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NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

MODEL AV-HTL

TEST LOAD ADAPTER

FOR USE WITH AVTECH PULSERS

SERIAL NUMBER: _____

WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been dissembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

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Manual Reference: /fileserver1/officefiles/instructword/av-htl/av-htlx,edition1.odt.
Last modified February 29, 2024.

INTRODUCTION

The laser diode drivers in the Avtech AVO-8 and AVOZ-B families of products are voltage pulsers which require a resistance in series with the diode device under test (DUT) to define and limit the current. To maintain fast rise and fall times, it is important that this resistance have a very low parasitic inductance. The rise time degradation introduced by a resistor R with a parasitic inductance L can be estimated as 2.2 × L / R. This resistance may also have a very high power dissipation requirement. For instance, the AVO-8C1-B can delivery up to 40V and 200A at duty cycles up to 50%, resulting in a power dissipation of 40V × 200A × 50% = 4000 Watts!

The Avtech AV-HTL series of water-cooled resistors is provided to meet this need. The AV-HTL resistors models each consist of ten discrete high-power resistors wired in parallel on a large heavy-duty water-cooled aluminum base. The maximum power rating is 4000 Watts, and the maximum parasitic inductance is 20 nH.

1 meter (3 feet) length of AV-CLZ1 transmission line cabling is connected to the input side of the AV-HTL-0R1, AV-HTL-0R2, and AV-HTL-1R0 models. AV-CLZ2 cabling is used on the AV-HTL-2R2. The input end of this cabling is terminated with a male DB-37 connector, which will mate to the female DB-37 output connector present on certain Avtech AVO-8 and AVOZ models. (More information about AV-CLZ1 transmission line cabling is available at http://www.avtechpulse.com/transmission/av-clz1).

The transmission line nature of the cabling largely eliminates inductive cabling effects. The AV-CLZ1 line has a characteristic impedance (Z0) of 1.0Ω, and the AV-CLZ2 has a Z0 of 1.8Ω. Pins 1-19 of the DB-37 connector are wired to the input end of the resistance, and pins 20-37 are wired to the base plate (ground).

Other input connector styles can be provided upon request. Other styles may be more suitable for DC or wide-pulse applications. (The DB-37 connector is best suited for lower-duty-cycle pulsed applications).

The other end of the resistance (the "output") is provided on a copper plate with bolt holes for external connections. A copper-plate “jumper bar” is provided allowing the output to be shorted to the base plate (ground). In this configuration, the resistance can be used as a test load, without any diode. The jumper bar can be removed, and the user may connect a diode load between the output and the grounded base. Bolt holes are provided in the base and the output plate for this purpose. (These models are shipped from the factory with the ground jumper bar installed.)

Other mechanical and electrical configurations can be provided upon request (info@avtechpulse.com).

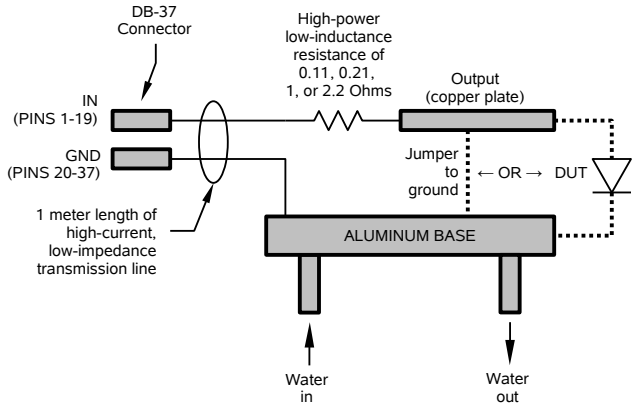
SPECIFICATIONS

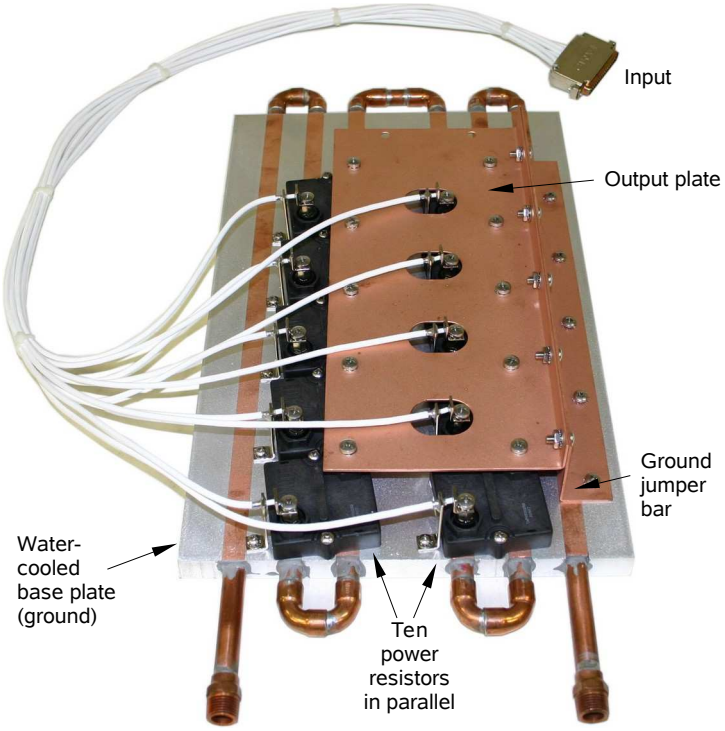
Model:	AV-HTL-0R1	AV-HTL-0R2	AV-HTL-1R0	AV-HTL-2R2
Load resistance (R_L, ±10%):	0.11 Ω	0.21 Ω	1.0 Ω	2.2 Ω
Parasitic inductance:	< 20 nH			
Max. power dissipation:	4000 Watts			
Base plate thermal resistance, R_{TH}:	0.005 °C/W, for a water flow rate of 6 liters / 1.5 gallons per minute			
Max. operating temperature:	65 °C. The water cooling must be used to keep the resistor temperature below this rating.			
Water cooling connections:	3/8" NPT[1] male connectors on both ends			
Water flow rate:	6 liters / 1.5 gallons per minute is recommended			
Input connection:	Standard models: Male DB-37 connector on the end of a non-detachable 1 meter length[2] of AV-CLZ1 or AV-CLZ2 cabling. Pins 1-19 = input, pins 20-37 = ground. Optional: Specify the "-8D1" option for an input connector that will mate to the Avtech AVO-8D1-B output copper bars. (Replaces DB-37 connector.) Also available: Customized terminations (Multi-Contact 6 mm plugs, for example). Contact Avtech with your requirements.			
Output connections:	Multiple bolt holes are provided in the output copper plate and the aluminum base (ground).			
Supplied accessory:	Output-to-ground jumper bar			
Base size (H×W×D, approx):	0.75 × 16[3] × 10 inches, 2 × 41[3] × 25 cm			

1) NPT = National Pipe Thread. Contact Avtech for suggested NPT-to-hose-barb adapters, if required.
2) Optionally 2 meters. Specify -L200 option.
3) Optionally 20 inches / 51 cm. Specify -W20 option.

BASIC USAGE

The basic connection scheme for the AV-HTL is shown below:





AV-HTL-0R1 (with ground jumper installed)

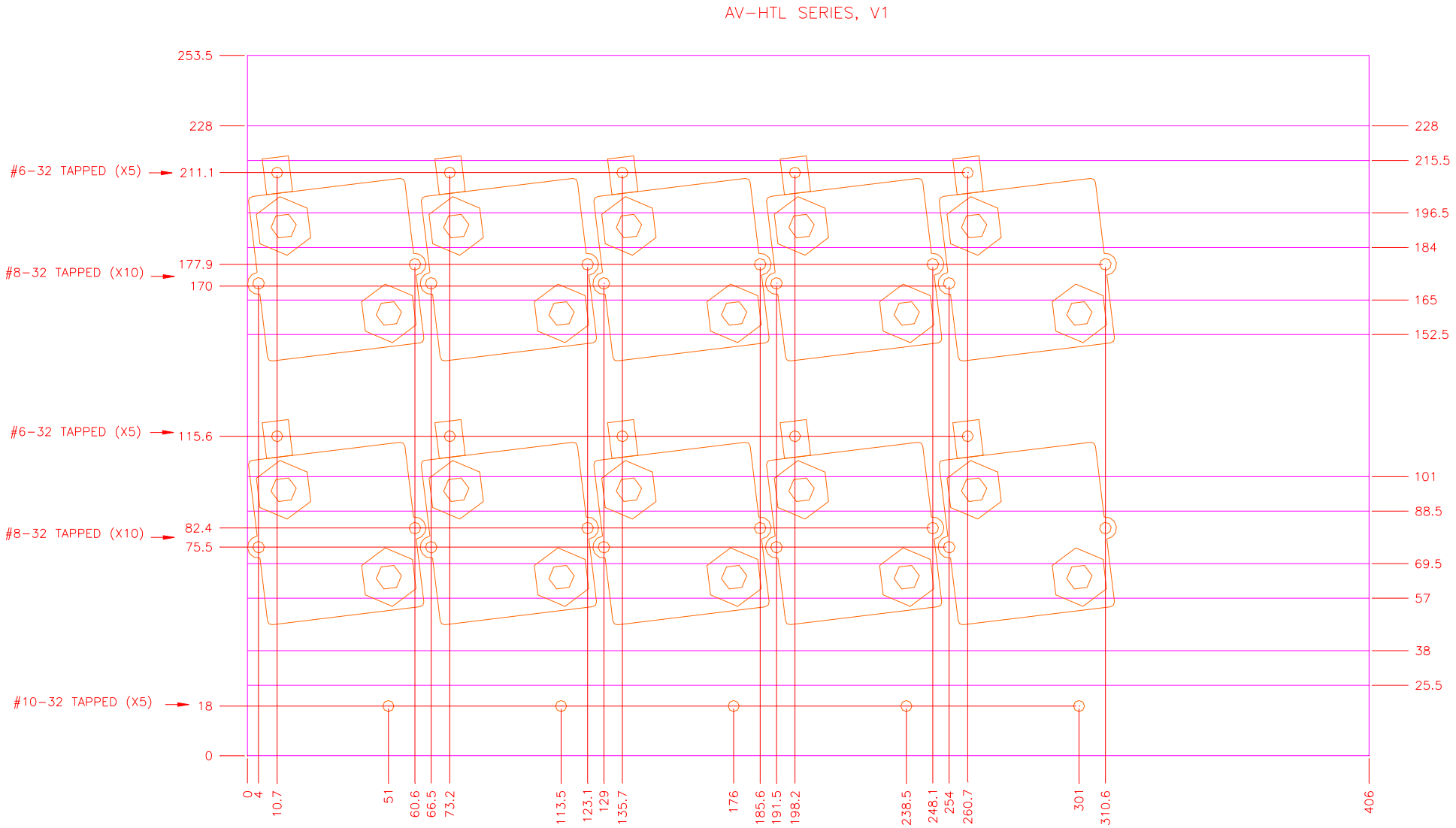
The jumper bar is installed when shipped from the factory.

The user may remove the jumper bar, if desired, by removing the five bolts securing it to the base plate, and the five bolts securing it to the output plate.

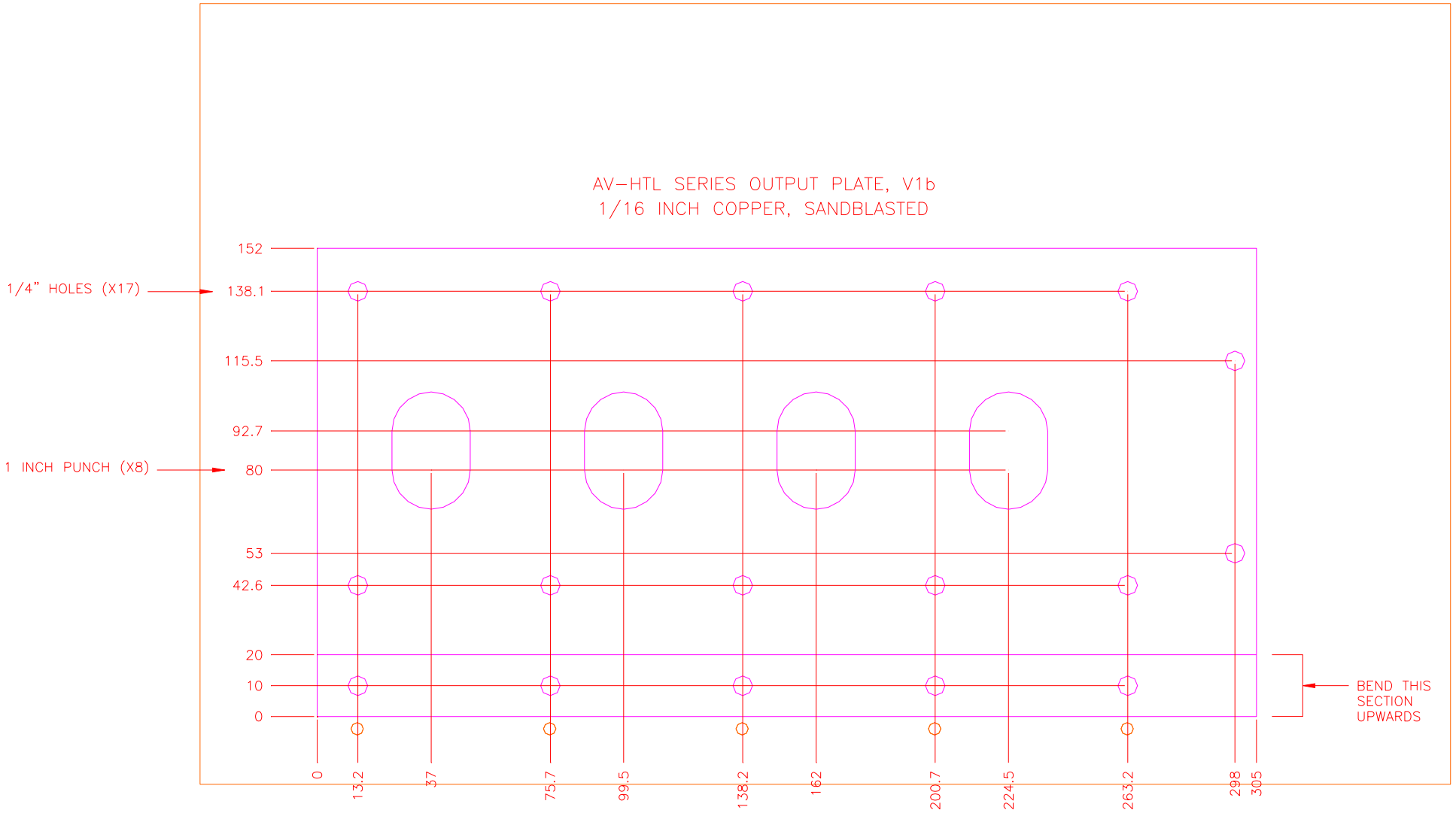
The user may then connect the output plate and the base plate to the DUT in any mechanically-convenient, low-inductance fashion. The mechanical drawings in the following section will assist the user in designing mating hardware.

MECHANICAL DRAWINGS

BASE PLATE MOUTING HOLES



OUTPUT PLATE



JUMPER BAR

AV–HTL–0R1 and AV–HTL–0R2 SHORTING BAR, V1b
1/16 INCH COPPER, SANDBLASTED