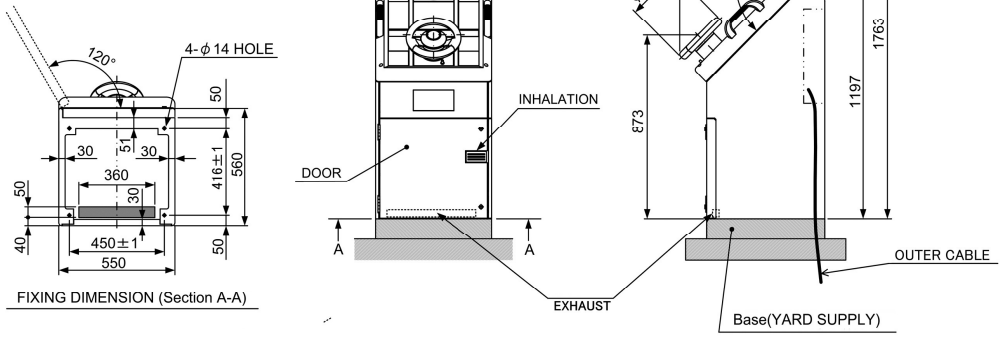
PT900 component models

PT900□—□—□—□□

- Steering gear
  S : single rudder
  T : twin rudders
- Systems :
  1 : 1 system
  2 : 2 systems
- Type of steering gear control(□= No. of pumps)
  - N□ : Direct activation of solenoid valves on steering gear pump unit
  - N□F : Direct activation of solenoid valves on steering gear pump unit made by MITSUBISHI
  - J□ : Hydraulic power unit for MITSUBISHI JANNEY steering gear
  - H□ : Hydraulic power unit
  - K□T : Continuous control steering gear made by KAWASAKI HEAVY INDUSTRIES
  - Y□A : Torque motor control steering gear made by MITSUBISHI HEAVY INDUSTRIES
  - T□ : Continuous control steering gear made by HATLAPA
  - ANA□ : Analog control
- System style
  - S : Stand alone steering stand
  - K : Stand built-in CMZ900 Gyro compass
  - P : Panel mounting type (Console mounting type)
  - Q : INS concept type (Control stand and Console mounting)
- Control model
  - A : PT900 Adaptive control type
  - D : PT900 PID control type

PT900 Outline

MODEL	MPM190
MASS	100kg



YOKOGAWA

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Represented by:

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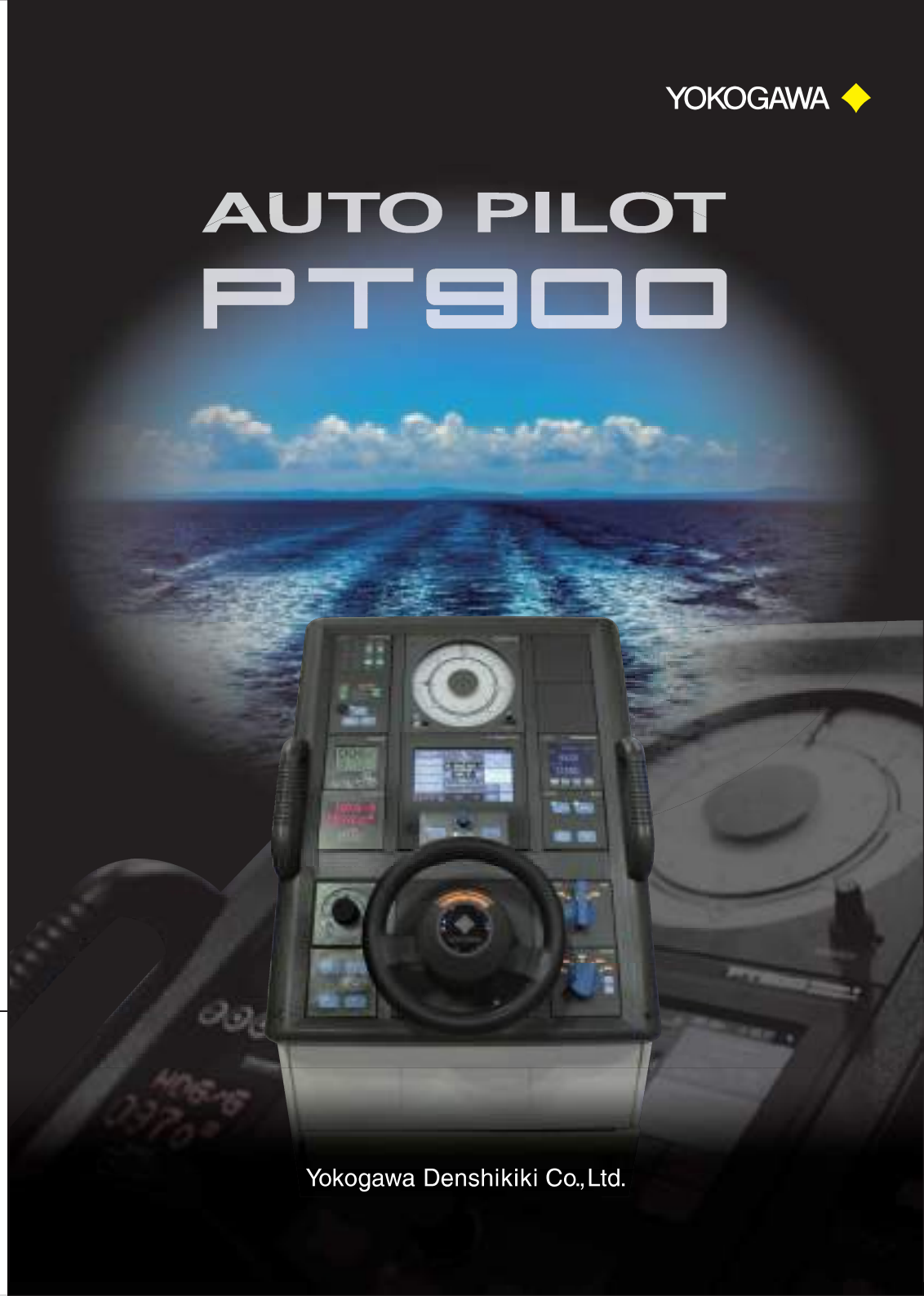
YOKOGAWA

AUTO PILOT
PT900



Yokogawa Denshikiki Co.,Ltd.

PT900 : An adaptable Autopilot which eliminates unnecessary steering for optimal steering.

PT900 fully conforms to the technical requirements below,
and improves on economical efficiency, safety, usability, and extensibility.
This Autopilot can be adapted from small vessels to large vessels.

Conformity standards
IMO Resolution A.342(IX),A.694(17) and 64(67) Annex 3 & 191(79)
ISO 11674(2006), IEC 60945(2002)
IEC 61162-1(2010), IEC61162-2(1998)
IEC 62288(2014)

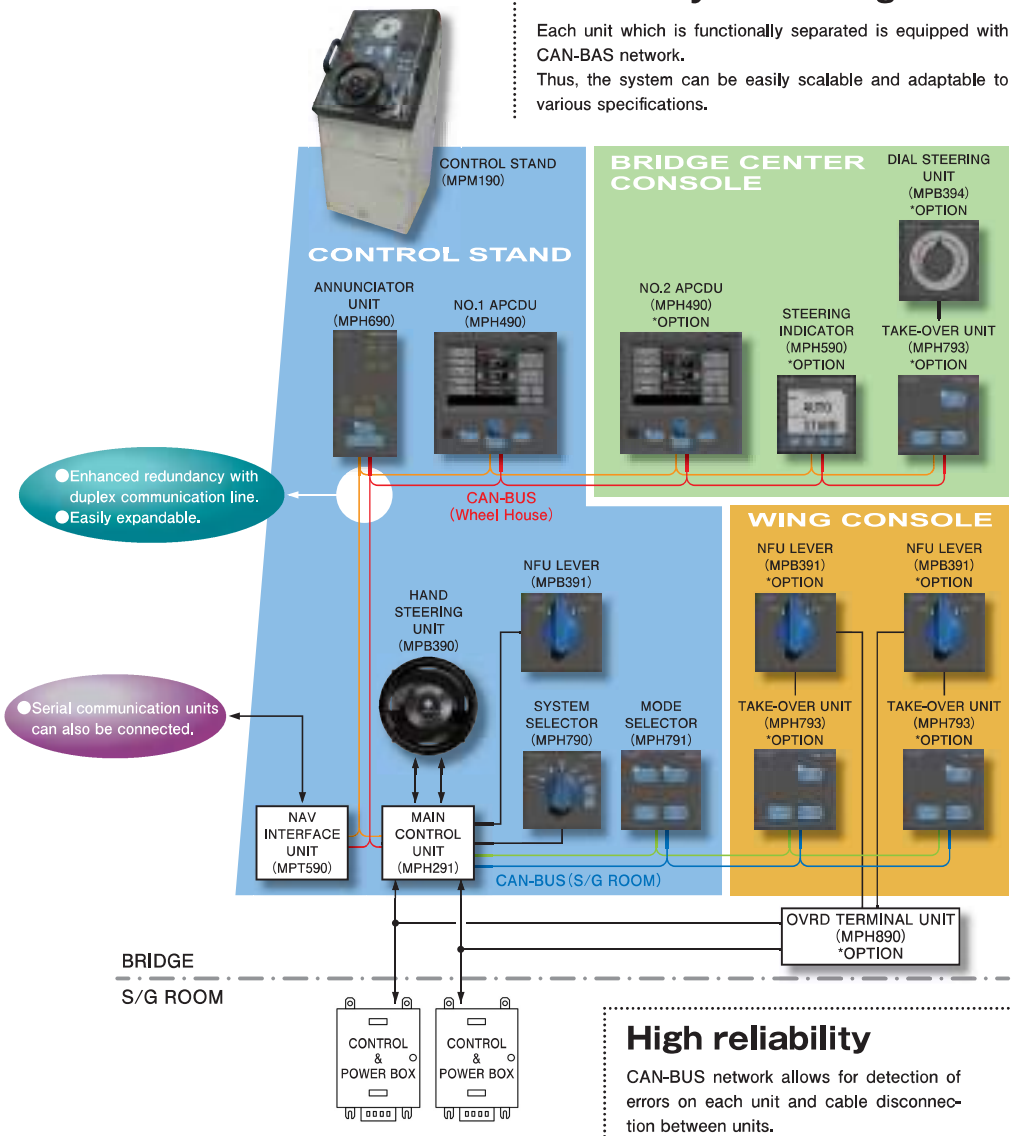
AUTO PILOT
PT900

CONTROL STAND UPPER PANEL

- ANNUNCIATOR UNIT (MPH690)
- AP CDU (Control&Display Unit) (MPH490)
- UNIVERSAL DATA DISPLAY (MHR110A) *OPTION
- INDEPENDENT OFF-COURSE ALARM UNIT (MZY750) *OPTION
- TMC DISPLAY UNIT (MPC430)
- DIMMER UNIT (MGS507)
- HAND STEERING UNIT (MPB390)
- STEERING REPEATER (MKR056)
- STEERING INDICATOR (MPH590) *OPTION
- MODE SELECTOR (MPH791)
  - –AUTO : Heading control
  - –MAN : Manual control
- NON FOLLOW-UP LEVER (MPB391)
  - –STBD
  - –PORT
- SYSTEM SELECTOR (MPH790)
  - –OFF : Shut down of PT900
  - –NO.1 : Startup of PT900 and selection of NO.1 system
  - –NO.2 : Startup of PT900 and selection of NO.2 system
  - –NFU : Non follow-up steering

Flexible system configuration

Each unit which is functionally separated is equipped with CAN-BAS network.
Thus, the system can be easily scalable and adaptable to various specifications.



High reliability

CAN-BUS network allows for detection of errors on each unit and cable disconnection between units.

Various optional units

PT900 offers various kinds of optional units to meet customer's requests.

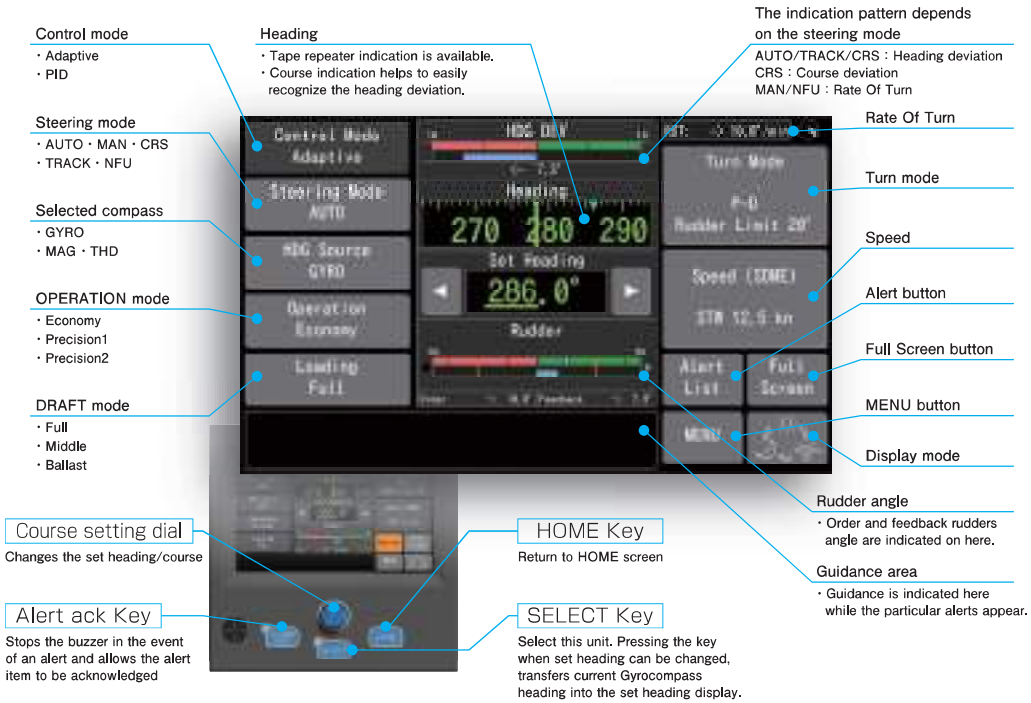
- DIAL STEERING UNIT (MPB394)
- STEERING INDICATOR (MPH590)
- STEERING ANGLE INDICATOR (MPH591)
- STEERING ANGLE SELECTOR (MPH792)
- TAKE-OVER UNIT (MPH793)
- FU OVERRIDE OPERATION UNIT (MPH794)
- NFU OVRD OPERATION UNIT (MPH795)
- ANALOG I/F UNIT (MPT490)

7 inch color display

- High visibility
- User-friendly screen layout
- Constant display of main data

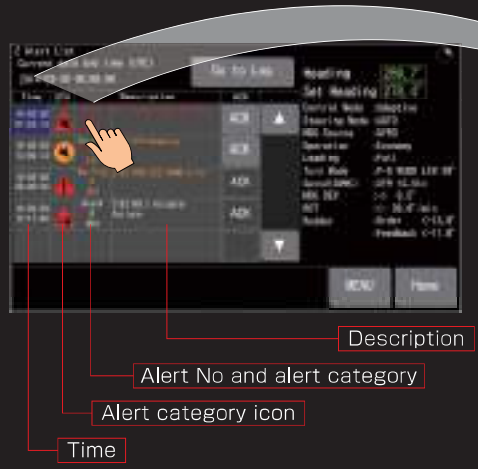
Touch panel screen

- Enhanced man-machine interface
- Intuitive operation



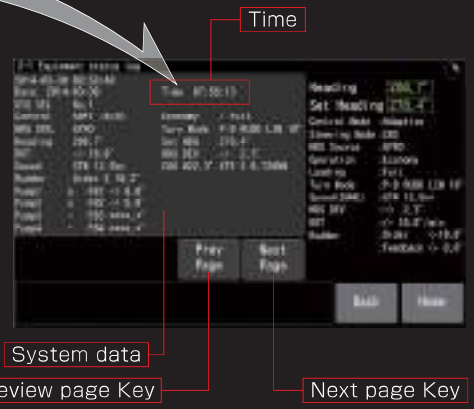
Alert display and logging function

By displaying the alerts in a list, the status of alerts can be checked.
Past alerts can be checked on Alert Log screen (UP to 1000 factors can be recorded)



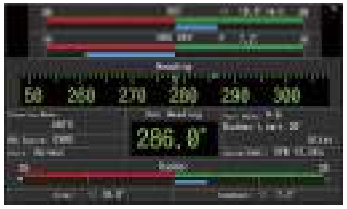
System data at the time of alert

System data at the time of alert can be checked by touching the alert on Alert Log screen.
By touching "Prev Page" or "Nex Page," the data can be checked per second up to previous 90 days back.



Full screen mode

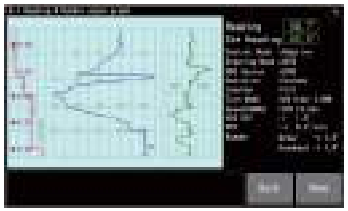
Can be used as Mini conning display by enlarging necessary data.



Various display (for PT900A)

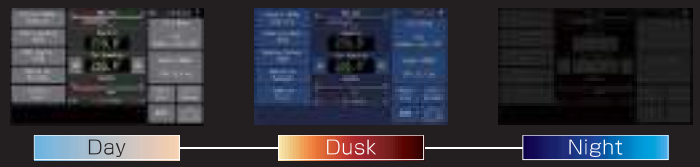
Ship's heading and actual rudder can be displayed for 60 mins.
Autopilot controllability can be checked easily.

■Heading & Rudder angle graph



Screen color tone and central dimmer control

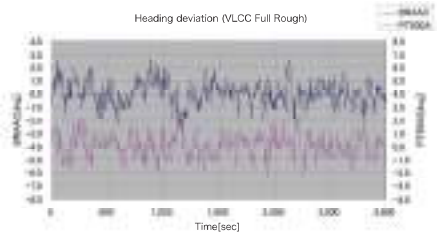
By touching the screen color icon, the color tone can be changed between 3 types : Day, Dusk and Night.
Also, central dimmer allows to changing the brightness of all units, simultaneously.

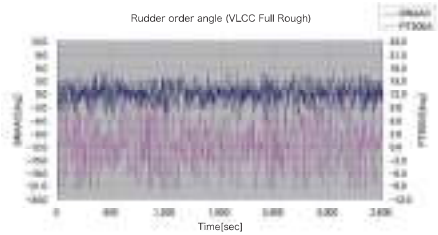


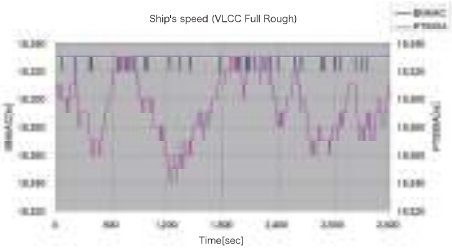
PT900 fuel saving function

Batch Noise Adaptive Autopilot Controller (BNAAC)

BNAAC is an energy saving Autopilot which adopts modern control theory.
The optimal rudder angle can be updated automatically by the disturbance around the ship on straight leg.





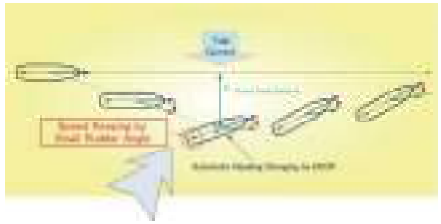


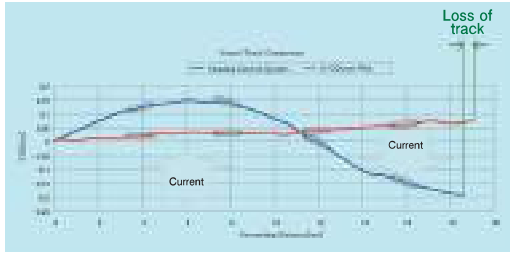
BNAAC has achieved course keeping equal to conventional model AutoPilot (PT500A) by an amount of the steer which is 60% less.
There was a difference with the improvement rate of ship's speed and fuel consumption compared with PT500A.

Ship's Type	Draught	Improvement Rate [%]			
		Rudder Angle	Deviation	Ship's Speed	Fuel Consumption
VLCC	Full	60.89	-1.08	0.203	0.61

Course control (E-Course Pilot) *OPTION

Fuel saving effect is improved by incorporating control over the ground which reduces loss of track.
Course control is available by changing the steering mode to "CRS" on the screen of APCDU.





Track Control System *OPTION

PT900 can be interfaced with a number of partners' ECDIS, and provides Track Control System which contributes to ship's safety by compensating the drift caused by tide or wind and staying on the planned navigation route.

PT900 AutoPilot