



## NATIONAL 420 SERIES STEREO ZOOM MICROSCOPE

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*See illustrations on page 7.*

The convenience and versatility of viewing a large picture at 10x magnification, then zooming continuously all the way to close-up detail at 40x magnification. Upright, unreversed 3-dimensional image remains in focus throughout zoom range. Optional eyepieces and auxiliary objectives expand magnification range and working distances.

### OPTICAL SYSTEM

- Paired widefield 10x eyepieces are 45° inclined, with dual diopter adjustments, interpupillary adjustment from 55mm to 75mm. Accepts 23mm eyepiece reticle.
- Viewing head rotates 360°.
- Achromatic, color corrected lenses.
- Continuous magnification from 10x thru 40x. See specification chart for full magnification range available with use of optional auxiliary lenses

### FOCUSING

- Rack and pinion focusing with large dual focusing knobs with slip clutch to prevent damage to mechanism. Tension adjustment eliminates focus "drift".

### WARRANTY

- Lifetime limited warranty excluding bulb, cord, and fuse.

See additional specifications on individual models listed below.

### **National Model #420-430PHF-10**

Features top light with directional beam, bottom light with cool, long-life fluorescent illumination.

### ILLUMINATION

- Top light is 12v 15 watt halogen, bi-pin with directional beam and rheostat control.
- Bottom light is 110v 5 watt fluorescent for cool operation, greater light efficiency.
- Base mounted light controls permit choice of top only, bottom only, or dual illumination.
- Heavy-duty 3-wire grounded cord and plug.
- Available with 110v or 220v (220v is CE approved and supplied with European plug). To order 220v, add -220V to end of model number.

### STAGE

- Two 80mm stage plates (frosted glass and reversible black/white plastic contrast plates).
- Blue filter for transmitted light.
- Locked-on stage clips

### FRAME

- Professional, all-metal frame, gray enamel finish.
- Heavy-duty post mount with locking support collar, permits up or down adjustment of viewing head to accommodate different sized objects on stage.
- Height: 340mm (13-3/8 in.) extends to 433mm (17 in.) for larger objects.
- Base width: 171mm (6-3/4 in.), Base depth: 242mm (9-1/2 in.)
- Net wt. 5.3 kgs (11.7 lbs)

### PACKING

- Molded styrofoam container with rubber eyeshields, vinyl dustcover and instruction manual.
- Individual: Ship wt. 7.7 kgs (17 lbs), Dimensions 550x375x375mm (22x15x15 in.)
- Master carton pack 2 each: Ship wt. 14.4 kgs (32 lbs), Dimensions 475x375x475mm (19x15x19 in.)

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**National Model #420-420AHF-10**

Features top light with directional beam, bottom light with cool, long-life fluorescent illumination.

ILLUMINATION

- Top light is 12v 15 watt halogen, bi-pin with directional beam and rheostat control.
- Bottom light is 110v 5 watt fluorescent for cool operation, greater light efficiency.
- Base mounted light controls permit choice of top only, bottom only, or dual illumination.
- Heavy-duty 3-wire grounded cord and plug.
- Available with 110v or 220v (220v is CE approved and supplied with European plug). To order 220v, add -220V to end of model number.

STAGE

- Two 80mm stage plates (frosted glass and reversible black/white plastic contrast plates).
- Blue filter for transmitted light.
- Locked-on stage clips

FRAME

- Professional, all-metal frame, gray enamel finish.
- Heavy-duty fixed arm stand. Note: #705-420 0.5x auxiliary objective is not operational on this particular frame.
- Height: 340mm (13-3/8 in.).
- Base width: 171mm (6-3/4 in.), Base depth: 242mm (9-1/2 in.)
- Net wt. 5.3 kgs (11.7 lbs)

PACKING

- Molded styrofoam container with rubber eyeshields, vinyl dustcover and instruction manual.
- Individual: Ship wt. 7.7 kgs (17 lbs), Dimensions 550x375x375mm (22x15x15 in.)
- Master carton pack 2 each: Ship wt. 14.4 kgs (32 lbs), Dimensions 475x375x475mm (19x15x19 in.)

**National Model #420-421AHH-10**

Features top light with directional beam, bottom halogen illumination.

ILLUMINATION

- Top light is 12v 15 watt halogen, bi-pin with directional beam and rheostat control.
- Bottom light is 12v 10 watt halogen, bi pin.
- Base mounted light controls permit choice of top only, bottom only, or dual illumination.
- Heavy-duty 3-wire grounded cord and plug.
- Available with 110v or 220v (220v is CE approved and supplied with European plug). To order 220v, add -220V to end of model number.

STAGE

- Two 80mm stage plates (frosted glass and reversible black/white plastic contrast plates).
- Blue filter for transmitted light.
- Locked-on stage clips

#### FRAME

- Professional, all-metal frame, gray enamel finish.
- Heavy-duty fixed arm stand. Note: #705-420 0.5x auxiliary objective is not operational on this particular frame.
- Height: 340mm (13-3/8 in.).
- Base width: 171mm (6-3/4 in.), Base depth: 242mm (9-1/2 in.)
- Net wt. 5.3 kgs (11.7 lbs)

#### PACKING

- Molded styrofoam container with rubber eyeshields, vinyl dustcover and instruction manual.
- Individual: Ship wt. 7.7 kgs (17 lbs), Dimensions 550x375x375mm (22x15x15 in.)
- Master carton pack 2 each: Ship wt. 14.4 kgs (32 lbs), Dimensions 475x375x475mm (19x15x19 in.)

#### **National Model #420-1105-10**

Universal stand features heavy construction and counterbalanced arm for maximum stability. With an adjustable mounting post, it provides extreme flexibility in positioning.

#### ILLUMINATION

- No built-in illumination is included with this model.

#### STAND

- Professional, all-metal stand.
- Heavy-duty post mount with locking support collar, permits up or down adjustment of viewing head to accommodate different sized objects.
- Total stand height: 386mm (15.4 in.). Net weight: 18.1 kgs (40 lbs).
- Base diameter: 200mm (8 in.). Base height: 55mm (2.2 in.)
- Vertical post length: 331mm (13.2 in.). (O.D. 25mm)

#### OTHER DIMENSIONS & SPECIFICATIONS

- Distance between main vertical post and center of field of view, when horizontal bar is adjusted to minimum or maximum extension: Minimum = 255mm, Maximum = 455mm
- Distance from bottom edge of objective lens and work surface when horizontal bar is adjusted to minimum or maximum height:
  - With pivot arm up: Minimum = 170mm (6.8 in.), Maximum = 515mm (20.6 in.)
  - With pivot arm down: Minimum = 58mm (2.3 in.), Maximum = 260mm (10.4 in.)

#### PACKING

- Head, focusing block and universal stand are in separate molded styrofoam containers with vinyl dustcover, eyeshields and instruction manual.
- Master carton pack 1 each:
  - Head & focusing block: Ship wt. 4.1 kgs (9 lbs), Dimensions 400x425x275mm (16x17x11 in.)
  - Universal boom stand: Ship wt. 19.1 kgs (42 lbs), Dimensions 500x325x300mm(20x13x12 in.)

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***National Model #420-1107-10***

Platform stand has a large work space and provides greater stability, which are important particularly for photographic or video applications.

ILLUMINATION

- No built-in illumination is included with this model.

STAND

- Professional, all-metal stand.
- 82mm reversible black/white contrast plate.
- Heavy-duty post mount with locking support collar, permits up or down adjustment of viewing head to accommodate different sized objects.
- Total stand height: 246mm (9.8 in.). Net weight: 2.8 kgs (6.1 lbs).
- Base width: 220mm (8.7 in.). Base depth: 280mm (11 in.)
- Vertical post length: 220mm (8.8 in.). (O.D. 25mm)

PACKING

- Head, focusing block and platform stand are in separate molded styrofoam containers with vinyl dustcover, eyeshields and instruction manual.
- Master carton pack 1 each: Ship wt. 7.7 kgs (17 lbs), Dimensions 550x375x375mm (22x15x15 in.)

**420 SERIES OPTICAL SPECIFICATIONS**

Eyepieces	Zoom Objective Position	Standard Objective 1X (supplied)		Auxiliary Objective 0.5X (Optional)		Auxiliary Objective 0.75X (Optional)		Auxiliary Objective 1.5X (Optional)	
		Working Distance – 79mm		Working Distance - 137mm		Working Distance - 90mm		Working Distance - 34mm	
		Total Magnification	Field Size	Total Magnification	Field Size	Total Magnification	Field Size	Total Magnification	Field Size
WF5X Field No.22 (Optional) (No Reticle Holder) Interpupillary Distance 59-83	1X	5X	22mm	2.5X	44mm	3.75X	29.3mm	7.5X	14.7mm
	2X	10X	11mm	5X	22mm	7.5X	14.6mm	15X	7.3mm
	3X	15X	7.3mm	7.5X	14.7mm	11.25X	9.8mm	22.5X	4.9mm
	4x	20X	5.5mm	10X	11mm	15X	7.3mm	30X	3.7mm
WF10X Field No. 20 (Supplied) Accepts Reticle 23mm O.D. Interpupillary Distance 54-78	1X	10X	20mm	5X	40mm	7.5X	26.7mm	15X	13.3mm
	2X	20X	10mm	10X	20mm	15X	13.3mm	30X	6.7mm
	3X	30X	6.7mm	15X	13.3mm	22.5X	8.9mm	45X	4.4mm
	4x	40X	5mm	20X	10mm	30X	6.7mm	60X	3.3mm
WF15X Field No. 13 (optional) (No Reticle Holder) Interpupillary Distance 50.5-74.5	1X	15X	13mm	7.5X	26mm	11.25X	17.3mm	22.5X	8.7mm
	2X	30X	6.5mm	15X	13mm	22.5X	8.7mm	45X	4.3mm
	3X	45X	4.3mm	22.5X	8.7mm	33.75X	5.8mm	67.5X	2.9mm
	4x	60X	3.25mm	30X	6.5mm	45X	4.3mm	90X	2.2mm
WF20X Field No. 10 (optional) (No Reticle Holder) Interpupillary Distance 52-76	1X	20X	10mm	10X	20mm	15X	13.3mm	30X	6.7mm
	2X	40X	5mm	20X	10mm	30X	6.7mm	60X	3.3mm
	3X	60X	3.3mm	30X	6.7mm	45X	4.4mm	90X	2.2mm
	4x	80X	2.5mm	40X	5mm	60X	3.3mm	120X	1.7mm
Model	Specimen Height		Specimen Height		Specimen Height		Specimen Height		
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	
420-430PHF and 420T-430PHF	0.0mm	93mm	0.0mm	19mm	0.0mm	66mm	0.0mm	120mm	
420-421AHH and 420T-421AHH	0.0mm	45mm	Inoperative	Inoperative	0.0mm	18mm	27mm	72mm	
420-420AHF and 420T-420AHF	0.0mm	45mm	Inoperative	Inoperative	0.0mm	18mm	27mm	72mm	
420-1105 and 420T-1105	0.0mm	437mm	0.0mm	363mm	0.0mm	410mm	00mm	464mm	
420-1107 and 420T-1107	0.0mm	97mm	0.0mm	* 23mm	0.0mm	70mm	0.0mm	124mm	

\*When using optional 0.5x objective lens on 420-1107 and 420T-1107, maximum specimen height can be increase to 133mm by using optional M-1110 auxiliary post (350mm tall).

**PARTS & ACCESSORIES**

498-420-10	Stereo body only, 10x-40x, w/WF10x eyepieces, no focusing block
499-000	Focusing block (fits 25mm mounting post)
499-420AHF	Stand w/focusing block, fixed arm, dual illum., top #800-422 12v 15 watt halogen, bi-pin, bottom #800-138 5 watt fluorescent
499-421AHH	Stand w/focusing block, fixed arm, dual illum., top #800-422 12v 15 watt halogen, bi-pin, bottom #800-170 12v 10 watt halogen
499-430PHF	Stand w/focusing block, post mount, dual illum., top #800-422 12v 15 watt halogen, bi-pin, bottom #800-138 5 watt fluorescent
499-1105	Universal boom stand, without focusing block, no illumination
499-1107	Platform stand, without focusing block, 240mm x 280mm, no illumination
600-400	Eyepiece shields, rubber, pair
605-400	WF5x/23 eyepieces, paired (note: permit only 60mm-84mm I.P.D.)
610-400	WF10x/20 eyepieces, paired
615-400	WF15x/13 eyepieces, paired
620-400	WF20x/10.4 eyepieces, paired
705-420	0.5x auxiliary objective lens; reduce magnification by 50%, increases working distance from 80mm to 135mm, doubles field diameter.
715-420	1.5x auxiliary objective lens; increases magnification by 50%, reduces working distance from 80mm to 39mm, reduces field diameter by 35%.
775-420	0.75x auxiliary objective lens; reduces magnification by 25%, increase working distance from 80mm to 95mm, increases field diameter by 25%.
800-138	Replacement bulb (bottom), 110v 5 watt fluorescent
800-170	Replacement bulb (bottom), 12v 10 watt halogen, bi-pin
800-422	Replacement bulb (top), 12v 15 watt halogen, bi-pin
801-050	Replacement fuse for 220v version, 0.5 amp
801-100	Replacement fuse for 110v version, 1.0 amp
923-409	Blue filter, frosted, 35.6mm O.D.
931-420	Ring light adapter, 54.5mm O.D., 18mm extension
940-410	Frosted glass stage plate, 80mm
941-410	Black/white reversible plastic stage plate, 80mm
942	Darkfield kit
943	Specimen holder (tweezer) (fits in place of stage clip on all stereo models)
952	Vinyl dustcover, 18" tall x16"
965-400-05	Eyepiece reticle, 5mm/100 div., 23mm O.D.
965-400-10	Eyepiece reticle, 10mm/100 div., 23mm O.D.
970-400	Stage clip for stereo microscope, 75mm from post, each
975-001	Carrying case, anodized aluminum, fabric lining, accessory pockets, Velcro straps, keyed lock. Fits all 420 series except 420-1105 & 420-1107. No case available for these models.

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Model 420-430PHF-10



Model 420-420AHF-10  
Model 420-421AHH-10



Model 420-1105-10



Model 420-1107-10