



Apache
ARROW 2™

Pipe Laser

Apache Technologies, Inc.

8261 State Route 235
Dayton, Ohio 45424 USA
Phone: (937) 482-0200
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Thank you for purchasing an Apache Technologies product. Your ARROW 2™ pipe laser is a premium quality tool that has been designed and manufactured to provide years of precise and reliable performance. The ruggedness, versatility, and ease of use of the ARROW 2™ are unequaled in the industry. The ARROW 2™ has been specifically designed for use in harsh construction environments.

This manual is an important part of your purchase. It will familiarize you with the unit and explain the numerous features that have been designed into it. Please read this manual thoroughly before using your ARROW 2™ pipe laser.

Please contact your Apache dealer or the Apache factory should you have questions regarding specific applications or if you require additional information.

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SERIAL NUMBER: _____

DATE OF PURCHASE: _____

PURCHASED FROM:

PHONE: _____

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APPLICATION:

The ARROW 2™ pipe laser is an easy-to-use laser instrument for aligning gravity flow drainage pipe. It can be set inside pipe diameters of 6" (150mm) or greater. It may also be used on a tripod. It is particularly easy to use on construction sites because the unit uses a laser diode as a beam source which is powered by self-contained internal rechargeable batteries. There is no need for a power cable to a heavy external battery. A power cable is supplied for times when the internal batteries are not recharged. An easy to operate keypad and a large backlit LCD window aid in the quick set-up of the laser.

An adjustable universal target and quick exchange base extensions allow the beam to be centered in various diameter pipe.

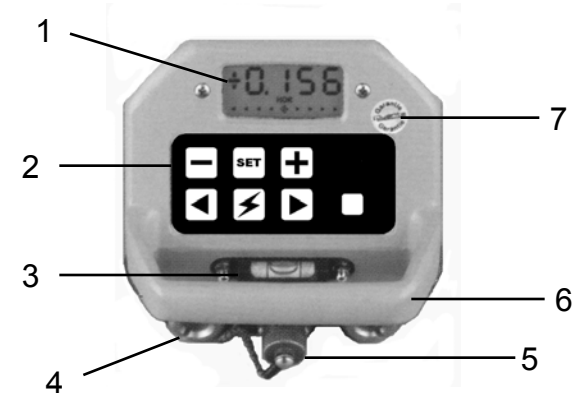
An infrared remote control unit allows the adjustment of the line over long distances without the need for remote control wiring harnesses. The compact housing design permits access into cramped and awkward positions.

The ARROW 2™ pipe laser is completely waterproof and is designed to be used in tough pipe laying conditions.

CONTROLS AND DISPLAYS:

A. CONTROLS

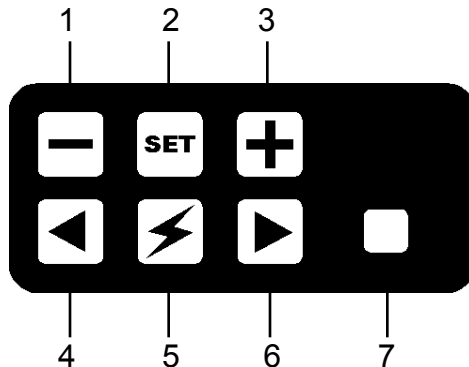
1. Liquid Crystal Display - Grade setting indicator, line position indicator, self-leveling status and low battery warning.
2. Keypad - Power switch, grade and line setting, and infrared remote control window.
3. Level vial for aligning laser in the cross axis.
4. Self-centering bumpers for 6" pipe.
5. Connector socket and protective cap for attaching battery charger or power cord.
6. Carrying Handle
7. Service Port



CONTROLS AND DISPLAYS:

B. KEYPAD

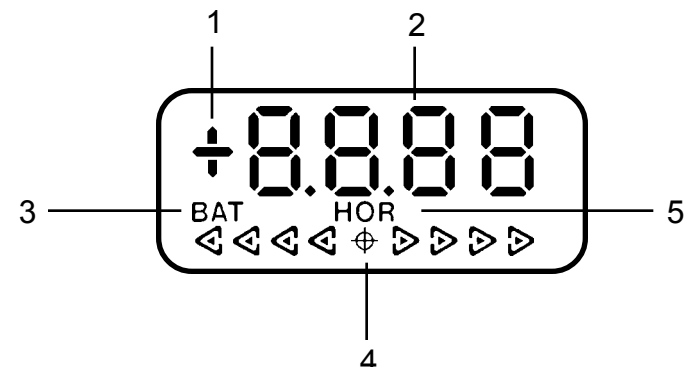
1. Minus Key - lowers the grade value displayed. Change is indicated by flashing numbers.
2. Set Key - Sets the grade value displayed in the LCD window. The beam will flash and not be operational until the Set Key is pressed.
3. Plus Key - raises the grade value displayed. Change is indicated by flashing numbers.
4. Left Arrow Key - moves the laser beam to the left.
5. Power Key - turns the unit on and off.
6. Right Arrow Key - moves the laser beam to the right.
7. Infrared Remote Control / Charge Status Window - receives signals from the remote control / LED indicates charging status when recharging.



CONTROLS AND DISPLAYS:

C. LIQUID CRYSTAL DISPLAY (LCD)

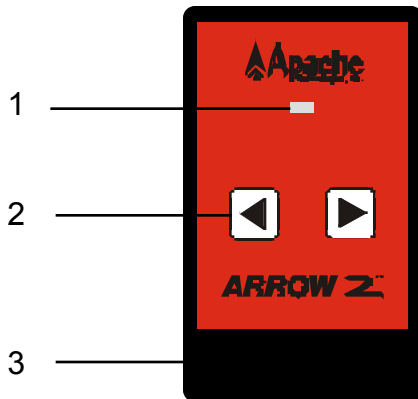
1. Plus or Minus Grade - plus grade is upward from the laser beam exit window; minus is downward from the laser beam exit window.
2. Grade Percentage - displays grade range from +30% to -10% in increments of 0.002%.
3. "BAT" - Displays when internal battery requires recharging.
4. Line adjustment position indicators - Center, left, right arrows indicate beam line position relative to the laser axis. Line movement is 7% or +/- 7 feet at 100 feet.
5. "HOR" - displays when the beam is self-leveled. Continuous display - unit is leveled
Flashing display - unit is in the process of self-leveling.



CONTROLS AND DISPLAYS:

D. REMOTE CONTROL

1. Remote emission indicator / remote battery status indicator - LED turns on when a line adjustment is made and assures battery is in working order.
2. Left / right line adjustment - pressing the left or right arrow sends a signal to the laser and the line is moved. The arrow keys correspond to the direction of line travel when the remote is in front (target side) of laser.
3. Battery compartment - access on back of remote control. Uses one 9-volt battery.



OPERATION:

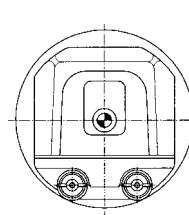
- A. **Battery Charging** - Remove the protective cap from the laser charging socket. Insert the charger plug into a 110V wall outlet. Connect the cannon connector to the connector on the pipe laser. A constant red LED on the keypad will indicate the unit is charging. A flashing LED indicates that the charging is complete. Charging time is less than 4 hours. When charging is complete, remove the cable from the laser and replace the protective cap.
- B. **Set-up** - Align the laser in the pipe or invert. Align the level vial located behind the carrying handle so it is in the center position. Angle errors of up to $\pm 3^\circ$ have no significant influence on the accuracy of the beam.
- C. **Grade-setting** - Turn the laser on by pressing the power key (lightning bolt symbol). The laser beam and LCD will flash with the last entered value. Use the plus (+) and minus (-) keys to select the desired grade. Plus is upward from the laser beam exit window and minus is downward from the exit window. If the laser is set outside its self-leveling range, the beam and display will flash and the unit will have to be reset.

OPERATION:

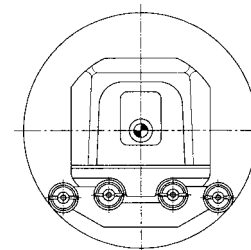
- D. When the desired grade is displayed, press the 'SET' key. The laser will then self-level to the entered grade. When the laser beam remains on and the 'HOR' is constantly displayed on the LCD, the unit has been self-leveled.
- E. Line adjustment - Line is adjusted by either the left or right arrow keys on the laser keypad or the remote control keypad. It is advisable to start the set-up with the line adjustment in the center position (9). The longer the arrow key is pressed, the faster the line movement will be.
- F. Set-up in various diameter pipe - The pipe laser and target are equipped with base extensions and targets faces for centering in various diameter pipe. Standard equipment for the laser include 6" bumpers and laser base extensions for 8" and 10" pipe. Standard equipment also includes an adjustable target face for 6", 8", and 10" pipe. An optional package includes laser base extensions and an adjustable target face for 12", 15", and 18" pipe diameters

OPERATION:

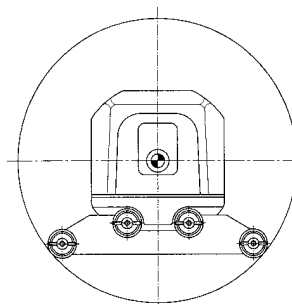
To attach base extensions, loosen the 2 front and 2 rear 6" bumpers with a coin or screwdriver. Insert the appropriate base extension as illustrated in the following diagrams. Tighten the 6" bumpers and the laser is ready to be used in the appropriate pipe diameter.



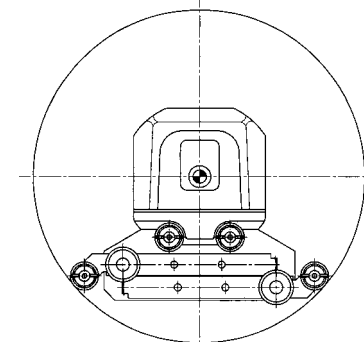
6 inch pipe
bumpers



8 inch pipe
base extension

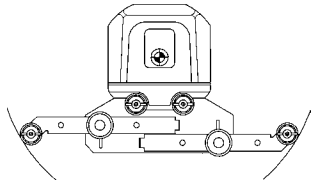


10 inch pipe
base extension

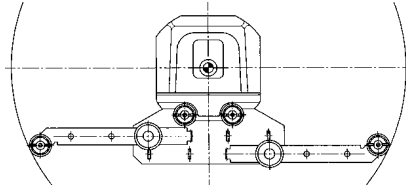


12 inch pipe
base extension

OPERATION:

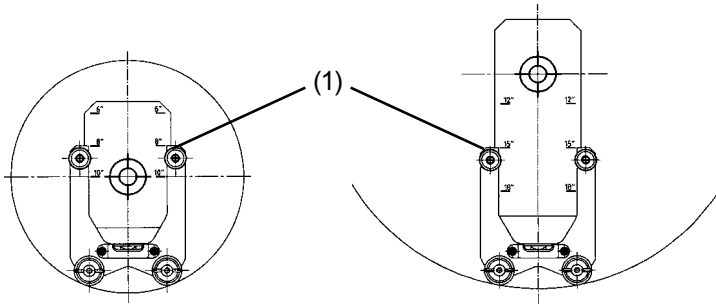


15 inch pipe
base extension



18 inch pipe
base extension

Align the target face mark for the corresponding pipe diameter to the top of the target stand (1) as illustrated below.



Target face set
for 8" pipe

Target face set
for 15" pipe

SPECIFICATIONS:

ARROW 2™ Laser

Grade Range:

-10.00% to +30.00%

Self-Leveling Range:

-15.00% to +35.00%

Minimum Grade Setting:

0.002%

Leveling Accuracy:

Better than $\pm 10''$

Line Adjustment Range:

$\pm 7\%$ (14 ft at 100 ft)

Laser Source:

Diode, 635 nm wavelength

Laser Classification:

Class IIIa

Power Supply:

NiCad Batteries - Internal

Operating Time:

24 hours on full charge

Charge Time:

Maximum 4 hours

Operating Voltage:

12 Volts DC only
Reverse Polarity Protected

Waterproofness:

Purged, filled with Nitrogen

Operating Temperature:

-20° C to +50° C

SPECIFICATIONS: Remote Control

Beam Type: Infrared

Operating Range: Front - 300 ft.
Rear - 50 ft.

Power Supply: 9V Alkaline Battery

DIMENSIONS AND WEIGHT:

Arrow 2™ Laser: LxWxH - 12.4 x 4.7 x 5.1 in.

Weight: 9.3 Lbs.

Carrying Case: LxWxH - 20.1 x 15.2 x 6.7 in.

Weight, with Accessories: 26.5 Lbs.

TROUBLESHOOTING:

Problem Possible Cause / Remedy

LCD Reading:



Excess Temperature Display - The operating temperature of the laser diode has been exceeded and the laser beam shuts off. Switch off the laser. The warning will disappear when the operating temperature falls below the maximum.



Leveling Range Display - The leveling range has been exceeded, and the laser cannot self-level. Change the tilt of the laser to within its leveling range and the laser will self-level within about 10 seconds.



Error Display - Errors F1 and F2 can only be eliminated by an authorized service center. Errors F3 and F4 can be eliminated by switching the unit off and on again.

TROUBLESHOOTING:

Problem	Possible Cause / Remedy
Laser will not power on	-Drained battery -Defective power cable -Defective charger
Laser beam flashes	Laser is outside its self-leveling range. Adjust laser.
Laser beam is unstable	Temperature in pipe is not consistent. Laser beam defracts. Use blower to circulate the air.
Weak laser beam	Dirty exit window. Use mild soap and water or glass cleaner and soft cloth to clean window.
Remote control does not function	Drained battery. Replace.

SAFETY:



This pipe laser is a Class IIIa laser product in the USA and complies with all applicable portions of Title 21 of the Code of Federal Regulations, Department of Health and Human Services; Food and Drug Administration; Center for Devices; Bureau of Radiological Health.

Do not stare into the laser beam or view directly with optical instruments.

Do not disassemble the instrument or attempt to perform any internal servicing.



CAUTION - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.



This product contains a Laser Diode with a maximum radiant power output of less than 5.0 milliwatts that is accessible both in the interior of the product as well as externally.

Operation:

Use this product only with laser targets such as those supplied with the unit. Do not attempt to stare directly into the beam or eye damage may result. For detailed installation and operating instructions see the appropriate sections of this manual.

SAFETY:

Maintenance:

This product is designed to require no routine maintenance by the user. The ARROW 2™ is not to be disassembled by any one other than an authorized Apache dealer, service center, or by Apache Technologies, Inc. The unit is essentially non serviceable except by trained personnel. Operating the laser creates the potential for exposure to high voltage and hazardous radiation.

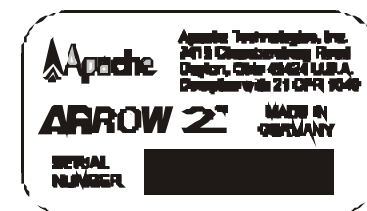
Periodically inspect the housing to verify that no parts are loose or distorted so as to allow access to laser light. Also verify the emission indicator lights up. If either condition exists, return the unit to an authorized dealer for repair.

Labels required for this product:

Danger logotype
(Placed on the top side of the laser)



Certification / Identification Label
(Placed on the underside of the laser)



Aperture Label
(Placed underneath beam output window)



Non-interlocking protective housing label
(placed on front lower laser housing)



WARRANTY:

Apache Technologies, Inc. ARROW 2™ pipe laser is warranted to be free of defects in material and workmanship for a period of two years. This warranty period is twenty-four months from the date the product is delivered from the dealer to the purchaser or is put into service by a dealer as a demonstration unit or rental unit.

A warranty registration card must be filled out properly and on file with Apache Technologies, Inc.

Any evidence of abuse, misuse, alteration, accident or negligent use, or an attempt to repair products by unauthorized personnel, or with use of parts other than those provided by Apache Technologies, Inc. automatically voids the warranty.

The user of the product is expected to follow all operating instructions, periodically checking the instrument and the work as it progresses. The user is responsible for the calibration of the instrument.

Apache Technologies, Inc. liability under this warranty is limited to repairing or replacing any product returned to an authorized service center for that purpose. The foregoing states the entire liability of Apache Technologies, Inc. regarding the purchase and use of its product and they shall not be held responsible for any consequential loss or damage of any kind.

This warranty is in lieu of all other warranties, expressed or implied, and constitutes all of Apache Technologies, Inc. liability with respect to merchandise sold by it.