FURUNO®

Voyage Data Recorder

Model VR-5000

Records essential navigational status,
Helps locate casualty causes and

- **Reliable and fast data exchange between data collecting and data recording units via a single IEEE1394 cable**
- **Easy commissioning and maintenance by PC downloading/uploading**
- **12-hour recording of normal sensor stored in standard memory**
- **UTC time tagged for system synchronization and easy data retrieval**
- **Choice of flash memory capacity in the data recording unit**

- **Expansion for more sensors via inexpensive junction box**
- **Complies with IMO A.861(20), IEC 61996, IEC 60945**
- **Expandable flash memory capacity in DRU for storage of data beyond mandatory requirements.**
- **Hot Swap HD for storage and retrieval of data for longer periods**

The VR-5000 is a Voyage Data Recorder (VDR) designed to meet IMO A.861 (20) and IEC 61996. The revised SOLAS Chapter V requires the installation of a VDR on passenger ships of 150 GT and above and other ships of 3000 GT and above on international voyages for new building on and after 1 July, 2002. The purpose of the VDR is to help investigators locate causes of marine casualty and promote education for safe navigation.

The VR-5000 consists of a Data Collecting Unit (DCU) and a Data Recording Unit (DRU). The DCU contains interface modules, a powerful computer and a status monitor. It collects data from sensors as required by the IMO and IEC standards. The DCU processes the incoming data and information in the order of occurrence while old data is overwritten with new one for storage in the DRU.The recording hour is minimum 12 h with the standard flash memory. In case of emergency supply failure, the dedicated reserve batteries enable the VDR to

record bridge audio for 2 h. The DCU can be fitted with a Hot Swap HD for storage and retrieval of voyage data for periods up to several weeks. The hot swap system and an external docking station for the HD allows data to be retrieved without interrupting the mandatory data collection.

The Data Recording Unit DRU stores the data coming from the DCU in the flash memory. All essential navigation and status data including bridge conversation, VHF communications and radar images are recorded. The data can be retrieved with use of playback software for an investigation after an incident or for education or briefing purposes. The DRU components are embodied in a protective capsule. The capsule ensures survival and recovery of the recorded data after an incident. An acoustic pinger helps locate the capsule.
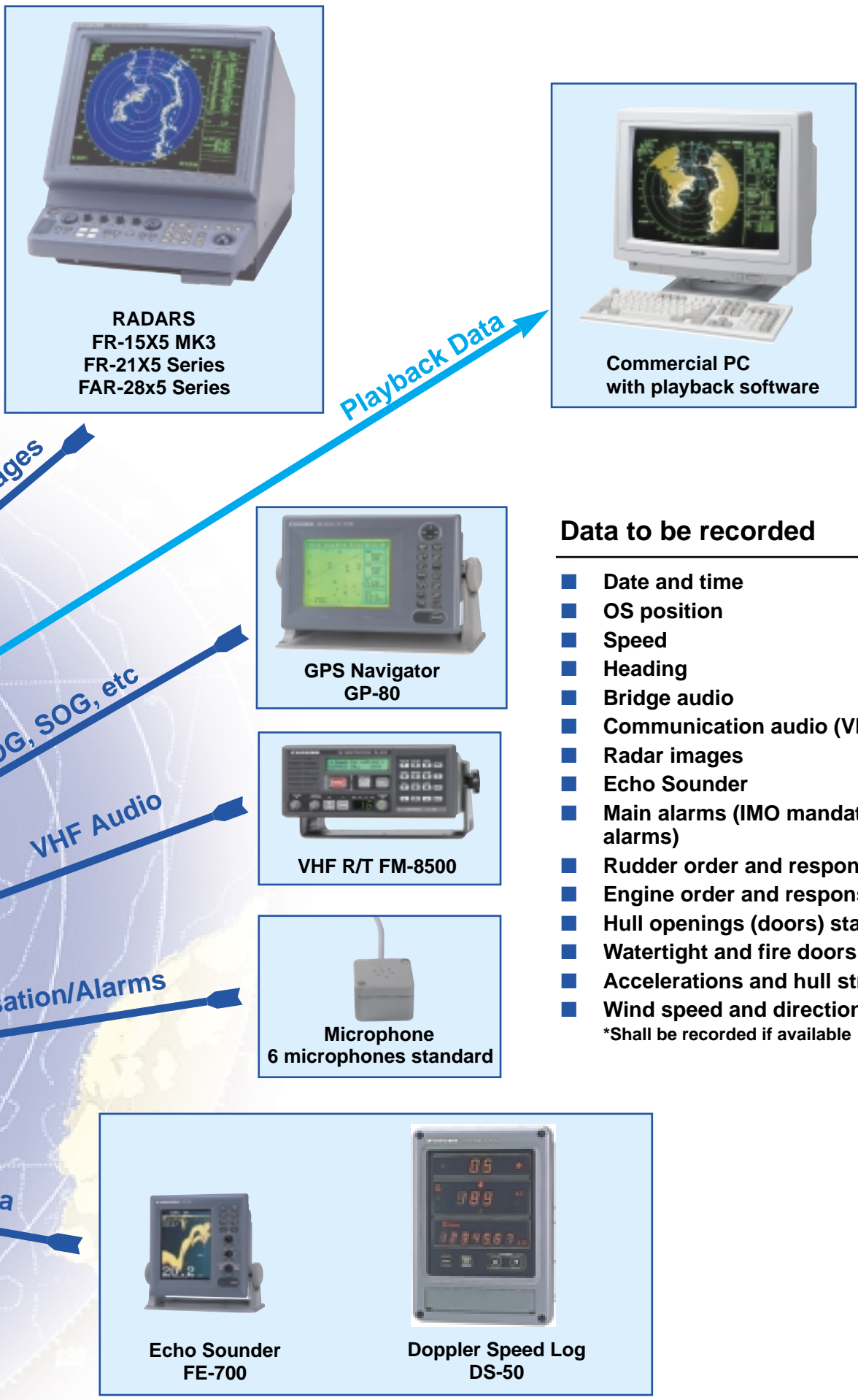
Data Recording Unit

Bri

Data Collecting Unit

Implementation schedule (International voyages)
.1 passenger ships NB: 1 July 2002;
.2 ro-ro passenger ships constructed before 1 July 2002: before first survey after 1 July 2002;
.3 passenger ships other than ro-ro constructed before 1 July 2002: before 1 January 2004; and
.4 NB other than passenger ships, of 3,000 gross tonnage+ : 1 July 2002.

command and control of ship.
promote education for safe navigation.

RADARS
FR-15X5 MK3
FR-21X5 Series
FAR-28x5 Series

Playback Data

Commercial PC
with playback software

Radar Images

POSN, COG, SOG, etc

VHF Audio

GPS Navigator
GP-80

VHF R/T FM-8500

ge conversation/Alarms

Microphone
6 microphones standard

Data to be recorded

- Date and time
- OS position
- Speed
- Heading
- Bridge audio
- Communication audio (VHF)
- Radar images
- Echo Sounder
- Main alarms (IMO mandatory alarms)
- Rudder order and response
- Engine order and response
- Hull openings (doors) status
- Watertight and fire doors status
- Accelerations and hull stresses*
- Wind speed and direction*

*Shall be recorded if available

Sensor Data

Echo Sounder
FE-700

Doppler Speed Log
DS-50

SPECIFICATIONS OF VR-5000

GENERAL

Rules and Regulations
IMO A.861(20), IEC 61669, IEC 60945, IEC 61162

Data Collecting Unit (DCU)
Structure of DCU
Deck mounted, containing a status display, interface, mainframe computer, dedicated reserve battery, power supply for all VDR operation

Interface

Fire wire (IEEE1394)	1 ch
Digital interface IEC 61162:	8 channels
Ethernet:	1 ch 10/100 Base-T
Analog:	16 ports
Contact:	12 ports
Digital status (5-32 V):	52 ports
Bridge communication:	2 ch (max 6 ch)
VHF audio:	2 ports
Radar RGBHV (VGA to SXGA):	1 ch (max 4)

Integrity monitoring
Alarms for mains supply failure, recording function, bit error rate, mic function

Data retrieval
Data stored in the CPU in the DCU may be copied for lesson or investigation with an optional software. Interruption of data storage to DRU is less than 8 minutes.

Data Recording Unit (DRU)
Memory
6 GB flash memory standard for IMO mandatory data for 12 h cycle, first-in first-out basis. Retains data for more than 10 years under no external power

Optional: Larger memory for extended duty cycle

ENVIRONMENTAL TESTS (for protective capsule)

Fire:	1100°C for 1 h, 260°C for 10 h (complies with ED 56A)
Shock:	50 G, duration 11 ms
Penetration:	250 kg with a pin ø100 mm dropped from 3 m (ED 56A)
Deep sea immersion:	6,000 m
Acoustic Pinger:	Pinger emitting 10 ms pulses at 37.5 kHz. Automatically switched on when submerged in water.
Data retrieval:	By playback equipment (not part of standard VR-5000)

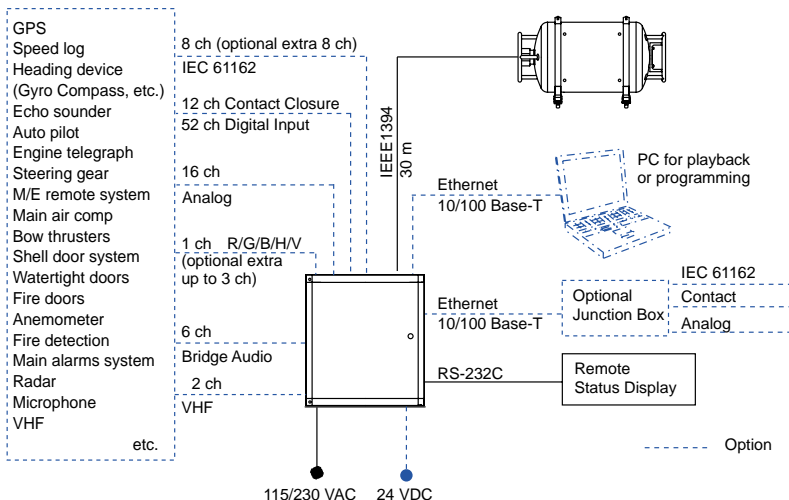## POWER SUPPLY
115 - 230 VAC, 50 - 60 Hz

EQUIPMENT LIST

Standard
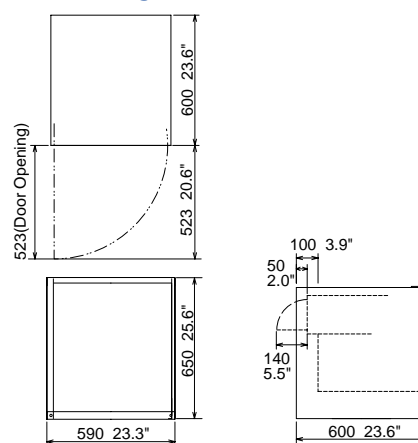|		
1.	Data Collecting Unit	1 unit
2.	Data Recording Unit with 30 m cable	1 unit
3.	Cradle for DRU	1 unit
4.	Remote Status Display	1 unit
5.	Microphone	6 sets
6.	Installation Materials and Spare Parts	1 unit

Optional
1. Junction Box
2. Extra Flash Memory for DRU
3. Playback software
4. Additional Radar/Video Connections: Up to 3 extra Radar/Video channels
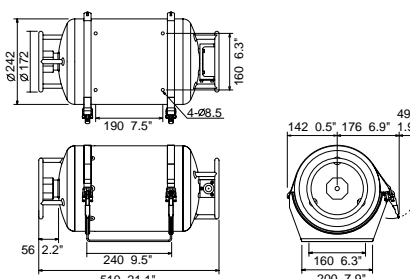5. Removable Hard Disk Drive

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Data Collecting Unit   Weight: 65 kg, 143 lb

Data Recording Unit   Weight: 25 kg, 55.0 lb

Interconnection Diagram

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE