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|-----------|-------------|----------------------------|----|-----|------|
| C0 | 31/10/08 | Emissione per approvazione | DV | DL | YE |
| REVISIONE | DESCRIZIONE | | | EL. | APP. |

**MINISTERO DELLE INFRASTRUTTURE E DEI TRASPORTI
MAGISTRATO ALLE ACQUE**

**NUOVI INTERVENTI PER LA SALVAGUARDIA
DI VENEZIA**

LEGGE N.798 DEL 29-11-1984

CONVENZIONE REP. 7191 DEL 04-10-1991

ATTO ATTUATIVO REP. 8249 DEL 28-12-2007 (PROGETTAZIONE)

**INTERVENTI ALLE BOCCHE LAGUNARI PER LA
REGOLAZIONE DEI FLUSSI DI MAREA**

CUP: D51B02000050001

PROGETTO ESECUTIVO

WBS: LN.L1.50

**BOCCA DI LIDO: SAN NICOLO' - TREPORTI
IMPIANTI**

**MEZZI PER LA RIMOZIONE DEI SEDIMENTI
SPECIFICA TECNICA - IMPIANTO DI GENERAZIONE,
DISTRIBUZIONE E UTILIZZO ENERGIA ELETTRICA,
AUTOMAZIONE E POSIZIONAMENTO DINAMICO -
APPENDICE D - STRUMENTAZIONE**

| | | |
|--|---|--------------------------------|
| ELABORATO D. Zanisco | CONTROLLATO D. Lesina | APPROVATO Y. Eprim |
| N. ELABORATO MV146P-PE-GES-2005-C0 | CODICE FILE MV146P-PE-GES-2005-C0.doc | DATA 31 Ottobre 2008 |

CONSORZIO "VENEZIA NUOVA"

COORDINAMENTO PROGETTAZIONE

VERIFICATO:

S. Pastore

CONTROLLATO:

M.T. Brogato



CONSORZIO VENEZIA NUOVA


PROGETTAZIONE

ING. ALBERTO SCOTTI

IL RESPONSABILE


PROGETTAZIONE
SPECIALISTICA



| | | | | |
|---|---------|----------------|--|-----------|
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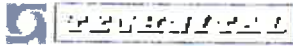
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1. SCOPO DEL DOCUMENTO

La presente Appendice riporta informazioni tecniche relative ai seguenti componenti della strumentazione, con caratteristiche simili a quelle riportate nella Specifica N. MV146P-PE-GES-2001:

- Radar
- Bussola magnetica
- Girobussola
- Ecoscandaglio
- AIS
- Solcometro
- Anemometro
- Impianto rivelazione e allarme incendio



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2. RADAR

JRC

MULTI-FUNCTION RADAR JMA-3910 / JMA-3925

(3cm, 6ft antenna, 10kW, 15" display, 96 NM) (3cm, 6ft 9ft antenna, 25kW, 15" display, 120 NM)

For Merchant Ships

- Superb target detection and simple operation
- Sharp, blur-free display in stabilized course-up mode
- Radar-plotter combined mode suited for coastal navigation
- Most advanced radar designed to IMO-ATA/EPA





XXXXXXXXXXXXXXXXXXXX

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RADAR/ATA MODE

(ATA function is an option.)

• Superb target detection

Small targets in short to long ranges can be clearly detected and displayed.

The latest signal processing technology provides improved performance in sea clutter and rain/snow clutter, ensuring an extremely easy-to-see radar display.

• Stabilized course-up mode (Stabilized relative bearing display)

In the stabilized course-up mode, the radar presents no blurred echo due to the ship's turning or yawing, but a sharp echo video.

• One-touch operation by presetting parameters

Various parameters to match the sea situation are preset in the radar, so that the user can be released from complicated adjustment against sea and rain/snow clutter. The optimum video is available by one-button operation.

• Designed to IMO-ATA/EPA

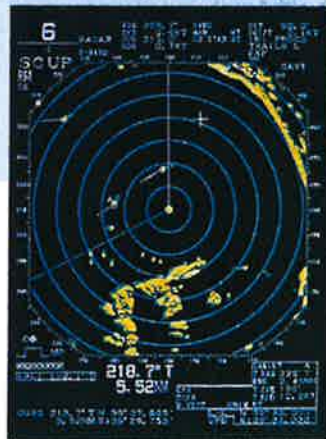
By fitting it with the optional ARPA unit (NCA-840), the radar can be operated as an ATA-specified ARPA (automatic radar plotting aid) system that enables automatic tracking of up to 30 targets.

• Ship's trail display (trail afterimage memory)

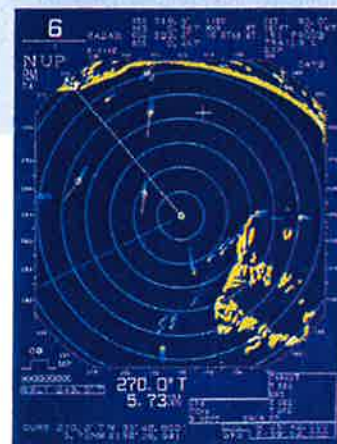
The movements of other ships can be monitored at a glance by display of real-time trails and afterimage trails.

• Easy operation

The operability of the radar is substantially improved by using a track ball and large control knobs for EBL (electronic bearing line) and VRM (variable range marker).



Display of trails of other ships in stabilized course-up mode



Display of trails of other ships in north-up mode

RADAR/PLOTTER-COMBINED MODE

* Plotter function is an option *

In the radar/plotter-combined mode, synthetic displays such as coastlines and other marks and symbols are overlaid on the radar video, so that all necessary navigational information can be displayed on a single screen. This combined mode is effective, especially in coastal navigation and entering or leaving a port.

- **Overlay display of coastlines on radar video**

By inserting the JRC coastline ROM card into the equipment, coastlines and depth contour lines can be overlaid on the radar video. This function can be used effectively not only in coastal navigation and entering or leaving a port, but also very useful to prevent the ship from stranding.

- **Display of own ship's track**

Own ship's track can be displayed in 7 colors and its memory capacity is 20,000 dots. This function is very effective to record own ship's tracks and for safety of navigation.

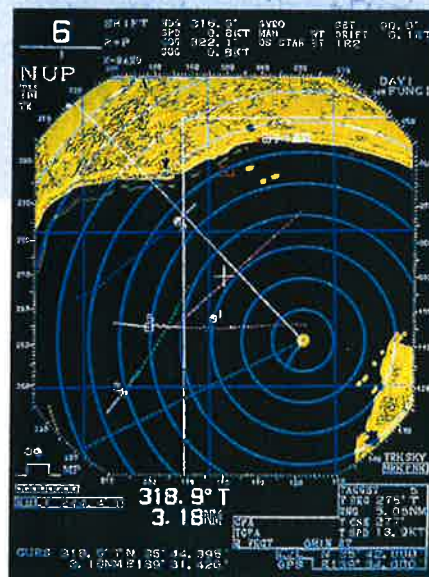
OPTIONAL EXPANDED PLOTTER FUNCTIONS

- **Display of other ship's trail**

The ATA/Plotter function (option) enables the tracks of up to 10 other ships to be displayed by thin lines in 7 different colors with up to 800-dot tracks per ship. So the movements of other ships can be monitored at a glance.

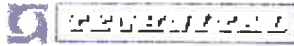
- **Route setting for safety of navigation**

Up to 10 routes can be preset, and alarms for cross-track-error and arrival at destination can also be displayed. This function is different from the normal plotter mode and own ship can be maneuvered while monitoring the movements of other ships on the radar screen.



Overlay display of coastlines and other ship's tracks on radar display in ATA/Plotter combined mode

In operation in the combined mode, it is required to connect the radar to other navigational equipment such as a GPS receiver and a gyrocompass



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PLOTTER MODE

(Plotter function is an option)

- **Highly accurate position fixing by DGPS**

A JRC DGPS or GPS receiver can be connected directly to the radar equipment in order to fix the highly accurate own ship's positions.

- **Coastline ROM**

The coastline ROM stores names of places, navigational marks and signs, and depth contour lines. The detailed data as is equivalent to a chart can be displayed on the 15-inch high-resolution CRT display.



Display of coastlines in plotter mode

- **Navigational data**

The navigational data made up by the user can be stored in the internal memory with the capacity of 20,000 dots including own ship's track. This data will be useful for safe navigation and data management for ship maneuvering.

- **Instant switching of up to 10 scales**

In the plotter mode, 10-step scales preprogrammed independently from radar ranges can be selectively displayed. The smooth and continuous scaling of 1/1,000 to 1/10,000,000 are also available.



GPS receiver
GPS100
(Option)

Differential GPS receiver
DGPS200
(Option)



CHART ROM CARD



MEMORY CARD CDD-611



WORLD BACK GROUND
CARD CDD-630

Multi-function Radar

JMA-3910 / JMA-3925

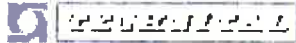


Specifications

| Specifications | Model | JMA-3910-6 | JMA-3925-6 | JMA-3925-9 |
|----------------------|-------|---|---------------------------------|---------------------------------|
| General | | | | |
| Frequency band | | X band (3 cm) | X band (3 cm) | X band (3cm) |
| Antenna length | | 8 feet | 8 feet | 9 feet |
| Transmitting power | | 10 kW | 25 kW | 25 kW |
| Display type | | 15-inch color CRT | 15-inch color CRT | 15-inch color CRT |
| Maximum range | | 98 NM | 120 NM | 120 NM |
| Scanner Unit | | | | |
| Model | | NKE-1055-6 | NKE-1056-6M | NKE-1056-3M |
| Beam width | | Horizontal 1.2° Vertical 25° | Horizontal 1.2° Vertical 25° | Horizontal 0.8° Vertical 25° |
| Pulse length | | 0.08, 0.2, 0.4, 0.8 1.2 μs | 0.08, 0.2, 0.4, 0.8 1.2 μs | 0.08, 0.2, 0.4, 0.8 1.2 μs |
| Rotation speed | | 24 rpm | 24 rpm | 24 rpm |
| Weight | | 31 kg | 35 kg | 44 kg |
| Dimensions (mm) | | W1890xH440xD437 | W1890xH519xD508 | W2830xH519xD508 |
| Display Unit | | | | |
| Model | | NCD-3780-2 | | |
| Display type | | 15-inch square color CRT upright type (with automatic magnetic erasing) | | |
| Effective diameter | | 180 mm or more | | |
| Range scales | | 0.125 to 96 NM | 0.125 to 120 NM | |
| Modes | | Radar mode, radar/plotter-combined mode and plotter mode | | |
| Presentation mode | | True Motion (TM)/Relative Motion (RM) | | |
| Bearing presentation | | Head-up/Course-up/North-up/Stabilized course-up | | |
| Coastline data | | JRC coastline ROM card/C-MAP® card | | |
| Own ship's track | | 7 display colors and memory capacity of 20,000 dots | | |
| Weight | | 34 kg | | |
| Dimensions | | W370 x H452 x D182 mm | | |
| Power supply | | | | |
| Power voltage | | 24 VDC | | |
| Power consumption | | 230 W | 250 W | |
| Rectifier unit | | NSA-3306 (option) 100/110/115 VAC or 200/220/230 VAC, 50/60 Hz, single-phase | | |

Specifications

| | ATA Unit, NCA-840 (Option) | Plotter Unit, NDB-32 (Option) |
|--------------------------|--|--|
| Target acquisition: | Manual/automatic (by guard ring) | Chart display: Mercator's projection |
| Number of targets: | 30 targets | Reduced scales: 1/1,000 to 1/10,000,000 in 10 steps or continuous |
| Tracking range: | 32 NM | Memory capacity: 20,000 dots including own ship's track, marks and lines |
| Dangerous target alarms: | Audible/visual by setting CPA/TCPA | Waypoints: Up to 99 points, with arrival and cross-track error |
| Other ship's track: | Up to 10 ships, 800 dots per ship, in 7 different colors | Routes: 10 routes, approach and course deviation alarms |



Scanner Units

JMA-3910-6
6-foot Scanner unit

JMA-3925-6
6-foot Scanner unit

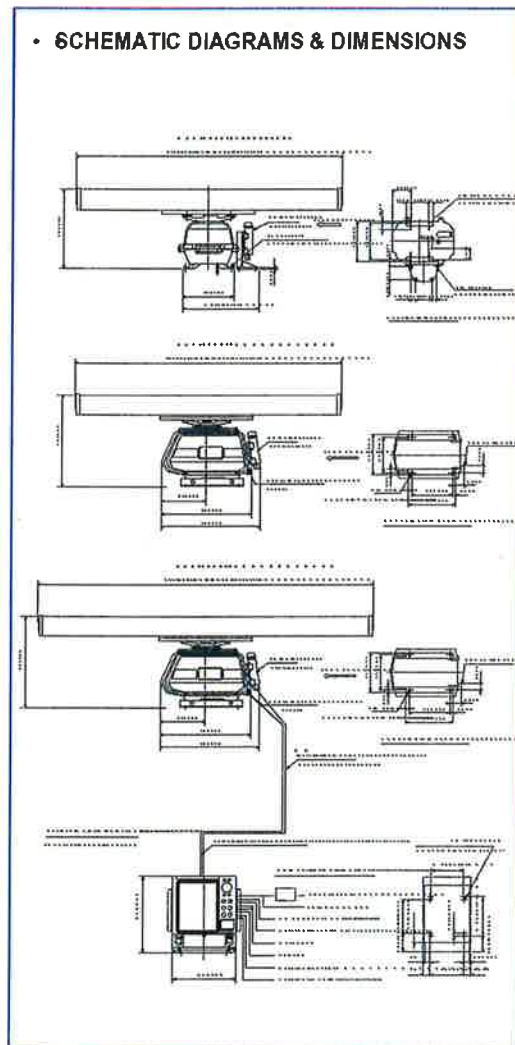
JMA-3925-9
9-foot Scanner unit

COMPOSITION

| Component | Model | Quantity |
|---------------------|-------------|-----------------------------|
| Scanner Unit | NKE-1055-6 | One unit of the models left |
| | NKE-1056-6M | |
| | NKE-1056-9M | |
| Display Unit | NCD-3780-2 | 1 |
| Performance monitor | MJU-64 | 1 |
| Installation Cable | CFQ-8681-15 | 1(15m) |
| | 2695111160 | 1(PM Unit) |
| Standard Spares | 6ZPRD00193 | 1 kit |
| Instruction Manual | 7ZPRD0439 | 1 copy |

Options

| | |
|--------------------|--------------------|
| ATA Unit | NCA-840 |
| Printer Unit | NDB-32 |
| Installation Cable | CFQ-8681-20 (20 m) |
| Installation Cable | CFQ-8681-30 (30 m) |
| AC Rectifier unit | NBA-3309 |
| OGPS Receiver | OGP-5200 |
| GPS Receiver | GPS100 |



For further information, contact:



Japan Radio Co., Ltd.

Since 1915

JRC Homepage <http://www.jrc.co.jp/>

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Singapore, Jakarta, New Delhi, New York, Rotterdam,

Piraeus, Las Palmas



ISO 9001

Certificate No.
JQA-0691

Certificate No.
FM 30249



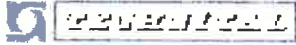
3. BUSSOLA MAGNETICA

NORTHROP GRUMMAN

Magnetic Compass Systems



Sperry Marine

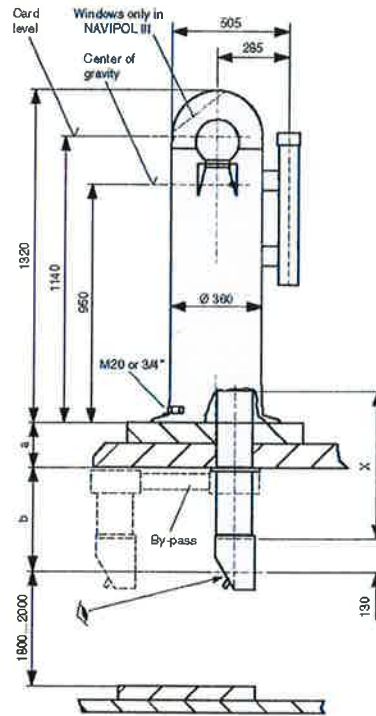


Magnetic Compass Systems

The Sperry Marine Magnetic Compass System

Sperry Marine manufactures its own magnetic compasses and binnacles. The wide range of equipment offered by the comprehensive Sperry Marine Magnetic Compass System program includes aluminium alloy binnacles, the legendary **Jupiter** magnetic flat glass compass, a flux-gate pick-off with an integrated sine/cosine interface, by-pass arrangements, azimuth devices, electronic compasses and magnetic compass autopilots (TMC). All of these products are manufactured to Sperry Marine's well-known high standards.

The NAVIPOL Magnetic Compass Binnacles



NAVIPOL I Standard and Steering Compass Reflector Binnacle

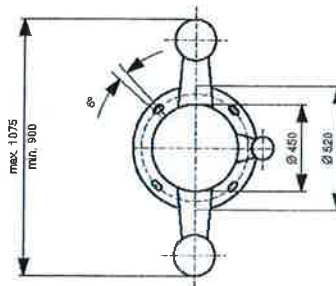
The length of the reflector tube is determined by $x = a + b$
Reflector tubes are available in the following lengths

- 1000 mm
- 1500 mm
- 2000 mm

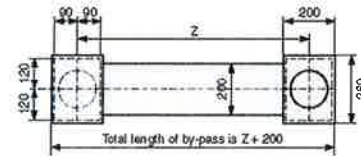
NAVIPOL II Standard and Steering Compass Binnacle

NAVIPOL III Steering Compass Binnacle with Window

NAVIPOL IV Standard and Steering Compass Reflector Binnacle with a By-pass Arrangement



All dimensions in mm



$a + b + Z = \text{max. } 4000 \text{ mm}$
 $Z \text{ minimum} = 410 \text{ mm}$

Technical Data

Standard power supply 230 VAC or 115 VAC or 24 VDC

Emergency power supply 230 VAC or 115 VAC or 24 VDC

Weight 60 kg

All binnacles are supplied with a **Jupiter** magnetic compass, a dimmer and B, C, D and Flinder's bar correctors.

Optional: Protective cover, set of additional B and C compensating magnets, replacement parts kit, azimuth device PV 24.

Cover photo of „Altonia“
by courtesy of
Peter Döble Schiffabrits-KG



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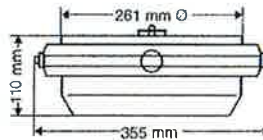
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Sperry Marine

The JUPITER Flat Glass Magnetic Compass



Dimensions



JUPITER is an Over-head Mounting Bracket

Bearing compass, steering compass, reflector compass and overhead compass for large vessels. A "class A" compass with a card diameter of 180 mm. It meets ISO 449 standards and is type approved in accordance with the EC Council Directive 96/98/EC. Further type approvals for many other countries are available on request. The **Jupiter** compass may be installed in all NAVIPOL binnacles and its accuracy is better than 0.5°. Weight: 8.7 kg.

Options include: flux-gate pick-off, shadow pin, wooden transport box, replacement parts kit, azimuth device.

The Flux Gate with the Integrated Sine / Cosine Interface

The Sperry Marine flux gate is an in-house development which combines modern electronic technology with SMD manufacturing techniques to produce a very compact unit which also incorporates a fully integrated sine/cosine interface.

Technical Data

| | |
|--------------------|---|
| Power requirements | 12 V ± 20% |
| Power rating | 40 mA |
| Output voltage | ± 3.75 VDC (variable ± 1.5 V to ± 4 V) |
| | two channels sine and cosine and a reference output |



Integrated circuitry with sinusoidal interface in SMD technology.



| | |
|-------------------|---------|
| Dimensions | |
| Body | 70 mm Ø |
| Height | 34 mm |
| Mounting base | 80 mm Ø |

An adapter kit is available for attachment to non Sperry Marine compasses.

Type approved in accordance with the EC Council

Directive 96/98/EC in combination with a JUPITER magnetic compass.

An Electronic Compass with an automatic total compensation feature is also available from Sperry Marine. Heading output format is NMEA 0183 to 0.1° resolution, Accuracy 0.2° RMS. Dimensions: body 120 mm Ø, height 104 mm; mounting base 162 mm Ø.

Universal Digital Repeater

The Universal Digital Repeater in combination with an autopilot indicates the corrected magnetic compass heading through the RS 422 magnetic compass heading output from the autopilot. The Universal Digital Repeater is available as a console version and in a watertight housing with bracket attachment. Type approved in accordance with the EC Council Directive 96/98/EC.



Environmental

| | |
|-------------------|-----------------------------|
| Temperature range | -26°C to +70°C |
| Vibration | 2 Hz to 100 Hz to IEC 60945 |
| Protection grade | front IP 65 to DIN 40050 |
| | rear IP 23 to DIN 40050 |

Power Requirements

18 to 36 VDC

Power Consumption

7 W

Signal Input

one RS 422 input

Protocols NMEA 0183

C. Plath

Lehmkuhl

NAVIPILOT

Course to Steer Indicator

steer

Status Input

one RS 422

Signal Output

Protocols VDR

Status Output

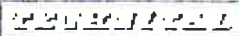
open collector, rating 50 V / 500 mA. Status change according to speed input (threshold can be set in the setup menu).

Dimensions and Weight

| | | |
|---|--------|--------|
| Console Version | Width | 158 mm |
| Front plate 96 mm x 96 mm to DIN Standard | Height | 155 mm |
| Depth | Depth | 154 mm |
| Weight | Weight | 1.0 kg |

Watertight Housing with Bracket Attachment

| | |
|--------|--------|
| Width | 158 mm |
| Height | 155 mm |
| Depth | 154 mm |
| Weight | 1.0 kg |



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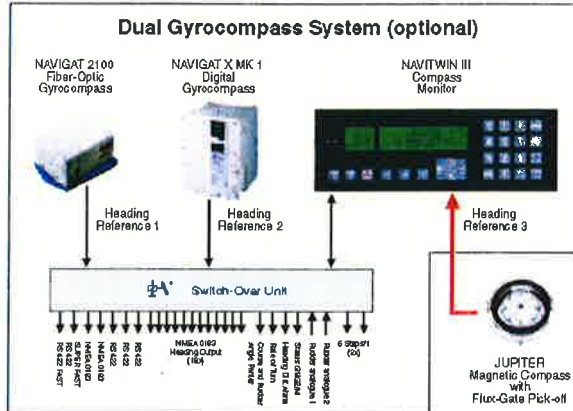
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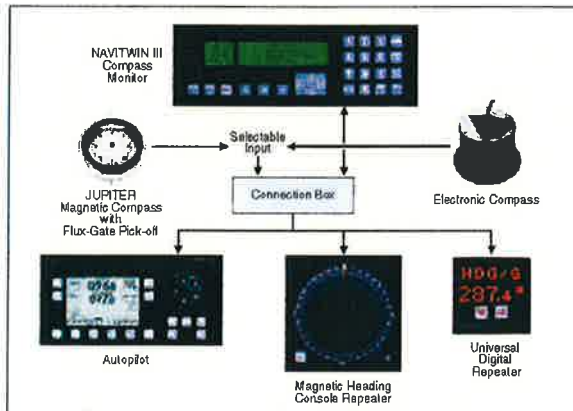


Back-Up Heading Function



A **Jupiter** magnetic compass with a flux-gate pick-off, combined with a NAVITWIN III Compass Monitor, provides an ideal independent back-up heading source in gyrocompass systems for distribution to autopilots, repeaters, radars and other peripheral appliances.

Single Heading Reference Source (TMC)



Configured with a NAVITWIN III Compass Monitor, a **Jupiter** magnetic compass with a flux-gate pick-off will provide an accurate heading source for autopilots and repeaters for the smaller vessel.

Sperry Marine

www.sperrymarine.northropgrumman.com
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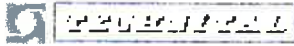
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Fax: +49-40-299-00-146
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Sperry Marine
ServiceNet
Over 400 Locations Worldwide

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|---|---------|----------------|--|------------|
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4. GIROBUSSOLA

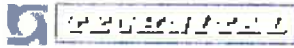
NORTHROP GRUMMAN

NAVIGAT X MK 1 Microprocessor Controlled Digital Gyrocompass System



The Leader in the Advanced Technology Class.

Sperry Marine



| | | | |
|---------|----------------|---|------------|
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DESIGN AND STANDARD FEATURES

With an eye on the fast approaching shipboard navigation and control system technologies of the 21st century, Sperry Marine has created a generation of advanced marine gyrocompasses: NAVIGAT X MK 1

The first of its type to be designed as a single unit and of unparalleled compactness in a polyurethane hard foam housing is of low weight and allows this gyrocompass to be installed on any bridge, from large yachts to the most capacious merchant marine vessels.

Ship's cables are connected directly to terminals within the housing, facilitating installation. All electronic components are plug-in modules, thus providing fast and easy service. Digital heading information is derived as an absolute value from a 12 bit shaft encoder. The NAVIGAT X MK 1 has a control and display unit installed in the front access cover. When required, the control and display unit can be removed from the housing and installed at a location (e.g. bridge console) remote from the gyrocompass.

Standard Features

- Comprises one single unit.
- Control and display unit in front cover with 4-digit heading display and 6 operating keys.
- Easy to install and easy to service.
- High-speed follow-up system 100°/sec.
- Type approved rate-of-turn output.
- Automatic static north speed error correction.
- Integrated TMC interface.
- Compass monitor function.
- Highly accurate digital heading data transmission by shaft encoder.
- Self-synchronizing repeater compasses.
- ±180° electronic alignment error correction in setup program.
- Can be installed at any location.
- Will drive a maximum of 12 analogue repeaters.
- 180° heading offset function for shuttle vessels.
- 7 independent serial outputs RS 422 & IEC 61162-1.
- 2 independent 6 steps/° heading outputs (0.5 A).
- Complies with IMO regulations A.424 (IX), A.694 (17), A.821 (19) - HSC (High-Speed Craft) and ISO 8728.
- Outputs to Voyage Data Printer:
 - Heading
 - Heading source gyro/magnetic
 - Rudder angles of two independent rudders.

- Complies with NAUT-AW.
- Insensitive to horizontal acceleration.
- Twin rotors and liquid damping system eliminates latitude error.
- High MTBF (mean time between failures) and low power consumption.
- All repeater compasses with serial interface.
- Automatic emergency power changeover and status alarm.
- Gyro system remains north stabilized during power interruptions of up to 3 minutes.
- Single point suspension of the gyrosphere container eliminates the well-known adverse effects associated with gimbals.
- Monitoring and alarm functions for all voltages, gyroscope current and follow-up system.

The unique method of supporting the now enhanced well-proven Sperry Marine gyrosphere by means of mere buoyancy ensures north stabilization during short power failures. For example, after a three minute gyrocompass power failure, no more than two degrees of deviation may be expected. Once power has been restored, the gyrocompass will return quickly to the correct heading without requiring the usual settling period. The combined effect of the twin rotors and the liquid damping system prevent latitude error. For operation in extremely heavy seas where highly accurate heading information is absolutely essential, the NAVIGAT X MK 1 Mod. 7 gyrocompass, equipped with a special gyrosphere container, is recommended. Here, the unique centering pin retaining arrangement for the gyrosphere is mounted in an additional gimbal system, which allows the NAVIGAT X MK 1 Mod 7 gyrocompass an almost unlimited freedom of roll and pitch (±90°).

NAVIGAT X MK 1 has been type approved in accordance with EC Council Directive 96/98/EC by the German Federal Maritime and Hydrographic Agency (BSH). A special version, NAVIGAT X MK 1 HSC, is available to meet the demands of high-speed craft.

NAVIGAT X MK 1 HSC has been type approved to the High-Speed Craft Code in accordance with EC Council Directive 96/98/EC by the German Federal Maritime and Hydrographic Agency (BSH). The rate-of-turn outputs of NAVIGAT X MK 1 and NAVIGAT X MK 1 HSC have been type approved by the German Federal Maritime and Hydrographic Agency (BSH) to EC Council Directive 96/98 EC (Wheelmark) and also fulfills IMO resolution A.526 (13).

Options and Accessories

- Automatic dynamic north speed error correction.
- Remote control unit Compass Monitor NAVITWIN III for additional operational convenience.
- Magnetic compass with flux gate.
- Analogue and digital repeaters.
- Voyage Data Printer NAVIPRINT.
- Conventional, adaptive and high-speed code autopilots
- Rudder angle feedback units.
- Electromagnetic speed log.
- Electronic compass with IEC 61162-1 interface.

Inputs and Outputs for all Basic Systems

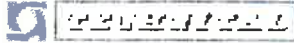
Inputs

- Position lat./lon. in IEC 61162-1*
- Speed in IEC 61162-1 or 200 pulses/nm*
- Rudder angle, analogue.
- Rate-of-turn time constant from external selector.
- Sine/cosine from magnetic compass flux-gate.
- Heading in IEC 61162-1 from electronic compass.
- Steering mode status (auto/man) from selector switch.
- Power supply 115 - 230 VAC and/or 24 VDC.

Outputs

- 12 heading outputs in NMEA 0183 to serial repeaters.
- 2 outputs NMEA 0183 speed, magnetic heading.
- 2 outputs RS 422 gyro heading, ROT, lat./lon.
- 1 output heading, ROT in IEC 61162-1 EAST.
- 1 output heading, ROT in IEC 61162-2 SUPER EAST.
- 1 output status signal.
- 1 rate of turn.
- 1 output RS 422 to Voyage Data Printer with heading, rudder angle, time, lat./lon., steering mode, and speed.
- 1 output status gyro/magnetic.
- 2 6 steps/° heading outputs (0.5 A).

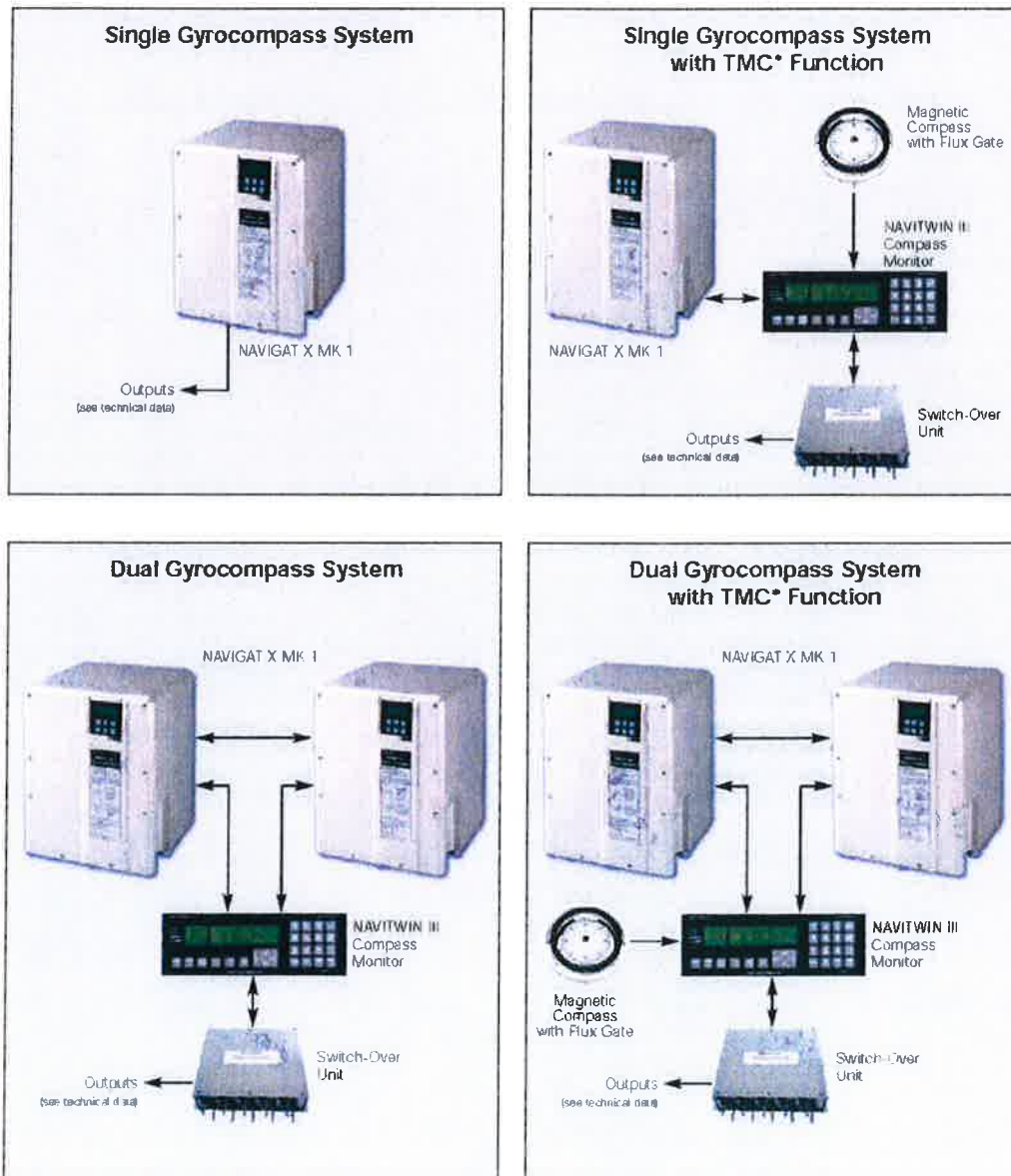
* Required for automatic north speed error correction only.



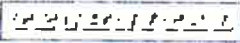
SYSTEM CONFIGURATIONS

Sperry Marine

NAVIGAT X MK 1 Digital Gyrocompass System with Automatic Static and Dynamic North Speed Error Correction



* In TMC systems, the Compass Monitor NAVITWIN III provides an independent back-up magnetic heading source for distribution to autopilots, repeaters, radars and other peripheral appliances when required. In Dual Gyrocompass TMC Systems an additional isolation amplifier is required.



NORTHROP GRUMMAN

Sperry Marine

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Fax: +45-77-33-66-11
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Fax: +47-55-34-52-27
United Kingdom, New Malden
Tel: +44(0)-20 8329-2000
Fax: +44(0)-20 8329-2415

Performance

Linear mean settle point error < 0.1° secant latitude
Static error < 0.1° secant latitude
Dynamic error < 0.4° secant latitude
Performance in accordance with IMO A. 424 (XI), A.694 (17), IMO A. 821 (19) and ISO 8728

Freedom of Roll and Pitch

NAVIGAT X MK 1 Mod. 7 ±90°
NAVIGAT X MK 1 Mod. 10 ±40°

Power Requirements

24 VDC (18 V to 36 V)
and/or 115/230 VAC ±10% 50 Hz / 60 Hz
The single-unit gyrocompass includes automatic switch-over to 24 V emergency power supply in accordance with GMDSS Rules for INMARSAT/SES Terminals.

Data Outputs

- NMEA TTL 12 outputs of gyrocompass heading, magnetic compass heading, rate of turn, heading reference status to repeaters, radar, navigation systems.
- Sensor data 4 outputs of gyrocompass heading, magnetic compass heading, ROT, position, speed, hdg. ref. status.
- RS 422
- IEC 61162-1 1 output of gyrocompass heading, magnetic heading, rate of turn, heading reference status.
- Fast
- RS 422 2 outputs of gyrocompass heading, magnetic compass heading, rate of turn, heading reference status.
- Superfast
- IEC 61162-1 or IEC 61162-2, selectable
- RS 422 1 output to Voyage Data Printer: heading, rudder angle, hdg. ref. status, hdg. diff. alarm threshold, north speed error corr., mag. variation, steering mode, date/time, speed, position.
- 6 steps/° 2 outputs of heading. Internal supply 24 VDC, 18 W; external supply 12 VDC to 70 VDC, min.
- Rate of turn 1 selectable output of ± 30°, 90° and 300°/min., or customized ±0.1 to 999.9 mV°/min. (± 10 V, 10 mA max.).
- Status signals 1 each for: Gyro 1, Gyro 2, Magnetic, AC power, DC power.
- Alarm signals 1 each for: watch alarm, hdg. diff., max. ROT exceeded, power failure & general device error.

Data Inputs

- Position 1 IEC 61162-1
- Speed 1 IEC 61162-1 or 200 pulses/nm
- Rudder angle 2 analogue from feedback unit.
- Rate-of-turn time constant 1 from external selector.
- Heading from 2nd gyro 1 IEC 61162-1, C.PLATH format

- Magnetic compass heading: from flux-gate 1 sine and cosine.
- or
- from electronic compass 1 IEC 61162-1
- Steering mode status 1 Man/Auto from selector.
- External heading source status 1 Gyro/Mag: G1/G2 from selector.

Operational Data

- Ambient temperature range operation -10°C to +55°C storage -25°C to +70°C (without supporting fluid)
- Settling time 3 hours (0.7°)
- Maximum deviation after a power interruption of 3 min. 2°
- Gyrocompass follow-up rate 100°/sec.
- Heading display digital with 4 digits
- Power failure alarm visible and audible and potential-free contact, max. current 2 A, max. voltage 250 V
- Mean time between failure 40 000 hours (MTBF)
- North speed error correction: standard: static, input IEC 61162-1, or manual. optional: dynamic, input IEC 61162-1, or manual.
- Built-in test equipment standard

Power Consumption

| | DC | AC |
|---------------------------------|------|--------|
| Start-up | 80 W | 125 VA |
| Operation | 45 W | 75 VA |
| Each analogue repeater | 7 W | 7 VA |
| Each universal digital repeater | 7 W | 7 VA |

Protection Grade

Gyrocompass IP 23
in accordance with DIN 40050

Environmental Requirements and EMC

in accordance with EN 60945 (IEC 945 + AL)

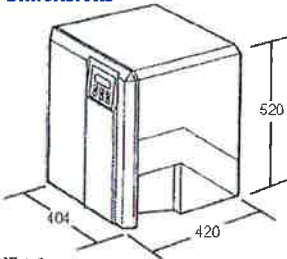
Magnetic clearance to

| | |
|---------------------------|-------|
| standard magnetic compass | 0.6 m |
| steering magnetic compass | 0.4 m |

Reduced magnetic clearance to

| | |
|---------------------------|-------|
| standard magnetic compass | 0.3 m |
| steering magnetic compass | 0.3 m |

Dimensions



Weight

| | |
|------------------------|-------|
| NAVIGAT X MK 1 Mod. 10 | 25 kg |
| NAVIGAT X MK 1 Mod. 7 | 23 kg |

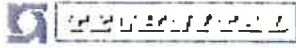
Sperry Marine, with worldwide headquarters in Charlottesville, VA, and major engineering and support offices in Melville, NY, New Malden, England, and Hamburg, Germany, is part of the Northrop Grumman Electronic Systems sector.

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Over 400 Locations Worldwide



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5. ECOSCANDAGLIO

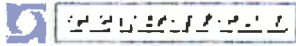
JFE-680 Echo Sounder

Consorzio Venezia Nuova
Magistrato alle Acque di Venezia

Il prodotto JFE-680 è un echoscandaglio a ultrasuoni a fascio largo, progettato per applicazioni di monitoraggio ambientale e di ricerca scientifica. È dotato di un display a colori che visualizza i dati in tempo reale, consentendo di analizzare la struttura e la composizione del fondale marino, nonché la presenza e il movimento di organismi marini. Il sistema è robusto e resistente alle condizioni operative in ambiente marino.

Per informazioni e richieste di vendita, contattare il nostro ufficio.

Japan Electric Co., Ltd.
Anno 1970



JFE-680 – performance features

Unique features

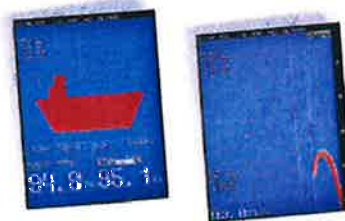
- The powerfully built, all-in-one JFE-680 echo sounder integrates advanced depth data technology, displaying sub aqua conditions with startling effectiveness.

Display modes

JRC's new standard in navigation echo sounding incorporates a 10.4" high visibility colour TFT display. The innovative display modes allow you to select and view echoes in 8 colours or 8 levels of monochrome. The all-in-one JFE-680 echo sounder has a system-integrated thermal printer, providing the ship's log with valuable printouts if required.

Depth data management

JRC's enhanced depth data technology has three central presentation modes, i.e. standard, history and docking. Both standard and docking mode provide a wide range of information. This is stored in the memory for up to 24 hours. The history mode allows you to retrieve all memorised depth data to provide complete feedback.



StarNetwork™

JRC has been providing sales and support of products since 1915! Today, JRC offers comprehensive support through its organisation, in partnership with a world-wide StarNetwork™ of over 270 fully qualified agents, giving support 24 hours a day, 7 days a week, and 365 days a year!



JFE-680 echo sounder – dedicated one-screen p



JFE-680

- dimensions and weights

IMO compliant

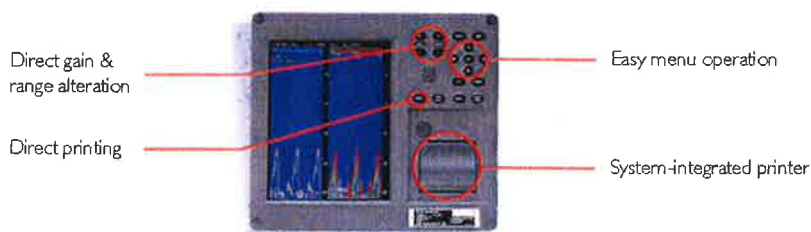
The JFE-680 provides detailed depth information and meets the IMO performance standard. All passenger ships and cargo ships exceeding 300GT are required to have a type approved echo sounder onboard. In addition, JRC is continuously developing and evaluating new products, based on future IMO requirements, that will contribute to your future safety and navigation at sea.

Flexible installation

The JFE-680 can be easily installed thanks to the integrated connection box and printer. The echo sounder can be used with one or two transducers, 50 kHz and 200 kHz, allowing you to operate both frequencies independently or simultaneously.

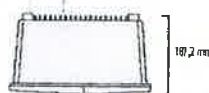
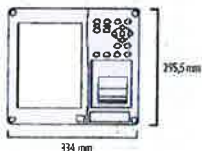
Enhanced ergonomics

Among a wide range of new features, such as the various screen display options and paperless functionality, the JFE-680 echo sounder is suited to any number of operational criteria, thus continuing the tradition of enhanced user-friendliness and ergonomics.



Dimension drawings - Display

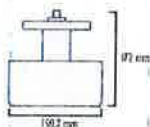
JFE-680 Weight 8 kg



Dimension drawings - Transducer, Matchingbox

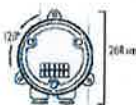
NKF-345 Weight 20 kg
(50 kHz)

NKF-341 Weight 22 kg
(200 kHz)



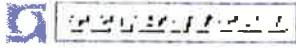
AW-154F-50 Weight 4 kg
(50 kHz)

AW-154F Weight 4 kg
(200 kHz)



resentation

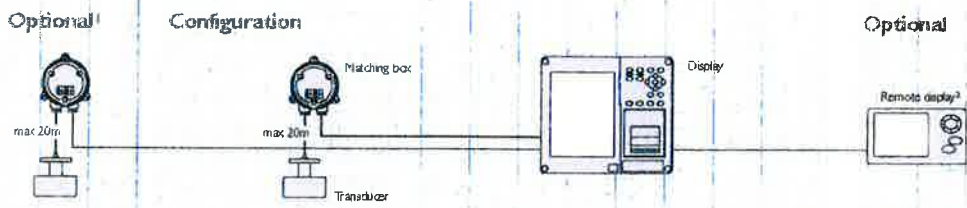
JRC Japan Radio Co., Ltd.



JFE-680 -- specifications

Configuration

The all-in-one JFE-680 echo sounder integrates both connection box and printer, contributing to easy configuration.



¹dual frequency or bow-stern is optional, 3-NWW-58

| | | |
|----------------------------|---|---------|
| Model | | JFE-680 |
| IMO compliant | | ✓ |
| Display/control unit | | |
| Display | 10.4" colour TFT LCD (480x640 dot) | |
| Echo colour | 8 colours or 8 levels mono colour | |
| Digital depth | 4 digits (0.1m) | |
| Display range | 10/20/50/100/200/500/990m | |
| Depth accuracy | ±2.5% | |
| Minimum sounding depth | 1m (200kHz) / 2m (50kHz) | |
| Draft adjust | 50m in 0.1m steps | |
| TX pulse repetition rate | 1/1PRR (10/20/50m) / 8xPRR (100/200m) / 43PRR (500/900m) | |
| Presentation mode | standard / history / docking | |
| Time range of echo display | 5/10/20/30min | |
| Auto function | gain / range | |
| Alarm function | depth (shallow depth) / power failure / system error | |
| Preview function | 24hrs memory | |
| Image printer | built in (optional) | |
| TX | | |
| Frequency | 200kHz / 50kHz | |
| Output power | 200kHz : 1kW / 50kHz : 500W | |
| IO | | |
| IEC61162-1 input | NMEA0183 (ver1.5/2.3) / JRC / RMA / RMC / GLL / VTG / ZDA / GGA / ACK | |
| IEC61162-1 output | NMEA0183 ver1.5 (DBS / DBT / DBK) / ver2.3 JRC / (ALM / DPT) | |
| RS232C input | RS232C Interface for external printer NKG-91 (optional) | |
| RS232C output | RS232C Interface for external printer NKG-91 (optional) | |
| Power supply | | |
| DC | DC 24V -10% + 30% (used for power fail alarm only) | |
| AC | AC 100-115/200-230V ± 15%, 50/60Hz ± 5% | |
| Power consumption | ≤50W | |
| Environment | | |
| Operating temperature | -15°C + 55°C | |
| Humidity | 93% at 40°C | |
| Storage temperature | -25°C + 75°C | |
| Splash proof | IP<2 | |
| Construction (standard) | display control unit / printer / matching box / transducer | |

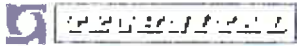
For further information please contact:

All specifications are subject to change without notification.



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6. AIS



- Fourth generation transponder technology with an extensive installed base. Selected OEM product by some of the most prominent systems integrators in the Marine Industry
- Unprecedented reliability through joint development and shared technology with Airborne products from Saab TransponderTech
- AIS solutions such as base stations and infrastructure from SAAB have been selected by the vast majority of maritime administrations and VTS operators worldwide. Interoperability guaranteed
- Developed to satisfy the most stringent usability requirements, featuring a user-friendly multi-purpose display unit. Outstanding interfacing capability and data validation ensure safe operation when connected to navigation sensors, radars and electronic chart systems

The mariner's preferred choice

AIS products from SAAB are specifically designed to support the mariner in mission-critical decision making. The R4 Class A transponder will satisfy all carriage requirements, but more importantly it will provide better situation awareness to the officer on watch. In the smaller vessel, the unique simplicity and versatility of the man-machine interface will allow the operator to carry out all important tasks required to operate the AIS system, using the multi-purpose display unit only. In the integrated bridge system, the R4 will feed reliable data to virtually any electronic chart system and/or radar, and thus vastly improve the quality of the information presented. Predefined safety-related text messages will assist in quickly notifying other ships and VTS stations in distress situations. Furthermore, the R4 vessel transponder offers unprecedented VHF radio coverage, thus allowing the mariner to see further ahead.

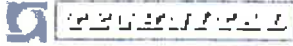
Users of SAAB AIS products have been providing us with feedback for years. This feedback is constantly used to further enhance our world-leading solutions.

The ship owner's preferred choice

When making a vendor selection for AIS, product reliability is a key decision criterion. There have already been cases where authorities have forced ships to stay moored due to a malfunctioning AIS Transponder, resulting in tremendous cost to the operator.

At Saab, we are well aware of this fact and have designed our products to the same principal qualities as the corresponding airborne systems manufactured by our company. Those systems have to fulfill the more stringent test specifications of the aviation industry. The result? AIS products that will exceed your expectations on reliability and maintainability. In the unlikely event of a system failure, all users of SAAB AIS technology supplied by SAAB or one of our OEM partners will have access to our comprehensive network of support partners worldwide.

In summary, we offer you the best solutions, featuring type approved technology, sold under all applicable licenses.



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APPENDICE D - STRUMENTAZIONE**Applications and key features**

- Standard AIS features fully implemented in accordance with relevant specifications and recommendations
- Highly versatile multifunctional display unit
- Integrates with external differential GPS receiver, gyro compass, speed log, chart systems and radars
- Large number of input and output ports to support highly complex and integrated bridge systems
- Channel management capability (regional AIS frequencies)
- Identifies and validates position data from older GPS receivers
- Easy access to standardized and proprietary safety-related text messages

- Fully upgradable to support future features
- Pilot plug integrated in display unit
- 1 W output power option when handling hazardous cargo
- Interoperable with Saab airborne AIS

Optional

- Silent and tactical mode for coast guards, blue forces and military applications
- Stand-alone DGPS and integrated GPS capability in accordance with latest standards
- GLONASS receiver
- Precabled low cost junction box
- Gimble or flush mounting

Physical

Transponder:
Size WxHxL 144x85x226 mm, Weight: 2.3 kg
Display
Size WxHxL 102x207x270 mm, Weight: 1.1 kg

Power

Input 24V DC (230/110 vac with converter)
Power consumption
Transponder 15W (50W peak)
Display 7.5W

GPS Receiver (AIS internal)

Receiver 12ch (Ready for DGPS)
Frequency L1 (1575.42 MHz)
Update rate: 1Hz
Position accuracy (SA off)
Position < 1 m DGPS (CEP)
Position < 16 m GPS (CEP)

Electrical Interfaces

8 data ports RS422
Port Default speed (bps) 1
Pilot In/Out 38400
ECDIS In/Out 38400
Long Range In/Out 9600
Sensor 1 In 4800
Sensor 2 In 4800
Sensor 3 In 4800
Aux In 9600
Display In/Out 57600

Connectors

Transponder data port: 50 pin D-sub (M)
Transponder power: 9 pin D-sub (M)
GPS antenna connector TNC female (50 Ω)
VHF antenna connector BNC female (50 Ω)
Display data port: 18 pole Connall Maxi-Con-X
Display power: 3-pole Mini-Con-X
Power and data interfaces to be connected on rail terminals or in junction box

Cables (recommended)

Antenna, VHF and GPS RG214/U
For sensors e.g. Gyro RFE-HFI 2x2x0.75 mm²
Transponder to Display RFE-HFI 4x2x0.75 mm²
Power cables Transponder LKM-HF 3x2.5 mm² and display

VHF Transceiver

Frequency 156–163MHz
Output power 2/12.5W (\pm 1.5dB)
Channel bandwidth 25/12.5kHz
Channel step 12.5kHz
Bit rate 9600bps
Intervals between position reports 1–180s
Modulation FM-GMSK/GFSK
Transmitter 1
Receivers 3
DSP Based Transceiver Sensitivity < -107dBm

Environmental

Protected environment (IEC 60945)
Operating temperature: -15°C to +55°C

Compliant with the following Standards

IMO Performance Standard for AIS (MSC 74(69) Annex 3)
ITU-R M.1371-1
IEC 61993-2 (Standard for Class A mobiles)
IEC 61162-1/2 Edition 2 (NMEA 0183, Version 3.0)

IEC 60945 (ed 4)

IALA Technical clarifications on ITU R. M.1371-1
IALA Guidelines on AIS

Type approvals

Wheelmark
CE Approval
FCC
USCG

For current national approvals,
see www.transpondertech.com

Membership Organizations

Specifications subject to change without notice

Dotazione nr 3000 100-0818

SAAB TRANSPONDERTECH AB

P.O. Box 4113, SE-171 04 Söina, Sweden
Tel +46 13 18 80 00 Fax: +46 8 627 49 49
Home page: www.transpondertech.se
E-mail: info@transpondertech.se
A subsidiary within the Saab Group



7. SOLCOMETRO

JRC

DOPLER SONAR

JLN-550

MED (EU Marine Equipment Directive) - Certificate Number: QQ-MED-07/03-01

*Stable Speed Display
in Dual Frequency Modes*



JRC *Japan Radio Co., Ltd.*

JLN-550

The JLN-550 Doppler Sonar is designed to provide ship speed information with higher stability in the dual frequency modes: one using a lower ultrasonic frequency that is adequate to measure the ship's speed against the ground up to larger depths and the other using a higher ultrasonic frequency that allows the ship's speed against the water to be measured even in water with tiny bubbles. The transducer is designed for dual-frequency transmission, but its size is smaller than the conventional models.

This equipment is designed to comply with the following Standards:

IMO A 824 (19)

Revised MSC.96(72), IMO A.694 (17), IEC61023:1999, IEC60945:2002 and IEC61162-1:2000

FEATURES

- Ship speed measurement is insensitive to bubbles generated in high-speed navigation, ensuring stable speed display.
- The transducer is substantially downsized, allowing it to be installed on the bow side that is little affected by bubbles.
- An underwater-mateable connector is adopted for the transducer, so that a transducer can be replaced at a quay even in case of its failure.
- The equipment is provided with an additional function of indicating the ship's fore and aft speeds and port and starboard speeds by entering GPS information.
- The ship's port and starboard speeds at its arbitrary position can be indicated by entering ROT information.
- An optimal Doppler sonar system can be configured by combining a variety of options.
- On-line maintenance (option) allows any failure to be detected during navigation.

SPECIFICATIONS

| | |
|---------------------------------|---|
| Operating system | 2-axis 4-beam pulse Doppler sonar or ROT-combined 3-axis 4-beam pulse Doppler sonar (ROT: option) |
| Operating frequencies | 240kHz (BT: for speed against the ground) 2MHz (WT: for speed against the water) |
| Speed range | BT Fore/Aft: -10,00 to +40,00 kts Port/Stb.: -9,99 to +9,99 kts Stern P/S: -9,99 to +9,99 kts (with optional ROT) WT Fore/Aft: -10,00 to +40,00 kts |
| Distance run range | 0 to 99999,99nm |
| Depth range | BT: 2 to 250m (below hull bottom) depending upon sea bottom conditions WT: 3m or more (below hull bottom) |
| Speed measuring accuracy | ±1% or ±0,1 kts whichever is greater |
| Total distance run accuracy | ±1% or ±0,1 nm whichever is greater |
| Ship speed indication | XX.XX 4-digit indicator (in kts or m/s) (P/S: 3-digit) Analog indication (in kts) |
| IEC61162-1 inputs (NMEA0183) | ROT (Stern P/S speed) **ROT (excl. GPROT) GPS (GPS ship speed) GGA, RMC, RMA, GLL, VTG GYRO (GPS ship speed) HDT, HDG |
| Data outputs | IEC61162-1: 2000 outputs: 5 circuits VBW, VLW, DPT, DBT DC voltage output: 2 circuits (for analog indicator) Opto coupler signal: 8 circuits (200 pulses/nm) Relay closure signal: 1 circuit (200 pulses/nm) Relay closure signal: 1 circuit (Power fail alarm) |
| Power supply | 100/110/115/220/230VAC ±10%, 50/60Hz, single-phase |
| Power consumption | 300VA or less |
| Operating temperature | -15 to +55°C |



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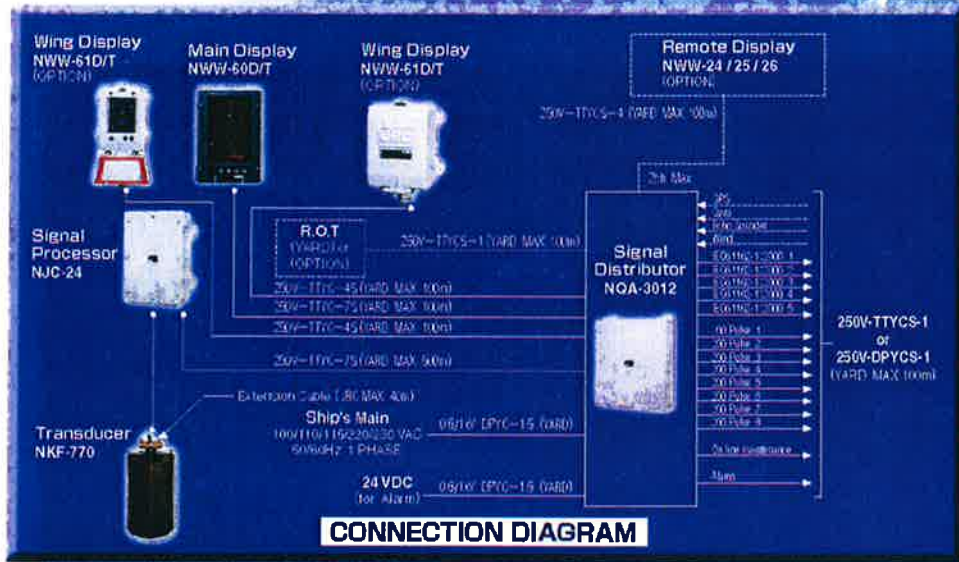
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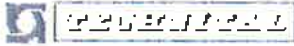


STANDARD COMPONENTS

| Description | Model | Quantity | Remarks |
|--------------------|-----------|----------|---|
| Main Display | NWW-60DB | 1 | DB: 2-axis flush mount type (standard) DA: 2-axis wall mount type TB: 3-axis flush mount type TA: 3-axis wall mount type |
| Signal Distributor | NQA-3012 | 1 | |
| Signal Processor | NJC-24 | 1 | IP55 |
| Transducer | NKF-770 | 1 | With underwater-mateable connector and max. 40m cable |
| Spare Parts | 7ZXBS0018 | 1 | |
| Instruction Manual | 7ZPBS2802 | 1 | English |

OPTIONS

| Component | Model | Quantity | Remarks |
|------------------|-----------|----------|---|
| Wing Display | NWW-61D | 2 | D: 2-axis, IP56 T: 3-axis |
| Remote Display | NWW-24 | 2 max. | Analog Flush-mount type |
| Remote Display | NWW-25 | | Analog wall mount type |
| Remote Display | NWW-26 | | Analog Flush-mount type |
| Distance Counter | NWW-7B | 1 | Flush-mount type |
| Gyro Sensor | NJZ-1080 | 1 | ROT |
| Operator Unit | NWZ-120GA | 1 | ROT, GA: Wall-mount type GB: Flush-mount type |
| Rectifier | NBA-3263 | 1 | ROT |
| Dimmer Unit | NCM-227 | 1 | For NWW-60 Main Display Unit |
| Dimmer Unit | NCM-329H | 1 | For NWW-24/25/26 Remote Display Unit |
| Transducer | NKF-770W | 1 | Inner demountable type |
| Transducer | NKF-772 | 1 | Gate valve type |



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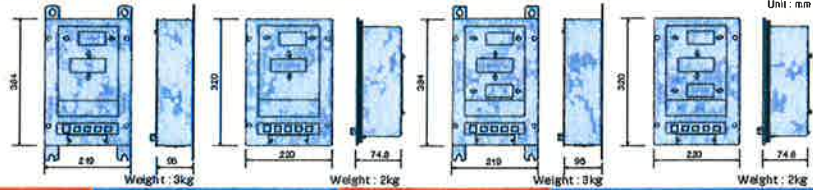
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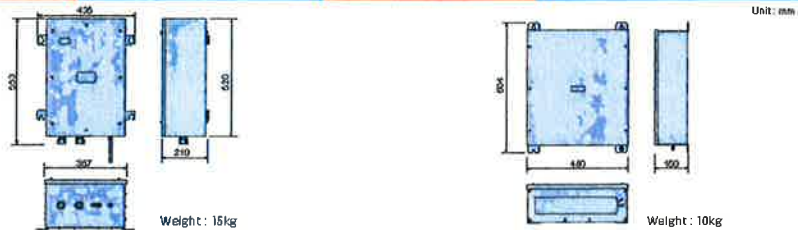
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DIMENSIONS & WEIGHT

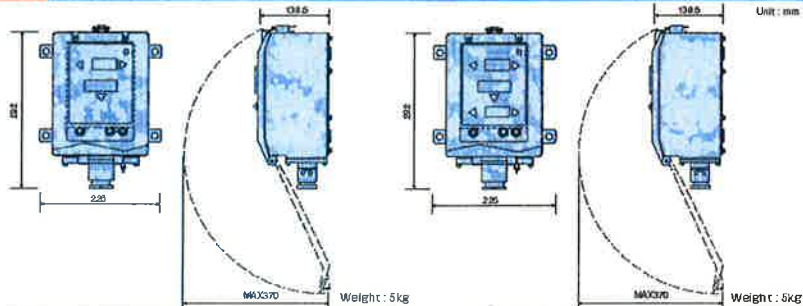
Main Display Unit **NWW-60DA** **NWW-60DB** **NWW-60TA** **NWW-60TB** Unit: mm



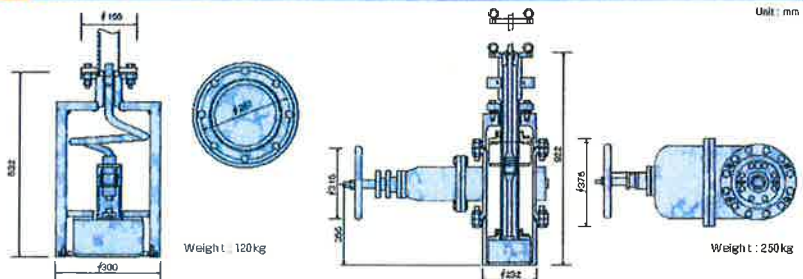
Signal Processor Unit **NJC-24** Signal Distributor Unit **NQA-3012** Unit: mm



Wing Display Unit **NWW-61D (option)** **NWW-61T (option)** Unit: mm



Transducer Unit **NKF-770** **NKF-772 (option)** Unit: mm



◆ Specifications and appearance may be subject to change without notice. For further information, contact:



Japan Radio Co., Ltd.

Since 1915

URL <http://www.jrc.co.jp/>

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8. ANEMOMETRO



WindObserver II

Wind Speed & Direction Sensor

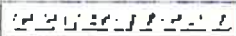
WINDOBSERVER II



ALL WEATHER SENSING TECHNOLOGY

- ULTRASONIC TECHNOLOGY
- MAINTENANCE FREE
- ROBUST CONSTRUCTION
- LLOYD'S TYPE APPROVAL
- LOW TEMPERATURE DE-ICING
- USERSELECTABLE OUTPUTFORMAT
- TRANSPORT SAFETY
- WIND TURBINE CONTROL
- SHIPDYNAMICPOSITIONINGSYSTEMS
- AIRCRAFT LANDING SYSTEMS
- METEOROLOGICAL SYSTEMS
- STRUCTURAL SAFETY

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WINDOBSERVER II - ULTRASONIC WIND SENSOR

The WindObserver II provides the best solution on the market for reliable, accurate and cost-effective wind speed and directional measurement. It combines the latest patented advances in ultrasonic technology together with Gill's fifteen years experience as the recognised world leading supplier of all-weather ultrasonic wind sensors. The elimination of moving parts, together with a rugged stainless steel construction means that WindObserver II is virtually maintenance free and requires no calibration on site. The heated head keeps the unit free from ice and snow, providing continuous use even in the most extreme weather conditions.

A new flexible design ensures that the WindObserver II can be configured by the user to their exact requirements, which

may include analogue outputs, 10 Hz output, heating or sonic temperature.

The Windows™ based WindCom communications package allows the user to operate the anemometer in various modes, permitting the measurement of U & V vectors or wind speed and direction. Communication is via an RS422 bidirectional link, which allows several units to be networked together and data to be logged on demand. The WindObserver II has been rigorously tested to internationally recognised standards and meets the stringent performance criteria specified by airport, marine, oil, production, meteorological and utility organisations around the world.

| | | | |
|--------------------------|---------------------------------------|-----------------------------------|--|
| DIMENSIONS | | ANALOGUE OUTPUT - OPTIONAL | |
| Size | 405mm x 210mm | Quantity | 3 (speed, direction, status or sonic temp) |
| Weight | 1.5kg | Scale | Multiples of ±10 m/s up to 70 m/s |
| MEASUREMENT | | Type | ± 2.5V, 0 - 5V or 4 - 20mA |
| Output | 1Hz, 4Hz, 10Hz | V output resistance | 60 Ohms |
| Parameters | UV, Polar, NMEA, Tunnel | 4 - 20mA loading | 10 - 300 Ohms |
| Units | m/s, Knots, MPH, KPH ft/min | MATERIALS | |
| Averaging | Flexible 1-3600 seconds | External Construction | Stainless Steel 316 |
| WIND SPEED | | ENVIRONMENTAL | |
| Range | 0 - 65 m/s (0 - 145mph) | Moisture Protection | IP66 (NEMA4X) |
| Starting Threshold | 0.01 m/s | Operating Temperature | -55°C to +70°C |
| Accuracy | 2% | Humidity | 5% to 100% RH |
| Resolution | 0.01 m/s | Precipitation | 300mm/hr |
| Offset | ± 0.01 m/s | EMC | EN 61000-6-2 : 2001 EN 61000-6-3 : 2001 |
| DIRECTION | | Icing | MILSTD883C Method 521.1 Procedure I |
| Range | 0 - 359° | WIND | |
| Dead Band Direction | None | Standards | Traceable to NAMAS standards |
| Accuracy | ± 2° | Site Calibration | None Required |
| Resolution | 1° | | Integrity Check Unit (Zero Wind) supplied as optional extra |
| SONIC TEMPERATURE | | POWER REQUIREMENT | |
| Range | -40°C to +70°C (refer to user manual) | Anemometer only | 9-30 V DC (40mA @ 12 V DC) |
| DIGITAL OUTPUT | | Heating Optional | 3A @24V AC or DC |
| Communication | RS422, full duplex | | |
| Baud Rates | 1200 2400 4800 9600 19200 38400 | | |
| Formats | 8 data, odd, even or no parity | | |
| Anemometer Status | Supplied as part of standard message | | |



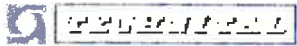
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Fax: +44 (0) 1590 613555
E-mail: anem@gill.co.uk
Website: www.gill.co.uk

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The WindObserver II is part of the Solent range of ultrasonic anemometers. The range is in continuous development and therefore specifications may be subject to change without prior notice.



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9. IMPIANTO RIVELAZIONE E ALLARME INCENDIO



Developed and Manufactured in the United Kingdom the T1200 range of Conventional Panels from Tyco is a powerful yet user friendly series of Control Panels. The range is fully approved by all major Marine Authorities and takes advantage of the very latest technological advancements both in terms of design and manufacturing to the latest European, Marine and Asian standards

MINERVA® Marine

T1200 Conventional Panel Range

Benefits

- Allows very early detection of accommodation fires with significantly reduced false alarms when used with Tyco's unique heat enhanced Compensated Carbon Monoxide (CCO) Detector
- Configurable Detection Zones allowing Zones to be configured for any or all of the following:- Latching or Non Latching Fire Indication Normal or Intrinsically Safe Zone Monitoring Machinery space zones
- Crew Alert Mode :- Manages Alarm Annunciation
- Pre-configured for Immediate use.

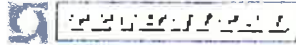
Features

- Developed for use in vessels which require between 4 and 32 zones of fire detection
- Compact 4 Zone option for Console Mounting
- Range includes a separate Water Mist Panel
- Integrated Voyage Data Recorder output on 16 and 32 Zone Panel
- No external secondary power source required
- Discrimination between Automatic Fire Detectors and Manual Alarm Callpoints to provide the appropriate response
- Optional Marine Approved Muster Alarm
- Text label Inserts for Controls and Indicators in customer supplied language.
- Extensive configuration options using simple onboard DIL switches and links
- Installation costs reduced by being able to connect Intrinsically Safe (I.S.) and non I.S. devices on the same zone.

a vital part of your world

tyco

Fire & Integrated Solutions



| | | | |
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MINERVA® Marine T1200 Conventional Panel Range

Detection Options*

Optical Detector - An excellent all round detector suited to all applications

High Performance Optical (HPO) Detector - A direct replacement for the Ion Chamber Smoke Detector

Flame Detector - Used where there is a risk of large flaming fires e.g. Machinery Spaces.

Enhanced Compensated Carbon Monoxide (CCO) Detector - The best detector for early warning without false alarms, used in life threatening applications e.g. Cabins, Public Spaces etc.

Heat Detector - Used where smoke detectors cannot be used e.g. Galleys, Laundries, Drying Rooms etc.

Fault Finding Features

The following fault finding indications are available:-

General Fault - Any Fault Condition

Power Supply Fault - Mains or standby power supply/charger fault

System Fault - Micro Controller or memory fault

Earth Fault - Positive or Negative Power Supply Earth Fault

Fuse Fault - Auxiliary Supply Fuse Failure

Repeater Fault - Repeater Fault or Repeater communications failure

Sounder Fault - Any Sounder Fault

Fire Protection Fault - Fault on the Fire Protection Output**

Fire Output Fault - Fault on the Fire Output**

Fault Output Fault - Fault on the Fault Output**

Ease of Installation

The following features are provided to ease installation:-

- Designed for one man installation
- Gland Plates provided top and bottom
- Factory configured to work straight out of the box
- Integral VDR Output (16 and 32 Zone Panel)
- Integral Battery (16 and 32 Zone Panel)
- Integral Muster Alarm

Service

Service is available from the network of Tyco Marine Offices situated in all major ports around the world (www.tycomarine.com)

* Fire Protection Fault - A fault on the output used to activate ancillary Fire Protection equipment or systems, for example Fire Doors or Plant Shutdown.

** Fire Output Fault - A fault on the output used to transmit a common Fire Signal to a remote monitored station

** Fault Output Fault - A fault on the output used to transmit a common Fault Signal to a remote Monitored Station

Technical Information

Enclosure Material:

Mild Steel Zinc Plated & Passivated + Polyester Powder Coated

Controller Range

T1204 4 Zone AC Controller 93.5 to 121Vac, 47.5 to 63HZ
T1216R 16 Zone AC Repeater 93.5 to 121Vac, 47.5 to 63HZ
T1232R 32 Zone AC Repeater 93.5 to 121Vac, 47.5 to 63HZ
T1204 4 Zone AC Controller 195.5 to 253Vac, 47.5 to 63HZ
T1216R 16 Zone AC Repeater 195.5 to 253Vac, 47.5 to 63HZ
T1232R 32 Zone AC Repeater 195.5 to 253Vac, 47.5 to 63HZ
T1216 16 Zone Controller 99.0 to 253Vac, 47.5 to 63HZ
T1216W 16 Zone Water Mist Panel 93.5 to 253Vac, 47.5 to 63HZ
T1232 32 Zone Controller 93.5 to 253Vac, 47.5 to 63HZ
T1204 4 Zone DC Controller 18.0 to 31.2Vdc
T1216R 16 Zone DC Repeater 19.6 to 28.4Vdc
T1232R 32 Zone DC Repeater 19.6 to 28.4Vdc
T1200 EA Expansion Box C/W PSU 93.5 to 253Vac, 47.5 to 63HZ

Overview of Operation (Ease of Use)

Alarm Acceptance

Turn the Access Control Keyswitch to position "1" to unlock the controls. Press the "Silence Alarms/Resound" button once only to silence the Fire Alarm Sounders. To silence the buzzer press the "Silence Buzzer" button.

Panel Reset

Turn the Access Control Keyswitch to position "1" to unlock the controls, press the "Reset" button.

Zone Isolation

Turn the Access Control Keyswitch to position "1" to unlock the controls. Press the "Select ON/OFF" button to enter the select mode, use the select ∇ button to move the pulsed cursor indication down through the LEDs until it pulses the required zone LED. Press the "Disable" button to disable the selected zone.

Sounder Isolation

Turn the Access Control Keyswitch to position "1" to unlock the controls, Press the "Select ON/OFF" button to enter the select mode, use the select \blacktriangle button to move the pulsed cursor indication up through the LEDs until it pulses the Sounder Fault/Disabled and Sounder Test LEDs. Press the "Disable" button to disable the sounders.

One Man Zone Test

Turn the Access Control Keyswitch to position "1" to unlock the controls, Press the "Select ON/OFF" button to enter the select mode, use the "Select ∇ " button to move the pulsed cursor indication down through the LEDs until it pulses the required Zone LED. Press the Test Button to activate the test condition on the selected zone.

One Man Sounder Test

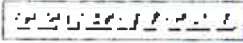
Turn the Access Control Keyswitch to position "1" to unlock the controls, Press the "Select ON/OFF" button to enter the select mode, use the select \blacktriangle button to move the pulsed cursor indication up through the LEDs until it pulses the Sounder Fault/Disabled and Sounder Test LEDs. Press the Test button to start the Sounder Test.

Options

C 1631 Repeater Interface PCB
C 1633 LED Driver PCB
C 1634 Relay Output PCB
C 1635 Monitored Output PCB
C 1665 Muster Interface PCB

Please refer to the following datasheets:-

*PSF123UM - Series 600 Conventional Fire Detector Range
*PSF132UM - 601F-M & 601FEX-M Conventional Infra Red Flame Detectors
*PSF122UM - M600 EX Intrinsically Safe Fire Detector Range
*PSF036UM - CP Series Callpoints



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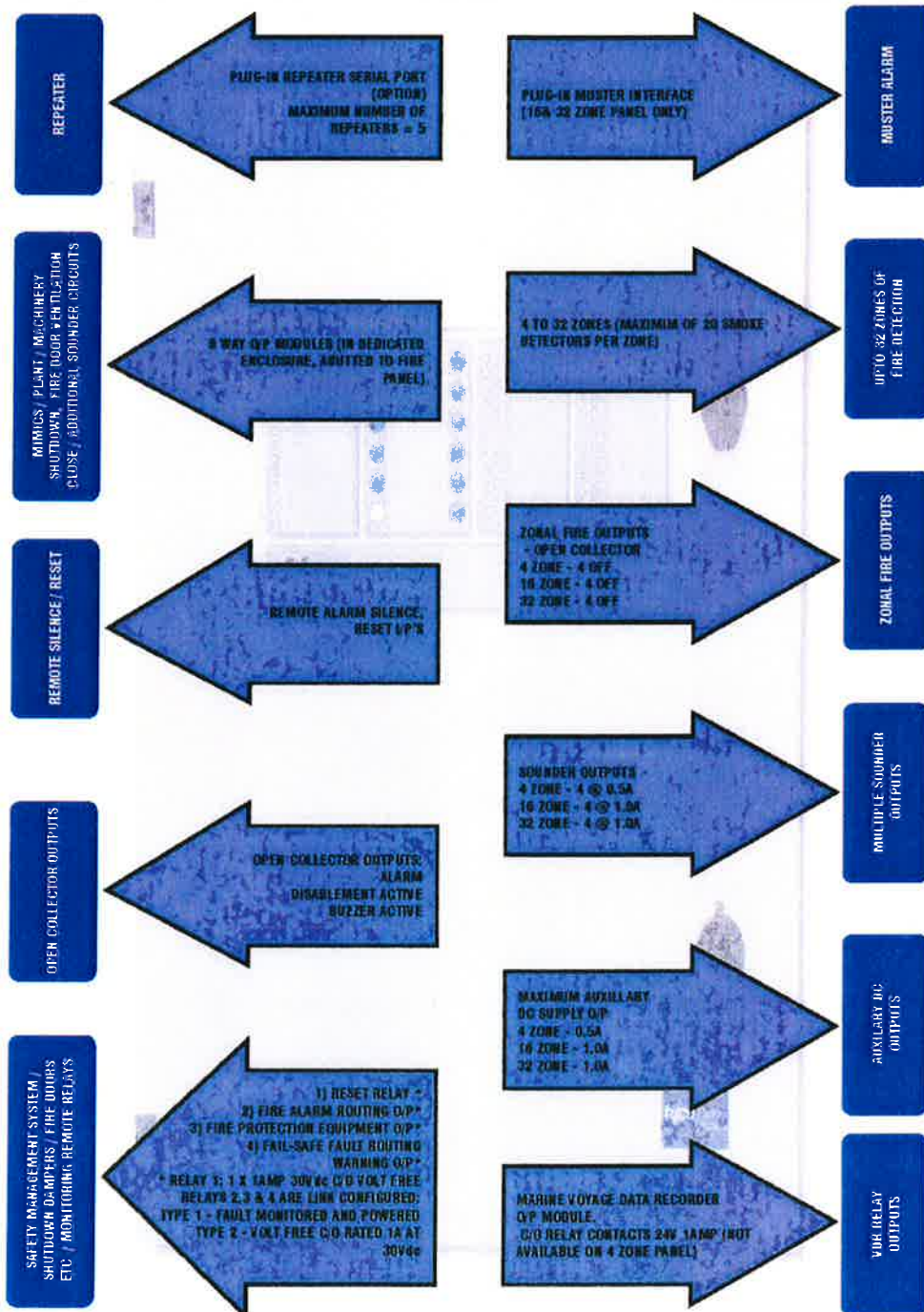
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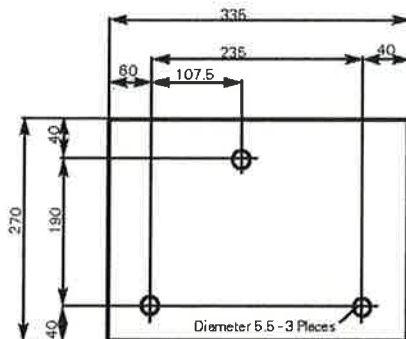
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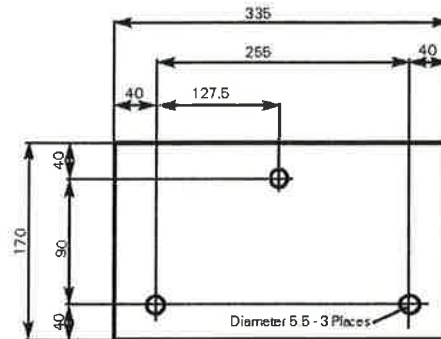
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MINERVA® Marine T1200 Conventional Panel Range

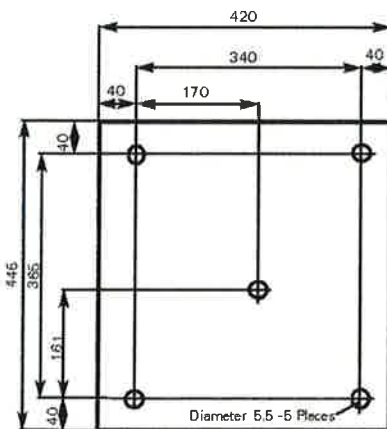


SPECIFICATIONS
Mounting Arrangements


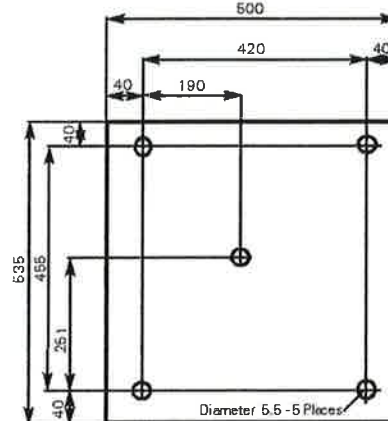
T1204 4 Zone AC Controller
 T1204 4 Zone DC Controller
 T1216R 16 Zone DC Repeater



4 Zone Battery Box



T1216 16 Zone Controller
 T1216R 16 Zona AC Repeater



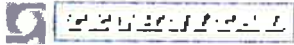
T1232 32 Zone Controller
 T1216W 16 Zone Water Mist Panel
 T1232R 32 Zone AC Repeater
 T1232R 32 Zone DC Repeater
 T1200 EA Expansion Box C/W PSU
 T1200 EDC Expansion Box

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MINERVA®

M600Ex Rivelatori Incendio a Sicurezza Intrinseca

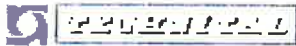
Caratteristiche:

- Rilevatore Intelligente Universale Fumo/Termico/CO
- Compatto, discreto non ostrusivo
- Prestazioni ed affidabilità superiori
- Nuovo design
- Progettato per un'installazione rapida e facile
- Kit di bloccaggio opzionale
- Utilizzabile nei sistemi conformi a BS5839 Parte 1
- LED di allarme integrato e remoto
- Certificato ATEX: Ex II 1G and Cenelec: EEx ia IIC T5

Gamma Rivelatori Incendio M600Ex

Il nuovo sofisticato sistema Ex da usare in atmosfere a rischio, introduce sul mercato una gamma di rivelatori incendio convenzionali a S.I. Oltre alla dimensione poco vistosa ed la forma stilizzata, nella nuova gamma, sono state introdotte una serie di nuove caratteristiche, ivi inclusi un'unica visita al soffitto durante l'installazione ed una posizione parking del rivelatore durante il servizio e la manutenzione.





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Caratteristiche Generali

In questa gamma troviamo il rivelatore di Fumo Ottico ad Alte Prestazioni (HPD), un Rivelatore di Monossido di Carbonio, e un Rivelatore che abbina la rivelazione dei Monossido di Carbonio a quella termica.

La gamma completa è stata progettata in conformità alle norme inglesi BS, e a quelle europee EN riguardanti i rivelatori d'incendio. I rivelatori presentano anche il nuovo marchio CE.

Rivelatori Convenzionali Serie M600Ex

La Serie M600Ex propone il rivelatore parte di un sistema automatico di rivelazione incendio come definito nella norma BS5839 Parte 1: 2002. La Serie Convenzionale M600Ex o rivelatore a due stati, offre due uscite di stato al controller che possono essere di condizione "normale" o "allarme incendio".

I rivelatori, insieme ai pulsanti manuali sono raggruppati in zone, ed ogni zona è collegata alla Centrale di controllo, mediante un circuito a 2 conduttori. Sulla Centrale di controllo, ogni zona dispone di un indicatore specifico di zona.

Barriere di sicurezza sono usate per mantenere in qualsiasi condizione lo stato di sicurezza intrinseca del circuito.

Applicazione

Considerando che ogni rivelatore risponde ad un particolare "prodotto incendio" la velocità relativa di risposta del rivelatore dipende pertanto dal tipo d'incendio che viene rilevato. La gamma dei rivelatori M600Ex è stata progettata per offrire il prima possibile l'allarme di condizione di incendio, con la minima possibilità di falsi allarmi o allarmi non voluti.

Considerando che il fumo normalmente è già presente nel primo stadio dell'incendio, i rivelatori di fumo (ottici ad alte prestazioni e a camera di ionizzazione) sono considerati i più utili. Per decidere il tipo di rivelatore di fumo, bisognerebbe considerare il probabile tipo di combustibile che alimenta l'incendio, in genere, gli incendi di propagazione veloce sono rilevati prima dai rivelatori a camera di ionizzazione. Ma, per un rilevamento generico d'incendi, in cui c'è la stessa probabilità che si sviluppino incendi "rapidi" o "lenti", il rivelatore intelligente ottico ad alte prestazioni offre un'eccellente risposta.

In situazioni in cui l'installazione dei rivelatori di fumo potrebbe causare un livello inaccettabile di falsi allarmi (p.e. cucine, lavanderie), si devono preferire dai rivelatori termici. La Serie M600Ex offre una selezione completa di rivelatori termici che va da quelli a Gradiente di Temperatura a quelli a Temperatura Fissa. Considerando le innumerevoli possibilità d'applicazione a cui sono destinati questi rivelatori di incendi, si consiglia di aiutarsi nella scelta riferendosi alla norma BS5839 Parte 1:2002.

Risposta al Test Incendio

| Test Incendio | Calore Sprigionato | Fumo | Aeroso | Parte Visibile | Alte Prestazioni Ottica | Camera di Ionizzazione |
|--|--------------------|------|------------|----------------|-------------------------|------------------------|
| TF1 Fuoco Cellulosico aperto (legno) | FORTE | SI | INVISIBILE | CHIARO | C | A |
| TF2 Fuoco Pirolisi a Combustione Lenta (legno) | IRRILEVANTE | SI | VISIBILE | CHIARO | B | C |
| TF3 Fuoco che Cova a Combustione Lenta (cotone) | IRRILEVANTE | SI | INVISIBILE | LEGGERO | B | B |
| TF4 Fuoco Apero Plastica (poliuretano) | FORTE | SI | INVISIBILE | MOLTO SCURO | B | A |
| TF5 Incendio Liquidi (n-eptano) | FORTE | SI | INVISIBILE | MOLTO SCURO | B | B |
| TF6 Incendio Liquidi (alcol denaturato con metanolo) | FORTE | NO | NIENTE | NIENTE | N | N |



TECNOLOGIE

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Rev.

Data:

SPECIFICA TECNICA - IMPIANTO DI GENERAZIONE,
DISTRIBUZIONE E UTILIZZO ENERGIA ELETTRICA,
AUTOMAZIONE E POSIZIONAMENTO DINAMICO -
APPENDICE D - STRUMENTAZIONE

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Rilevatori di Fumo Ottico ad Alte Prestazioni MR601Ex

Questi rilevatori reagiscono a tutti i tipi di incendio, anche quelli latenti a lenta combustione che producono particelle visibili alle fiamme aperte che producono una grande quantità di aerosol molto caldi, con particelle di piccole dimensioni. Questo tipo di rilevatori abbina la tecnologia ottica e termica per individuare i prodotti chiari della combustione che altrimenti potrebbero essere facilmente rivelati da rilevatori a camera ionizzata. Per le normali condizioni ambientali, il rilevatore ottico ad alte prestazioni si comporta come un normale rilevatore.

Solo quando viene rivelato un rapido innalzamento della temperatura, il rilevatore aumenta la sensibilità e la presenza di fumo conferma la condizione di incendio che verrà trasmessa come condizione di allarme.



Rilevatore di Fumo a Camera di ionizzazione MF601Ex

Questi rilevatori reagiscono agli aerosol visibili ed invisibili del fuoco (prodotti della combustione) e pertanto sono capaci di rivelare immediatamente la presenza di fuochi a combustione lenta e con fiamme generate da legno, carta, etc. Sono particolarmente adatti per applicazioni generiche in tutte le aree e usano una doppia camera di ionizzazione in cui l'aria è ionizzata da una unica fonte radio attiva (33.3k Bq Americio). La presenza del fumo nella camera di campionatura produce un variazione della tensioni, tra le due camere.



Rilevatori Termici MD601Ex e MD611Ex

Questi rilevatori usano due termistori in configurazione a ponte in modo da garantire una rapida risposta, che dipende tanto dalla temperatura assoluta quanto dal gradiente della temperatura. I rilevatori di calore a gradiente di temperatura / o a temperatura fissa possono essere usati in aree in cui i sensori del fumo non andrebbero bene a causa delle condizioni ambientali (fumo, polvere, etc.). Questi tipi di aree includono le cucine, spogliatoi, refettori, garage, zone adibite al carico.



Rilevatore incendio Monossido di Carbonio MU601Ex

Il rilevatore incendio CO è un rilevatore generale di incendio, in grado di rilevare sin dai primissimo stadio incendi a lenta combustione. Ideale per rischi latenti, il rilevatore incendio CO è anche molto adatto a varie applicazioni in cui la rilevazione del calore è insufficiente, mentre quella del fumo può indurre a falsi allarmi.

Considerando che il CO si sposta più liberamente del fumo, la posizione dei rilevatori CO è molto flessibile. Questa caratteristica è particolarmente utile in strutture complesse molto grandi tipo atri, magazzini, in cui è difficile il posizionamento dei rilevatori di fumo.



Rilevatore Termico e Monossido di Carbonio Potenziato MDU601Ex

Il rilevatore MDU601Ex abbina le caratteristiche dei due rilevatori MU601Ex e MD601Ex offrendo un Rilevatore a gradiente termico e di CO in cui la sensibilità del rilevatore di CO ha una maggior risposta ad un brusco cambio della temperatura.

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 INFORMAZIONI DI
 PRODOTTO

Specifiche Tecniche

Caratteristiche Meccaniche

| | |
|-----------------------------|----------------------------------|
| Materiale Rilevatore | FR 1 10 "Bayblend" Resistente al |
| Fuoco | |
| Dimensioni | Vedere diagramma sotto |
| Peso | 0.2Kg rilevatore e base (approx) |
| Colore | Bianco |

Caratteristiche Ambientali

| | |
|--|--------------------|
| Gamma Temp. Funzionamento | da -10°C a +55°C |
| Temp. Stoccaggio. | da -20°C a +55°C |
| Umidità Relativa | 90% senza condensa |
| Nota: Fonte di radiazione camera ionizzazione - americio 241-33.3KBq | |

Caratteristiche Elettriche

| | |
|---------------------------------|--|
| Tensione d'Alimentazione | da 16 a 28V d.c. |
| Corrente di Riposo | 100µA tipica |
| Corrente Allarme | 48mA tipica |
| Tempo di Reset | 0.5 - 5 secondi |
| Conduttori | 2 Terminali SEM Terminal da 5mm ² |

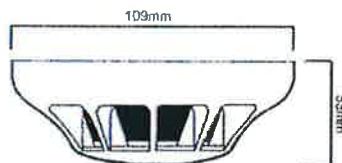
Compatibilità Elettromagnetica

| | |
|---------------------------|-------------------|
| ESD | secondo EN50081-1 |
| Radiata | secondo EN50130-4 |
| Transitoria Rapida | secondo EN50130-4 |
| Alta Energia Lenta | secondo EN50130-4 |

Omologazioni

Questi rilevatori hanno ottenuto le seguenti omologazioni:

| | |
|------------|-----------------------------|
| ABS | American Bureau of Shipping |
| BV | Bureau Veritas |
| DNV | Det Norske Veritas |
| KRS | Korean Register of Shipping |
| LRS | Lloyds Register of Shipping |



Per ulteriori informazioni su come vi possiamo aiutare, contattate il vostro ufficio ADT locale:

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 Website: www.adteurope.com

Belgio - ADT Security Services SA
 Tel: 02 481 08 00
 Website: www.adt-belgium.be

Republik Ceca - ADT Security Center s.r.o.
 Tel: 267 267 267
 Website: www.adt-cz.cz

Danimarca - ADT A/S
 Tel: 70 80 70 00
 Website: www.adt-nordic.com

Francia - ADT France
 Tel: 08 10 600 260
 Website: www.adt-france.fr

Germania - ADT Security Deutschland GmbH
 Tel: 0800 7070 238
 Website: www.adt-deutschland.de

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