EAGLE

PAN TILT SYSTEMS

Helping to bring your world into focus

PTE-300

Pan Tilt Head
Installation and Operations Manual
Revision 4
January 2007

Distributed by Hitachi Denshi America Ltd.
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Contents

ITEMS INCLUDED WITH YOUR PTE-300 PAN TILT HEAD:

1) EAGLE PTE-300 PAN TILT HEAD

2) PT-EE-* HOUSING MOUNTING BRACKET

3) 2X PURPLE ANODIZED BRACKET MOUNTING SPACERS

4) 2X WHITE O-RING GASKETS (USED BETWEEN SPACER AND PANTILT BODY)

5) 4X 1/4"-20 X .75" SOCKET HEAD CAP SCREW FOR DISC MOUNTING

6) 4X 1/4"-20 X 1.25" FLAT HEAD CAP SCREW FOR DISC/BRACKET MOUNTING

7) 2X 1/4"-20 X 1.00" SOCKET HEAD CAPSCREW FOR MOUNTING HOUSING TO BRACKET, WITH LOCK AND FLAT WASHERS

8) WATER RESISTANT CONNECTOR AND SOCKET PINS FOR BUILDING INPUT CABLE TO PTE-300, WITH HEAT SHRINK BACKSHELL

1. PRECAUTIONARY STATEMENT

Improper settings and connections may cause damage to the PTE-300 pan tilt head, environmental housing, camera, and the lens being used. Please read all of the following documentation before attempting the installation and configuration of these systems. If any of the instructions are unclear to you, call your servicing dealer or Hitachi before proceeding for clarification. Failure to correctly configure and install these systems may cause damage to the equipment, and will void the warranties. Please make sure before connecting or disconnecting any cables that the power supplies are turned OFF.

2. WARRANTY

Hitachi Kokusai Electric America, Ltd. warrants to the original customer that each unit shall be free from malfunction due to defective workmanship or component failure for a period of ONE YEAR from the original date of delivery to the customer. For service under the warranty period, return authorization must be obtained before returning the product. This warranty does not apply to finish or appearance items, to malfunction due to abuse or operation in violation of published operating specifications, or to failures caused by improper connections, modifications, alterations, or other unauthorized repairs. This warranty does not cover labor or shipping costs for removal and/or reinstallation of equipment under warranty. Under no circumstances shall Hitachi Kokusai Electric America, Ltd. or Display Devices, Inc., their owners or employees be liable to you for any special damages, including any lost profits, lost savings, or other incidental or consequential damages, or for any claim by any other party.

3. HARDWARE INSTALLATION

Before starting installation, make certain that all power supplies to equipment are turned OFF.

Attach PTE-300 to optional wall arm or parapet mount using supplied 5/16" hardware, or to location of your own choosing. **Inverted mounting is not recommended with this pan tilt head**. Make sure that wall or parapet mount is capable of securely handling weights of 150 pounds (68kg). Ensure that the mount is level in both directions. **Use care in handling the PTE-300 as it is heavy; extreme damage or harm may result to the head and to other personnel if the head is dropped.**

Attach the supplied housing mounting cradle to the hub of the pan tilt head. The cradle may be placed on either the left or right side of the head, depending upon your installation conditions. Use one of the included spacer discs and O-rings between the bracket and the hub, using the 1.25" long 1/4"-20 flat head hex bolts to attach it to the hub. Bolt the other disc on the hub of the unused side using the shorter 1/4"-20 X3/4" socket head hex bolts.

Place the PT-EE-* housing (not included) onto the housing mounting cradle of the PTE-

300. Open the housing latches and raise the cover (it hinges at the front). Using the supplied 1/4"-20 x 1" fasteners and washers, thread them from the underside of the cradle into the bottom of the housing. Tighten the fasteners securely. Connect the umbilical cable conduit harness from the PTE-300 head to the bottom of the PT-EE-* housing. It will be necessary to push the connectors through the conduit fitting one at a time in order to get them to fit, starting with the largest connector first.

Assemble camera/lens combination. Remove any lens hood from the lens. Attach camera/lens system onto sled inside housing using the supplied fasteners. The camera / lens system can be mounted on either top of bottom of the sled depending on the centerline height of the lens needed. Place the sled into the housing onto the adjustable screw mounting points. Do not completely tighten the fasteners until after the next step. Depending on your camera, your system may include a spacer block or shims to raise the camera body above the mounting sled in order to accomodate lens motor design.

Move the camera/lens assembly to the front or rear of the cradle until the lens is very close to the glass window at the front of the housing; this is to reduce stray reflections from the window-lens interface. Make sure to allow room for the lens to zoom and focus; not all lenses have internal focusing and zooming, and will change physical di-

mensions when focused or zoomed. Tighten the sled mounting screws securely now.

Attach labeled connecting cables from controllers and power supply to the camera and lens. **CAUTION! DO NOT ATTACH ANY POWER OR LENS CONNECTORS TO THE CIRCUIT BOARD INSIDE THE HOUSING! THIS BOARD CONTAINS HIGH AND/OR IMPROPER VOLTAGES FOR USE WITH THE HITACHI CAMERAS AND LENSES. DESTRUCTION OF CAMERA AND LENS MAY RESULT!** Use cable ties and mounts to insure that cables are not restricted, yet will not obstruct operation. Keep cables clear of the cooling fan blades.

Make and attach the control/power/video cable as detailed on pages 11 and 12. Don't melt the heat shrinkable sleeve until you have verified proper operation of the system!

SPECIAL NOTE: For remote camera control operation, the camera must be set to 9600 baud and to native remote mode before placing it in the housing in order to be controlled by the PTE-300 head. Consult your Hitachi camera manual for instructions on setting up the baud rate of your particular camera model.

DO NOT ATTEMPT TO PAN OR TILT THE UNIT BY HAND! Gear reductions on the motors make this impossible to do, and damage will result if this is attempted. Always use the Eagle controller or the Windows® compatible software to control the movement of the pan tilt systems.

Follow the detailed instructions in Eagle controller manuals and/or the following software control instructions for complete usage of the pan-tilt head.

4. ADDITIONAL INSTRUCTIONS IF USING PT-PCS CONTROL SOFTWARE

If using EAGLE™ PT-PCS software to control the pan-tilt head via computer, follow these instructions.

NOTE: Software is for use with Windows NT® ,2000®, and Windows XP® compatible computer systems only

Download the software from the Eagle website (http://www.eaglepantilt.com)

Click on Start on the Windows menu bar, and choose Run. Type in a:setup

Press ENTER key and follow the instructions that appear on the screen.

Connect communication cable from PTE-300 pan-tilt head to PT-RSA RS-485 adapter (optional). Plug PT-RSA adapter into PT-AAM modem (optional), or to serial port of

the computer.

5. FUNCTION DEFINITIONS FOR CONTROL OF PTE-300 when used with EAGLE PT-PCS software or PT-C desktop controller

These are a simple overview of controls; for more complete details, consult the manual included with your particular Eagle controller. Your controller may or may not include all of these listed features.

Select the FUNCTION button then the following numbers to run the desired function;

#1 Lens "position" mode.

Enter this mode to set lens zoom and focus presets. See section "SAVE PRESET" above for details on the operation of this function. The LCD display will read POSITION MODE.

#2 Lens "speed" mode

This is the normal lens operating mode. The LCD will read SPEED MODE momentarily.

#3 Preset speed change mode.

In conjunction with function 7 below, this function allows changing preset speeds to different values than were originally chosen. For example, travel to preset 3 was originally set to speed 1(high speed). If you now want to change travel speed to this preset to 2 (normal), recall preset 3, then enter FUNCTION, 3; the LCD will read PRESET SPEED. Then press 2 for normal speed. The LCD display will clear itself after 3 to 4 seconds.

#4 Scene recall / Preset location functions.

Dependent upon the camera being used, i.e., if using the HV-D30, HV-D15, or HV-D5W cameras, SCENE files can be stored on the camera controller and recalled in conjunction with a specific location preset. This could be useful if the scene has multiple shots to be setup, under different lighting conditions. First, the scene files must be set up AND STORED using the PT-CC or PT-TSC2 camera controller. Next, decide which position preset you want to link to which scene file. For our example, let's use position preset 3, and link it to scene file 1. RECALL position preset 3 (as described in section 5.4), then hit FUNCTION, 4, and the LCD display will show CAMERA SCENE. Then press number 1, specifying the recall of scene file 1. This will now link the position preset 3 and the scene file 1 together. In order to make any changes after saving this information, you must either resave the SCENE file, or resave or delete the position preset 1. The LCD will clear itself after 3 to 4 seconds.

#5 Focus lock/unlock

This is a toggling function that will lock and unlock the FOCUS axis of the joystick. This is

convenient if you have a shot setup that the focus will not need to be changed, but you wish to zoom in and out to change the shot. This will prevent any accidental changes in focus while zooming. Press FUNCTION, then 5, then 1 to LOCK or 2 to UNLOCK. The LCD display will read FOCUS LOCKED and FOCUS UNLOCKED.

#6 Zoom lock/unlock

This is a toggling function that will lock and unlock the ZOOM axis of the joystick. This is convenient if you have a shot setup that the zoom setting will not need to be changed, but you wish to focus near or far to make the shot. This can also be used to prevent any unwanted or unauthorized changes. Press FUNCTION, then 6, then 1 to LOCK or 2 to UNLOCK. The LCD display will read ZOOM LOCKED and ZOOM UNLOCKED.

#7 Pan tilt movement speed control mode.

This allows the overall speed of the pan and tilt motion to be changed. Press the FUNCTION, 7; the display will read HEAD SPEED. Then press 1 for HIGH speed, 2 for NORMAL, and 3 for SLOW. Any pan and tilt presets will also store the speed originally chosen here. For example, you can set a preset position using two different speeds, and recall them at different times depending on the effect desired. NOTE: lens zoom and focus presets are always recalled at full speed, this is not changeable. The LCD will clear itself after 3 to 4 seconds.

#8 Camera controller feedback.

If using the PT-C standalone pan tilt controller with the PT-CC camera controller, this will let the PT-C know it has a camera controller installed to talk to. Press FUNCTION, 8–The display will toggle between CC ON and CC OFF.

#9 Inverted movement operation mode

(up/down, left/right reversed). This function is used when the pan/tilt is to be ceiling mounted instead of tripod mounted, and it reverses the movement directions of the pan tilt head. This can be set individually on a head by head basis so that if a mix of upright and inverted heads are being used in the same system, they can be configured such that they all move the same direction. Please note that with the current level of software, no LCD feedback is presented.

#10 Clear all movement limits.

This function will eliminate all safety limits that may have been set to prevent excess

travel. This clearing is temporary only; when power is reset, the previous limits will return unless you set new limits. Hit FUNCTION, then the 10 key; the LCD display will prompt you to press 1 to clear limits, 2 to cancel. Please note that this function only works with a single addressed head for safety reasons. If CAMERA, ALL is selected, you cannot clear movement limits. This is to prevent the accidental clearing of limits from other heads on the same RS 485 line.

Never use the PTE-300 head without having limits set to prevent damage to the PT head and/or housing if control is lost!

#11 Address of pan tilt head.

This is set by the factory to 1 when shipped. If a change is required, simply enter FUNCTION, the 11 button; the LCD display will read ADDRESS. Then click the number you wish to set the head to. Note that this will set the number for all heads on the RS-485 comm line; you must disconnect the power or communication for all the heads except the one you wish to address, otherwise all the powered heads will be set to the same address.

#12 Set lens type.

This is set by the factory when ordered for your specified lens type; 1 is for Rainbow and other CCTV type lenses, 2 is for Fujinon telecon and Canon telecon lenses set to Fujinon mode. The LCD display will read LENS TYPE.

#13 Set left pan limit.

Limits are preset at the factory to 50 degrees each up and down, and about 90 degrees each left and right. Change the limit settings if you want to change these amounts; this is useful to set up cameras such that they can not get shots of the wall behind the camera, the ceiling above the camera, the floor directly below the camera, etc. Also, limits may need to be set differently for your particular application; e.g., if a ceiling mount adapter is used, you may need to set a limit for tilting upwards to prevent lens contact with the ceiling, etc. The LCD display will read SET LEFT LIMIT.

Please note that dependent on the setting of FUNCTION 9, the INVERT command, that in some circumstances LEFT LIMIT will actually be RIGHT LIMIT; UP LIMIT will be DOWN LIMIT. If you accidentally set a limit incorrectly, simply clear it by hitting FUNCTION, 10, 1 (CLEAR ALL LIMITS). Limits may not be cleared individually, but only all at once.

#14 Set right pan limit.

See above Function 13

#15 Set up tilt limit.

See above Function 13

#16 Set down tilt limit.

See above Function 13

6. PAN-TILT OPERATIONS

Be sure to follow all of the installation instructions included with the Eagle pan tilt head before starting to use this system !!

Always power up the Eagle controller being used before powering up the PTE-300 head; make sure that the PTE-300 head is powered off before the controller if shutting down the power to the system!

First, select the address of the head you wish to control. Since up to 31 heads may be on a single RS-485 line, you must choose the correct one to control. Select CAMERA, then the number of the head to be controlled. Head addresses can be changed as described in your controller manual.

If this is the first time use of the system, the limits of pan tilt movement must be reset now to limits of your choosing. Begin by clear all movement limits. See your specific controller manual for details on this operation. This function will eliminate all position limits that have been set at the factory to prevent excess travel.

NOTE: **This clearing is temporary only**; when power is removed and then restored, the previous limits will return **unless** you have set new limits as below. This will erase any limits previously set by the factory during testing. **Never use the PTE-300 head without having limits set to prevent damage to the PT head and/or housing if control is lost!**

Next, set the limits of travel as desired. Use the functions of your controller for left, right, up, and down limit setting. Remember, that the pan tilt head has a range of pan of 360˚ (left or right 180˚), and a tilt range of 180˚ (up or down 90˚); it cannot turn more than a full circle. There are end travel stops programmed into the head to prevent traveling more than these amounts. Make sure when cabling the system that enough cable slack is

included to prevent damage to the pan-tilt connectors and camera and lens connectors. The motors in the head are very strong, and will easily rip a connector out of its' socket. Once the travel limits are set, normal usage of the pan tilt system may begin.

7. POWER REQUIREMENTS AND WIRING CONFIGURATIONS

The PTE-300 pan tilt head requires **24 volts DC** power. Maximum draw is approximately 3 amps; average current draw in operation is 1.5 amps. In operation with the recommended PT-PS-3E power supply, the head will provide power for camera / lens combinations drawing up to 3 amps @ 12VDC; if the camera / lens draws more than this, an external camera power supply is required. The input cable for the power to the pan tilt head is to be attached at the Tyco/Amp™ connector at the rear of the pan tilt head base. To help reduce power drop, it is common practice to run 4 conductors for power thus doubling the effective current carrying capability. Here is a chart with recommended AWG for different distances (at 77°F)

Distance in feet	AWG
up to 200	18
201-500	16
501-1000	12

On the next page is a listing of the conductors found at the Tyco/Amp 206036-1 connector built into the PTE-300 base. A removeable mating connector and heat shrinkable cable boot are supplied for you to make the necessary connections to the system wiring. Female mating solder type sockets are provided. It is recommended to make up the connector and test the head fully before using a heat gun to shrink the cable boot, as once the cable boot is shrunk it is very difficult to remove due to meltable adhesive inside it.

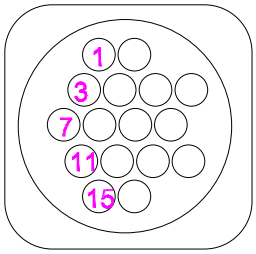
8. RS-485 COMMUNICATIONS SETUP

Communications for the PTE-300 series is transmitted via the RS-485 standard, a common multidrop network configuration. Three wires are required for RS-485 communications, two for signal and one for ground. The input for the RS-485 to the pan tilt head is contained within the AMP connector at the base of the pan tilt head. Using the appropriate gauge shielded twisted pair cable, maximum communication length without a repeater is 4,000 feet.

Inside each of our pan tilt heads and in the PT controller is a 120 ohm terminating resistor. The two units at the ends of the communication line should have the terminating

resistor in place; all other units on the line must have the resistor disconnected. The resistor is connected in series to a jumper for easy configuration; this jumper can be found inside the top access cover of the PTE-300 pan-tilt head. It is located on the bottom of the main logic board. (see photo next page) With the jumper in place, the resistor is terminated; remove the jumper with a pair of needle nosed pliers to unterminate the RS-485 line. Heads are shipped from the factory with the terminator resistors in place.

If using a controller other than the Eagle PT series pan tilt controller, such as an AMX or Crestron control system, termination should be provided at the controller end.



AMP 206036-1 connector pin layout on base of PTE-300 pan tilt head

PIN 1	24 VDC POSITIVE
PIN 2	24 VDC POSITIVE
PIN 3	RS-485 LINE 1
PIN 4	RS-485 LINE 2
PIN 5	RS-485 GROUND
PIN 6	OPEN
PIN 7	VIDEO CENTER
PIN 8	VIDEO SHIELD
PIN 9	GENLOCK CENTER
PIN 10	GENLOCK SHIELD
PIN 11	OPEN
PIN 12	OPEN
PIN 13	WASHER COMMON
PIN 14	WASHER TRIGGER
PIN 15	24 VDC GROUND
PIN 16	24 VDC GROUND

If the PT-EE-* housing has been purchased with the optional heater, defroster, or blower, they have been prepared for **120 VAC** power at the factory. The single flexible black silicone jacketed cable exiting the **bottom** of the PT-EE-*enclosure is for the 120 VAC power input; consult a licensed electrician for installation of the housing to line voltage. In most locations the electrician will need to make the final connections to power, depending upon local code requirements.

The two BNC connectorized cables inside the housing terminate at the AMP connector at the base of the pan tilt head. They are merely pass through cables; the connectors are marked for VIDEO and GENLOCK, and correspond to the pins shown in the diagram on page 12.

PTE-300 circuit board set; close up of PCB1003 main logic board showing location of RS-485 Termination jumper. Lens board is on right side, with blue lens drift adjust pot shown in center of board. Please see the lens reference adjust document at the rear of this manual for details on adjustment of lens drift if needed.

10. SPECIFICATIONS

GENERAL

All 6061 aluminum; polyester-based, UV resistant light grey powder coated to prevent corrosion. All fasteners are type 316 stainless steel.

TEMPERATURE RANGE: -20°F TO +120°F (-29°C TO +49°C)

WEIGHT: 20 lbs. (without housing and camera)

MECHANICAL

DRIVE SYSTEM: variable speed DC motors driving polypropylene-stainless steel reinforced ladder chain attached to worm gear final drive; worm drive adjustable for backlash elimination

PAN RANGE: 360° HORIZONTAL (-180° to +180°) -NOT CONTINUOUS ROTATION

SPEED: variable from 0° up to approx. 20° per second, with load correctly balanced

TILT RANGE: +90° TO –90° VERTICAL

SPEED: variable from 0° up to approx. 20° per second, with load correctly balanced

MAX. LOAD: approximately 40 pounds (17.5 kilos), including PT-EE-L housing, camera, and lens

ELECTRICAL

INPUT VOLTAGE: 24vdc from recommended PT-PS-3E power supply

CURRENT REQUIREMENTS: starting, 600ma pan or tilt;

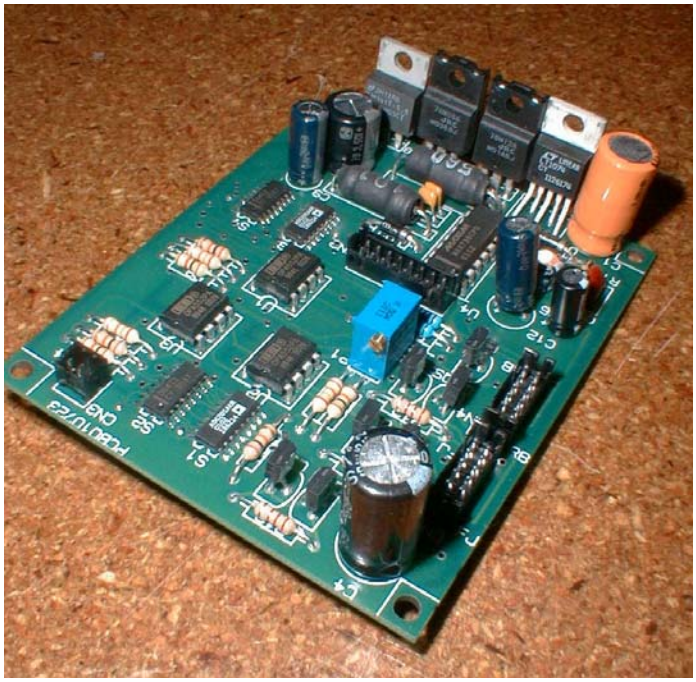
running, 300ma, pan or tilt

CABLE REQUIREMENTS:

3 conductor, 22 gauge for RS-485 control system

4 conductor, 18 gauge for pan tilt head power

Note that these are minimum gauge size requirements; check the tables in the manual for the gauge size needed for your application.



New lens board as of August 2001: PCB10723

Notice latest lens board has no heat sinks on board; has surface mounted drivers; has two separate headers on right edge for either C mount (RB) type lens or teleconferencing (FJ) type lens connection; also has blue trimmer pot in center of board for adjusting reference voltage on teleconferencing lenses. Pot adjustment has no effect on C mount lenses. If you have this style board, it has been set at the factory for 5.00V reference voltage. You may need to adjust this pot for your particular lens if focus and / or zoom drifting occurs when you move the zoom / focus joystick.

To adjust for drifting, simply use a small straight bladed screwdriver and turn the adjuster a very small amount one way or the other. Then slowly zoom in or out. Observe the drifting of the lens focus; if the drifting increases speed, you have turned the wrong way. Turn it a small amount the other direction, and observe it again. Once you think you have the drifting eliminated, wait a few minutes and then try the test again. If the focus drifts again, turn the adjuster a very small amount in the correct direction. Repeat this procedure until the drifting is eliminated.

REVISIONS				
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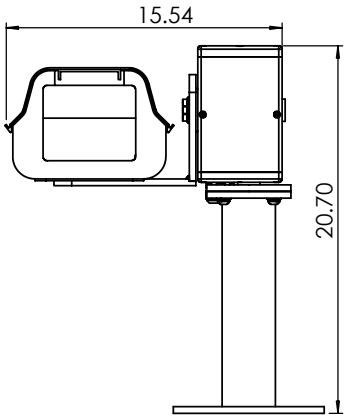
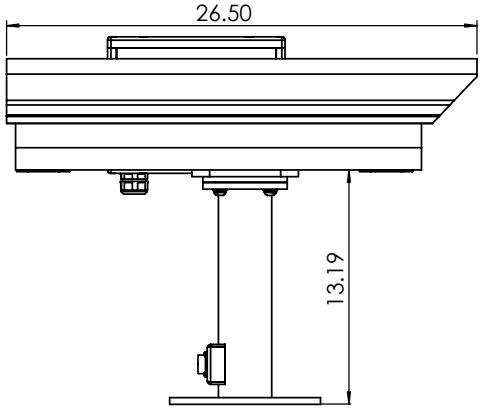
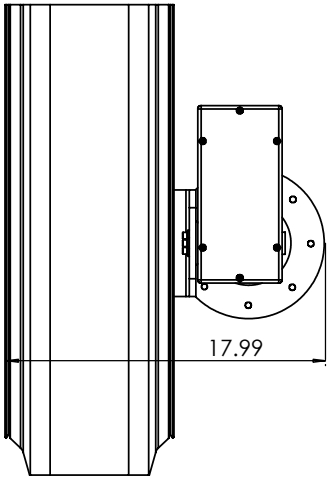
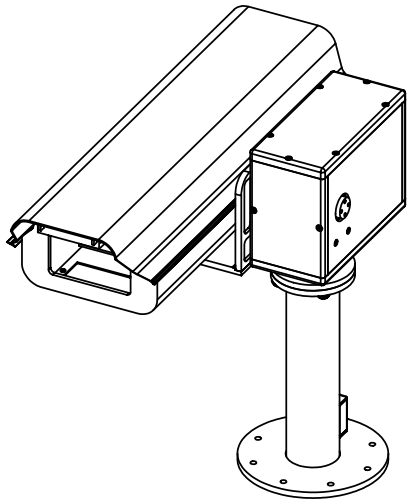








NOTE: Trimetric view for reference only
Housing may be mounted on either side

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL --

FINISH --

		DATE	NAME
DRAWN			
CHECKED			
ENG APPR.			
MFG APPR.			
Q.A.			

COMMENTS:

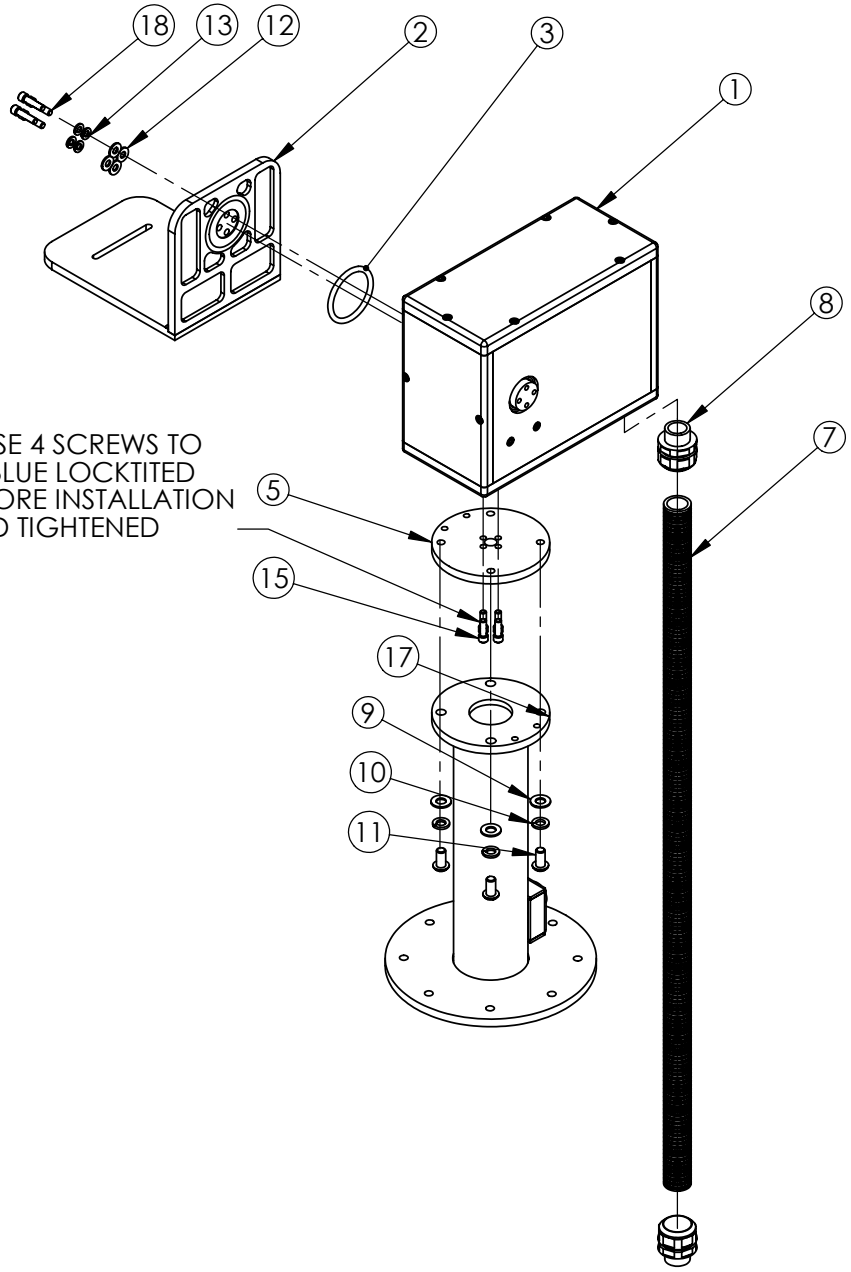
DISPLAY DEVICES INC.

TITLE:
PTE-300 W/PT-EE-L
HOUSING

SIZE	DWG. NO.	REV
B		

SCALE: 1:7	WEIGHT:	SHEET 1 OF 1

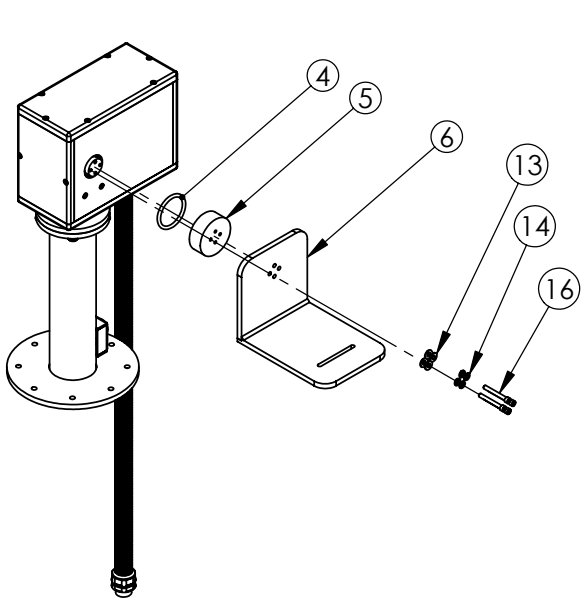
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED



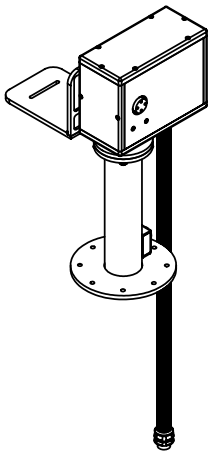
THESE 4 SCREWS TO BE BLUE LOCKTITED BEFORE INSTALLATION AND TIGHTENED

THIS VIEW SHOWN WITH LHS CAMERA MOUNT

NOTES: FLEX TUBE TO BE CUT TO 33.50" LONG.



THIS VIEW SHOWN WITH RHS CAMERA MOUNT



ISOMETRIC VIEW FOR REFERENCE ONLY

ITEM NO.	QTY.	DDI NO	DESCRIPTION
1	1	140-012	COMPLETE DRIVE UNIT ASSEM
2	2	140-024	CAMERA BRACKET ASSEMBLY
3	2		O-RING - 2.5 OD
5	1	140-027	BOTTOM ADPTR TO 12IN POLE
6	1	140-025	TILT ADPATER RING-PT-300
7	1		FLEX TUBING - 33.50" LONG
8	2		FLEX TUBE CONNECTOR
9	4		3/8" FLAT WASHER-STAINLESS STEEL
10	4		3/8" LOCK WASHER-STAINLESS STEEL
11	4		3/8-16 X 3/4" BHCS-STAINLESS TEEL
12	8		1/4" FLAT WASHER-STAINLESS STEEL
13	8		1/4" LOCK WASHER-STAINLESS STEEL
15	4		1/4-20 X 3/4 SHCS-STAINLESS STEEL
17	1	140-031	12" POLE ASSEM FOR PT-300
18	4		1/4-20 X 1" SHCS-STAINLESS STEEL
19	4		1/4-20 X 2 SHCS-STAINLESS STEEL

MATERIAL

FINISH

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:

FRACTIONS DECIMALS ANGLES
.XX ± .02 ±.5
.XXX ± .010

DRAWN BY: BAR

DATE: 11/14/2000

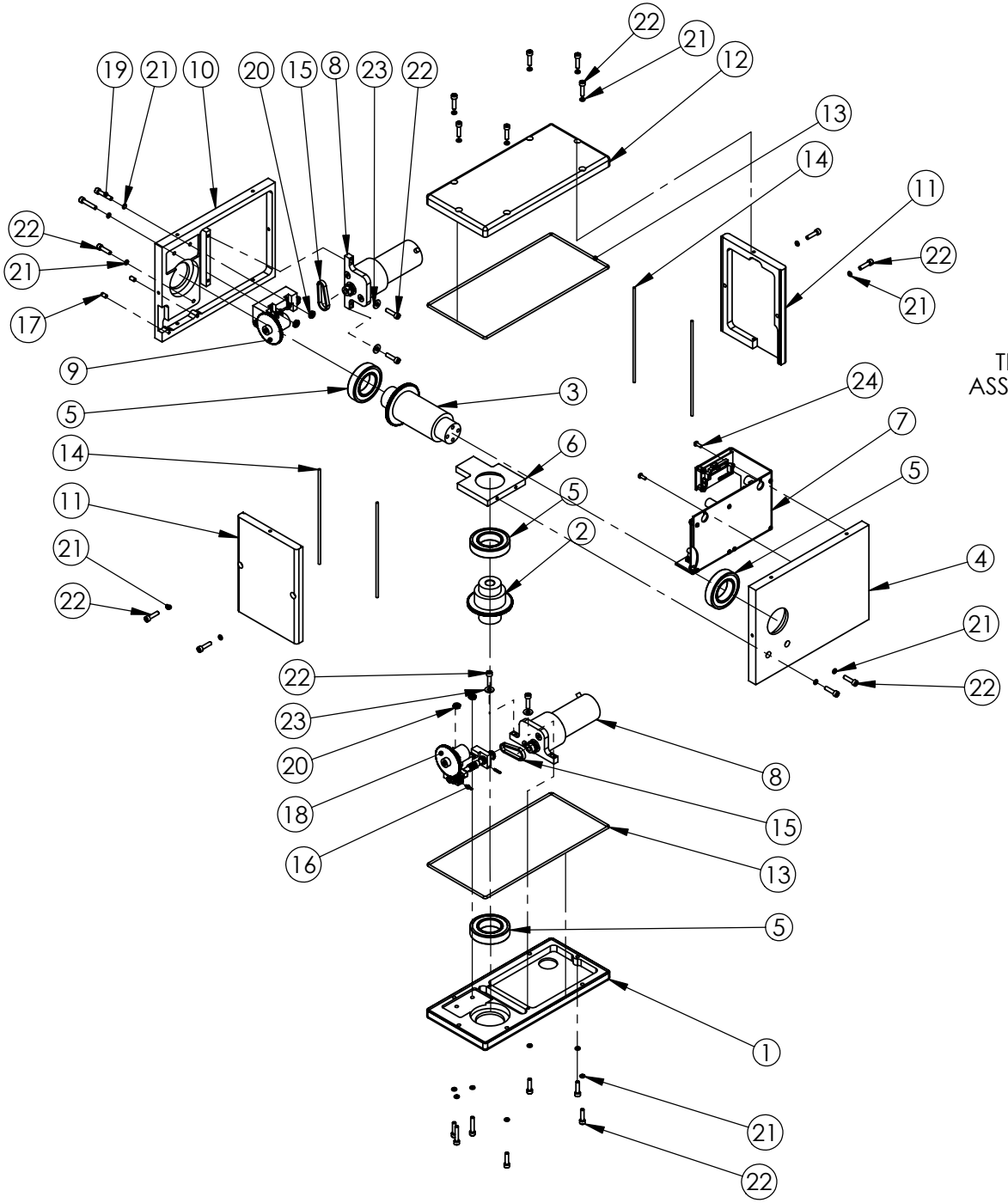
BASE AND CAM MNT DETAIL

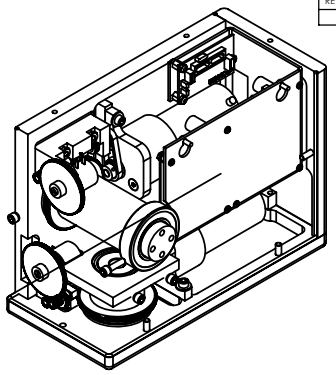
DISPLAY DEVICES, INC
5880 SHERIDAN BLVD.
ARVADA, CO 80003

SIZE DDI | DRAWING NO. 140-026 | REV. -

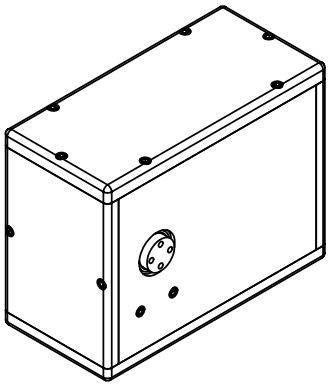
CAD FILE: 140-026.SLDDRW | SHEET 1 OF 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED





THIS VIEW SHOWS INTERANL ASSEMBLY WITHOUT TOP, FRONT, AND RHS COVER PLATES



ISOMETRIC VIEW FOR REFERENCE ONLY

ITEM NO.	QTY.	DDI NO	DESCRIPTION
1	1	140-010	BOTTOM-OUTER CASE
2	1	140-007	PAN SHAFT ASSEMBLY
3	1	140-006	TILT SHAFT ASSEMBLY
4	1	140-011	SIDE PLT-OUTR CASE
5	4		1.25 ID X 2.25 OD X .500 BEARING
6	1	140-013	PAN TOP BRG SUPPORT BLK
7	1	140-009	ELECT BOARD ASSEMBLY
8	2	140-018	MOTOR MOUNTING DETAIL
9	1	140-015	FORK DRIVE ASSEMBLY
10	1	140-019	SIDE PLATE-MOTOR DRIVE SIDE
11	2	140-020	END CAP - PT-300
12	1	140-021	TOP COVER PLATE-PT 300
13	2		ROUND FOAM CORD-28-5/16"
14	4		ROUND FOAM CORD-6.50"
15	2		NO SLIP BELT - 42T
16	2		SPRING .098 OD X .5 LONG
17	2		8-32 X 3/8" SET SCREW-STAINLESS STEEL
18	1	140-032	PAN FORK DRIVE ASSEMBLY
19	4		10-32 X 1 SHCS-STAINLESS STEEL
20	4		10-32 FLAT NUT - STAINLESS STEEL
21	22		O-RING
22	22		1/4-20 X 3/4 SHCS-STAINLESS STEEL
23	4		#10 FLAT WASHER-STAINLESS STEEL
24	2		10-32 X 3/8 PAN HEAD PHILLIPS - STAINLESS STEEL

MATERIAL

FINISH

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
.XX ± .02 ±.5
.XXX ± .010

DRAWN BY: BAR
DATE: 11/14/2000

COMPLETE DRIVE UNIT ASSEM

DISPLAY DEVICES, INC
5880 SHERIDAN BLVD.
ARVADA, CO 80003

SIZE: DDI | DRAWING NO.: 140-012 | REV.: -
CAD FILE: 140-012.SLDDRW | SHEET 1 OF 1