out the product.	
Step 3	After opening the box, check that all product components are present. - HEAD ASS'Y: 1EA - FIRST HORIZONTAL ARM: 1EA - WALL SECOND ARM: 1EA - WALL BRACKET: 1EA - SMPS 2: 1EA - SMPS BRACKET: 1EA	
Step 4	Connect the ARM BOX's WALL BRACKET with the WALL SECOND ARM.	 
Step 5	Tighten the Lock nut, and Lock washer after combining WALL BRACKET WALL SECOND ARM as shown in the picture.	 

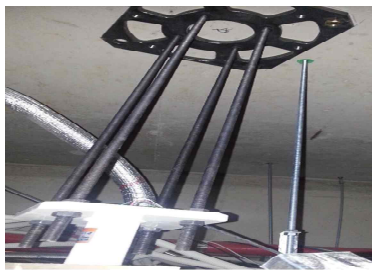
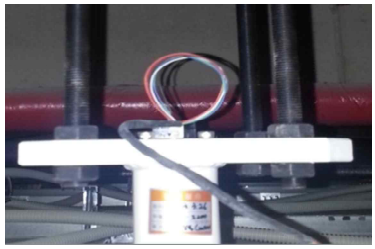
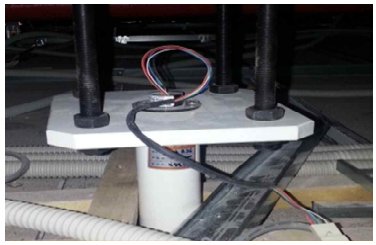
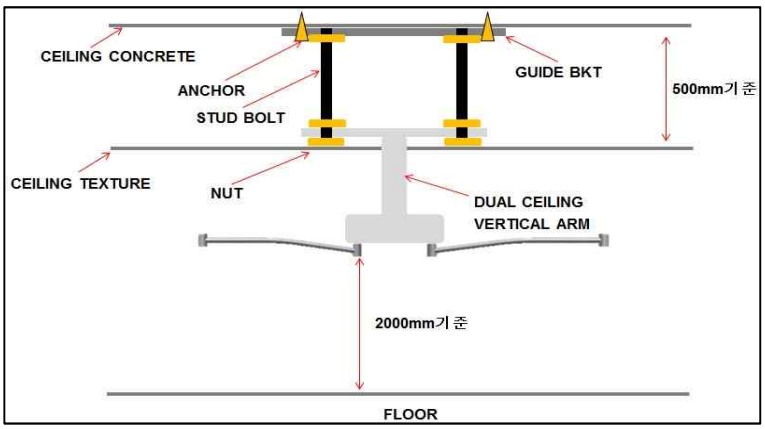
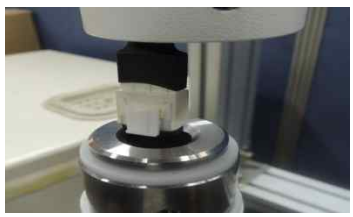
Step 6	Pass the wiring through the WALL BRACKET's hole and the WALL BRACKET's inner hole.	
Step 7	Position the wiring on the GUIDE (Behind the WALL BRACKET).	
Step 8	Install the WALL BRACKET to the already installed WALL ANCHOR and tighten the NUTs. Total of 4 Bolt need to be tightened. Tighten as hard as possible.	 
Step 9	Cover the 4 NUTs in the WALL BRACKET with the WALL BRACKET CAPs.	 

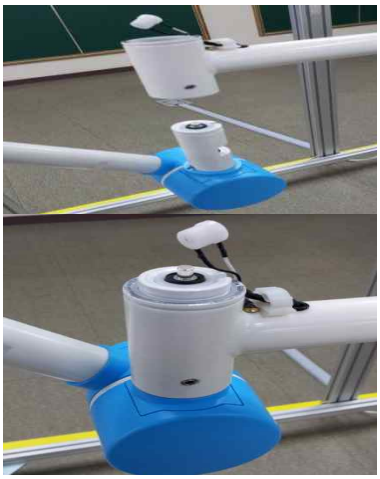
Step 10	Cover the top and bottom of the WALL BRACKET with the provided ARM HOUSING CAP and HEAD HOUSING CAP.	
Step 11	Prepare the SMPS BRACKET.	
Step 12	Install the SMPS BRACKET, after considering the outlet position. Then, mount the SMPS 2 and connect the electric wirings, as shown in the picture. Please refer to Step 47 in 1.1 MOBILE. The assembling steps are not different from the steps in MOBILE (Step 48~96). Also apply to WALL type device.	
Step 13	After attaching the connector of the SMPS 2 DC OUTPUT TERMINAL, use the shrinkable tube to finish connection. (Recommended size of shrinkable tube is Φ 18.)	
Step 14	The picture on the side shows the completed assembly and installation of a WALL type device.	

SINGLE CEILING (Refer to Drawing code no: DT-S200-5-MD-1)

Step 1	Check the BOX components.	
Step 2	Unseal the boxes and take out the product.	
Step 3	After opening the box, check that all product components are present. - HEAD ASS'Y: 1EA - FIRST HORIZONTAL ARM: 1EA - CEILING SECOND ARM: 1EA - CEILING VERTICAL ARM: 1EA - SMPS 2: 1EA - CEILING COVER: 1EA - CEILING COVER BRACKET: 1EA - GUIDE BRACKET: 1EA - STUD BOLT: 4EA	
Step 4	Prepare the GUIDE BRACKET.	
Step 5	Choose the product position on the concrete ceiling. Check the guide bracket hole position, and then drilled the hole and insert the anchor bolt. [Anchor Bolt Length Calculation] **Basic Formula: L = Diameter X 25** Hold the GUIDE BRACKET still and screw in STUD BOLT 4EA, as shown in the picture.	  

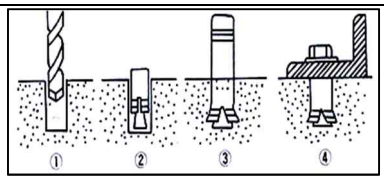
<table>
<tr>
<td>Step 6</td>
<td>Insert the 4 STUD BOLT into the CEILING VERTICAL ARM’s Equipping Holes. Then, set the arm by tightening nuts on the top and bottom.
Refer to Step 7 for Product Height Setting.

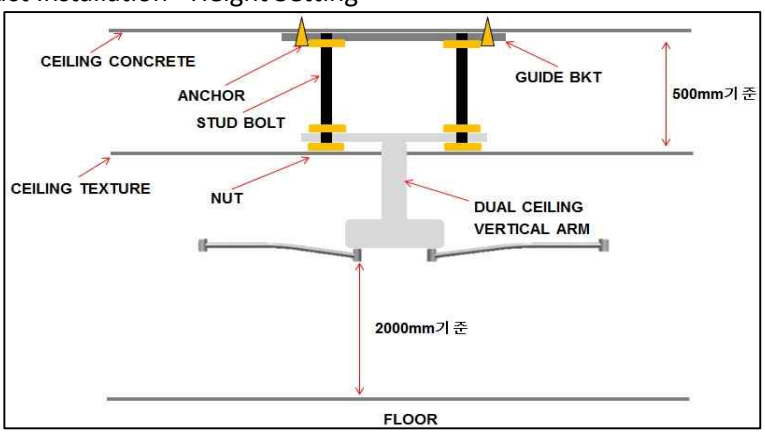
When installing STUD BOLTs over 50cm, fix the product to the ceiling structure so that the product does not wobble.</td>
<td>

</td>
</tr>
<tr>
<td>Step 7</td>
<td colspan="2">Product Installation - Height Setting (The same applies to DUAL CEILING)

</td>
</tr>
<tr>
<td>Step 8</td>
<td>Connect the wiring connector of the CEILING VERTICAL ARM and CEILING SECOND ARM. Then, attach the CEILING SECOND ARM to the CEILING VERTICAL ARM, after aligning the headless bolts’ holes properly.</td>
<td></td>
</tr>
</table>

Step 9	The picture on the side shows the completed assembly of the CEILING VERTICAL ARM and the CEILING SECOND ARM. ⚠ Before inserting the Headless Bolts, hold the CEILING SECOND ARM with your hand. If you don't, the arm may fall off.	
Step 10	Screw in the Headless Bolts (M5*8, 3EA), as shown in the picture. ⚠ When screwing the bolts, make sure that the 3 holes are properly aligned. If they are not, the thread of the bolts may get damaged. Don't screw in too deeply.	  **O** **X**
Step 11	Attach the CEILING SECOND ARM and the FIRST HORIZONTAL ARM 1 to the device, as shown in the picture.	
Step 12	After completely lifting up FIRST HORIZONTAL ARM 1, hang the SNAPRING. ⚠ Please refer to Step 47 in 1.1 MOBILE. The assembling steps are not different from the steps in MOBILE (Step 48~96).	

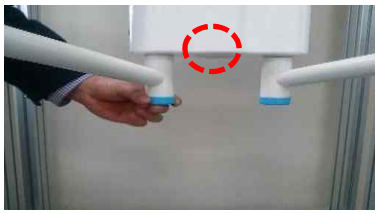
Step 13	Install the CEILING COVER between the DUAL CEILING VERTICAL ARM and TEXTURE. Then, tighten the enclosed bolt with a '+' DRIVER. Unscrew the captive bolt of the CEILING BRACKET. Then, assemble the DUAL CEILING VERTICAL. Raise the BRACKET up to the TEXTURE and fasten it with captive bolts 4EA.	
Step 14	SMPS 2 FIXING METHOD Install the SMPS in the direction shown in the picture.	
Step 15	Installation guide for the Individual switch of SINGLE CEILING.	Refer to Drawing code no: DT-S200-5-WD-1
Step 16	The picture on the side shows the completed assembly and installation of CEILING.	

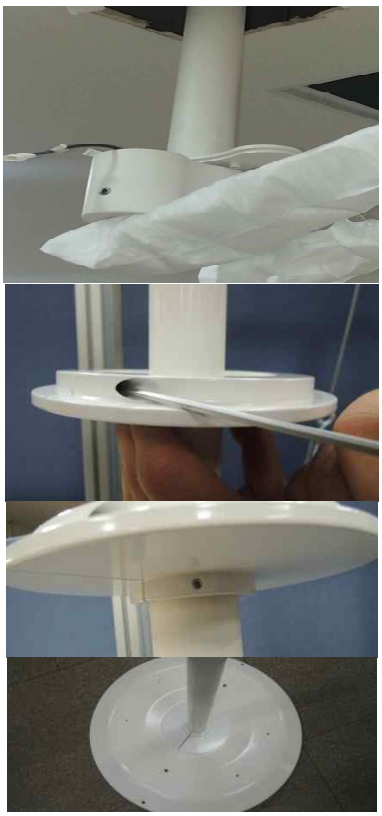
DUAL CEILING (Refer to Drawing code no: DT-S200-6-MD-1)

Step 1	Check the BOX components.	
Step 2	Unseal the boxes and take out the product.	
Step 3	After opening the box, check that all product components are present. - HEAD ASS'Y: 2EA - FIRST HORIZONTAL ARM 1: 2EA - WALL SECOND ARM 1: 2EA - DUAL CEILING VERTICAL ARM: 1EA - SMPS 2: 2EA - CEILING COVER: 1EA - CEILING COVER BRACKET: 1EA - GUIDE BRACKET: 1EA - FIXING BRACKET: 1EA - STUD BOLT: 6EA	
Step 4	Prepare the GUIDE BRACKET.	
Step 5	Choose the product position on the concrete ceiling. Check the guide bracket hole position, and then drilled the hole and insert the anchor bolt. [Anchor Bolt Length Calculation] **Basic Formula: L = Diameter X 25** Hold the GUIDE BRACKET still and screw in STUD BOLTs 6EA, as shown in the picture.	  

<table>
<tr><td>Step 6</td><td>Install the FIX BRACKET on the middle of the STUD BOLTs to prevent wobbling. Put and tighten the NUTs on the top and bottom of the bracket.</td><td></td></tr>
<tr><td>Step 7</td><td>Install the DUAL CEILING VERTICAL ARM on the bottom of the STUB BOLTs by inserting the bolts into its equipping hole. Put and tighten the NUTs on the top and bottom of the bracket.
Refer to Step 8 for Product Height Setting.</td><td></td></tr>
<tr><td>Step 8</td><td colspan="2">Product Installation - Height Setting

</td></tr>
<tr><td>Step 9</td><td>Remove the DUAL BRACKET COVER’s captive bolts.</td><td></td></tr>
<tr><td>Step 10</td><td>Open the DUAL BRACKET COVER.</td><td></td></tr>
</table>

Step 11	Prepare the WALL SECOND ARM 1.	
Step 12	Take out OD42 THRUST WASHER, M25 LOCK NUT, M25 LOCK WASHER from the WALL SECOND ARM.	 
Step 13	Attach the WALL SECOND ARM 1 to the both sides of DUAL BRACKET.	 
Step 14	Reassemble the OD42 THRUST WASHER, M25 LOCK NUT, M25 LOCK WASHER into the WALL SECOND ARM 1. If the lock washers and nuts are tightened too tightly, the device's maneuverability may get impaired. Tighten only sufficiently.	
Step 15	Attach the HARNESS connector to the DUAL CEILILNG VERTICAL ARM HARNESS and WALL SECOND ARM 1.	

Step 16	Insert the connector of **step 15** into the hole of DUAL CEILING VERTICAL ARM. If the connector is not installed in the hole of DUAL CEILING VERTICAL ARM, there is a risk of disconnection or short. Be sure to insert it.	  
Step 17	Close the DUAL BRACKET COVER.	
Step 18	Screw the DAMPER BOLT in. When you check the maneuverability of the device after installation, if the device does not stay still and slides to the side, tighten the bolt sufficiently to improve the condition.	
Step 19	Attach ARM HOUSING CAP on both arms. If the DUAL BRACKET does not stay still and wobbles, open the CAP (indicated by a red circle), tighten the LOCK NUT, and close the CAP back on.	

Step 20	Attach the WALL SECOND ARM 1 to the FIRST HORIZONTAL ARM 1, as shown in the picture.	
Step 21	After completely lifting up FIRST HORIZONTAL ARM 1, hang the SNAPRING. Please refer to Step 47 in 1.1 MOBILE. The assembling steps are not different from the steps in MOBILE (Step 48~96).	
Step 22	Install the CEILING COVER between the DUAL CEILING VERTICAL ARM and TEXTURE. Then, tighten the enclosed bolt with a '+' DRIVER. Unscrew the captive bolt of the CEILING BRACKET. Then, assemble the DUAL CEILING VERTICAL. Raise the BRACKET up to the TEXTURE and fasten it with captive bolts 4EA.	

Step 23	SMPS 2 FIXING METHOD Install the SMPS in the direction shown in the picture.	
Step 24	Installation guide for the Individual switch of DUAL CEILING.	Refer to Drawing code no: DT-S200-6-WD-1
Step 25	The picture on the side shows the completed assembly and installation of the DUAL CEILING.	

2. MAINTENANCE

2.1 MOBILE BASE IN SMPS CHANGE METHOD

Step 1	Check that the CASTERs are locked. (OFF → LOCK, ON → UNLOCK) Before working on this maintenance, please remove the POWER CORD from the ELECTRICAL OUTLET or turn OFF the Device. We recommend that you wear gloves before you begin the maintenance procedures.	
Step 2	Lay the device on the ground sideways. To prevent any damage to the device, lay a cushion or protection vinyl on the ground.	

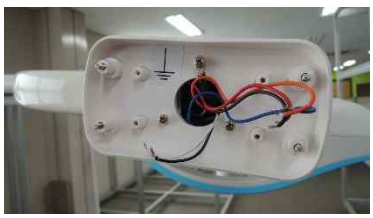
		
Step 3	Check the product's bottom. Refer to Drawing code no: DT-S200-2-ED-2	
Step 4	Using a '+' DRIVER, unscrew the captive bolts on the POWER CASE BRACKET 1.	
Step 5	Detach the connected connector.	
Step 6	Using a '+" DRIVER, unscrew the PG captive bolt that is connected to the WEIGHT. (Only detach the PG from POWER INPUT TERMINAL)	
Step 7	Detach the POWER CASE BRACKET using a '+' DRIVER. Replace the SMPS. Then, put the POWER CASE BRACKET back on.	

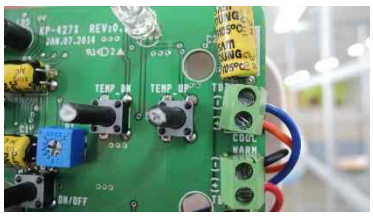
Step 8	Detach the POWER CASE BRACKET 1 captive bolts, using a '+' DRIVER.	
Step 9	Total of 4 screws should be screwed.	

2.2 CONTROL PCB ASS'Y CHANGE METHOD

Step 1	Check the back of the CONTROL CASE. Before working on this maintenance, please remove the POWER CORD from the ELECTRICAL OUTLET or turn OFF the Device. We recommend that you wear gloves before you begin the maintenance procedures.	
Step 2	Pull out the SILICON CAPs, located at the back of the CONTROL CASE, with tweezers.	
Step 3	Unscrew the bolts.	

<table>
<tr><td>Step 4</td><td>Detach the CONTROL CASE R.</td><td></td></tr>
<tr><td>Step 5</td><td>Check the CONTROL PCB ASS’Y.
Refer to Drawing code no: DT-S200-2-ED-1</td><td></td></tr>
<tr><td>Step 6</td><td>Detach the POWER TERMINAL and the SIGNAL TERMINAL from the CONTROL PCB, using a ‘-‘DRIVER.</td><td></td></tr>
<tr><td rowspan="2">Step 7</td><td rowspan="2">Unscrew the CONTROL PCB’s captive bolts, using a ‘+’ DRIVER.

Picture of the CONTROL CASE with CONTROL PCB ASS’Y removed</td><td></td></tr>
<tr><td></td></tr>
<tr><td>Step 8</td><td>Replace the CONTROLLER. Then, reassemble the SIGNAL TERMINAL, using a ‘-‘DRIVER.

WARM WHITE → RED(+), BLACK(-)
COOL WHITE → ORANGE(+), BLUE(-)</td><td></td></tr>
</table>

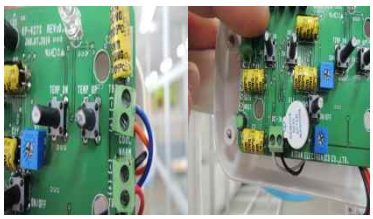
Step 9	Reassemble the POWER TERMINAL, using a '-'DRIVER. WHITE(+), BLACK(-)	
Step 10	Reattach the CONTROL PCB ASS'Y on the CONTROL CASE L, using a '+' DRIVER.	
Step 11	Reattach the CONTROL CASE R.	
Step 12	With a '+' DRIVER, screw all the bolts.	
Step 13	Put the SILICON CAP back into the case.	
Step 14	Check if the device functions properly by turning it on.	

2.3 ETC. SMPS CHANGE METHOD

Step 1	Separate the POWER CORD from the ELECTRICAL OUTLET. Before working on this maintenance, please remove the POWER CORD from the ELECTRICAL OUTLET or turn OFF the Device. We recommend that you wear gloves before you begin the maintenance procedures.	
Step 2	Check the SPMS 2's attachment location.	
Step 3	After checking the connection of the SMPS 2 DC OUTPUT TERMINAL, remove the shrinkable tube and separete the connection.	 
Step 4	Replace the SMPS 2 and re-connect the DC OUTPUT TERMINAL and handle it as the shrinkable tube.	 

2.4 STAND-BY INDICATOR LED OFF CARE METHOD

Step 1	Check that the POWER CORD is properly plugged into the ELECTRICAL OUTLET and that AC POWER is supplied properly with a MULTIMETER. ⚠ We recommend that you wear gloves before you begin the maintenance procedures. ⚠ Drawing code no: Refer to DT-S200-2-ED-2	 
Step 2	For the MOBILE type device, check the POWER SWITCH, which is located under the VERTICAL ARM 1 HANDLE, to see whether it is turned ON or OFF. MOBILE: VERTICAL ARM 1 HANDLE ⚠ Devices other than the mobile type do not have POWER SWITCHs.	**Refer to Step 80 in 1.1 MOBILE.**
Step 3	Check that the CONTROL PANEL's STAND-BY INDICATOR LED is turned on. ⚠ Proceed to Step 4, when LED does not flash.	**Refer to Step 84 in 1.1 MOBILE.**
Step 4	After dismantling the VERTICAL ARM 1 HANDLE, check whether the FUSE works properly. ⚠ Before dismantling the HANDLE, take the POWER CORD out from the ELECTRICAL OUTLET.	**Refer to 2.2 MOBILE HANDLE IN FUSE CHANGE METHOD**
Step 5	After plugging the POWER CORD back into the ELECTRICAL OUTLET, check the SMPS DC's output voltage with a MULTIMETER. → For devices other the MOBILE type, take the connector, indicated by a red arrow, out first. Then, check the voltage. For the MOBILE type device, lay the device down sideways first. Detach the POWER BRACKET CASE. Take out the connector, indicated by a red circle. Then, check the voltage. ⚠ If the voltage is DC 33V, proceed to Step 6. If the voltage is not DC 33V, replace the SMPS.	 

Step 6	Open the TENSION HOUSING COVER. Take out the wiring connector and check the voltage. If the voltage is DC 33V, proceed to Step 7. If the voltage is not DC 33V, check for any damage to wirings or short circuit that may have been caused while assembling.	  
Step 7	Take out the JOINT ARM & LOCKING KEY. Take out the wiring connector, connected to the head. Then, check the voltage. If the voltage is DC 33V, proceed to Step 7. If the voltage is not DC 33V, check for any damage to wirings or short circuit that may have been caused while assembling.	 
Step 8	Detach the CONTROL CASE R. While leaving the Input Wiring untouched, check the voltage. If the voltage is DC 33V, replace the CONTROL PCB ASS'Y. Then, check the voltage again. If the voltage is not DC 33V, check for any damage to wirings or short circuit that may have been caused while assembling.	 **Refer to 2.4 CONTROL PCB ASS'Y CHANGE METHOD**
Step 9	Check that the terminals on the CONTROL PCB are properly inserted and connected.	 **Refer to Step 8, 9 in 2.4 CONTROL PCB ASS'Y CHANGE METHOD**

2.5 ESSENTIAL PERFORMANCE MEASUREMENT METHOD

Step 1	Prepare an illumination photometry measurement that was calibrated, at most, a year ago.	
Step 2	Align the device's head and measurement, as shown in the picture. The height of the head should be 1 meter. The SENSING part of measurement should be located at the center of the pattern. (Same position for measuring maximum intensity.)	 
Step 3	Adjust the pattern size to 180mm. Adjust the intensity to the maximum (Step 5).	 
Step 4	Image of Intensity Step 5, Color Temperature 3,800K Check the intensity value on the measurement.	
Step 5	Image of Intensity Step 5, Color Temperature 4,300K. Check the intensity value on the measurement.	
Step 6	Image of Intensity Step 5, Color Temperature 4,800K. Check the intensity value on the measurement.	

3. PART LIST

No	PART NAME	PART NUMBER	DRAWINGS LOCATION
1	POWER CORD	-	-
2	SMPS	ASFAS-0027(Mobile)	DT-S200-2-ED-2
3	SMPS 2	ASFAS-0035 (Other than Mobile)	
4	CONTROL BORD	ASFAS-0003	DT-S200-2-ED-1
5	HEAD	ASFAS-0001(I),0002(B)	DT-S200-1-HD-1
6	FIRST HORIZONTAL ARM (MOBILE, DUAL CONNECTION, WALL)	ASFAS-0011(I),0012(B)	Page 7,10,13 ③
7	FIRST HORIZONTAL ARM 1 (SINGLE & DUAL CEILING)	ASFAS-0013(I),0014(B)	Page 16,20 ③
8	VERTICAL ARM 1 (MOBILE)	ASFAS-0029(I),0030(B)	DT-S200-2-MD-1 Page 7 ④
9	VERTICAL ARM 2 (MOBILE)	ASFAS-0104	
10	VERTICAL ARM BOLT	ASFAS-0105	
11	BASE BODY (MOBILE)	ASFAS-0025	DT-S200-2-MD-1 Page 7 ⑤
12	SECOND HORIZONTAL ARM (DUAL CONNECTION)	ASFAS-0033(I),0034(B)	DT-S200-3-MD-1 Page 10 ④
13	DUAL CONECTOR (DUAL CONNECTION)	ASFAS-0036	DT-S200-3-MD-1 Page 10 ⑤
14	WALL SECOND ARM	ASFAS-0053(I),0054(B)	DT-S200-4-MD-1 Page 13 ④
15	WALL BRACKET	ASFAS-0055	DT-S200-4-MD-1 Page 13 ⑤
16	CEILING SECOND ARM	ASFAS-0044(I),0045(B)	DT-S200-5-MD-1 Page 16 ④
17	CEILING VERTICAL ARM	ASFAS-0043	DT-S200-5-MD-1 Page 16 ⑤
18	DUAL CEILING VERTICAL ARM	ASFAS-0062	DT-S200-6-MD-1 Page 20 ⑥
19	CEILING COVER & BRACKET	ASFAS-0046,47	DT-S200-6-MD-1 Page 20 ⑧
20	DUAL CEILING COVER BRACKET	ASFAS-0064	DT-S200-6-MD-1 Page 20 ⑦
21	DUAL BRACKET	ASFAS-0063	DT-S200-6-MD-1 Page 20 ⑤
22	KNOB	ASFAS-0004	DT-S200-1-HD-1 Page 1 28
23	CASTER	ASFAS-0026	DT-S200-2-MD-1 Page 7

4. PACKING

4.1 MOBILE TYPE

Step 1	After packing the head part with an air cap, put it into the box.	
Step 2	Cover the component with the shock-absorbing packing materials.	
Step 3	Seal a box with tape.	
Step 4	After packing HORIZONTAL ARM with a woven fabric, put it into the box.	
Step 5	Pack VERTICAL ARM 1 and VERTICAL ARM 2 with a woven fabric, put it into the box. As shown the picture, put the box of HORIZONTAL ARM into the box of VERTICAL ARM 1 and VERTICAL ARM 2	
Step 6	Seal a box with tape.	

Step 7	After packing BASE PART with an air cap, put it into the box.	
Step 8	Cover the component with the shock-absorbing packing materials.	
Step 9	Spread some shock-absorbing packing materials on the bottom before putting BASE into the box.	
Step 10	After spreading some shock-absorbing packing materials on BASE, put SMPS.	
Step 11	Cover BASE & SMPS with the shock-absorbing packing materials.	
Step 12	Seal a box with tape.	

4.2 FIXED TYPE

Step 1	After packing the head part with an air cap, put it into the box.	
Step 2	Cover the component with the shock-absorbing packing materials.	
Step 3	Seal a box with tape.	
Step 4	After packing Fix ARM and the other components with an air cap or a woven fabric, put them into the box.	
Step 5	Seal a box with tape.	

5. APPENDIX

5.1 WARRANTY

Dentis warrants all products against defects in materials or workmanship for one year from time of delivery. Dentis's sole obligation under the warranty is to provide parts for the repair, or at its option, to provide the replacement product (excluding labor).
The buyer shall have no other remedy. All special, incidental, and coincidental damages are excluded. Written notice of breach of warranty must be given to Dentis within the warranty period. The warranty does not cover damage resulting from improper installation or maintenance, accident or misuse. The warranty does not cover damage resulting from the use of cleaning, disinfecting or sterilization chemicals and processes. The
Failure to follow instructions provided in the Dentis Instructions For Use (operation and maintenance instructions) may void the warranty. LED PCB Ass'y are covered under Dentis's Five year warranty.

Only use components sold by the manufacturer. We do not give guarantees if used with unauthentic components.

Service Engineer Qualification: Someone who received 16 hours of technical training from the manufacturer or the authorized dealer.

5.2 SPECIFICATIONS

Operating Specifications

- Rated Input

  Max 60,000 lux Model: AC 100-240 V, 50/60 Hz, 33-61 VA

  Max 80,000 lux Model: AC 100-240 V, 50/60 Hz, 35-50 VA

  Max 100,000 lux Model: AC 100-240 V, 50/60 Hz, 45-61 VA

- Focal range: Adjustable; 1,000mm (970 – 1,030mm)
- Color temperature: 3,800K / 4,300K / 4,800K

  Tcp: 3,953K

  △UV: + 0.0018

  Ra: 90

  R9: 80

- Light pattern: 180/300mm
- Light Field Diameter

  d50: 93mm / d10: 183mm

- Light Intensity

Classification	Color temp	Illuminance	Remark
Max 60,000 lux Model	3,800K	40,000 lux	1,000mm
	4,300K	60,000 lux	1,000mm
	4,800K	60,000 lux	1,000mm
Max 80,000 lux Model	3,800K	60,000 lux	1,000mm
	4,300K	80,000 lux	1,000mm
	4,800K	80,000 lux	1,000mm
Max 100, 000 lux Model	3,800K	80,000 lux	1,000mm
	4,300K	100,000 lux	1,000mm
	4,800K	100,000 lux	1,000mm

* Optical values are measured with a tolerance of ±10%

5.3 CONDITIONS OF THE USAGE ENVIRONMENT

- Temperature: 0 ~ 40 oC

- Humidity: 30 ~ 90%

- Atmospheric pressure: 0-2000M (106-80Kpa)

5.4 CONDITIONS OF THE TRANSPORTATION ENVIRONMENT

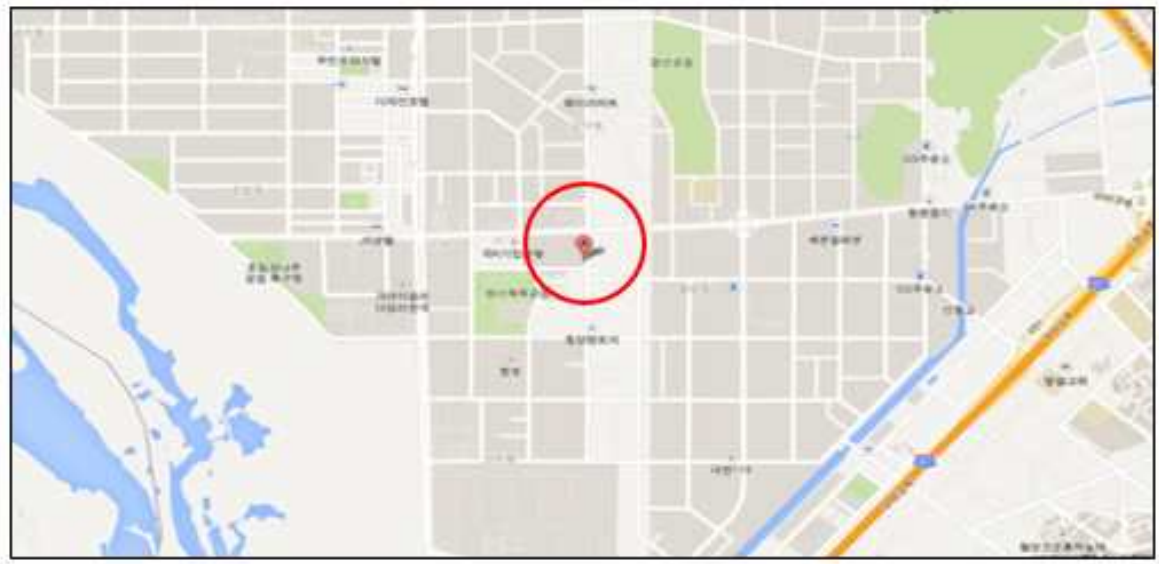
- Temperature: 0 ~ 40 °C

- Humidity: 0 ~ 80%

5.5 LOCATION OF HEAD OFFICE & EC REP

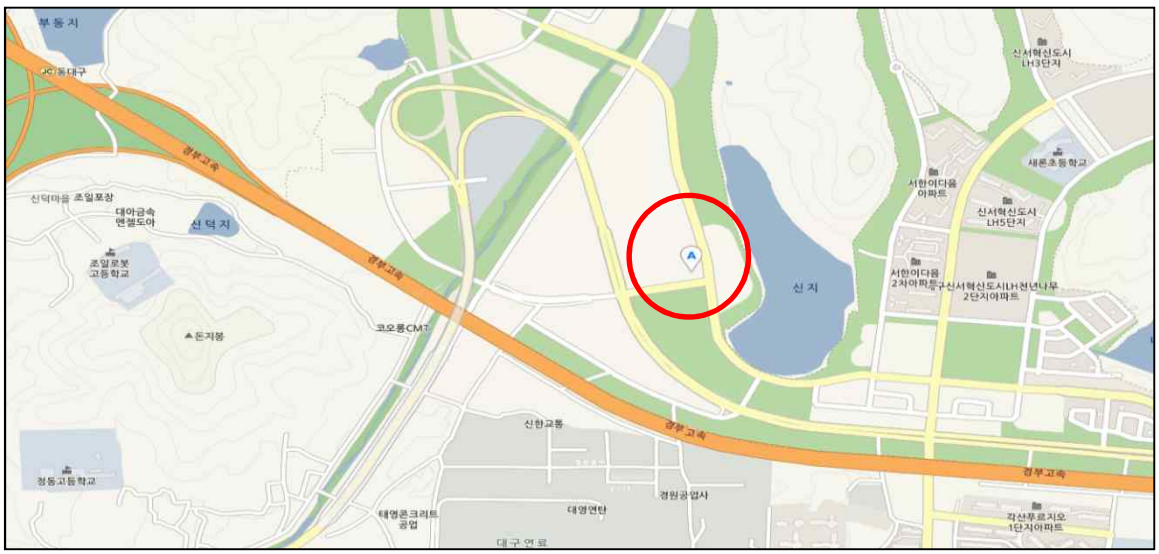
- Manufacturer: DENTIS CO., LTD.

  99, Seongseoseo-ro, Dalseo-gu, Daegu, Korea



- Factory : DENTIS MEDICAL DIVISION

  6, Yuram-ro, Dong-gu, Daegu, Korea

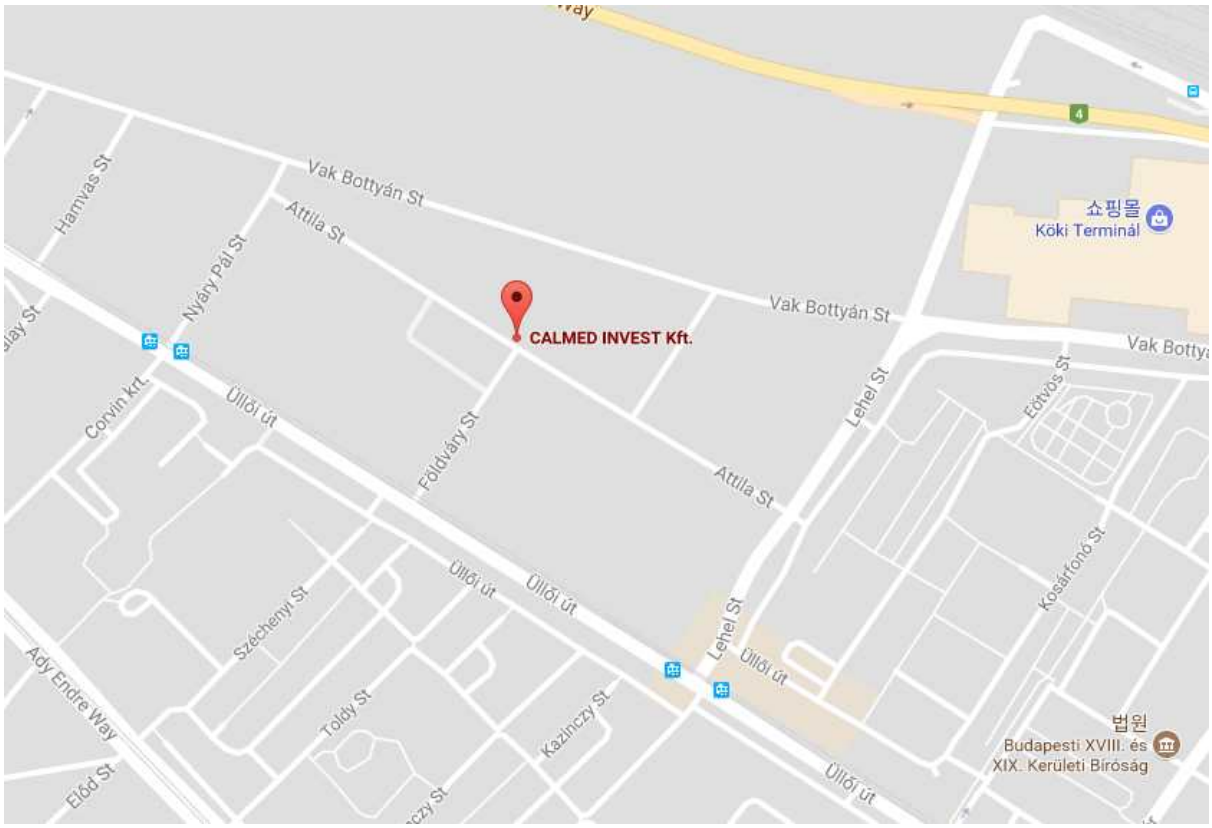




LOCATION OF EC REP

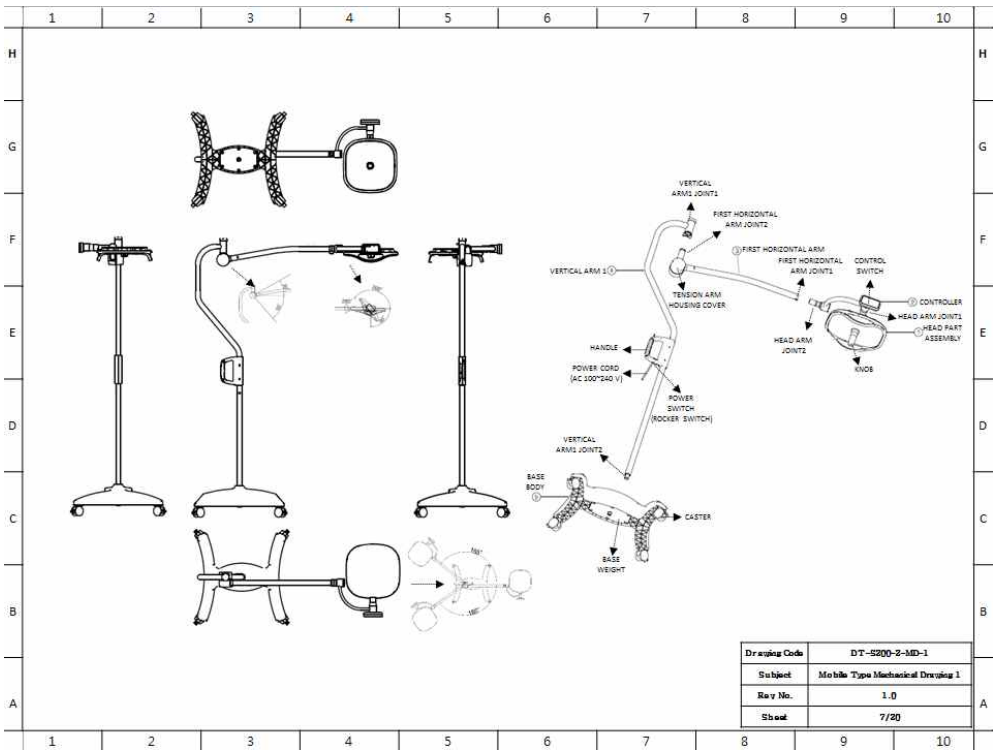
CALMED INVEST Kft.

Address : 1191 Budapest, Attila utca 34., Budapest, Hungary

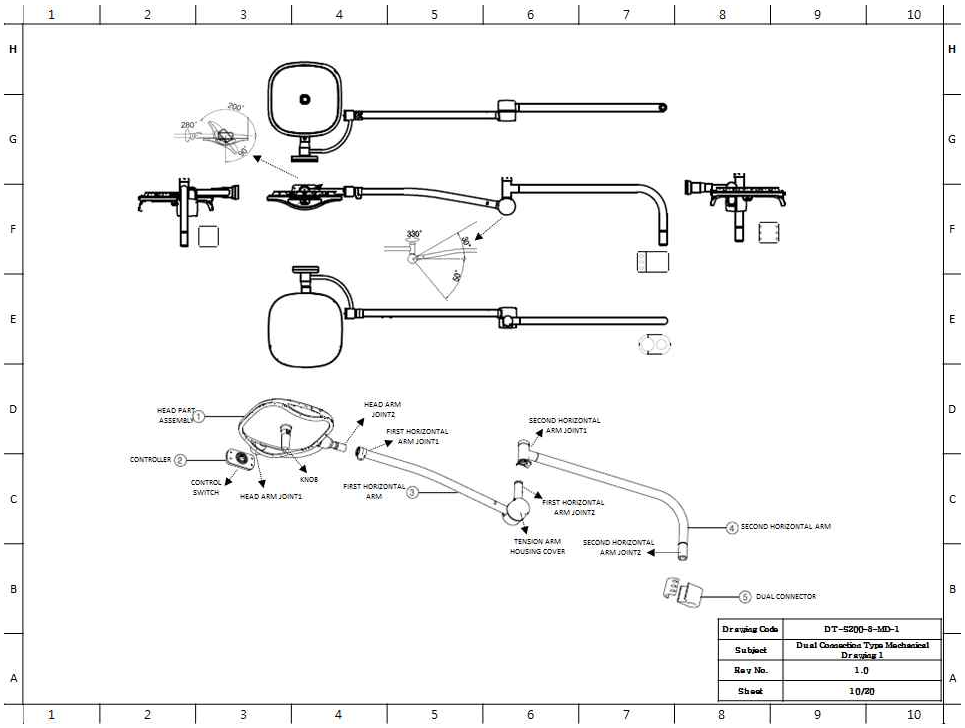


5.6 DRAWINGS

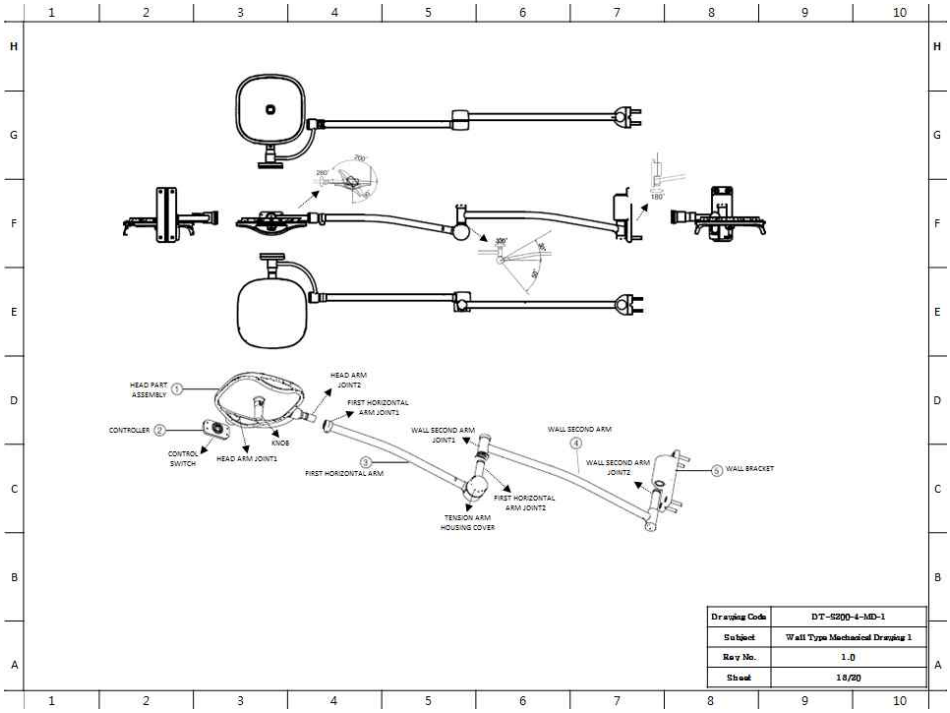
Mechanical drawings



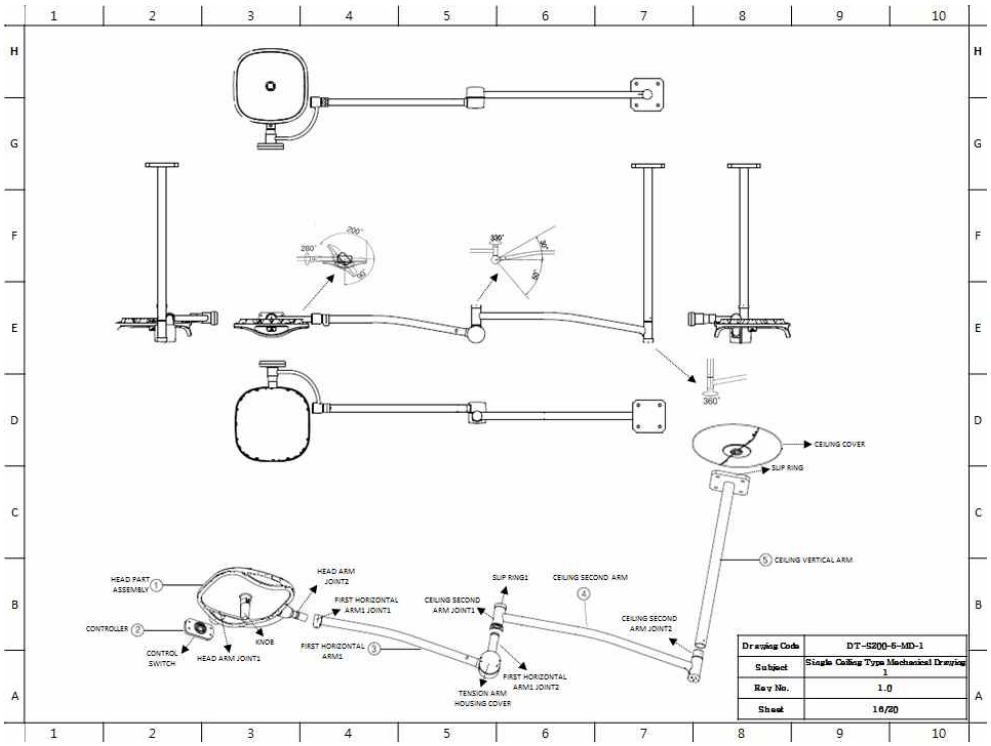
MOBILE <DT-S200-2-MD-1>



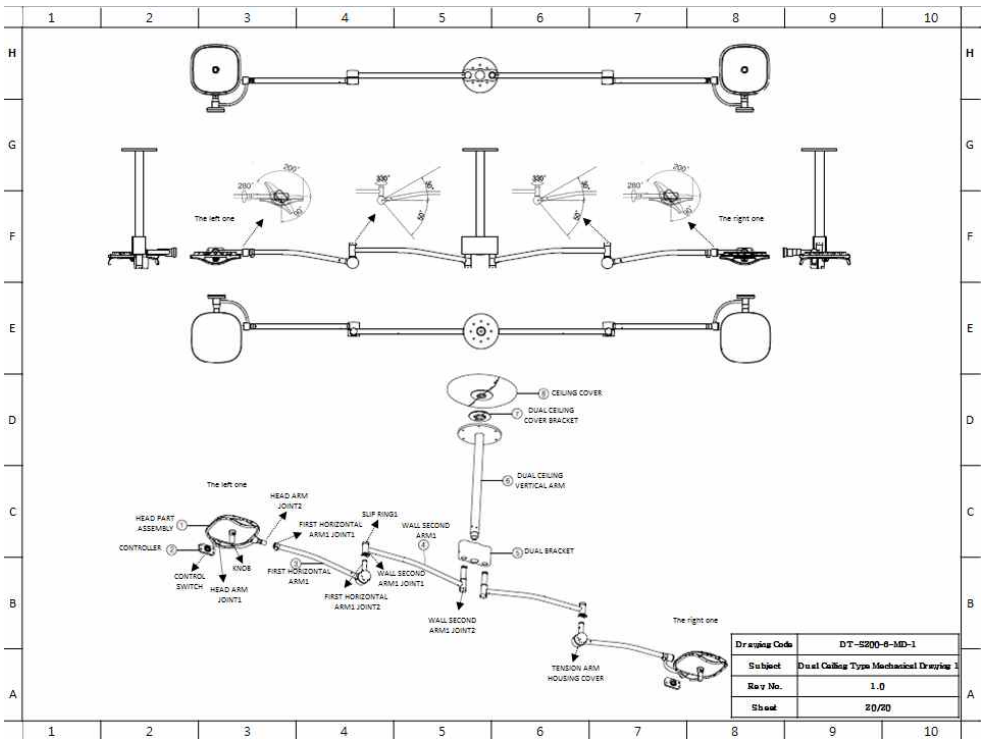
DUAL CONNECTION <DT-S200-3-MD-1>



WALL <DT-S200-4-MD-1>

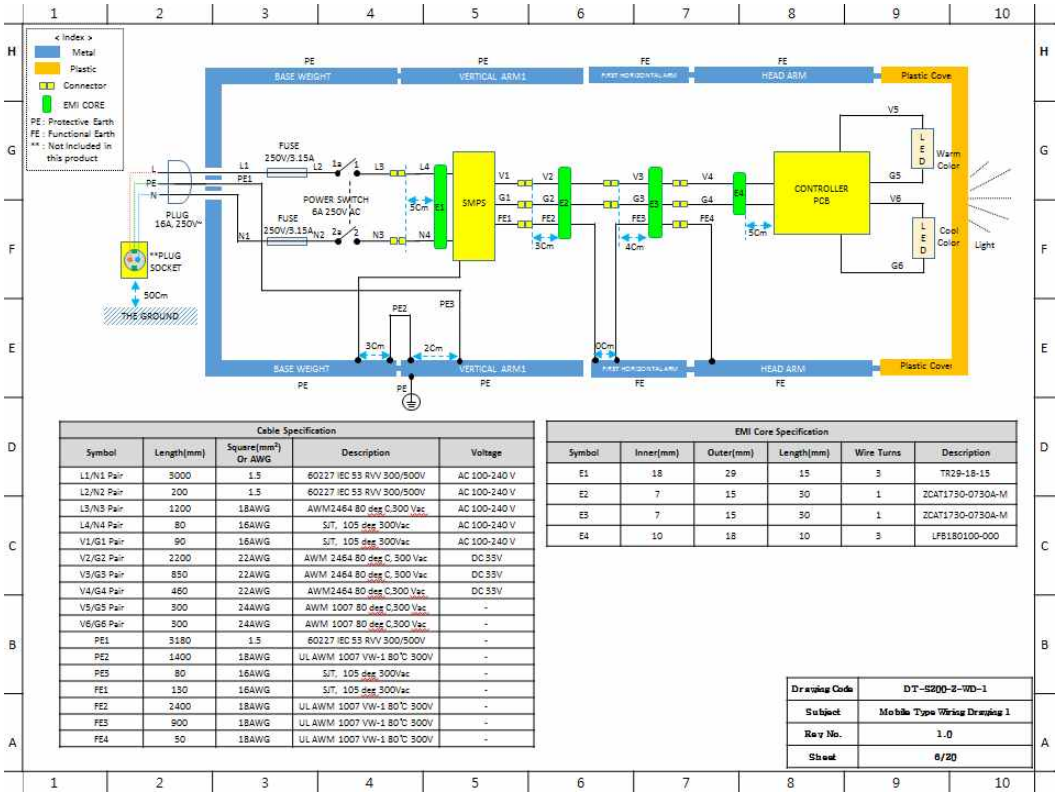


SINGLE CEILING <DT-S200-5-MD-1>



DUAL CELING <DT-S200-6-MD-1>

Wiring and circuit diagram

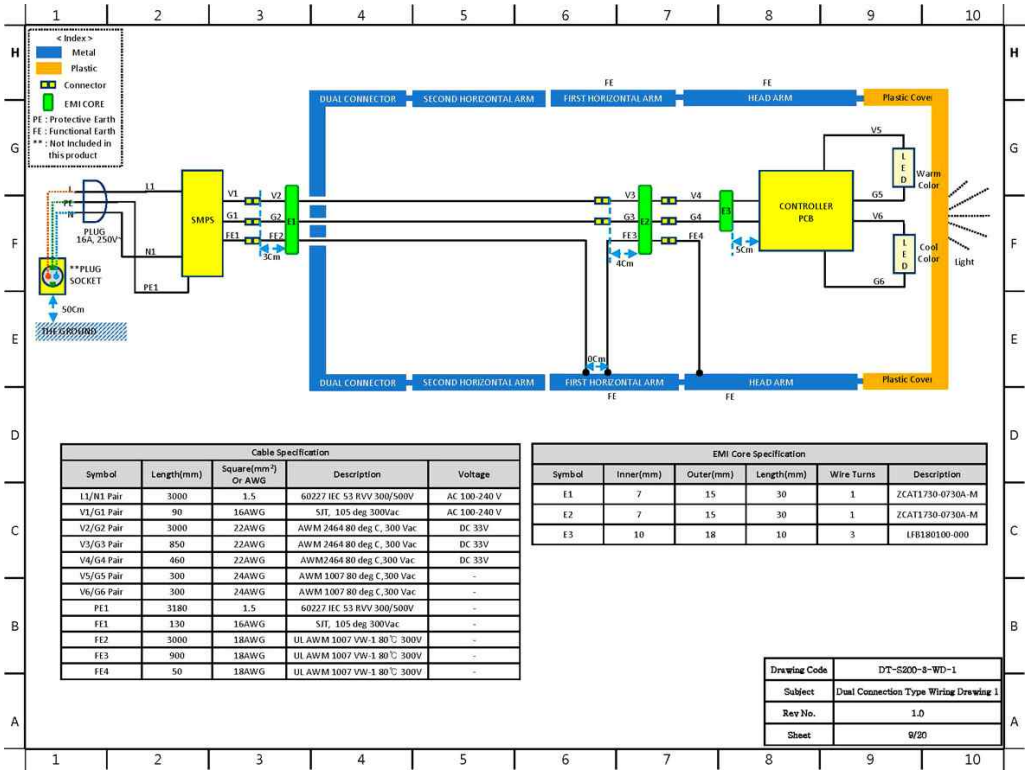


Cable Specification				
Symbol	Length(mm)	Square(mm²) Or AWG	Description	Voltage
L1/N1 Pair	3000	1.5	60227 IEC 53 RVV 300/500V	AC 100-240 V
L2/N2 Pair	200	1.5	60227 IEC 53 RVV 300/500V	AC 100-240 V
L3/N3 Pair	1200	18AWG	AWM2464 80 deg C,300 Vac	AC 100-240 V
L4/N4 Pair	80	16AWG	SJT, 105 deg 300Vac	AC 100-240 V
V1/G1 Pair	90	16AWG	SJT, 105 deg 300Vac	AC 100-240 V
V2/G2 Pair	2200	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V3/G3 Pair	850	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V4/G4 Pair	460	22AWG	AWM2464 80 deg C,300 Vac	DC 33V
V5/G5 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
V6/G6 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
PE1	3180	1.5	60227 IEC 53 RVV 300/500V	-
PE2	1400	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
PE3	80	16AWG	SJT, 105 deg 300Vac	-
FE1	130	16AWG	SJT, 105 deg 300Vac	-
FE2	2400	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE3	900	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE4	50	18AWG	UL AWM 1007 VW-1 80℃ 300V	-

EMI Core Specification					
Symbol	Inner(mm)	Outer(mm)	Length(mm)	Wire Turns	Description
E1	18	29	15	3	TR29-18-15
E2	7	15	30	1	ZCAT1730-0730A-M
E3	7	15	30	1	ZCAT1730-0730A-M
E4	10	18	10	3	LFB180100-000

Drawing Code	DT-S200-2-WD-1
Subject	Mobile Type Wiring Drawing 1
Rev No.	1.0
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MOBILE <DT-S200-2-WD-1>

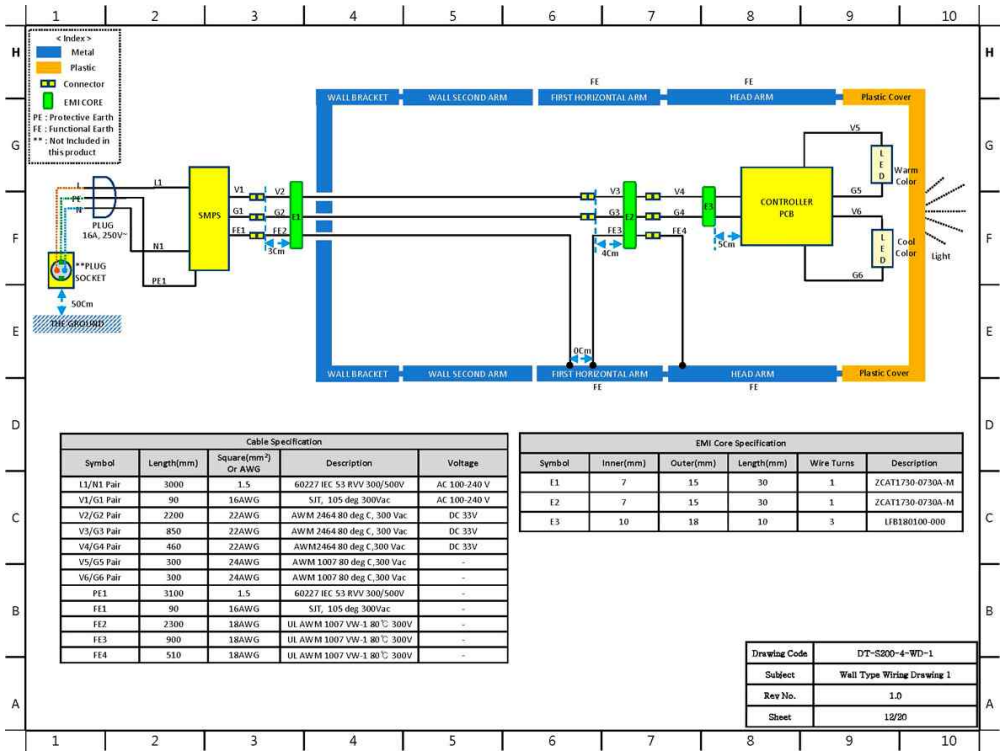


Cable Specification				
Symbol	Length(mm)	Square(mm²) Or AWG	Description	Voltage
L1/N1 Pair	3000	1.5	60227 IEC 53 RVV 300/500V	AC 100-240 V
V1/G1 Pair	90	16AWG	SJT, 105 deg 300Vac	AC 100-240 V
V2/G2 Pair	3000	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V3/G3 Pair	850	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V4/G4 Pair	460	22AWG	AWM2464 80 deg C,300 Vac	DC 33V
V5/G5 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
V6/G6 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
PE1	3180	1.5	60227 IEC 53 RVV 300/500V	-
FE1	130	16AWG	SJT, 105 deg 300Vac	-
FE2	3000	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE3	900	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE4	50	18AWG	UL AWM 1007 VW-1 80℃ 300V	-

EMI Core Specification					
Symbol	Inner(mm)	Outer(mm)	Length(mm)	Wire Turns	Description
E1	7	15	30	1	ZCAT1730-0730A-M
E2	7	15	30	1	ZCAT1730-0730A-M
E3	10	18	10	3	LFB180100-000

Drawing Code	DT-S200-3-WD-1
Subject	Dual Connection Type Wiring Drawing 1
Rev No.	1.0
Sheet	9/20

DUAL CONNECTION <DT-S200-3-WD-1>

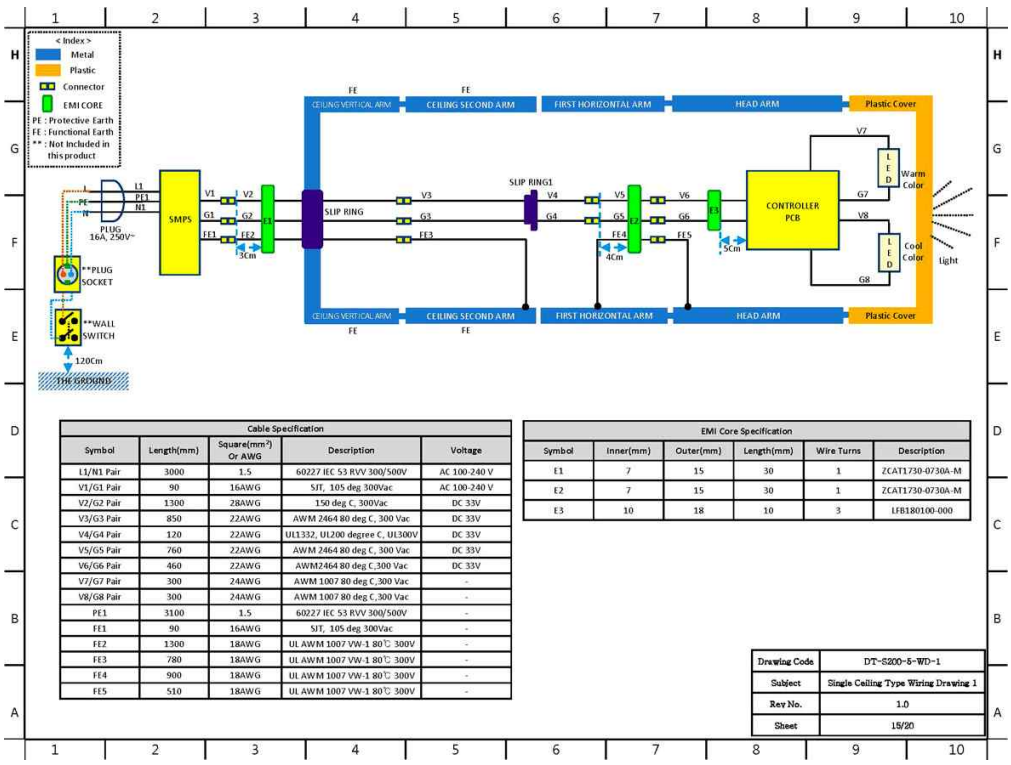


Cable Specification				
Symbol	Length(mm)	Square(mm²) Or AWG	Description	Voltage
L1/N1 Pair	3000	1.5	60227 IEC 53 RVV 300/500V	AC 100-240 V
V1/G1 Pair	90	16AWG	SJT, 105 deg 300Vac	AC 100-240 V
V2/G2 Pair	2200	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V3/G3 Pair	850	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V4/G4 Pair	460	22AWG	AWM2464 80 deg C,300 Vac	DC 33V
V5/G5 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
V6/G6 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
PE1	3100	1.5	60227 IEC 53 RVV 300/500V	-
FE1	90	16AWG	SJT, 105 deg 300Vac	-
FE2	2300	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE3	900	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE4	510	18AWG	UL AWM 1007 VW-1 80℃ 300V	-

EMI Core Specification					
Symbol	Inner(mm)	Outer(mm)	Length(mm)	Wire Turns	Description
E1	7	15	30	1	ZCAT1730-0730A-M
E2	7	15	30	1	ZCAT1730-0730A-M
E3	10	18	10	3	LFB180100-000

Drawing Code	DT-S200-4-WD-1
Subject	Wall Type Wiring Drawing 1
Rev No.	1.0
Sheet	12/20

WALL <DT-S200-4-WD-1>

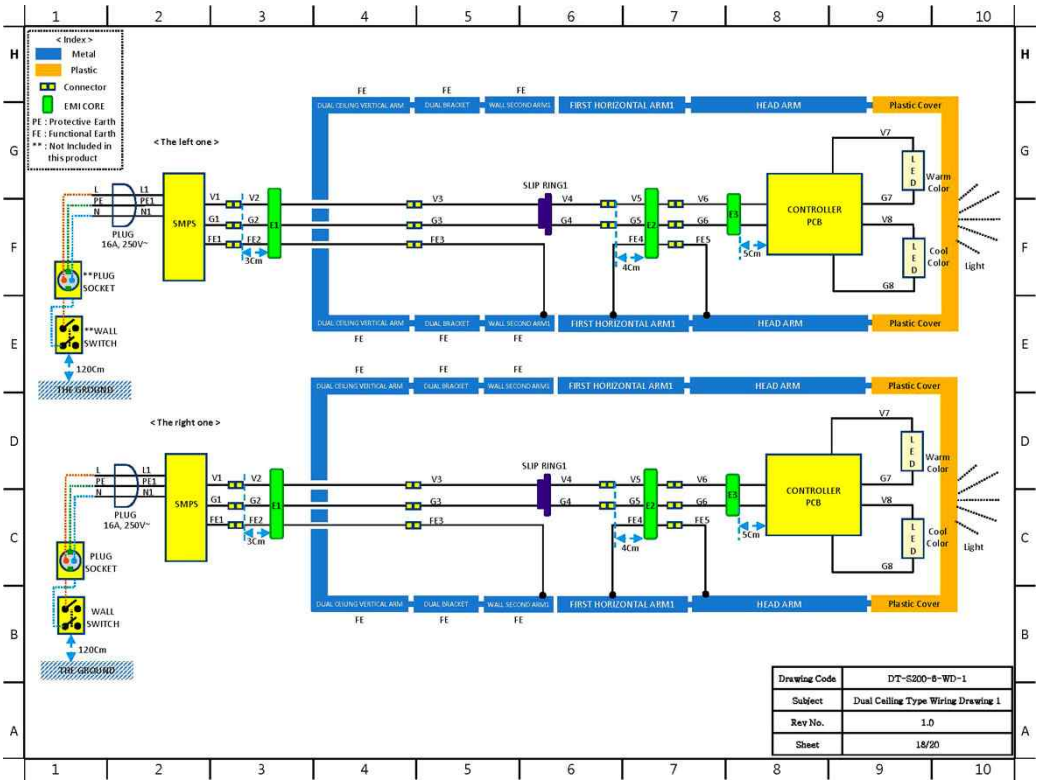


Cable Specification				
Symbol	Length(mm)	Square(mm²) Or AWG	Description	Voltage
L1/N1 Pair	3000	1.5	60227 IEC 53 RVV 300/500V	AC 100-240 V
V1/G1 Pair	90	16AWG	SJT, 105 deg 300Vac	AC 100-240 V
V2/G2 Pair	1300	28AWG	150 deg C, 300Vac	DC 33V
V3/G3 Pair	850	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V4/G4 Pair	120	22AWG	UL1332, UL200 degree C, UL300V	DC 33V
V5/G5 Pair	760	22AWG	AWM 2464 80 deg C, 300 Vac	DC 33V
V6/G6 Pair	460	22AWG	AWM2464 80 deg C,300 Vac	DC 33V
V7/G7 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
V8/G8 Pair	300	24AWG	AWM 1007 80 deg C,300 Vac	-
PE1	3100	1.5	60227 IEC 53 RVV 300/500V	-
FE1	90	16AWG	SJT, 105 deg 300Vac	-
FE2	1300	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE3	780	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE4	900	18AWG	UL AWM 1007 VW-1 80℃ 300V	-
FE5	510	18AWG	UL AWM 1007 VW-1 80℃ 300V	-

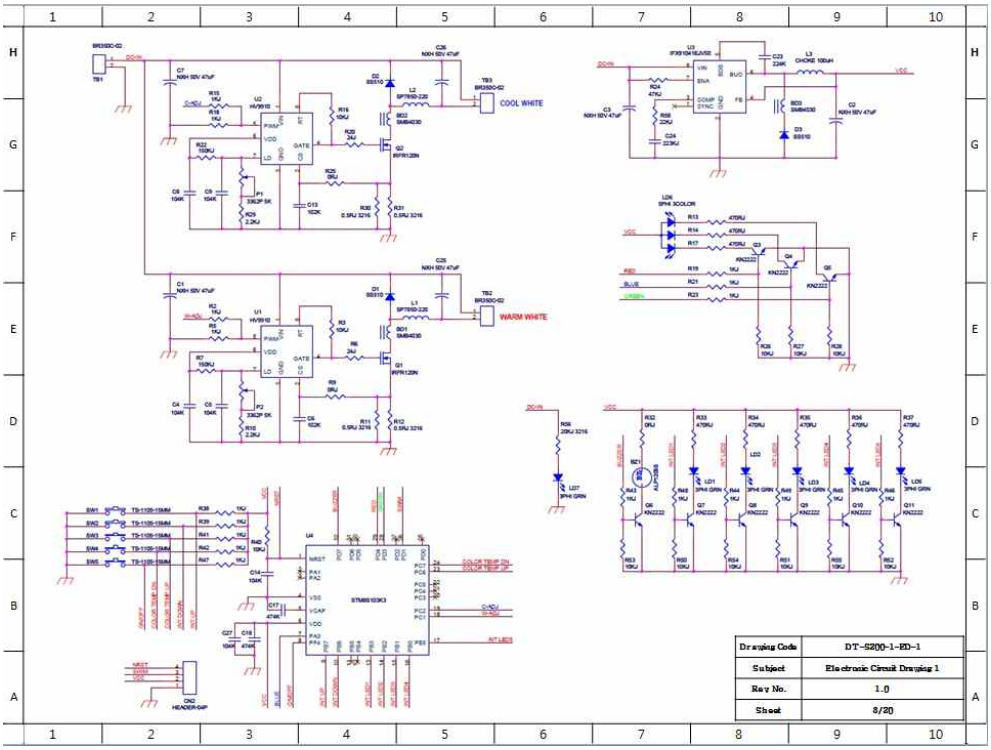
EMI Core Specification					
Symbol	Inner(mm)	Outer(mm)	Length(mm)	Wire Turns	Description
E1	7	15	30	1	ZCAT1730-0730A-M
E2	7	15	30	1	ZCAT1730-0730A-M
E3	10	18	10	3	LFB180100-000

Drawing Code	DT-S200-5-WD-1
Subject	Single Ceiling Type Wiring Drawing 1
Rev No.	1.0
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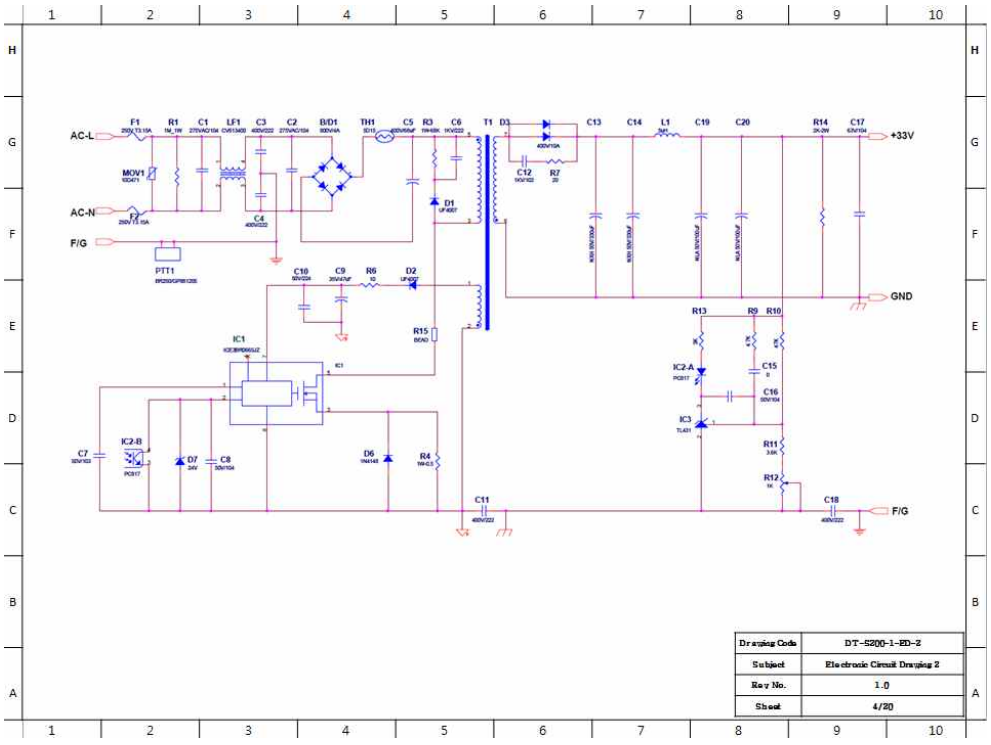
SINGLE CEILING <DT-S200-5-WD-1>



DUAL CEILING <DT-S200-6-WD-1>



<DT-S200-1-ED-1>



<DT-S200-2-ED-2>



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