# NIKONOS ISAF

Underwater Single-Lens Reflex Photographic System







# INTRODUCING THE NIKONOS RS CAMERA BODY

A single-lens reflex (SLR) designed exclusively for underwater use. Stylish and packed with high-tech features.

#### **VERSATILE FOCUSING SYSTEM**

Advanced focusing options

- Single-Servo Autofocus (S) with Focus Lock capability
- Continuous-Servo Autofocus (C)
- Power Manual Focus (P)
- Freeze Focus (F)
- Focus Tracking (in S or C)

#### **ERGONOMIC GRIP**

Assures secure handling of basic camera controls

- Shutter release/Meter switch
- Power Manual Focus

#### **AUTOMATIC FILM HANDLING**

- Built-in motor drive automatically advances film
- Power film rewind
- Automatic film loading



- Automatic ISO film speed setting
- Illuminated LED frame counter



#### INTERCHANGEABLE LENSES

Choice of three autofocus R-UW Nikkor lenses designed especially for use with the Nikonos RS

- R-UW AF Nikkor 28mm f/2.8
- R-UW AF Zoom-Nikkor 20-35mm f/2.8
- R-UW AF Micro-Nikkor 50mm f/2.8

#### **TERMINALS**

- Flash synchronization with speedlights
- Remote control operation



Power Focus Lever

Shutter Release Button

### EXPOSURE/METERING

- Aperture-Priority Auto (A) exposure control
- Aperture control from f/2.8 ~ f/22
- Quick setting of lens aperture by simple dial operation
- Intermediate aperture settings possible
- Manual shutter speed control: 1 full second to 1/2000 sec.
- Bulb (B) for long time exposure
- Matrix Metering
- 75/25 Center-Weighted Metering



#### **HIGH-EYEPOINT ACTION FINDER**

- Action-type with large view; nine-degree offset angle
- 60mm high-eyepoint relief for comfortable viewing
- BriteView finder screen for sharp, clear images
- Comprehensive information on LCD

#### **CAMERA BACK**

• Battery chamber



Rewind switch



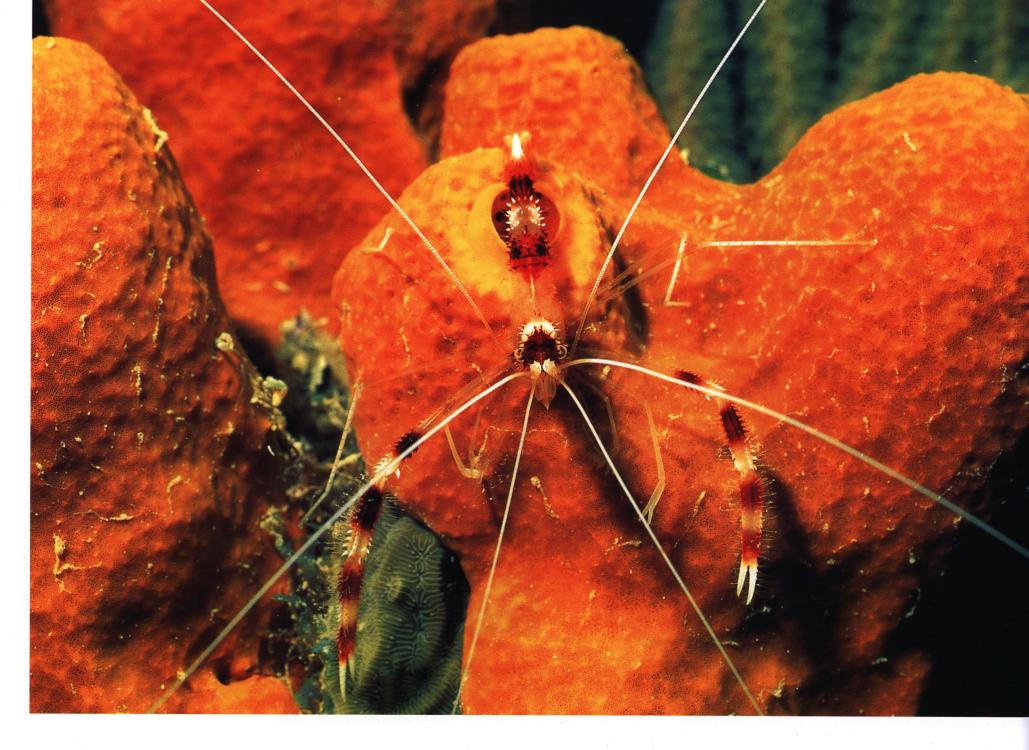
• Rear-curtain flash sync switch



- Inner camera door
- Film confirmation window

#### **EXPOSURE COMPENSATION/ISO FILM SPEED CONTROL**

- Fine-tuning exposure in 1/3 steps up to plus or minus 2 EV
- Automatic ISO film speed setting for DX coded films
- Manual ISO film speed setting 6~6400





R-UW AF Micro-Nikkor 50mm f/2.8 Center-Weighted TTL Flash ISO 50

#### Comprehensive viewfinder LCD screen

- Focus indication shows status: in focus, Focus Tracking, or out of focus
- 2 Exposure mode selected: A for Aperture-Priority auto exposure and M for Manual exposure
- 3 DX-coded film speed set
- 4 Shutter speed in use
- Manually selected ISO film speed
- Aperture selected on dial/Exposure compensation value
- Deviation from correct exposure value
- 8 Exposure compensation mark
- 9 Flash ready-light



#### REFLEX VIEWING MAKES THE IMAGE COME ALIVE

The Nikonos RS, a true SLR, has a high-eyepoint action finder for comfortable and clear viewing. One look and you'll see the difference.

To capture that banded coral shrimp darting in front of your lens, you need real concentration. But at least you don't have to imagine what the final picture will look like, which can be very distracting.

With the Nikonos RS, you know exactly where your target subject is located in the frame, even in close-up photography. You will compose precisely. You will see whether your subject is in focus or out of focus. And you never have to take your eye away from the viewfinder.

The image is big and bright, thanks to the oversized action finder and the BriteView finder screen that make the subject jump from the background. Viewing is comfortable because of the 60mm high-eyepoint relief and ninedegree offset angle, which allow you to hold the camera away from your mask.

You can even confirm picturetaking status in the viewfinder. All the information you need appears in **bright LCD readouts** that are illuminated for easy use in low light. So you can make all your decisions quickly, before your subject gets away.

#### Single-lens reflex system

Through the viewfinder, you see the image focused on the BriteView finder screen, which is precisely located on the film plane.







## INTRODUCING THE NIKONOS SPEEDLIGHT SB-104

The Nikonos RS comes with a brilliant partner to help you restore original colors. **Everything comes back alive!** 

#### VERSATILE FLASH CONTROLS

- Matrix Balanced Fill-Flash
- Center-Weighted TTL flash
- Manual flash output control: full power, 1/4, 1/16
- Rear-Curtain flash sync

#### **POWERFUL FLASH**

- Guide number of 16, in meters (53, in feet), underwater
- Wide 100° flash coverage
- Fast recycling time of only 3 seconds



#### SHIELDED FLASH UNIT

- Battery chamber holds removable, rechargeable NiCd battery pack
- Protects speedlight's main electrical chamber

#### **AUXILIARY FLASH FUNCTIONS**

- Normal flash sync
- Slave flash function for camera slave
- Flash slave in multi-flash operation
- Signal flash mode functions as signal light



Synchro Socket

**SELF-DIAGNOSIS SIGNALS** 

**Power Switch** 

- Flash ready-light
- Heat signal
- Moisture signal
- Flash performance signal

- · Open flash for test firing

#### **BRACKET SYSTEM SK-104**

 One-touch detachable arm for speedy handling

• Extension Arm SK-104E also available as optional accessory

#### **DOUBLE BRACKET SK-104W FOR MULTIPLE FLASH**

• Double bracket for use of two speedlights for more creative lighting (optional accessory)

• Double flash bracket and double TTL sync cord available (optional accessory)

#### **SB-104 Specifications**

Electronic construction: Automatic Insulated Gate Bipolar Transistor (IGBT) and series circuitry

Guide number at ISO 100: 32, in meters (105, in feet) above water;

16, in meters (53, in feet) underwater

Angle of coverage: 100° No. of flashes: Approx. 120 Recycling time: Approx. 3 sec.

Color temperature: Approx. 4,700K

Power source: Removable NiCd Battery Pack SN-104 Dimensions (dia. x length): 124 x 222mm (4.9 x 8.7 in.)

Weight (with batteries): 2,500g (88.2 oz.) above water;

-100g (-3.5 oz.) underwater

Supplied with SK-104 mounting bracket set, UW sync cord, spare O-ring set





- Rechargeable NiCd Battery Pack SN-104\* (required accessory)
- 120 flashes per charge
- Quick Charger SH-104\* (2 hrs.) (required accessory)
- \*These items must be purchased separatery.

#### **EXPOSURE CALCULATOR**

Calculation plates according to various ISO ratings inserted at unit's back

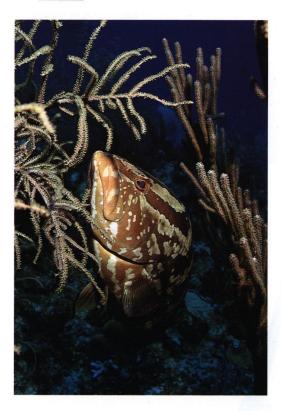




R-UW AF Nikkor 28mm f/2.8 Center-Weighted TTL Flash ISO 50















R-UW AF Nikkor 28mm f/2.8 Center-Weighted TTL Flash ISO 50



R-UW AF Nikkor 28mm f/2.8 1/60 sec. at f/8, Single-Servo Autofocus Center-Weighted TTL Flash ISO 50

# INTERCHANGEABLE AUTOFOCUS LENSES

#### Creative tools for personal expression

A close-focusing standard lens, the world's first underwater zoom lens and a Micro Nikkor for shooting lifesize. Each made of Nikon optical glass and corrected for superb underwater performance. And utilizing the new double bayonet lens mount that's both airtight and watertight.

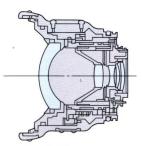




## R-UW AF Nikkor 28mm f/2.8

#### A great standard

Begin with moderately wide shots, come in for tight photos of your fellow diver, then get even closer for dramatic close-ups of fish with up to a 1:6 reproduction ratio. A compact and light choice.



#### **Specifications**

Aperture range: f/2.8 ~ f/22 Picture angle: 59.8°

Lens construction: 6 elements in 6 groups

Close focusing range: Infinity to 0.26m (0.85 ft.)

(max. reproduction ratio: 1:6)
Attachment size: 88mm (P=1mm)

Dimensions (dia. x length): 99 x 85mm (3.9 x 3.3 in.)

Weight: 550g (19.4 oz.)





R-UW AF Zoom-Nikkor 20-35mm f/2.8 (35mm) Center-Weighted TTL Flash ISO 50







R-UW AF Zoom-Nikkor 20-35mm f/2.8 (28mm) 1/60 sec. at f/5.6, Single-Servo Autofocus Center-Weighted TTL Flash ISO 50



R-UW AF Zoom-Nikkor 20-35mm f/2.8 (20mm) 1/60 sec. at f/5.6, Single-Servo Autofocus Center-Weighted TTL Flash ISO 50



## R-UW AF Zoom-Nikkor 20-35mm f/2.8

#### The world's first underwater zoom

Shoot a vista at 20mm, zoom in to 24mm, continue to 28mm and finish at 35mm. Or choose any intermediate focal length for many other creative compositions without moving. Of course, you can also shoot the same subject from various perspectives.

The 20-35mm f/2.8 is the world's first underwater zoom. Since you can't change lenses underwater, it's the ideal choice—you stay put, and simply zoom in or out. Perfect for shy subjects. No worrying about silt. Plus you can do in-camera cropping.

#### Specifications

Aperture range: f/2.8 ~ f/22 Picture angle: 79° ~ 51°

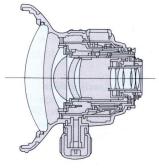
Lens construction: 10 elements in 10 groups Close focusing range: Infinity to 0.38m (1.2 ft.)

(max. reproduction ratio: 1:10) Attachment size: 148mm (P=1mm)

Dimensions (dia. x length):  $162 \times 129$ mm (6.4×5.1 in.)

Weight: 1,750g (61.7 oz.)







R-UW AF Zoom-Nikkor 20-35mm f/2.8 (20mm) Center-Weighted TTL Flash ISO 50





R-UW AF Zoom-Nikkor 20-35mm f/2.8 (35mm) 1/60 sec. at f/5.6, Single-Servo Autofocus Center-Weighted TTL Flash ISO 50



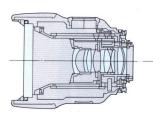




## R-UW AF Micro-Nikkor 50mm f/2.8

#### Lifesize creativity

As you carefully move in close to your subject, you keep on triggering the shutter without readjusting or measuring the distance. You focus continuously through the entire macro range up to 1:1. The all-new 50mm f/2.8 Micro is the workhorse lens in your toolbox. Perfect for classic close-up fish portraits, macro photography and general photography.



#### **Specifications**

Aperture range: f/2.8~f/22

Picture angle: 35°

Lens construction: 10 elements in 9 groups

Close focusing range: Infinity to 0.167m (0.55 ft.) (max.

reproduction ratio: 1:1)

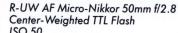
Attachment size: 88mm (P=1mm)

Dimensions (dia.  $\times$  length):  $103 \times 126$ mm ( $4.0 \times 5.0$  in.)

Weight: 1,100g (38.8 oz.)



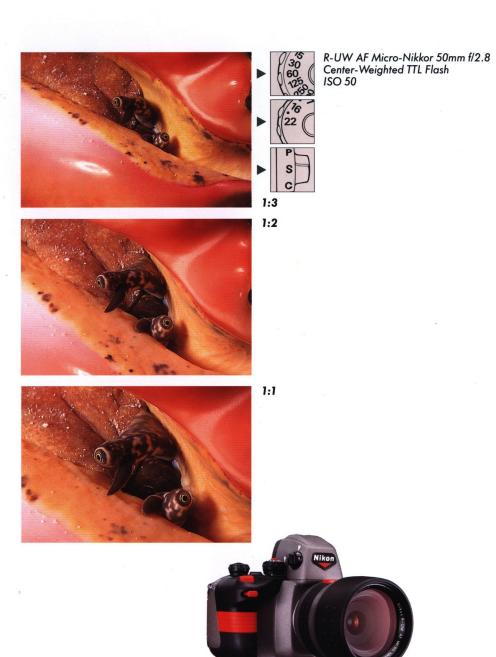














► 30 60 125 150 160

R-UW AF Micro-Nikkor 50mm f/2.8 Center-Weighted TTL Flash ISO 50





R-UW AF Nikkor 28mm f/2.8 Center-Weighted TTL Flash ISO 50







#### Speed and sharpness beyond imagination



You've made your approach cautiously. The squirrel fish casually swims

into view from behind the safety of the coral. Single-Servo Autofocus assures the shutter is released the instant the fish is in focus.

And you've also discovered that you can compose

> your pictures with the subject off-center by using the RS's

Autofocus Lock.

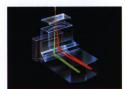
Above, in the water column, a diver approaches rapidly. You quickly switch to Continuous-Servo Autofocus, and **Focus Tracking** takes over automatically. It predicts the position of the moving subject at the precise

moment you trigger the shutter. Compare that to trying to refocus yourself.

But now you spot a brave little damselfish fiercely protecting its home. You use Freeze Focus. The camera "waits" for the fish to swim into focus. The instant it does, the shutter is released.

You continue capturing a variety of images that have eluded you before, thanks to the Nikonos RS's fast, accurate Autofocus system. Its powerful motor drives the lens into focus. The system is so sensitive it captures images in light so dim you can't even focus with your eye—in light as low as EV minus 1.

But when you do want to do the focusing, there's **Power Manual Focus** control which works with an accurate **Electronic** Rangefinder.

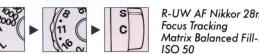


Advanced AM200 Assures fast, accurate autofocus in light as dim as EV minus 1. Responsive motor powers lens into focus.





R-UW AF Nikkor 28mm f/2.8 Matrix Balanced Fill-Flash



# EXPOSURE CONTROL

#### Two light meters for unmatched accuracy

Twenty-five meters (seventy-five feet) down, you look up and consider shooting the sculpted coral wall. Your experienced eye warns you that this is not going to be a simple exposure. Light values are high near the surface, but change quickly as it gets deeper. So, on which part of this column of brightness will you base your exposure?



like this, evaluating the scene's overall brightness with its computer. A matrix of varying combinations of brightness and contrast instantly determines and applies the optimum computation method—low brightness weighted, high brightness weighted, averaging or center segment.





Fill-Flash.

Matrix
Metering makes
short work of
quick-changing
and complex
lighting. Working with Aperture-Priority
auto exposure,

it enables you to control depth of field as it analyzes the scene and automatically sets the matching shutter speed for correct exposure. Matrix Metering is so sophisticated it can also give the background **Automatic Balanced** 

But now you chance upon a bright orange frogfish resting on a dark green coral, and you don't want to consider the exposure value of anything other than the fish. You switch the Nikonos RS to a manual shutter speed,

automatically activating

Center-Weighted Metering that concentrates 75% of its sensitivity in the 12mm center circle of the viewfinder. You now have Center-Weighted TTL control

over the exposure.

**Manual Exposure** 

allows creative control over shutter speeds and apertures. You use higher shutter speeds to capture fast-moving subjects, and you control apertures to determine depth of field. It works with the Center-Weighted Meter to measure the scene's exposure value.

Have you ever wanted to photograph late in the afternoon or in dark caverns, but were frustrated by the limitations of low available light? Now you can set the shutter speed as low as 1 second for slow sync photos that will capture the soft effects of these low-light scenes.

There is even a "B" setting for long time exposures.



If that isn't enough, you can use the **Exposure Compensa-**

**tion** control to brighten or darken the scene by +/-2 EV in 1/3 step increments.







Normal Exposure
R-UW AF Nikkor 28mm
Auto at fl5.6, Continuous-Servo Autofocus
Matrix Balanced Fill-Flash
ISO 50









R-UW AF Zoom-Nikkor 20-35mm f/2.8 (20mm) Matrix Balanced Fill-Flash ISO 50



R-UW AF Zoom-Nikkor 20-35mm f/2.8 (28mm) Center-Weighted TTL Flash ISO 50











R-UW AF Nikkor 28mm f/2.8 Matrix Balanced Fill-Flash ISO 50



# FLASH PHOTOGRAPHY

#### Create a rainbow underwater

You have entered a world of pastel colors no artist's palette can contain. But the water's intense turquoise and cobalt blue prevent the sun's rays from penetrating and revealing these pastels on film. First to disappear are the reds, closely followed by the oranges and the yellows. But now you can restore these colors in your pictures.

The new Nikonos SB-104 Speedlight brings your underwater world to light. This is a powerful unit with a Guide Number of 16, in meters (53, in feet), at ISO 100 underwater. The color temperature of 4,700K assures warm, natural-looking colors. Coverage is a wide 100-degree angle. And the fast three-second recycle time will make you incredibly prolific.

Light constantly changes underwater; to take good pictures, you must be able to work with it. You already know how complex this can be because no two situations are ever the same. The SB-104 works together with the Nikonos RS to provide you with such advanced capabilities as Matrix Balanced Fill-Flash, Center-Weighted TTL Flash, Manual Flash Output Control, Rear-Curtain Sync and Wireless Slave, New techniques that will bring to life, on film, a world of astounding colors.

Matrix Balanced Fill-

Flash, which works from 1/30 to 1/125 sec., automatically blends the artificial light for the foreground subject with the natural ambient light of the background. So you get a balanced exposure—the subject's brilliant colors stand out, but you don't lose the beauty of its environment.

To control the exposure of center-dominant subjects, you can use **Center-Weighted TTL Flash**, which controls flash output automatically. For even more control, use **Manual Flash Output**. You decide how much actual light you want on your subject while controlling shutter speed and depth of field.

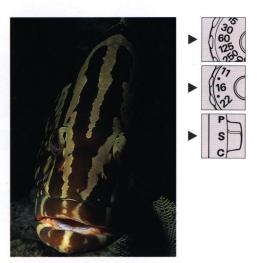
Have you ever imagined capturina a subject's movement in a photograph—for instance, a fish or a fellow diver swimming with a streak behind, indicating motion? Now you can create such special effects with the Nikonos SB-104's Rear-Curtain Sync capability that works in combination with slow shutter speeds—down to one full second in the case of Center-Weighted TTL Flash. The flash fires just before the shutter curtains close to create an unusual effect.

Also, you can creatively control a subject's highlights and shadows by using more than one flash output with a second TTL speedlight or with the SB-104's Wireless Slave.





R-UW AF Nikkor 28mm f/2.8 Rear-Curtain Sync. ISO 50



R-UW AF Micro-Nikkor 50mm f/2.8 Center-Weighted TTL Flash ISO 50



## ADD VERSATILITY WITH UNDERWATER ACCESSORIES

The Nikonos RS is not just a camera; it's a complete photographic system. A variety of Nikon accessories adds more fun and versatility to your underwater picture-taking.

SB-103

#### **SPEEDLIGHT SB-103**

With a guide number of 10, in meters (33, feet), underwater, the SB-103 offers TTL auto and manual flash output control, as well as TTL multi-flash capability.

### UNDERWATER SYNC CORDS SC-101/SC-102/SC-103

Special Sync Cords that attach the camera to Nikon Speedlights let you change equipment underwater. The model SC-103 connects to the camera, while the SC-101 (for single flash sync) and the SC-102 (for double sync) connect to the Speedlight(s).

#### **REMOTE CORD MC-100**

EYEPIECE COVER DK-100
Prevents external light from entering the camera through the viewfinder during remote

photography.



Enables remote photography from three

meters away via push-button operation.



#### O-RINGS AND LUBRICANT

Special Nikon lubricant and replacement O-rings are available for required maintenance.



#### **CARRYING CASE CT-N1**

Easy carrying protection for the Nikonos RS, three R-UW AF Nikkor lenses and the SB-104 standard set.



#### THE ENGINEERING CHALLENGE

In the last 30 years, Nikon has accumulated much experience in designing underwater cameras. But the Nikonos RS project presented a new challenge: how to use this know-how in developing a new camera system that would herald a new era in underwater imaging.

First, the camera's viewing system had to be bright and easy to use in the often dark, turbid environment underwater. The new lenses should offer different views of this world, and with the same superb optical quality associated with Nikkor lenses. There should be a zoom lens to give the underwater photographer creative freedom in composition such as has never been known before. Plus a choice of autofocus capability and fast, accurate manual focusing.

As for metering, there was a need for an exposure system that combined the best in automation with the finest in creative control. Of course, the system should also include a flash system that matched the camera's power and performance, offering such features as slow front- and rear-curtain synchronization, as well as multiple flash operation.

The final challenge was to integrate all this capability, and more, in a compact, ergonomically designed configuration that makes for fast, responsive operation. Nikon engineered the equipment to cope with harsh environments and underwater depths to 100 meters (328 feet).

Thus was born the Nikonos RS Single-Lens Reflex Underwater Photographic System. Your new tool for creative underwater imaging.

#### **SPECIFICATIONS**

**Type of camera:** Integral-motor autofocus 35mm single-lens reflex underwater camera

**Construction:** Body made of die-cast copper silumin oxidized aluminum alloy; all joints sealed by O-ring gaskets to ensure absolute watertightness; camera able to withstand pressures to a depth of 100m (328 ft.)

Picture format: 24mm x 36mm (standard 35mm film format)

Lens mount: Nikonos R-UW mount

**Lens:** Dedicated R-UW AF Nikkor lenses having CPU contacts **Viewfinder:** Fixed eyelevel pentaprism high-eyepoint type; offset angle 9°; 0.39X magnification with 28mm lens at infinity; 92% frame coverage; diopter – 0.7; 60mm eyepoint relief **Focusing screen:** Fixed Nikon advanced B-type BriteView screen with central focus brackets for autofocus operation

**Viewfinder information:** The following LCD indications appear: focus indicators, exposure mode, shutter speed, aperture, film speed, DX mark, ISO mark, electronic analog display, exposure compensation mark, over- or underexposure alert, ready-light; illuminated while meter is ON

**Film speed range:** ISO 25 to 5000 for DX-coded film; ISO 6 to 6400 for manual setting

**Film speed setting:** At DX position, automatically set to ISO speed of DX-coded film used; with non-DX-coded film, ISO speed is set manually

Film loading: Film automatically advances to first frame when shutter release button is depressed once

Film advance: Film automatically advances one frame when shutter is released

Frame counter: Additive type; counts back while film is rewinding; illuminated by LED

**Film rewind:** Automatic when film rewind lever is turned; approx. 26 sec. per 36-exposure roll; stops automatically when film is rewound

**Focus modes:** Single-Servo or Continuous-Servo autofocus, Power Focus and Freeze Focus

**Autofocus detection system:** TTL phase detection system using Nikon advanced AM200 autofocus module

**Autofocus detection range:** Approx. EV minus 1 to EV 19 (ISO 100)

**Autofocus lock:** By lightly pressing shutter release button in Single-Servo autofocus

**Focus tracking:** Automatically activated in Single-Servo and Continuous-Servo autofocus

Electronic rangefinder: Available in Power Focus mode
Exposure metering: Matrix and Center-Weighted Metering
built-in

**Exposure meter:** Activated by lightly pressing shutter release button; stays on for approx. 16 sec. after finger is lifted off button

Metering range: EV 3 to EV 20 (ISO 100)

**Exposure modes:** Aperture-priority auto (A) and manual (M) **Aperture-priority auto exposure control:** Shutter speed automatically set to match manually selected aperture

**Manual exposure control:** Both aperture and shutter speed are set manually

**Exposure compensation;** Possible using exposure compensation dial within +/-2 EV range in 1/3 EV steps **Shutter:** Electromagnetically controlled vertical-travel focal-plane shutter

Shutter speeds: Lithium niobate oscillator-controlled speeds from 1/2000 to 1 sec.; electromagnetically controlled long exposure at B setting

Reflex mirror: Automatic, instant-return type

Camera back: Hinged type; opened and locked via camera back lock/release latch; inner camera door is also provided Flash synchronization: 1/30 to 1/125 sec. in A mode, down

to one sec. shutter is available in rear-curtain sync; in M mode, shutter fires at speed set, and when set from 1/250 sec. or higher, shutter is automatically set to 1/125 sec.

Flash sync control: Front-curtain sync and rear-curtain sync provided; selected via switch inside body

Flash ready-light: Viewfinder LED lights up when dedicated Nikon Speedlight is ready to fire; blinks to warn of insufficient light for correct exposure

Power source: One 6V lithium battery pack (CR-P2) Tripod socket: Located at base plate of camera body; standard 1/4 in. (JIS)

Terminals: Accessory shoe, flash sync socket, remote socket Dimensions (W $\times$ H $\times$ D): 196 $\times$ 151  $\times$ 85mm (7.7 $\times$ 5.9 $\times$ 3.3 in.) Weight (body only): 2,060g (72.7 oz.), 920g (32.4 oz.) underwater

underwaler

Specifications and designs are subject to change without notice.

#### Important!

To prevent water from entering camera body, be sure to wipe all traces of water from camera before opening or closing camera back. Make certain O-ring is thoroughly covered with recommended lubricant. (Do not use silicon grease as it may cause damage and water leakage.) When removing lenses or cords, hold the camera with lens pointing downward. Before re-installing, remove all traces of water from lens mount or cord receptacle.

This product is a strategic product subject to COCOM regulations. It should not be exported without authorization from the appropriate governmental authorities.

NIKON CORPORATION





Entry forms and rules are available from your local Nikon distributor.







Nikon Inc., 1300 Walt Whitman Road, Melville, N.Y. 11747-3064, U.S.A.

#### Awards won by the Nikonos RS **Best of the Category**

Consumer products category, 38th Annual Design Review I.D. Magazine (U.S.)



#### **Grand Award**

Photography category, Best of What's New '92 Poplular Science (U.S.)



#### **The Best New Products**

The Best of 1992 Business Week (U.S.)



#### **Special Prize**

Camera Grand Prix '93 Camera Press Club (Japan)



