NAVITRON SYSTEMS LTD

POWER STEER CONTROLS

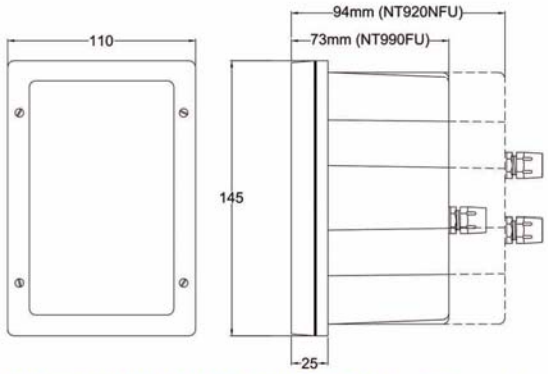
Navitron Power Steer controls are intended for installation in sheltered (bridge or wheelhouse) locations and are suitable for use as single or multistation units with all Navitron autopilot types.

Fully Type Approved and Wheelmarked for inclusion in NT921G/951G and NT990G/991G Autopilot Systems, the NT920NFU is a dual function device which enables permanent (NFU) and temporary (DODGE) heading changes to be ordered at locations remote from the autopilot control unit.

When set to the Dodge mode, movement of the sprung to centre jog lever produces a fixed amount of Port or Stbd rudder (as appropriate) to turn the vessel. When the jog lever is released to centre the applied rudder is removed and the vessel returns to the original heading.

When NFU is selected, the autopilot course setter is automatically switched to a 'tracking' mode. Subsequent movement of the jog lever produces a turn to Port or Stbd (as appropriate) which is 'tracked' by the course setter card as the vessel is power steered to a new heading. When the required new heading is attained and the NT920NFU switch is set to DODGE or OFF, the autopilot course setter card immediately 'locks' and the autopilot resumes control to maintain the vessel on the new (current) heading.

Model NT920NFU
Non Follow Up Control



Model NT920NFU & NT990FU Outline Dimensions

Model NT990FU Follow Up Control

The NT990FU (Full Follow Up) Control also enables permanent (POWER STEER) heading changes to be ordered at locations remote from the autopilot control unit.

The direction of movement of the NT990FU lever (right or left) to initiate Port or Starboard rudder movement is installation selectable and automatically results in reversal of the corresponding red and green sectors on the control panel. This is achieved by bi-colour backlighting which is variable via the ILLUM key.

Two installation programmable modes are available to the operator via the RANGE key. Range 1 can, for example, provide linear ± 40° rudder movement for normal operating use whilst Range 2 can be customised to suit special work requirements (alternative rudder angles, linear or non linear)

When the NT990FU is engaged (ON) and the vessel is power steered to a new heading by this means, the autopilot course setter card 'tracks' ships head. On attainment of the new heading required, the NT990FU key can be set to OFF at which time the course setter card automatically 'locks' and the autopilot immediately resumes control to maintain the vessel on the new (current) heading.

ISO 9001:2000 SGS UKAS QUALITY MANAGEMENT 005

NAVITRON SYSTEMS LTD

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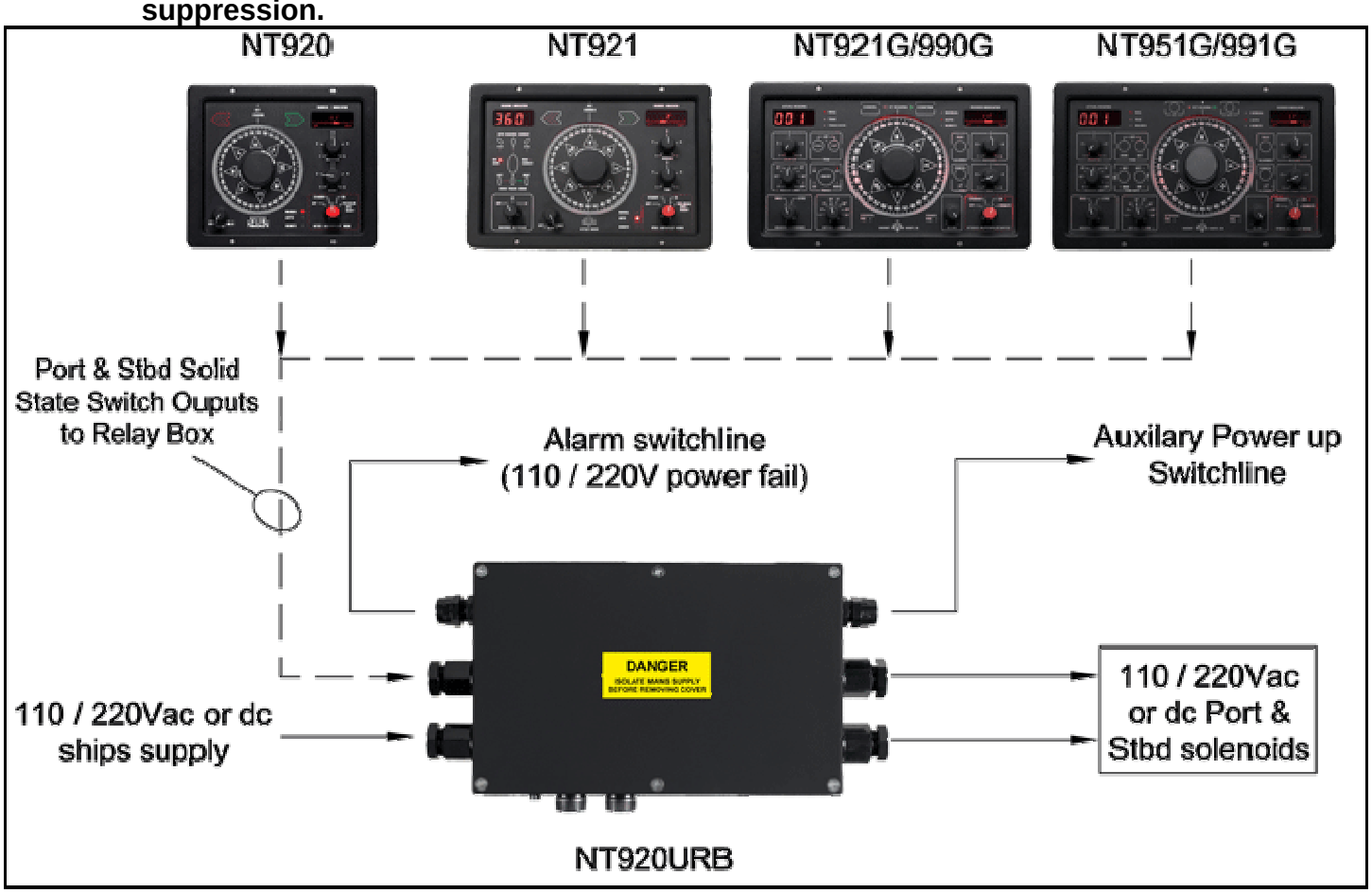
Navitron Systems Ltd — Universal Relay Box Type NT920URB

The solid state (FET) switches incorporated in all Navitron autopilot control unit types are suitable for solenoids in the voltage / current range 11 - 40Vdc / 5A maximum.

When higher voltage solenoids are involved (110 / 220Vac or dc) the Navitron Relay Box type NT920URB provides isolated switching complete with contact suppression.



Solenoid switchline polarity (common positive or common negative) is installation selectable as are the relay contact suppression components which are link selectable within the NT920URB dependent on supply voltage type (ac or dc).

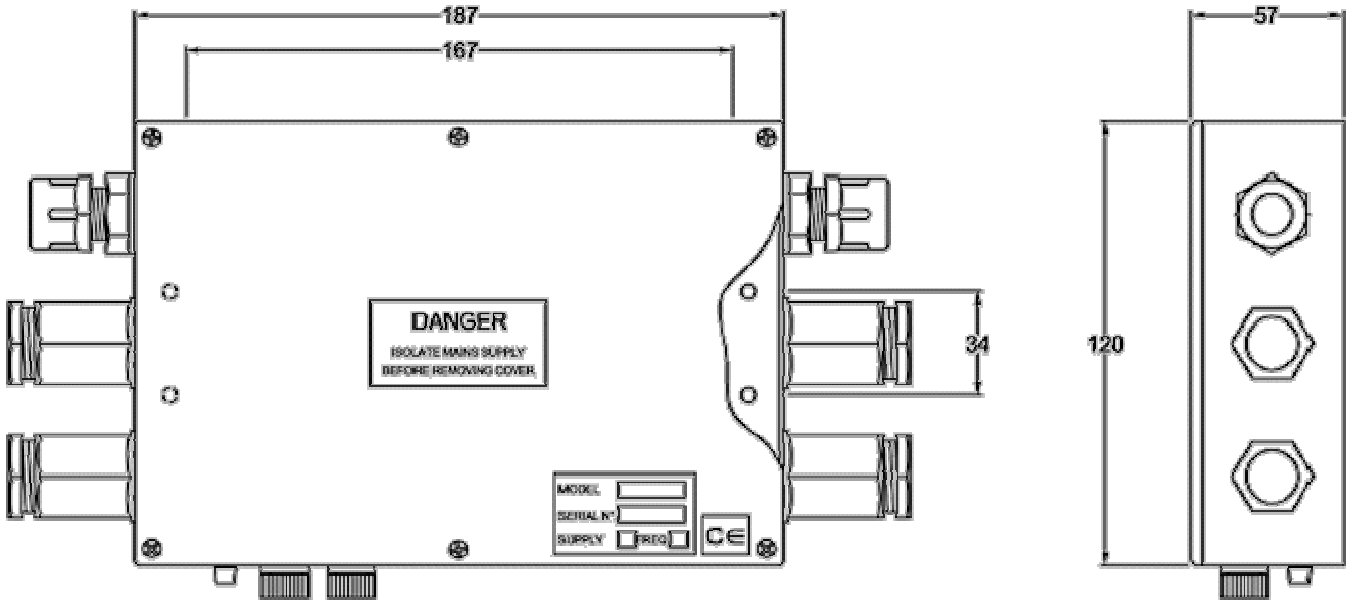
Additional features include a normally open relay contact for auxiliary use and a normally open contact which closes in the event of solenoid main

power failure to provide a switchline for an external alarm if required.

Compass Safe Distance - 1.5m

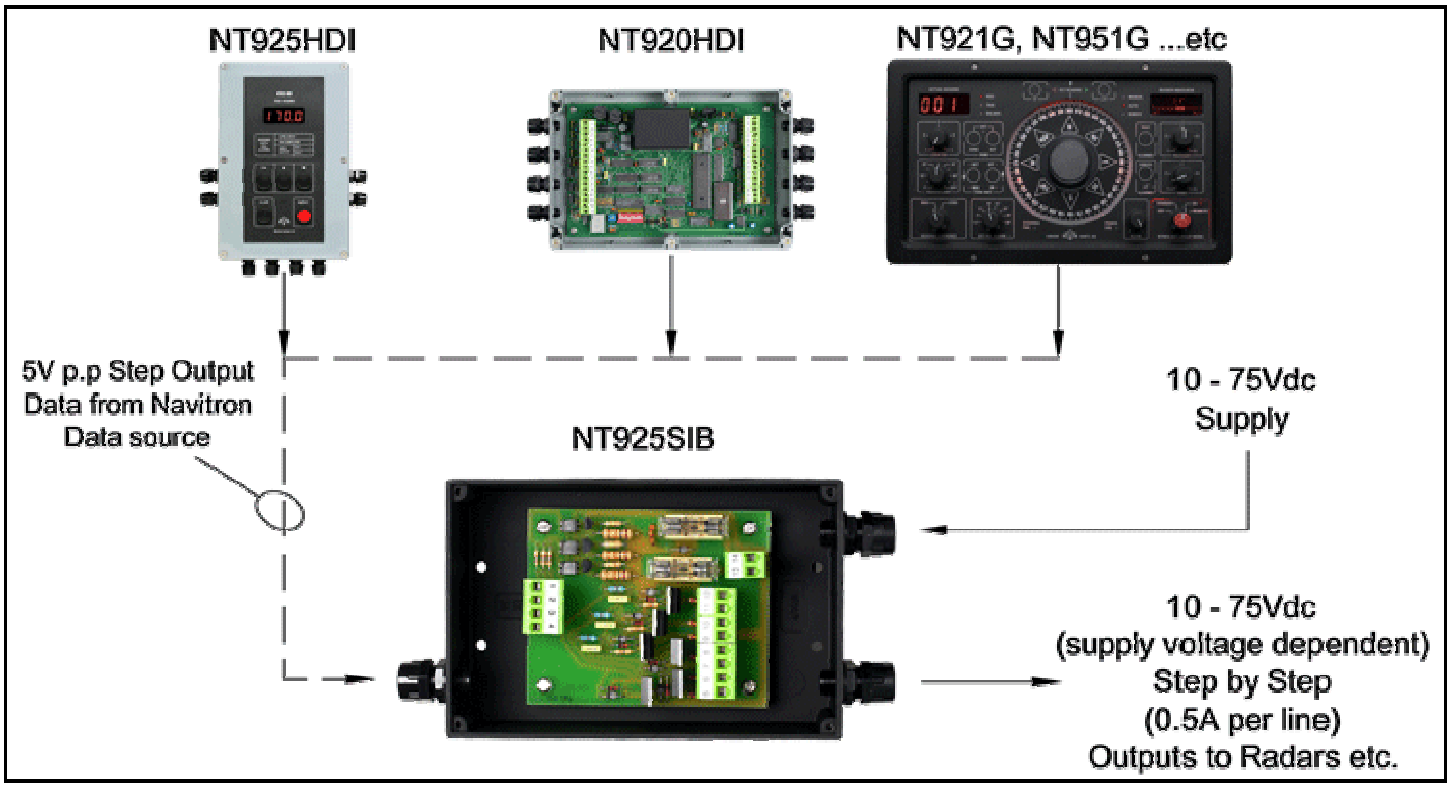
Weight - 0.8Kg

Outline Dimensions (mm): -



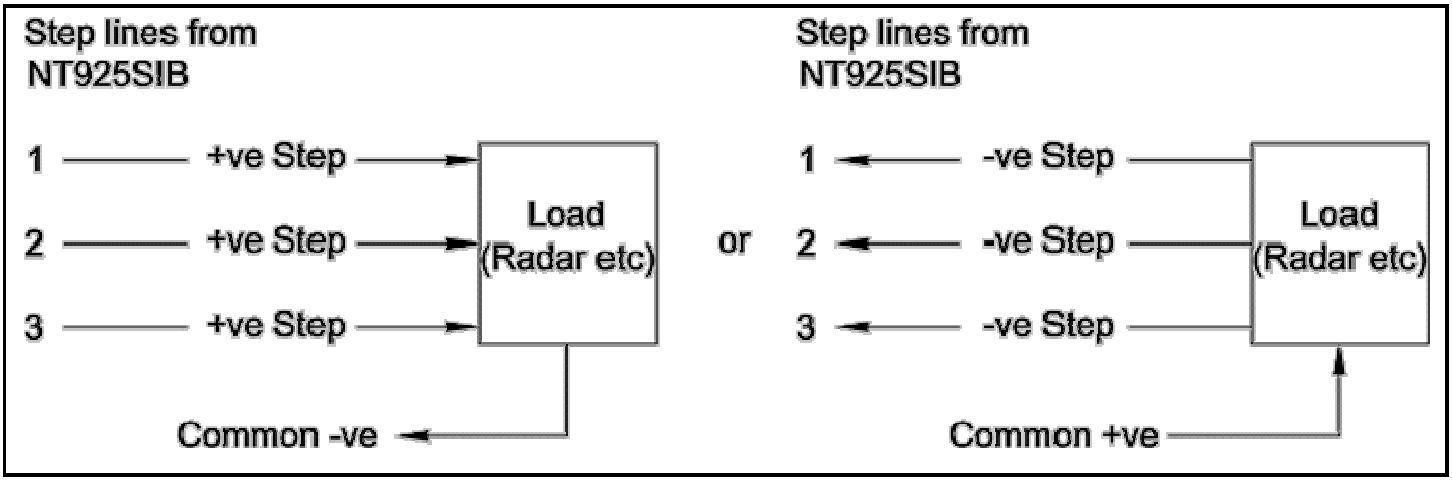
Navitron Systems Ltd — Step Interface Box Type NT925SIB

The NT925SIB provides opto isolation between the 5V p.p logic rated Step by Step output ports available from the majority of Navitron autopilot control units etc. and the higher voltage / current requirements of proprietary end users such as radars etc.



The Step by Step output voltage available from the NT925SIB is dependent on the supply voltage (i.e. 24Vdc supply = 24Vdc p.p Step by Step outputs etc.) with each step line rated at 0.5A max.

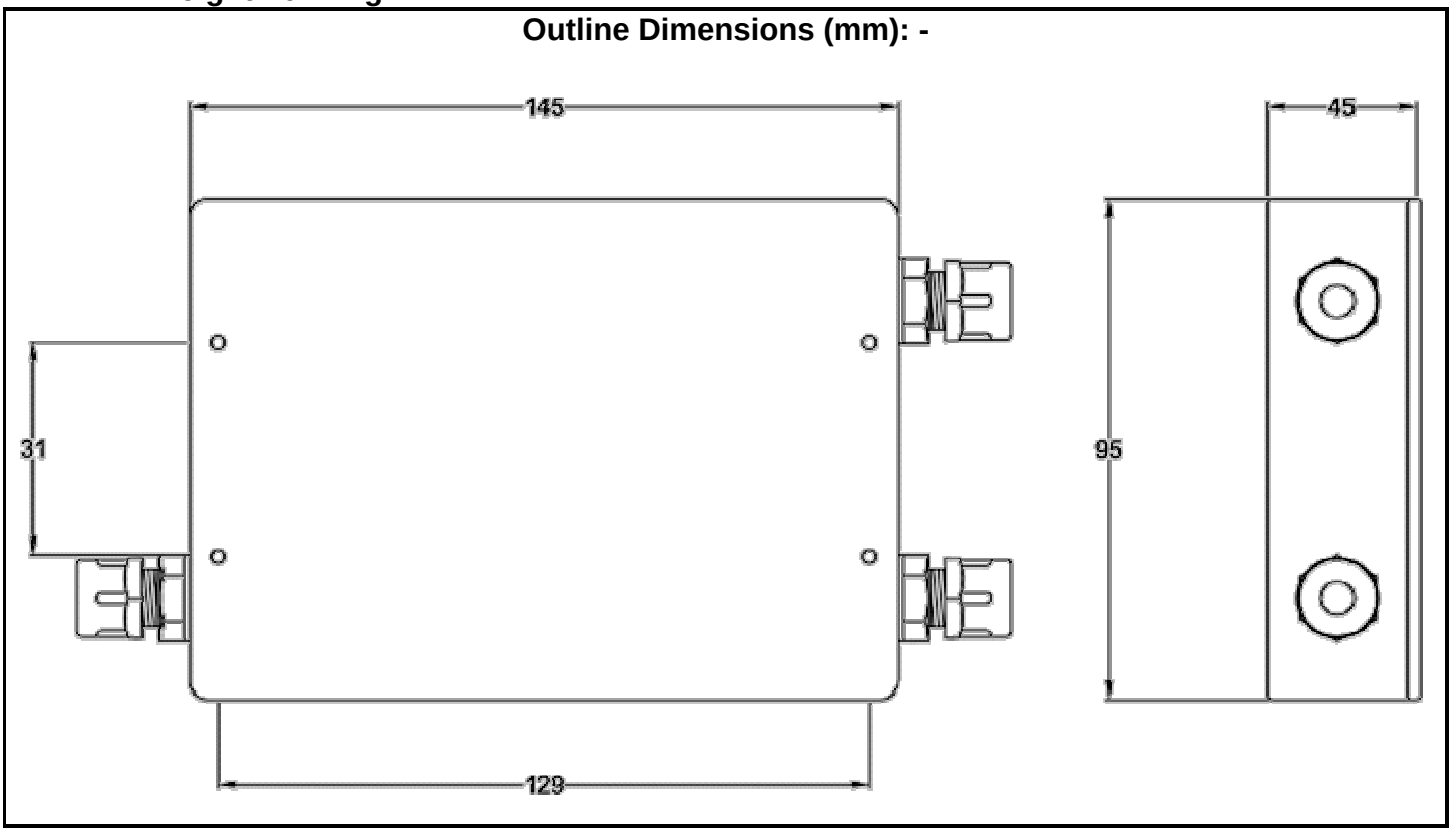
Output switchline polarity is installation selectable: -



Compass Safe Distance - 0.6m

Weight - 0.42Kg

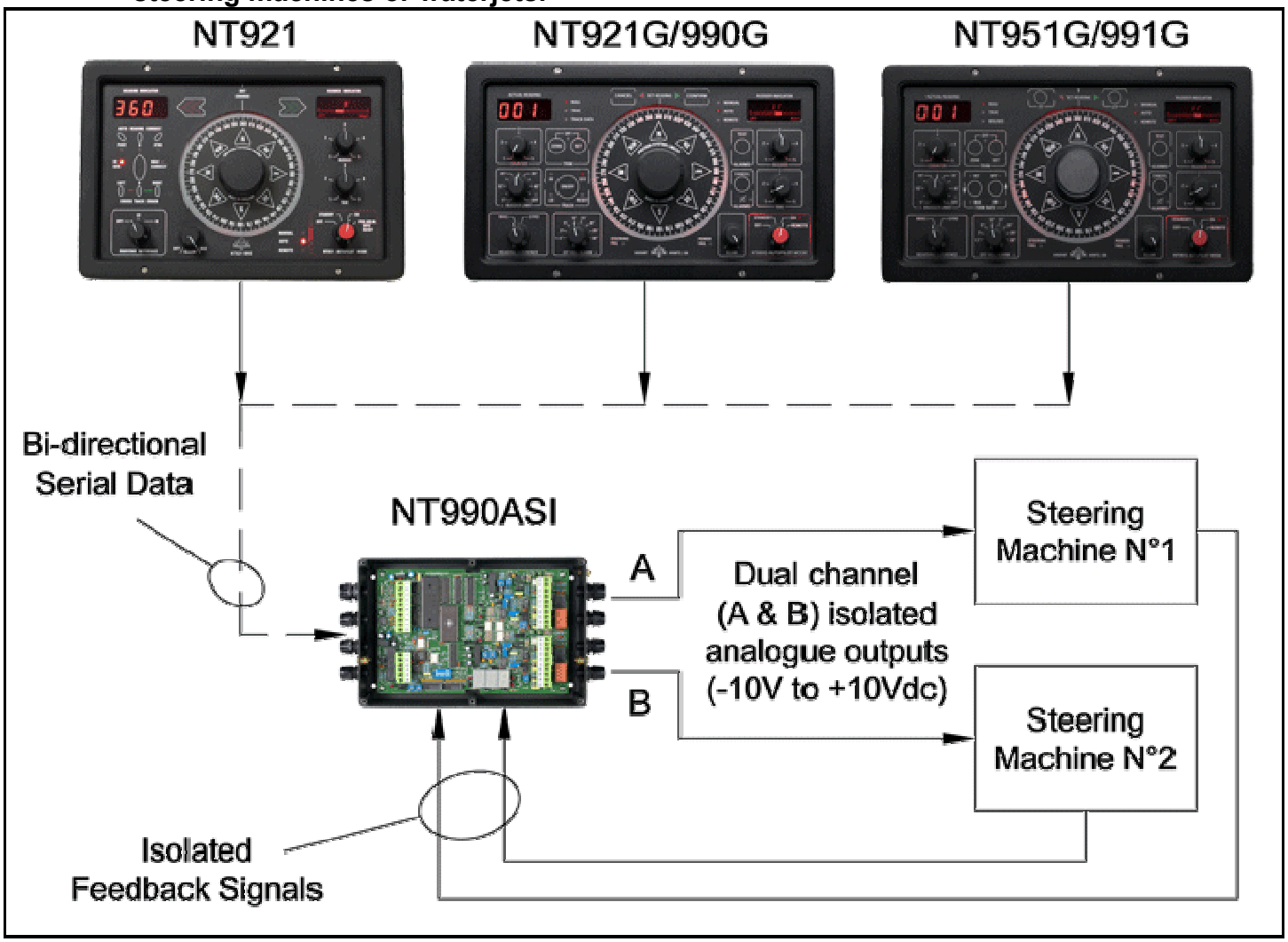
Outline Dimensions (mm): -



Navitron Systems Ltd

Analogue Steering Interface Type NT990ASI

The NT990ASI is used in conjunction with Navitron autopilot types NT921, NT921 MKII, NT921G/NT990G and NT951G/NT991G MK2 to provide dual galvanically isolated analogue signal outputs for the control of analogue steering machines or waterjets.



Fully Type Approved for inclusion in Navitron NT921G/NT990G and NT951G/NT991G MK2 autopilot systems, bi-directional steering control data is continuously transferred between the appropriate autopilot control unit and the NT990ASI to produce two isolated outputs - each with a range of -10Vdc to +10Vdc for connection to the steering machine / waterjet control system.

Steering machine positional feedback information can also be provided for the autopilot control unit via opto isolated inputs available within the NT990ASI which accept potentiometric (single ended) or sin/cos feedback signals taken from the analogue steering system without risk of loading or common mode problems.

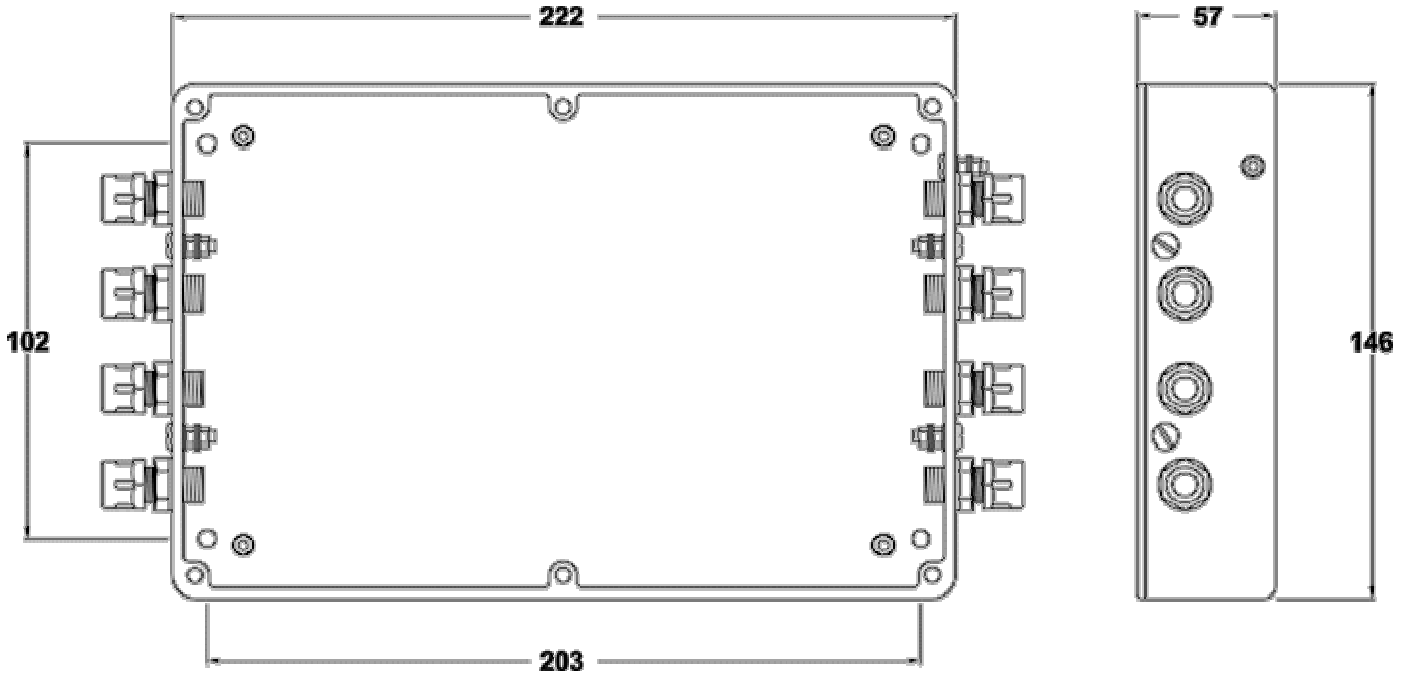
Standard features of the NT990ASI include: -

- **Dual channel isolated output voltage (±10Vdc) proportional to rudder position or rudder error.**
- **Dual channel installation presets for rudder gain, rudder bias and output voltage (max) limit.**
- **Dual isolated inputs (10 - 40Vdc) for steering enable and channel enable control delegation.**
- **Dual volt free contacts (1A / 30Vdc) for steering control demand.**
- **Dual volt free alarm contacts.**
- **Dual isolated sin/cos or single ended feedback inputs (±5Vdc or ±15Vdc ranges).**
- **D/A output to autopilot rudder indicator and APH function.**
- **NMEA 0183 rudder angle output sentence ($YXRSA)**
- **Internal 3 digit LED and individual LED status indications.**

Compass Safe Distance - 0.5m

Weight - 0.9Kg

Outline Dimensions (mm): -



Navitron Systems Ltd

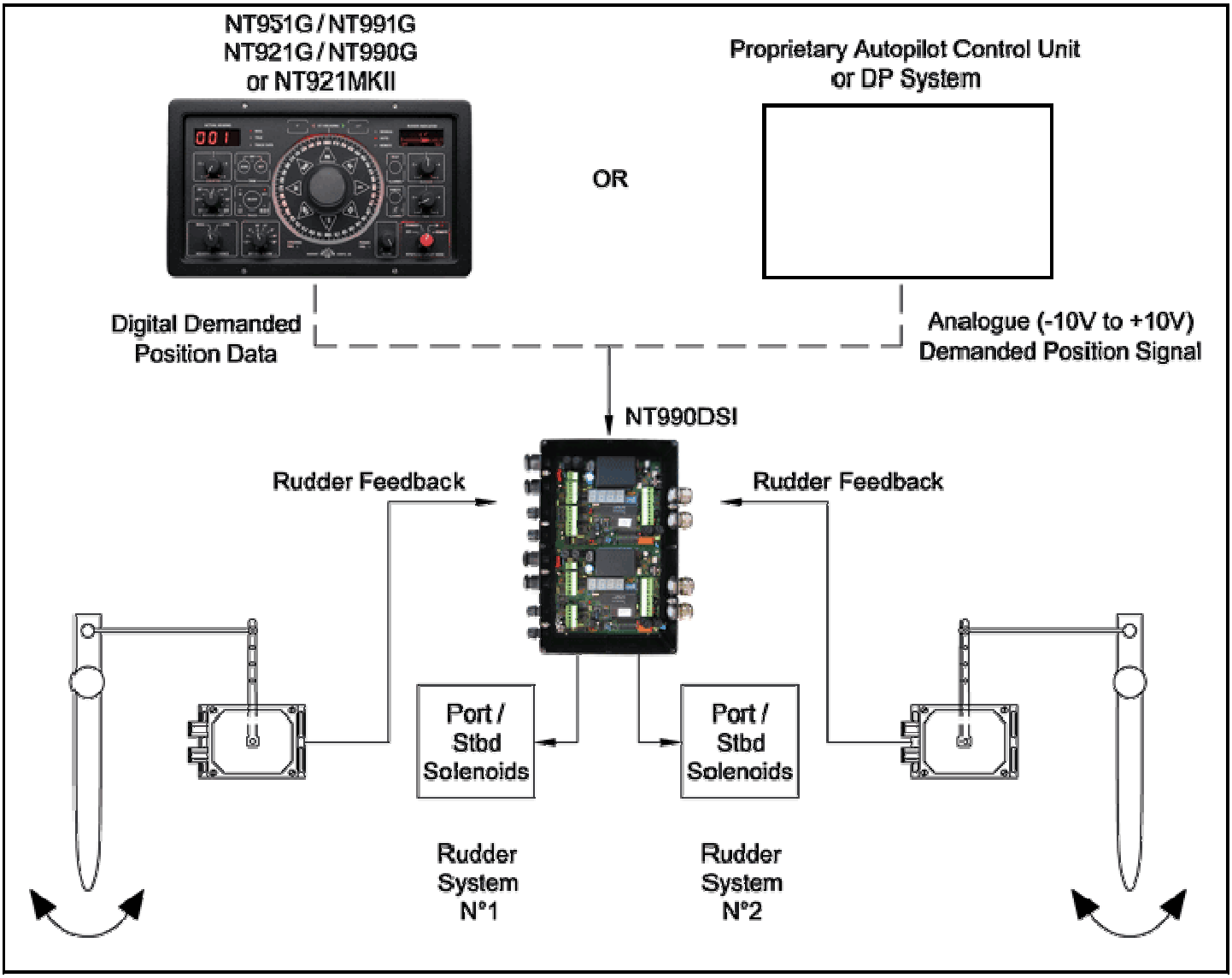
Dual Station Interface Type NT990DSI

The Navitron NT990DSI is a microprocessor intelligent interface which provides galvanically isolated signal conversions between wheelhouse steering control elements (Autopilot & DP systems etc.) and single or dual loop solenoid operated rudder positioning systems.

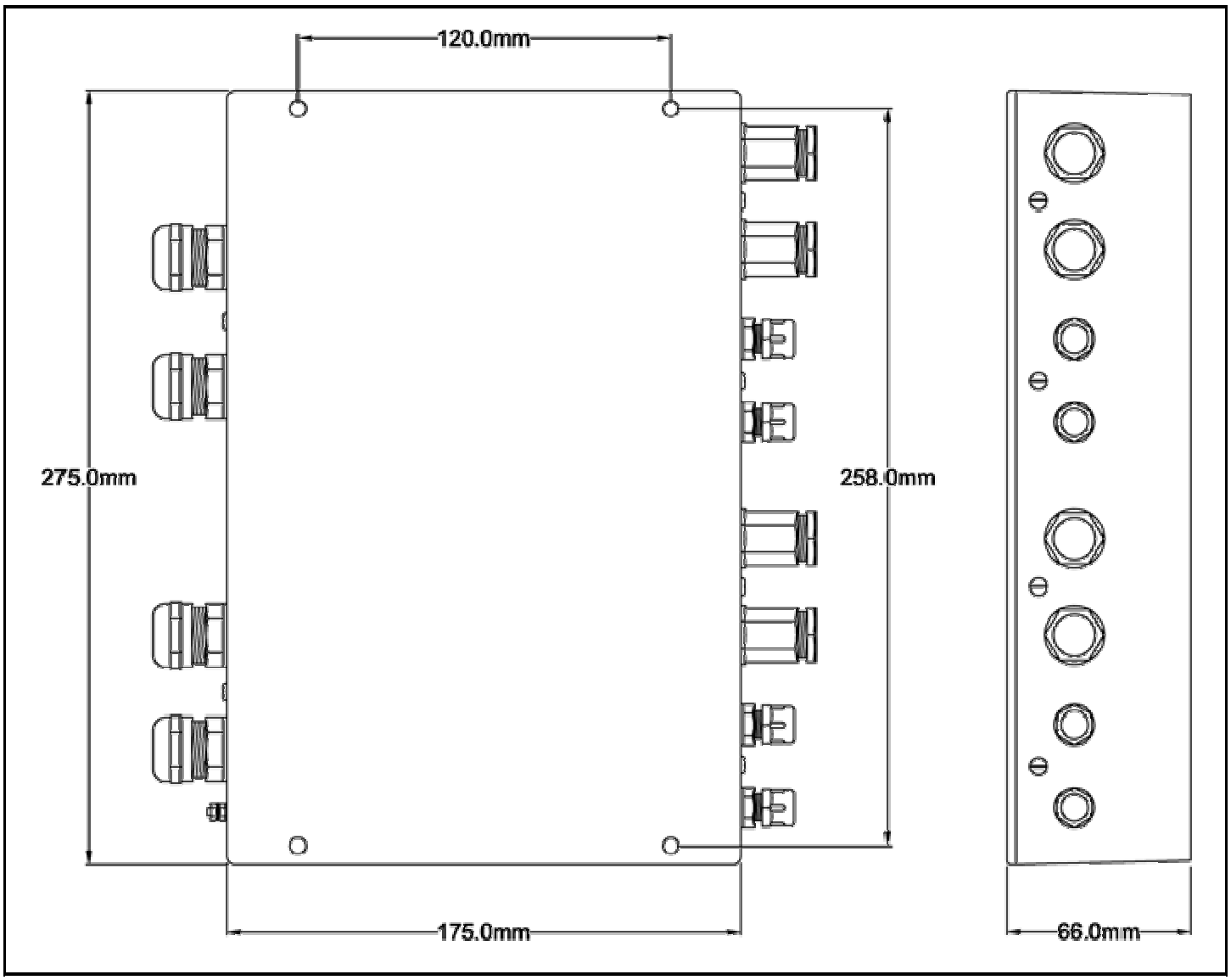
Type Approved and Wheelmarked for use with Navitron NT951G/991G MK2 autopilot systems, the NT990DSI is equipped with electrically isolated inputs for demanded rudder position data received from most Navitron Autopilot types and various proprietary control system types.

Digital data received from Navitron Autopilot Control Units, or analogue (-10Vdc to +10Vdc) signal voltages received from proprietary Autopilots/DP systems etc, is converted within the NT990DSI to provide installation selectable single or independent dual channel outputs for the positional control and automatic stabilisation of single or split rudder systems.

Four solid state switch outputs (2 per channel) rated 5A/11-40Vdc are a standard feature of the NT990DSI and solenoid switchline polarity (common +ve / common -ve) is installation selectable.



Outline Dimensions (mm): -


120.0mm
275.0mm
258.0mm
175.0mm
66.0mm

Navitron Systems Ltd — Bowthruster Interface Type NT921BTI

Used in conjunction with a Navitron autopilot system, the NT921 Bowthruster Interface provides operator selectable Power Steer and fully automatic control of single or dual thruster units and is compatible with the following Navitron autopilot types: -

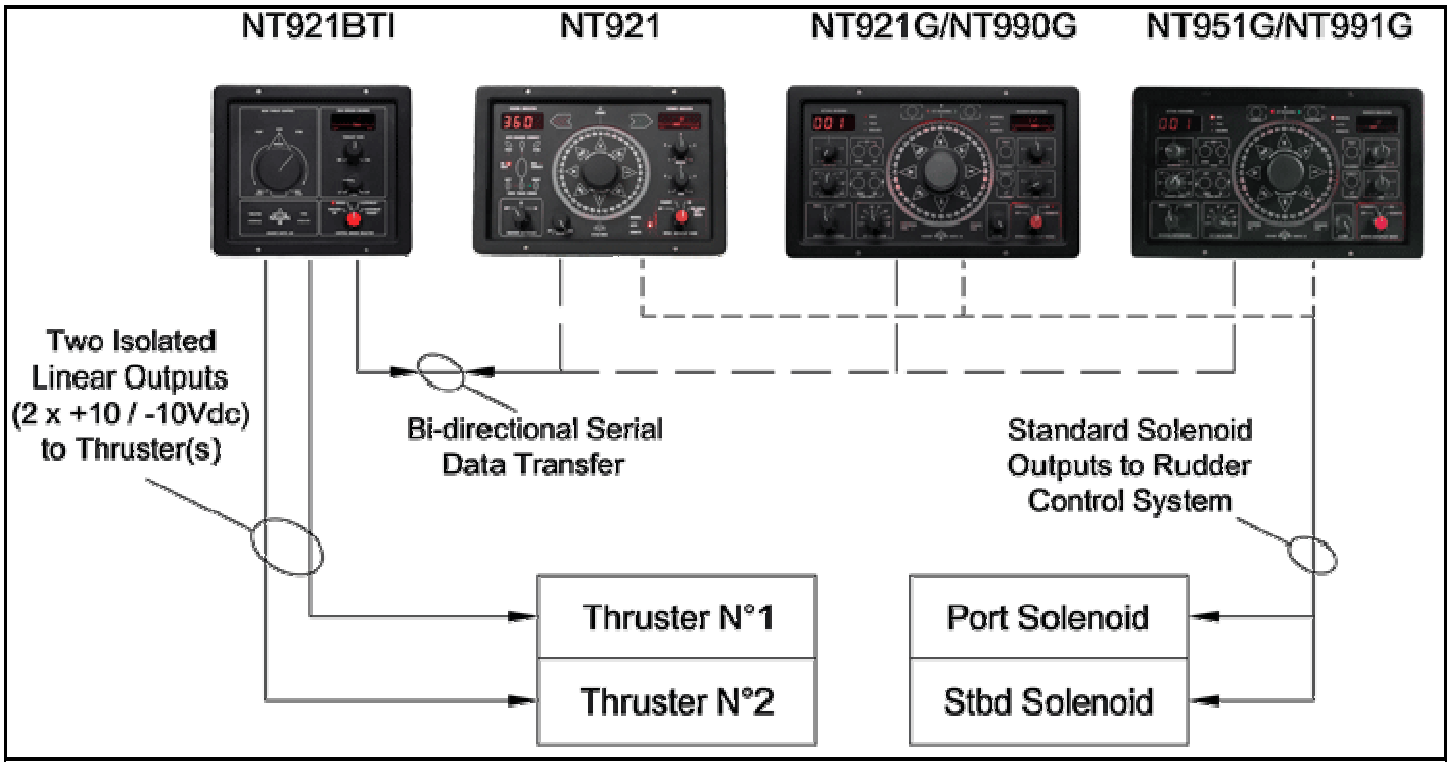
(i) Autopilot type NT921 - - - - - Version 4.1 Software and later.

(ii) Autopilot type NT921MKII - - - Version 1.0 Software and later.

(iii) Autopilot type NT921G/NT990G - - - Version 4.0 Software and later.

(iv) Autopilot type NT951G/NT991G MK2- - - Version 6.0 Software and later.

In addition to the normal Port and Stbd solenoid demands associated with autopilot control of rudder position, digital information is transferred from the autopilot control unit to the bowthruster interface (NT921BTI) where two galvanically isolated analogue output channels are generated for thruster control.



Both of the galvanically isolated channels provide a nominal output range of

±10Vdc and are independently installation adjustable for zero thrust alignment (±12.5%) and output voltage gradient required to develop maximum thrust (i.e. maximum thruster power adjustable from ±1V to ±10V to suit the response characteristics of the thruster unit(s) involved.

Model NT921BTI
Bowthruster Interface

Compass Safe Distance - 0.6m

Weight - 1.6Kg

Operator controls mounted on the autopilot control unit and on the NT921BTI allow simple adjustment in each steering mode available for selection via the Bowthruster CONTROL MODE SELECTOR switch as follows: -

- **THRUSTER OFF**
  for autopilot control of rudder only
- **MANUAL**
  for power steer via thruster(s) only using NT921BTI MANUAL control
- **AUTOTHRUST**
  for autopilot control of thruster(s) only
- **AUTOTHRUST + RUDDER**
  for autopilot control of rudder and thruster(s)

The NT921BTI control panel also provides LED status indicators and displays (LCD) bow error and thruster response level.

Designed as a matching module for internal (bridge or wheelhouse) location adjacent to the autopilot control unit, the NT921BTI is suitable for bracket or panel mounting.

Navitron Systems Ltd

NMEA Rudder Transmitter Unit Type NT990RTU

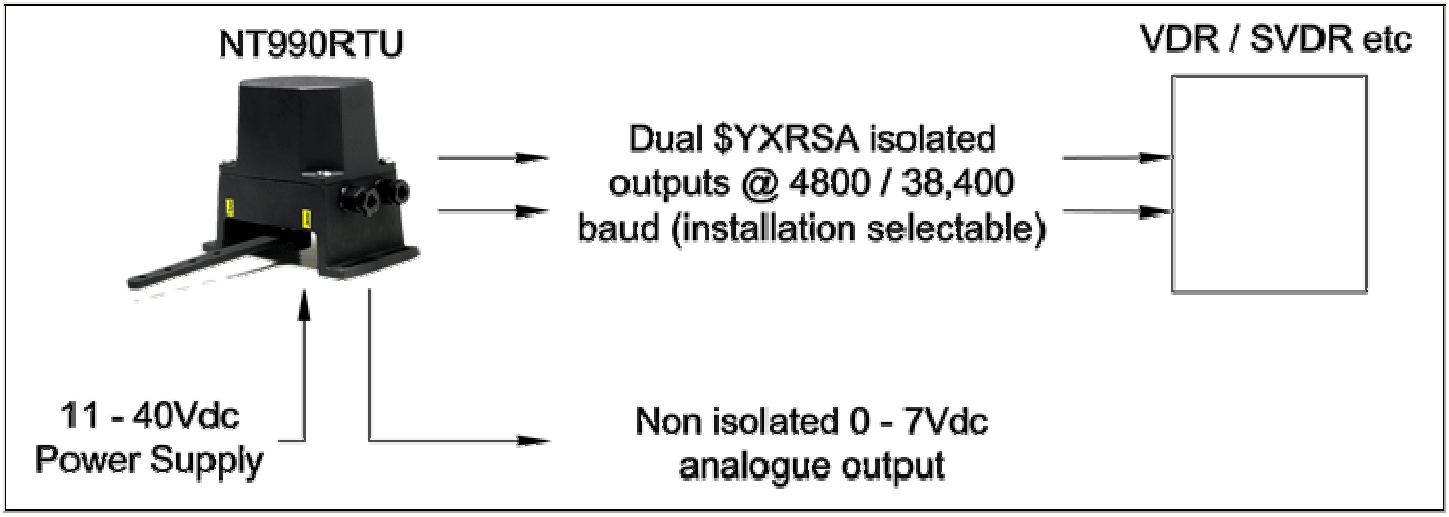
Engineered in Marine grade cast aluminium the NT990RTU is a robust stand alone rudder angle transmission unit which provides two isolated digital outputs and one non isolated analogue output for use by proprietary navigation computers and/or monitoring devices such as VDR/SVDR etc.

Suitable for direct connection to 11-40Vdc ships supply, the NT990RTU incorporates a high quality voltage regulated conductive plastic potentiometer and processor intelligent encoding to provide dual isolated NMEA outputs ($YXRSA sentence) with installation selectable 1Hz or 10Hz update and 4800 or 38,400 baud rates as required.

When mechanically coupled to the rudder stock / tiller arm, accurate rudder angle data is continuously transmitted to the receiving device.

Built in error management ensures that the NT990RTU detects illogical / fault conditions with resultant 'Invalid Data' transmissions if appropriate.

Model NT990RTU
Digital Rudder Transmitter Unit



Supply Voltage	**11 - 40Vdc**
Channel 1 Output (Isolated RS422)	**$YXRSA @ 4800 / 38400 baud**
Channel 2 Output (Isolated RS422)	**$YXRSA @ 4800 / 38400 baud**
Analogue Output Z Out Max Current Out	**0 - 7Vdc 470R 5mA**