

FURUNO®

FULL-CIRCLE COLOR SCANNING SONAR

Model FSV-30/30S



The future today with FURUNO's electronics technology.

FURUNO ELECTRIC CO., LTD.

9-52 Ashihara-cho, Nishinomiya City, Japan Phone: +81 (0)798 65-2111

Fax: +81 (0)798 65-4200, 66-4622 URL: www.furuno.co.jp

Catalogue No. E-398

TRADE MARK REGISTERED
MARCA REGISTRADA

FURUNO's cutting edge tech the creation of this groundbreaking scanning sonar

- **Powerful transmitter and high-sensitivity receiver offer long range detection capabilities**
- **New spherical transducer allows up to 90-degree presentations in vertical planes**
- **Sidelobe Suppressing Technology (SST)**
- **Auto filter for a clear image of fish schools and the seabed by suppressing noise and unwanted signals**
- **FURUNO's unique beam-stabilizing system eliminates the loss of important targets due to ship's motion in rough seas**
- **User-defined function keys and menu for intuitive operation**
- **Multi-frequency system allows menu-selection of operating frequency to reduce any interference by other sonar operating on the same frequency**
- **Combined display of full-circle and vertical scans for easy evaluation of density and distribution of fish schools**
- **New space-saving transceiver unit**
- **21" high resolution commercial grade display unit as standard (3 video output ports for connection of FURUNO or conventional SXGA monitors)**
- **Fish histogram shows signal strength distribution of echoes within estimate mark**

The FSV-30/30S are groundbreaking scanning sonar using FURUNO's revolutionary signal processing technology and hardware expertise. FURUNO's first-rate technologies bring about outstanding omni-direction searches with long-range detection all around the vessel horizontally and vertically. This means that the operator will not miss any important target echo. These features perfectly suit virtually all types of fishing vessels including trawlers and purse seiners.

A variety of presentation modes are available for efficient fishing: a single full-circle scan, a dual full-circle scan, and the combination of full-circle and single vertical scan/ dual vertical scan/ echo sounder presentation or historical presentation.

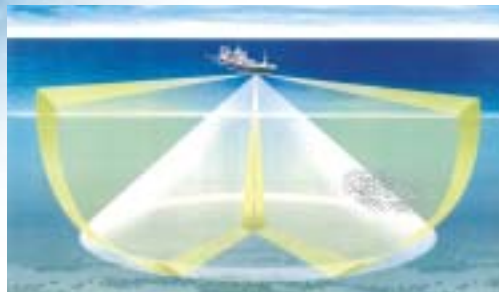
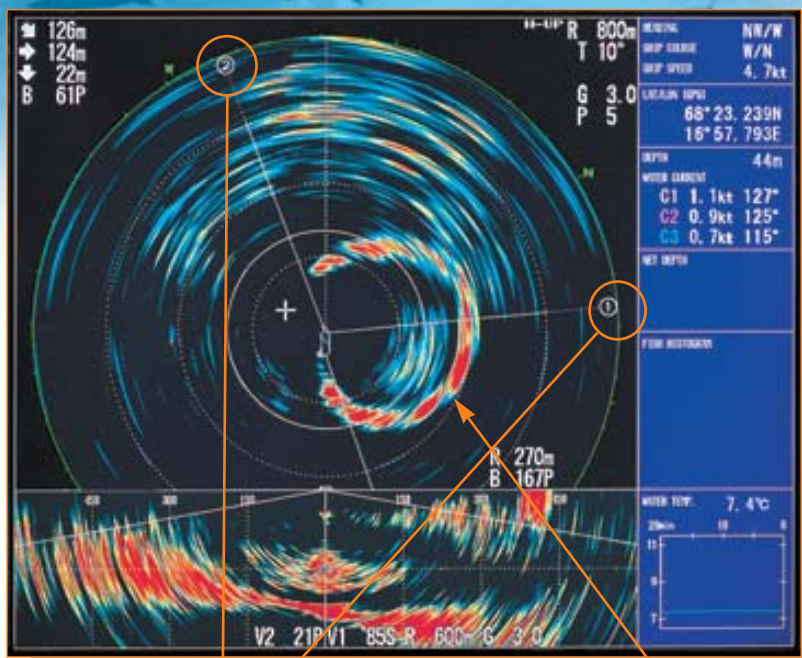
FURUNO's advanced acoustic technologies give a crystal clear presentation free from unwanted echoes. Sidelobe Suppression Technology (SST)

eliminates mimic echoes from the sidelobe. Thus, the display clearly distinguishes between the mimic echoes from the main beam. In addition, the stabilization system maintains the sonar beam at a desired angle with less effect of pitching and rolling. The FSV-30/30S allow the skipper to observe a stable target echo throughout the catching process of detection, net shooting and hauling.

The FSV-30/30S consist of a display unit, ergonomically designed control unit, processor unit, transceiver unit, and revolutionary spherical transducer unit. The compact transceiver unit allows space-saving installation. A BlackBox configuration is available as an option with FURUNO or conventional LCDs as a substitute for the standard 21" CRT display unit. The transducer tank is common to the CSH-20/21/23/23F for reducing time of installation.

Technology has made possible breaking 360-degree color

Combination of the full-circle and vertical scans



The upper part of the image on the left shows a 360-degree full-circle scan. The lower part shows vertical scans. These vertical scans show two directional scan images of the selected bearings next to each other.

This combination display helps the operators determine which fishing area is more lucrative. A single vertical scan is also available, which is suitable for observing detailed distribution and concentration of a fish school.

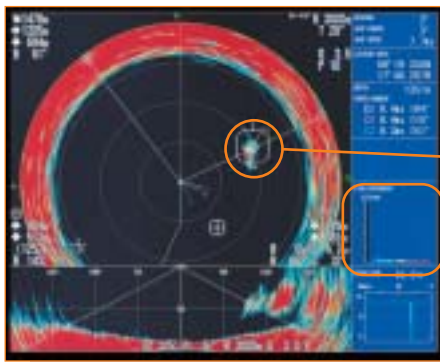
Vertical no.2

Vertical no.1

Net

These lines and marks indicate the directions of vertical scans. On no.1, the operator can observe the position of the fish school and the distance between the fish school and the net.

The setting of vertical scans is simple: Just use the trackball to place the marker at desired locations on the full-circle display, and press the designated keys. This greatly simplifies the sonar operation during the busy fishing activities.



Estimate Marks

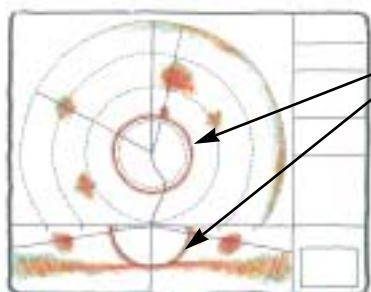
Estimate mark

Histogram

The operator can obtain an estimate of the volume of a fish school by using the estimate mark. The echo within the mark is presented with a histogram showing the echo strengths on the right side of the screen. This graphically helps to assess the concentration of the targeted fish school. Up to two marks can be placed.

Sidelobe Suppression Technology (SST)

The SST reduces the influence of mimic echoes caused by the effects of sidelobes and displays the echoes of targets clearly.



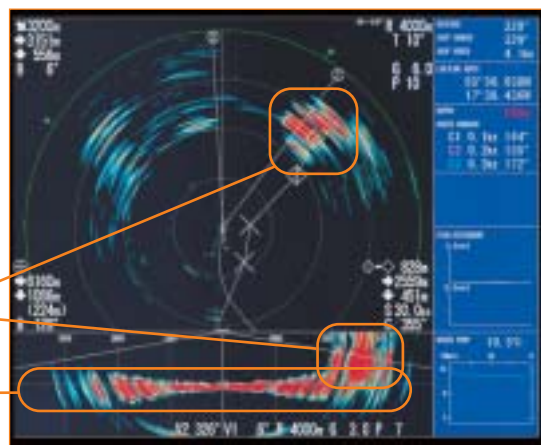
Sidelobes

Typical echo images affected by sidelobes.

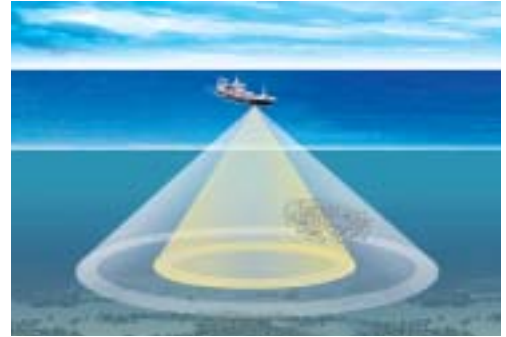
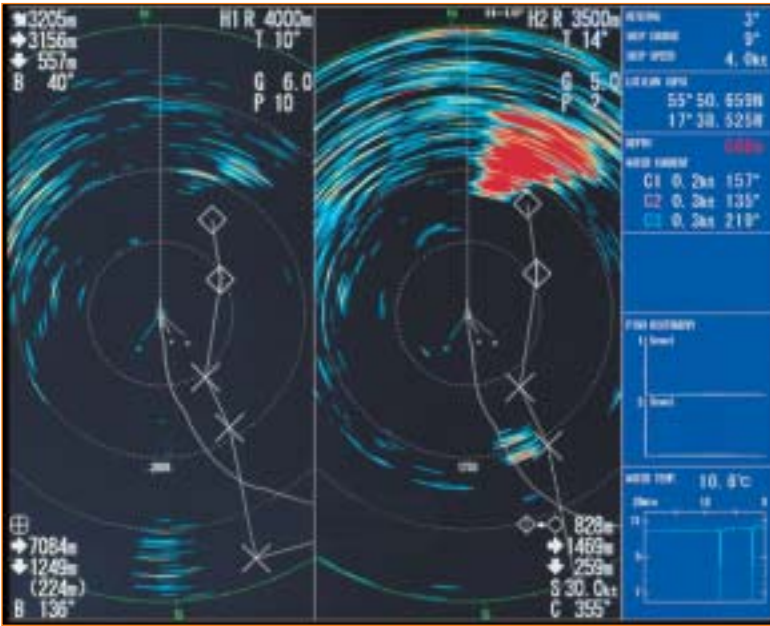
In the vertical scan display, the seabed is displayed as flat without being affected by sidelobes.

Fish school

Seabed



Dual full-circle scan

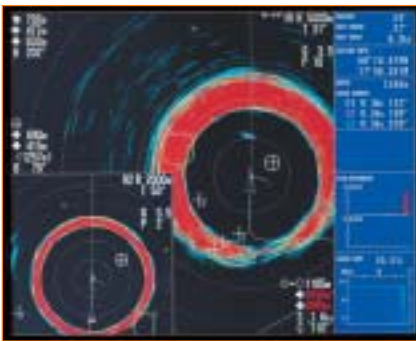


The dual full circle scan modes show simultaneously two full-circle scans at different tilt angles or range selected by the operator. The fish school shown on two images with different range scales permits skippers to conduct uninterrupted observation of the target.

The images are presented in a variety of ways including: dual-portrait, dual-landscape and inset modes. These improve the efficiency of the fishing operation.

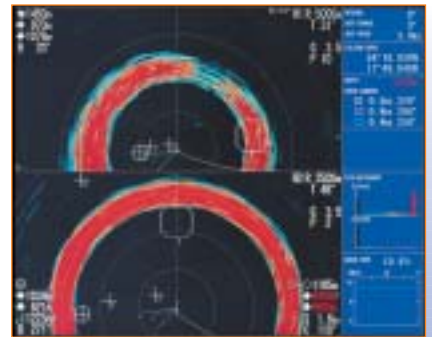
Dual portrait mode

Suitable for continuous observation of the targeted fish schools situated fore and aft of the vessel when trawling.



Dual landscape mode

Suitable for keeping the observation of the sea area in a forward direction as in purse seining.

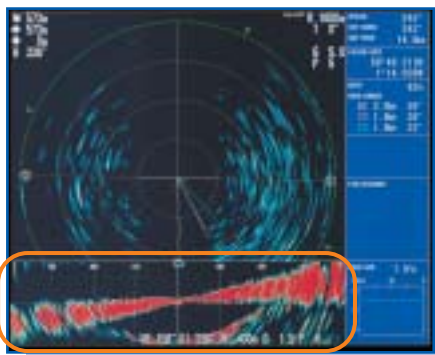


Inset mode

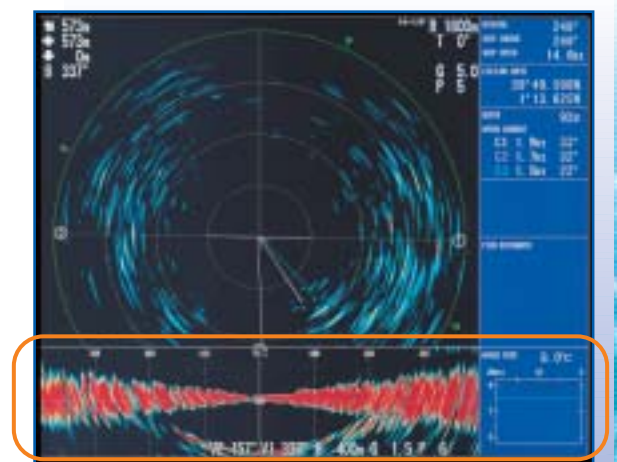
Effective in searching for targets with main and substitute scans at different range and angles.

Beam Stabilization

The beam stabilization mode maintains the sonar beam at required bearing and 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

The echo reflections in the vertical scan are listed to port due to rolling.

New Spherical Transducer

Furuno's advanced acoustic technology produced the revolutionary spherical transducer which allows 360-degree horizontal searches and 0 to 90 degree "blind-spot-free" vertical searches at all range. This transducer enables the FSV-30/30S to suit virtually all types of the fishing vessels.

Transducer elements

This transducer consists of hundreds of highly sensitive elements, which achieve high efficiency in energy conversion. This ensures detection with small output power compared with other spherical transducer types. This low power consumption of the FSV-30/30S makes their transceiver unit compact, offering space-saving installation.

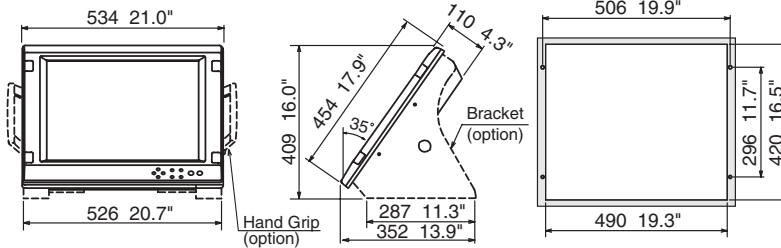
Multi-frequency transmission and reception: 21-27 kHz

This new transducer element has another unique feature; "multi-frequency transmission and reception". This allows the FSV-30/30S to conduct multi-frequency scans with frequency ranging from 21 kHz to 27 kHz without affecting the sensitivity of transmission and reception. The operating frequency is easily changed by menu settings. This is helpful in reducing the interference from other sounding equipment in a congested fishing area.



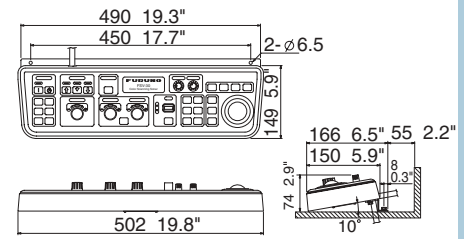
LCD DISPLAY UNIT MU-201C*

18.3 kg, 40.4 lb *Available in near future



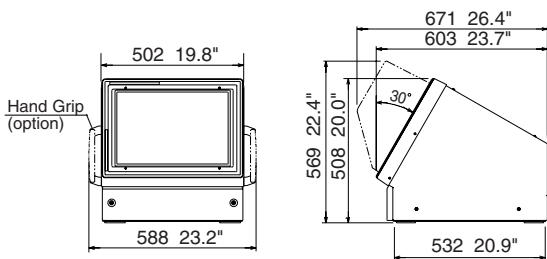
CONTROL UNIT

FSV-3001 4.2 kg, 11.5 lb



DISPLAY UNIT FSV-2400

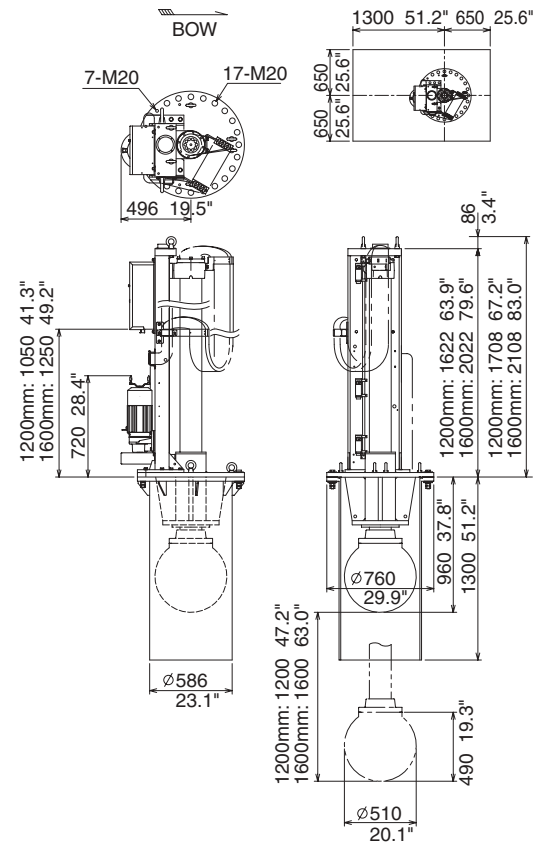
48 kg, 106 lb



HULL UNIT

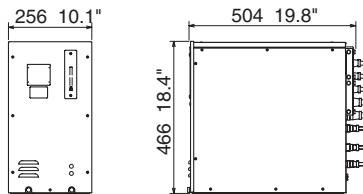
FSV-303 (for 1200mm travel) 1,110 kg, 2,976 lb

FSV-304 (for 1600mm travel) 1,160 kg, 3,087 lb



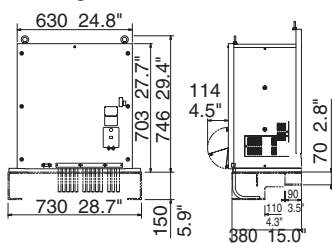
PROCESSOR UNIT

FSV-3002 29 kg, 53 lb



TRANSCIEVER UNIT

FSV-301 98 kg, 507 lb



SPECIFICATIONS OF FSV-30

- 1. Display**
High-resolution, 21-inch CRT
1280(H) x 1024(V) pixels
- 2. Presentation Colors**
Echoes in 32 colors, Marks in 4 colors
- 3. Frequency** 21 to 27 kHz
- 4. Presentation Modes**
Full-circle scan, Combination of Full-circle and vertical scan/echo sounder/ historical presentation
- 5. Orientation**
Head-up, Course-up*, North-up* and True Motion*
*Appropriate sensors required
- 6. Range Scales** FSV-30: 60 - 5,000 m
FSV-30S: 60 - 10,000 m
- 7. Pulselength** 0.5 to 125 ms (depending on range scales)
- 8. Beamwidth (at -3 dB)** TX: 360° (hor) x 10° (ver)
RX: 18° (hor) x 12° (ver)
- 9. Tilt** -5° to 90° (downward) in 1° steps
- 10. Hull Unit** FSV-303 FSV-304
Travel: 1200 mm 1600 mm
Raising Time: 22 s 29 s
Lowering Time : 21 s 28 s
Ship Speed: 18 kt 15 kt
(Raise/Lower): (15 kt) (12 kt)
- 11. Interface (NMEA 0183)**
Input: CUR, DBS, DBT, DPT, GGA, GLL,
GNS, HCC, HCD, HDG, HDM, HDT,
MTW, MWV, RMA, RMC, VBW,
VDR, VTG, VHW, ZDA

Output: TLL

- 12. Audio Search**
Sector: 30°, 60°, 90°, 180°, 330°
Audio Output: 2 W, Frequency: 1 kHz

POWER SUPPLY

- Display unit: 100/115/120/220/230 VAC, 50/60 Hz,
1Ø, (250 VA max)
- Transceiver unit: 100/115/120/220/230 VAC, 50/60 Hz,
1Ø, (2 kVA max)
- Hull unit: 220 VAC, 50/60 Hz, 3Ø, (4.5 kVA max)

EQUIPMENT LIST

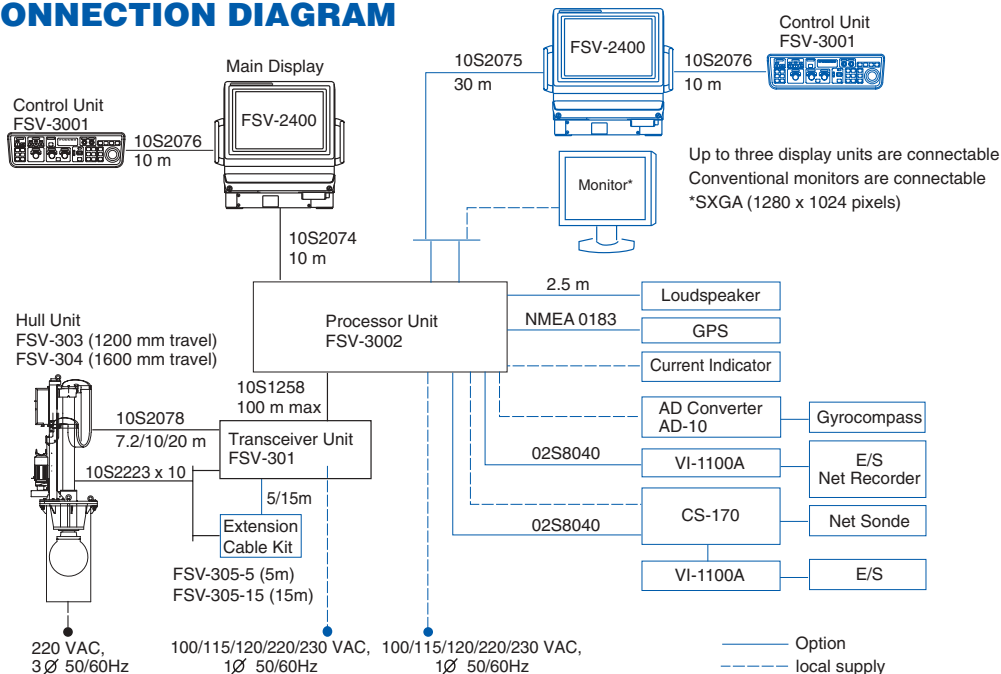
Standard

1. Display Unit FSV-2400
2. Control Unit FSV-3001-E-10
3. Processor Unit FSV-3002
4. Transceiver Unit FSV-301
5. Hull Unit (specify when ordering)
FSV-303 (1200 mm travel)
FSV-304 (1600 mm travel)
6. Installation materials and spare parts

Option

1. Display Unit FSV-2400
2. Control Unit FSV-3001-E-10 (for remote display)
3. NMEA cable MJ-A6SPF0012-050/100 (5/10 m)
4. Viewing Hood FP03-06503
5. Echo Sounder Interface VI-1100A
6. Cable for VI-1100A 02S8040 (6 m)
7. Loudspeaker SEM-21Q
8. Net Sonde Interface CS-170
9. Extension Cable Kit FSV-305-5/15 (15 m)
10. Power Supply Unit FS-2403 for CS-120A
11. Attachment Flange OP10-20 (1200m/travel)

INTERCONNECTION DIAGRAM



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

FURUNO U.S.A., INC.
Camas, Washington, U.S.A.
Phone: +1 360-834-9300 Fax: +1 360-834-9400

FURUNO (UK) LIMITED
Denmead, Hampshire, U.K.
Phone: +44 2392-230303 Fax: +44 2392-230101

FURUNO FRANCE S.A.
Bordeaux-Mérignac, France
Phone: +33 5 56 13 48 00 Fax: +33 5 56 13 48 01

FURUNO ESPAÑA S.A.
Madrid, Spain
Phone: +34 91-725-90-88 Fax: +34 91-725-98-97

FURUNO DANMARK AS
Hvidovre, Denmark
Phone: +45 36 77 45 00 Fax: +45 36 77 45 01

FURUNO NORGE A/S
Ålesund, Norway
Phone: +47 70 102950 Fax: +47 70 127021

FURUNO SVERIGE AB
Västra Frölunda, Sweden
Phone: +46 31-7098940 Fax: +46 31-497093

FURUNO FINLAND OY
Espoo, Finland
Phone: +358 9 4355 670 Fax: +358 9 4355 6710

04075Y Printed in Japan

