FURUNO

CONTROL UNIT FSV-8401

3.6 kg 7.9 lb

490 19.3"
450 17.7"
2-Ø6.5
149 5.9"
55
166 6.5" 2.2"
8
0.3"
502 19.8"
10°

TRANSCEIVER UNIT FSV-841A

95 kg 209.4 lb

405 15.9"
260 10.2"
68 2.7"
50 2.0"
4-Ø14
590 23.2"
630 24.8"
10
0.4"
545 21.5"
762 30"
806 31.7"
114
4.5"
(70 2.8")
(150 5.9")
640 25.2"
110 4.3"
90 3.5"
(400 15.7")
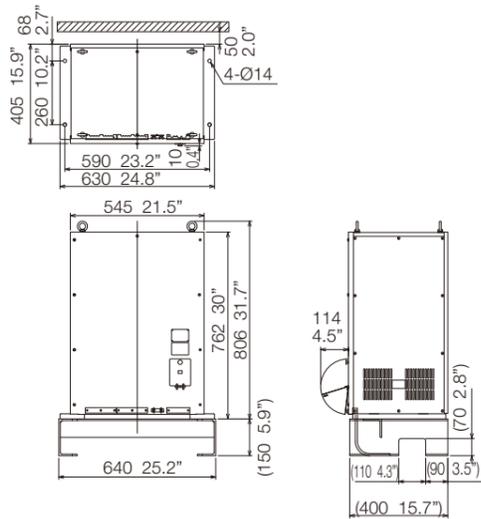
PROCESSOR UNIT FSV-8402

29 kg 63.9 lb

504 19.8"
5.5 0.2"
477 18.8"
160 6.3"
256 10.1""
34 1.3"
200 7.9"
195 7.7"
466 18.3"

HULL UNIT FSV-8432/8442

800 mm: 350 kg 815.7 lb
1100 mm: 370 kg 859.8 lb

BOW
1200 47.2" 500 19.7"
500 19.7"
500 19.7"
250 9.8"
152 6.0"
370 14.6" 282 11.1"
480 18.9"
360 14.2"
800mm: 1260 49.6"
1100mm: 1560 61.4"
FSV-8432: 2040 80.3"
FSV-8442: 2340 92.1"
780 30.7"
900 35.4"
ø470
ø340
342 14.3"
ø292
800 31.5"
1100 43.3"
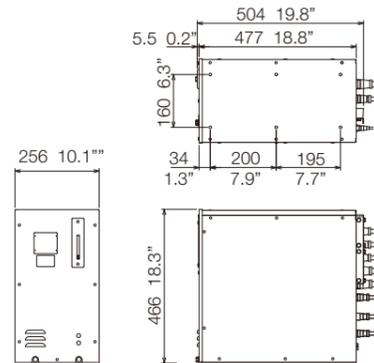
FULL-CIRCLE COLOR SCANNING SONAR

FSV-84

Photo:
Control unit with
optional monitor
MU-190HD

www.furuno.com

The groundbreaking 360-degree color scanning from both shorter to longer range.

sonar provides high resolution images
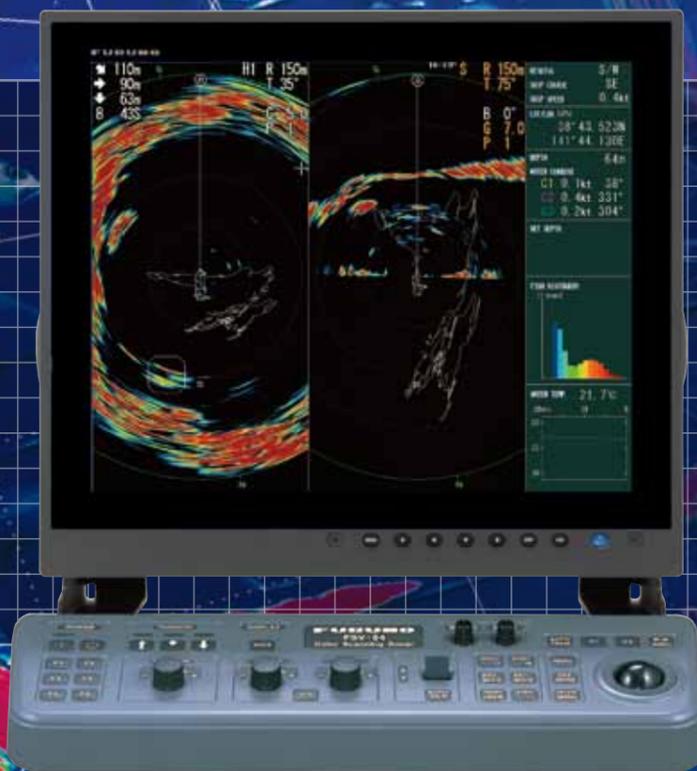
Photo:
Control unit with optional monitor MU-190HD

FULL-CIRCLE COLOR SCANNING SONAR

FSV-84

The FSV-84 is a new full-circle color scanning sonar with a transducer having highly sensitive elements. It offers high resolution image in all ranges. Its detection range capability has been improved significantly compared to conventional scanning sonar utilizing an equal frequency.

A variety of presentation modes are available for efficient fishing operation in various fishing methods. Adding to conventional presentation modes such as full circle and vertical mode, FSV-84 offers Dual Full Scan mode which simultaneously shows two full-circle scans at different tilt angles or range, and Slant mode for 180-degree half-circle fan picture. Viewing from various perspectives, it helps to detect fish schools faster, to find more lucrative fishing grounds and to grasp the timing of the net shooting.

In addition, FSV-84 features advanced functions such as Auto Filter and a stabilization system for skippers to observe targets even in foul weather conditions. With its user-friendly interface, often-used functions can be enabled in one touch.

▶ **Auto Filter provides the clear view of targets**
The Auto Filter enables stable observation of target even when the vessel is moving fast (under 18 knots). Additionally, the filter also reduces the influence of propeller noise and clutter from other vessels.

▶ **Beam stabilization**
The stabilizer keeps the beam on the designated target even in rough seas. The bottom and fish echoes are presented without undulation.

▶ **Tracking a fish school (target lock)**
The target lock function automatically tracks a fish school so you won't lose sight of it on the display. Two types of target lock are available: position tracking (TARGET MARK) and fish school tracking (FISH).

▶ **User program control and six function keys**
The user program control provides for instant setup of the equipment according to fishing ground or target fish.
Ten programs may be set up, and vertical and horizontal display settings may be programmed together or individually. The function keys also provide one-touch display of desired menu item or entire menu.

10 User program control
6 function keys

▶ **Customizable user menu**
You may program 10 often-used menu items to the user menu area in the menu.

▶ **Fish alarm**
When a speaker (option) is connected, the fish alarm sounds the aural alarm if a fish echo above a preset strength enters the operator-set alarm zone.

▶ **Built-in transceiver**
A compact built-in transceiver with power unit allows simplified retrofitting.

▶ **Utilizing common tank to conventional sonar**
The transducer tank is common to the CSH-83 for reducing cost and time of installation.
* Convert kit needed

▶ **Remote controlling and watching at upper bridge**
Up to three display units can be installed anywhere (such as upper bridge) to monitor fish movement from remote locations. A remote controller is also available.

▶ **Fish histogram**
The fish histogram shows, in graph form, signal strength distribution for the fish school(s) marked with an estimate mark on the horizontal and echo sounder displays.

The horizontal axis shows signal strength in 16 colors, and the vertical axis shows fish school concentration inside the fish estimate mark.

fish estimate mark

▶ **The innovative full-circle color scanning sonar designed for purse seiners and trawlers, ideal for mackerel and tuna detection**
FSV-84's various and flexible presentation offers efficient fishing operation especially for purse seiners and trawlers. It offers skippers to evaluate fish schools both around and under the vessel, and to keep tabs on caught fish inside the net. The powerful high frequency sonar detects weak and fast moving targets even under harsh conditions.

Trawlers
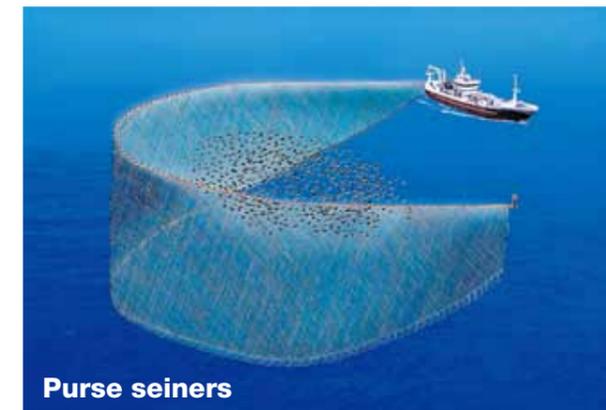
Purse seiners

Various display modes for a wide range of fishing applications

Dual full-circle scan

Full-circle scan can be set at the bearing of horizontally -5 degrees to 90 degrees under the vessel. Additionally, the dual full circle scan modes simultaneously show two full-circle scans at different tilt angles or range selected by the operator. The fish school shown on two images from far and near ranges permit skippers to conduct comparison between the two different targets. In other words, skippers can actually operate two sonar on one screen.

To enhance fishing operations, the images are presented in a variety of ways including dual-portrait, dual-landscape and inset modes.

Dual display (right and left)
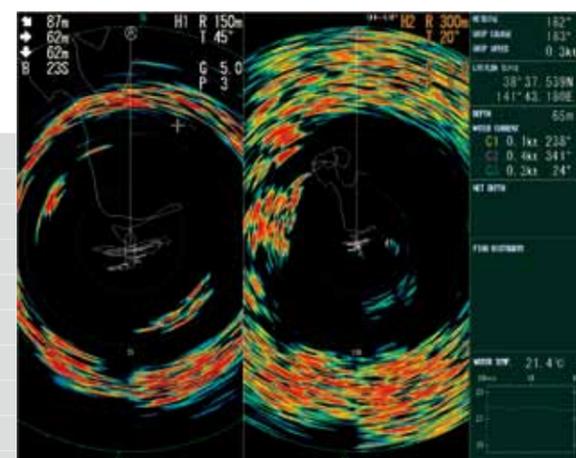
Horizontal scan 1
Range: 150 m
Tilt: 45
Gain: 5.0

Horizontal scan 2
Range: 300 m
Tilt: 20
Gain: 5.0

Horizontal scan 1   Horizontal scan 2
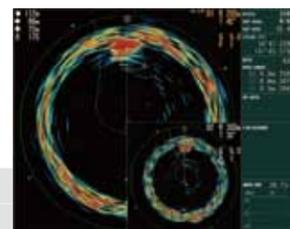
Inset display can be positioned right or left
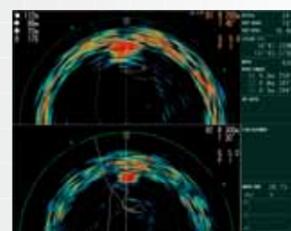
### Inset display mode

Landscape display mode

Combination of the full-circle and vertical scans

Adding to full-circle scan, the vertical scan can be displayed to show directional scan image of the selected bearing. The vertical scan setting can be simply done by just using the trackball to place the marker at desired location on the full-circle display, and press the designated key.

By utilizing both scans, the skipper can obtain location of a fish school and fish distribution in horizontal and vertical perspectives all the same time.

It is extremely helpful to grasp the spread of fish school or the most concentrated part of the target, as it is not necessary to go over the school to see the distribution on the echosounder.
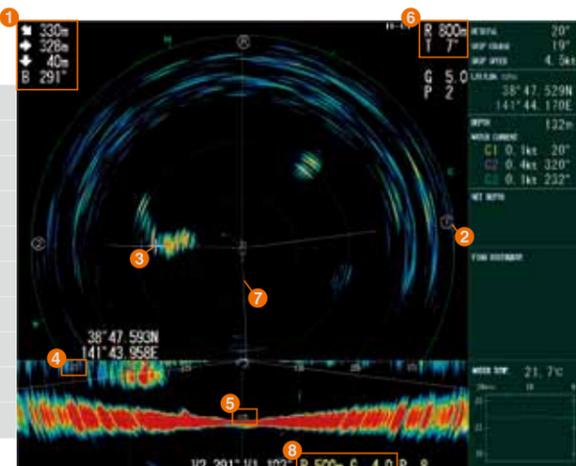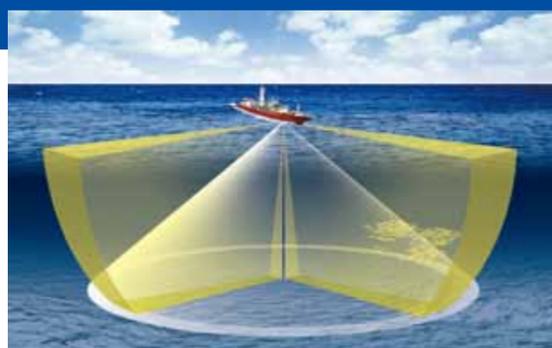
vertical scan 2   vertical scan 1

❶ Direct distance, horizontal distance, water depth, and bearing to the cursor.
❷ Bearing mark for vertical scan 1 (V1).
❸ Cursor
❹ Range distance of vertical scan
❺ Water depth under the boat
❻ Range, tilt, and display mode of Horizontal scan
❼ Ship track
❽ Range and gain of vertical scan

Slant mode scan

The Slant mode shows a 180-degree cross section, using chosen tilt angle and train setting. It is extremely useful for detecting bottom fish and monitoring changing bottom conditions, identifying the location of trawling activity. Purse seiners can also use this mode for observations of fish behavior and school structure in the net so that fish would not move away from the purse before catching. Moreover, sonar beam can be tilted to 90 degrees under the vessel and rotate 360 degrees, which can show scan image of the whole sea area around the vessel without any blind spot.
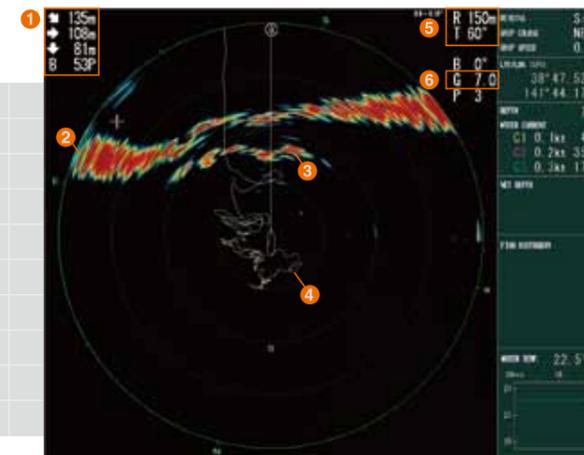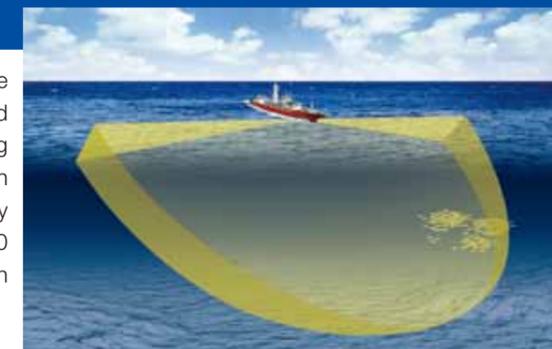
❶ Direct distance, horizontal distance, water depth, and bearing to the cursor.
❷ Seabed
❸ Fish school
❹ Ship track
❺ Range and tilt
❻ Gain

Suppressing Bottom and Surface Reflection

In shallow fishing grounds with hard or rocky bottom, bottom reflections often interfere with wanted fish echoes and they can not be eliminated sufficiently with gain controls. In such cases, the output power can be reduced by adjusting the Tx output instead of turning down the gain. The picture becomes clearer when output power is reduced rather than when the GAIN is decreased as illustrated below.
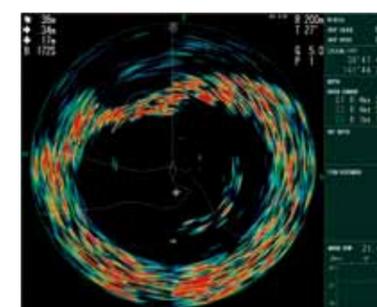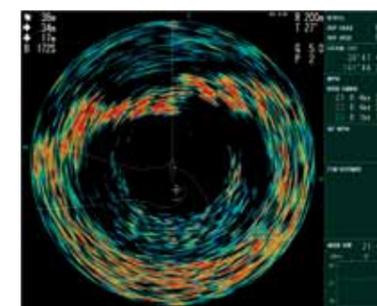
Beam Stabilization

Thanks to FSV-84's built-in motion sensor, the beam stabilization mode maintains the sonar beam at required tilt by compensating for ship's pitching and rolling. This gives an unwavering presentation of the echo images even in rough seas.
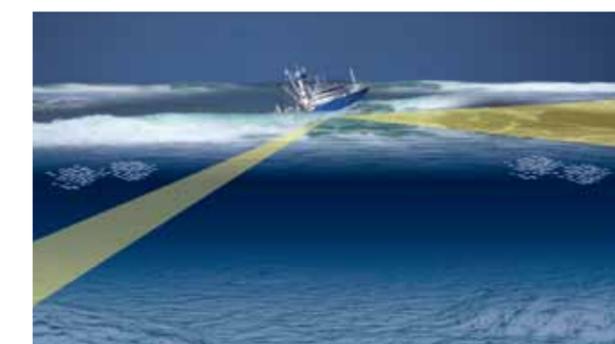
Stabilization OFF

Stabilization ON

FSV-84 provides you the flexibility to choose your own display.

FURUNO or commercial monitors for BlackBox type display

FSV-84 is a BlackBox type sonar which works with virtually any size multi-sync SXGA (1280 x 1024) LCD. Furuno also offers a premier line of high-quality LCD monitors that are a perfect complement to the FSV-84.

MU-190HD
with optional bracket

Lineup of FURUNO monitor for BlackBox type.

|	15 inch monitor **MU-150HD**	19 inch monitor **MU-190HD**	19 inch monitor **MU-190**
Resolution	XGA (1024 x 768)	SXGA (1280 x 1024)	SXGA (1280 x 1024)
Brightness	1,000 cd/m2	1,000 cd/m2	450 cd/m2
Interface	Analog RGB ×1	Analog RGB ×1	Analog RGB ×1
	DVI ×2	DVI ×2	DVI ×2
	Video ×3	Video ×3	Video ×1

Control panel callouts

Raise, lower the transducer.
↑ : Raises the transducer.
← : Lowers the transducer (mid protrusion).
↓ : Lowers the transducer (full protrusion).

Selects display range (horizontal and vertical modes).

Adjusts receiver sensitivity (horizontal and vertical modes).

Automatic transducer train width on audio bearing mark (horizontal mode), vertical bearing mark (vertical mode). Off > ±12° > ±24° > ±36° > Off

Selects display mode.

In vertical combination mode switches between normal and expansion display.

Displays range and audio bearing marks to monitor echoes along audio bearing mark (horizontal mode).

Opens, closes menu.

Off centers the picture.

Deletes trackball-selected mark.

Execute assigned program.

Selects user program.

Selects mode (horizontal 1/horizontal 2, or horizontal/vertical, horizontal/ half-circle) for which to adjust sensitivity, select range.

SHOOT: Displays net data.
EVENT: Inscribes event mark, own ship position mark.
ESTIMATE 1, 2: Compares volume of two fish schools.
TARGET LOCK: Tracks fish school.
FISH: Measures speed of fish school.

SPECIFICATIONS OF FSV-84

1. **Display Resolution**
   1280(H) x 1024(V) pixels
2. **Presentation Colors**
   Echoes in 32 colors, Marks in 4 colors
3. **Frequency** 73.5 to 86.5 kHz
4. **Presentation Modes**
   Full-circle scan, Combination of full-circle and Vertical scans, Echo Sounder, Historical presentation and Slant mode
5. **Orientation** Head-up, Course-up*, North-up* and True Motion*
   *Appropriate sensors required
6. **Range Scales** 60 - 2,000 m
7. **Pulselength** 0.5 to 40 ms (depending on range scales)
8. **Beamwidth (at -3 dB)**

Horizontal Tx Beam width	Horizontal 360º x Vertical 10.7º (–6 dB full width)
Horizontal Rx Beam width	Horizontal 12.6º x Vertical 10.1º (–6 dB full width)
Tilt Angle	–5º to 90º
Vertical Tx Beam width	Horizontal 12.7º x Vertical 118.2º (–6 dB full width)
Vertical Rx Beam width	Horizontal 12.6º x Vertical 12.1º (–6 dB full width)
Vertical Search Range	0º to 90º
S Tx Beam width	Horizontal 206.7º x Vertical 12.1º (–6 dB full width)
S Rx Beam width	Horizontal 12.6º x Vertical 12.0º (–6 dB full width)
Tilt Angle	–5º to 90º

9. **Hull Unit**

	FSV-8432	FSV-8442
Travel:	500/800mm	800/1100 mm
Raise/Lower Time:	21 sec	28 sec
Ship Speed: (Raise/Lower):	18 kt (18kt)	15 kt (15kt)

10. **Interface**
   Input (NMEA 0183): CUR, DBS, DBT, DPT, GGA, GLL, GNS, HCC, HCD, HDG, HDM, HDT, MTW, MWV, RMA, RMC, VBW, VDR, VTG, VHW, ZDA, VWT

Input (CIF): System clock, position, speed, bearing, first layer current data, water depth, water temperature, multi-layer current data, net depth, wind
Output: TLL

11. **Audio Search**
   Sector: 30°, 60°, 90°, 180°, 330°
   Audio Output: 1.1 W
   Frequency: 1 kHz

POWER SUPPLY
Processor Unit, Control Unit:
   100-115/220-230 VAC, 1ø, 50/60 Hz, 2 A
Transceiver unit: 100/110/115/200/230 VAC, 1ø, 50/60 Hz, 15 A
Hull unit: 200-220 VAC, 3ø, 50/60 Hz, 4 A

EQUIPMENT LIST
Standard
1. Control Unit — FSV-8401-10
2. Processor Unit — FSV-8402-60 (110 VAC) / FSV-8402-70 (220 VAC)
3. Transceiver Unit — FSV-841A
4. Hull Unit (specify when ordering) — FSV-8432-T (800 mm travel) / FSV-8442-T (1100 mm travel)
5. Installation materials and spare parts

Option
1. Display Unit — MU-190HD
2. Control Unit — FSV-8401-10 (for remote display)
3. Power Kit for CS-120A — FSV-2403
4. Controller Extension Kit — FSV-846 (for control box)
5. Attachment Kit — OP10-30
6. Installation Material for interface — CP10-04801
7. Loudspeaker — SEM-21Q
8. E/S Interface — VI-1100A
9. Net Sonde Junction Box — CS-170
10. 37-core Cable — 10S1258
11. Cable Assy. — MJ-A6SPF0012-050C/100 (5/10 m)
12. 8-core Cable — 02S8040 (for echo sounder 6m)

INTERCONNECTION DIAGRAM

Control Unit FSV-8401

Control Unit FSV-8401

10S2076

10S2076 10m

10 m

Main Display MU-190HD

MU-190HD

Monitor*
Up to three display units are connectable
Conventional monitors are connectable
*SXGA (1280 x 1024 pixels)

Hull Unit FSV-8432 (800 mm travel) FSV-8442 (1100 mm travel)

Processor Unit FSV-8402

2.5 m

NMEA 0183

Loudspeaker

GPS

Current Indicator

10S2078 7.2/10/20 m

Transceiver Unit FSV-841A

10S1258

AD Converter AD-10

Gyrocompass

02S8040

VI-1100A

E/S Net Recorder

5 m

5/15 m

Extension Cable Kit

02S8040

CS-170

Net Sonde

VI-1100A

E/S

200-220 VAC, 3ø 50/60Hz

100/115/220/230 VAC, 1ø 50/60Hz

100-115/220-230 VAC, 1ø 50-60Hz

—— Option
----- local supply