



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

P.O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265

TEL: 888-670-8729 (USA & Canada) or +1-613-686-6675 (Intl)  
FAX: 800-561-1970 (USA & Canada) or +1-613-686-6679 (Intl)

info@avtechpulse.com - <http://www.avtechpulse.com/>

BOX 5120, LCD MERIVALE  
OTTAWA, ONTARIO  
CANADA K2C 3H5

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 disassembled, 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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E-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)

World Wide Web: <http://www.avtechpulse.com>

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Manual Reference: /files/officefiles/instructword/av-htl/av-htlx,edition2.odt.  
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## 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  $2.2 \times L / R$ . This resistance may also have a very high power dissipation requirement. For instance, the AVO-8C3-B can delivery up to 40V and 200A at duty cycles up to 50%, resulting in a power dissipation of  $40V \times 200A \times 50\% = 4000$  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 parasitic inductance is typically 20 nH.

A 1 meter length of AV-CLZ1 (or AV-HLZ1 on -HLZ units) transmission line cabling is connected to the input side of most models, except AV-CLZ2 (or AV-HLZ2) cabling is used on the AV-HTL-2R2.

The input end of this cabling is terminated with a male DB-37 connector on standard units, which will mate to the female DB-37 output connector present on certain Avtech models.

The cable can also be configured with a high-voltage, high-current Positronic connector suitable for use with the current generation of Avtech AVO-8 models. Specify the -HLZ option to use this connector. Other input connector styles can be provided upon request.

The transmission line nature of the cabling largely eliminates inductive cabling effects. The AV-CLZ1 / AV-HLZ1 line has a characteristic impedance ( $Z_0$ ) of  $1.0\Omega$ , and the AV-CLZ2 / AV-HLZ2 cabling has a  $Z_0$  of  $1.8\Omega$ . More information about Avtech low-impedance transmission line cabling is available at:

<http://www.avtechpulse.com/transmission>

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).

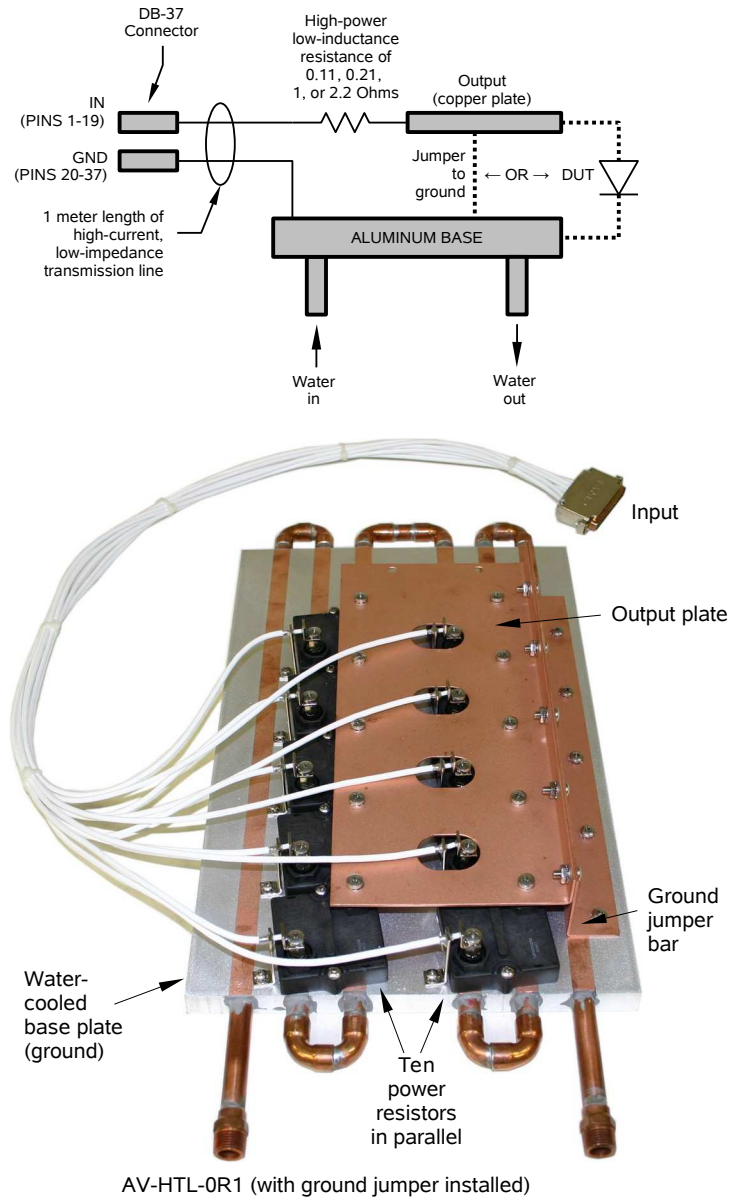
## SPECIFICATIONS

Model:	AV-HTL-0R1	AV-HTL-0R2	AV-HTL-0R3	AV-HTL-0R5	AV-HTL-1R0	AV-HTL-2R2
Load resistance ( $R_L$ , $\pm 10\%$ ):	0.11 $\Omega$	0.21 $\Omega$	0.31 $\Omega$	0.51 $\Omega$	1.0 $\Omega$	2.2 $\Omega$
Parasitic inductance:	20 nH typically					
Max. power dissipation:	4000 Watts					
Base plate thermal resistance, $R_{TH}$ :	0.005 $^{\circ}\text{C}/\text{W}$ , for a water flow rate of 6 liters / 1.5 gallons per minute					
Max. operating temperature	65 $^{\circ}\text{C}$ . The water cooling must be used to keep the resistor temperature below this rating.					
Water cooling connections:	1/2" NPT <sup>1</sup> 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 <sup>2</sup> of AV-CLZ1 or AV-CLZ2 cabling. Pins 1-19 = input, pins 20-37 = ground. Optional: Specify the "-HLZ" option for an input connector that will mate to the Positronic connectors on current-generation AVO-8 models. 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 <sup>3</sup> × 10 inches, 2 × 41 <sup>3</sup> × 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:



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.

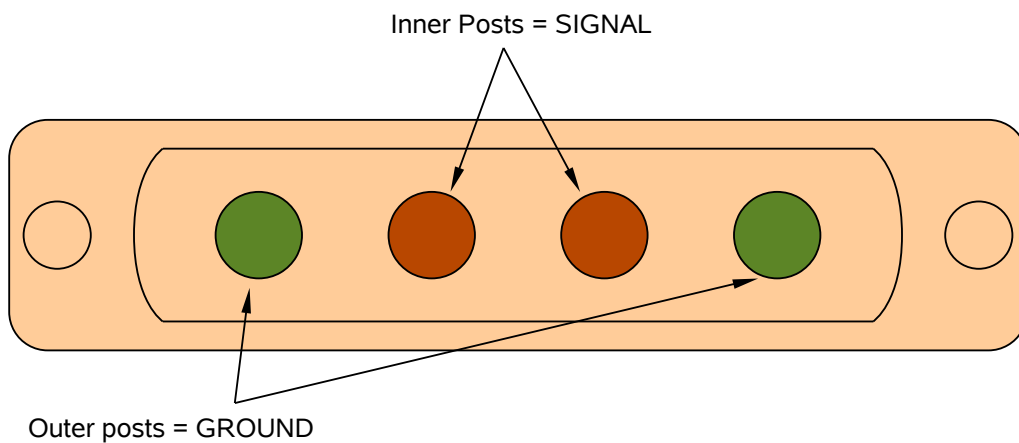
The user may then connect the output plate and the base plate to the DUT in any mechanically-convenient, low-inductance fashion. The mechanical drawings in the following section will assist the user in designing mating hardware.

### -HLZ Option

Units with the -HLZ option use a Positronic input connector, rather than a DB37 connector. This connector is shown below:



The outer two posts are connected to ground. The inner two posts carry the signal:

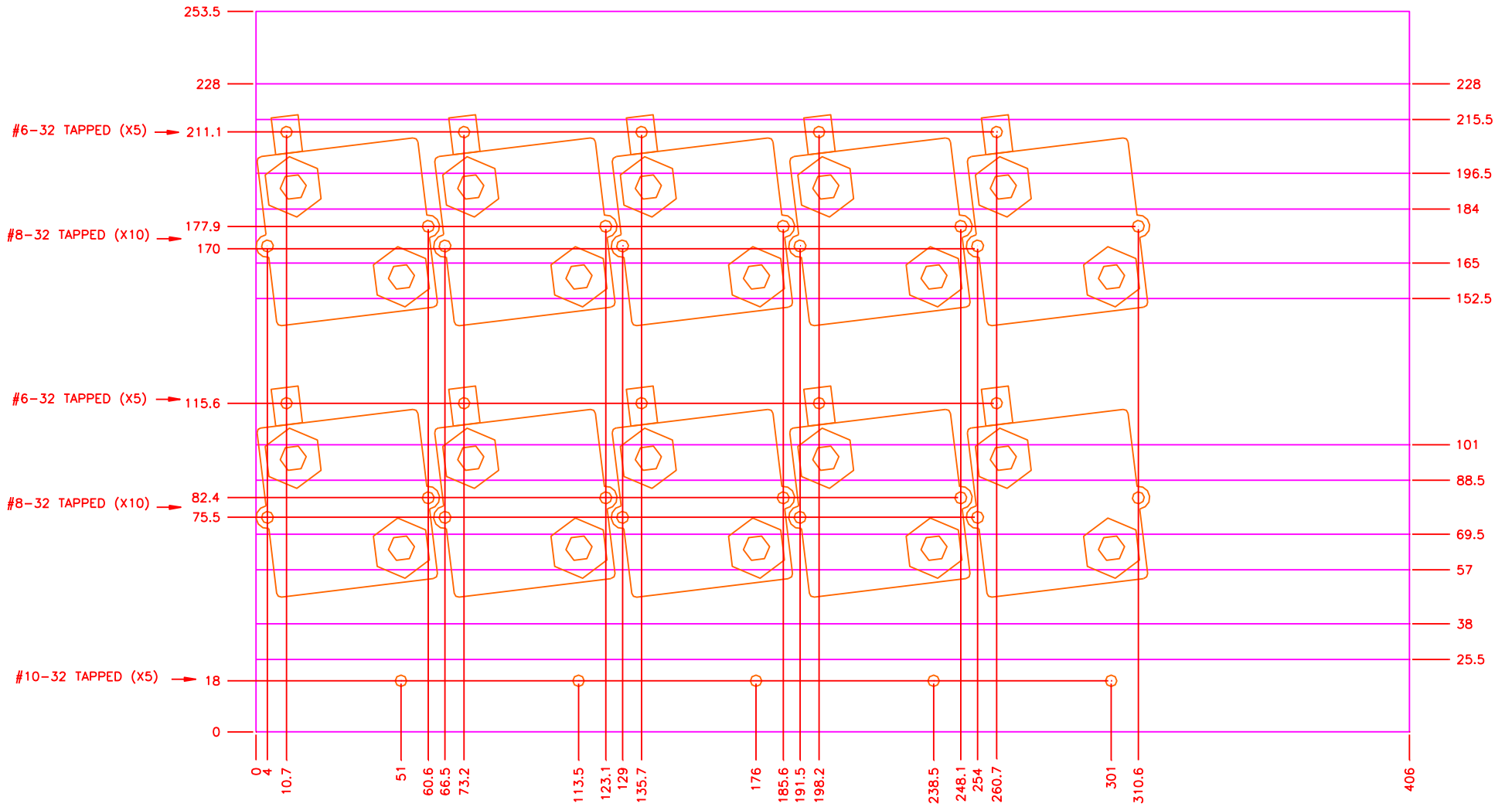


*End View of Positronic / HLZ Connector*

# MECHANICAL DRAWINGS

## BASE PLATE MOUNTING HOLES

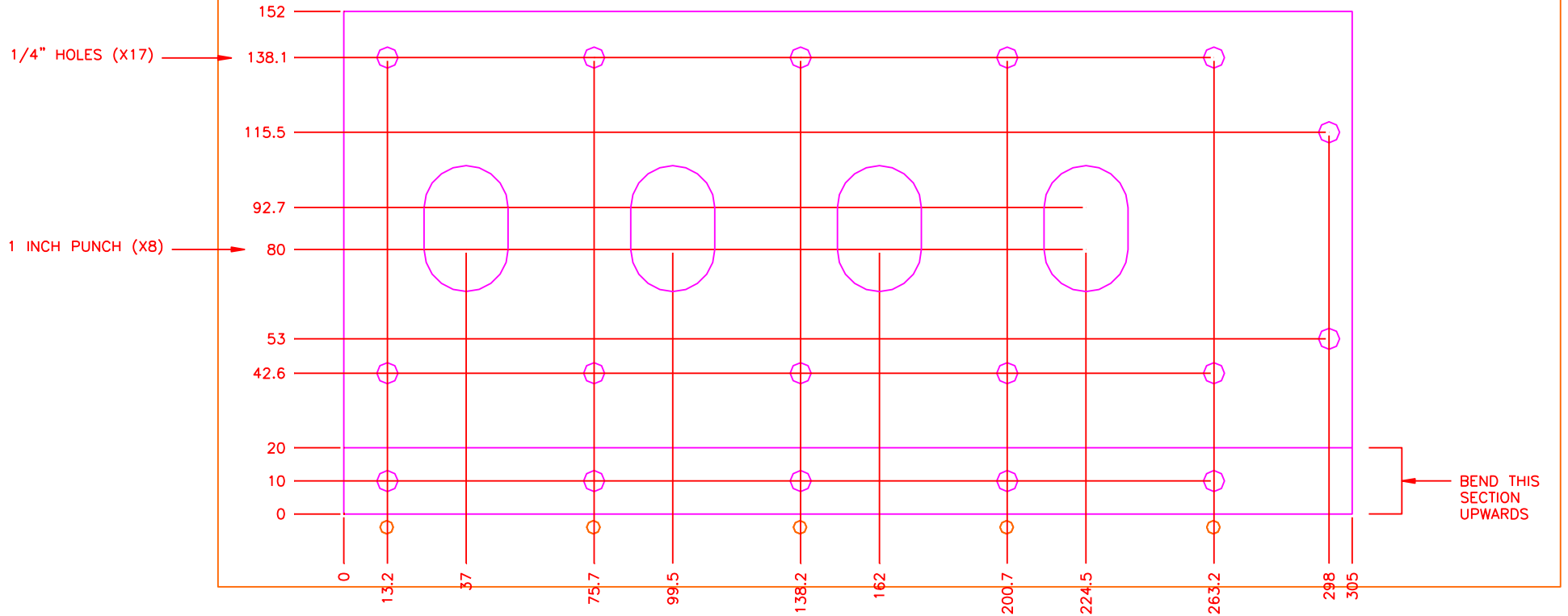
AV-HTL SERIES, V1





# OUTPUT PLATE

AV-HTL SERIES OUTPUT PLATE, V1b  
1/16 INCH COPPER, SANDBLASTED



# JUMPER BAR

AV-HTL-OR1 and AV-HTL-OR2 SHORTING BAR, V1b  
1/16 INCH COPPER, SANDBLASTED

