

# AUTO PILOT PT9000



# PT900 : An adaptable autopilot which optimizes gain, and minimizes unnecessary steering action.

PT900 fully conforms to the technical requirements below, and improves on economical efficiency, safety, usability, and extensibility.

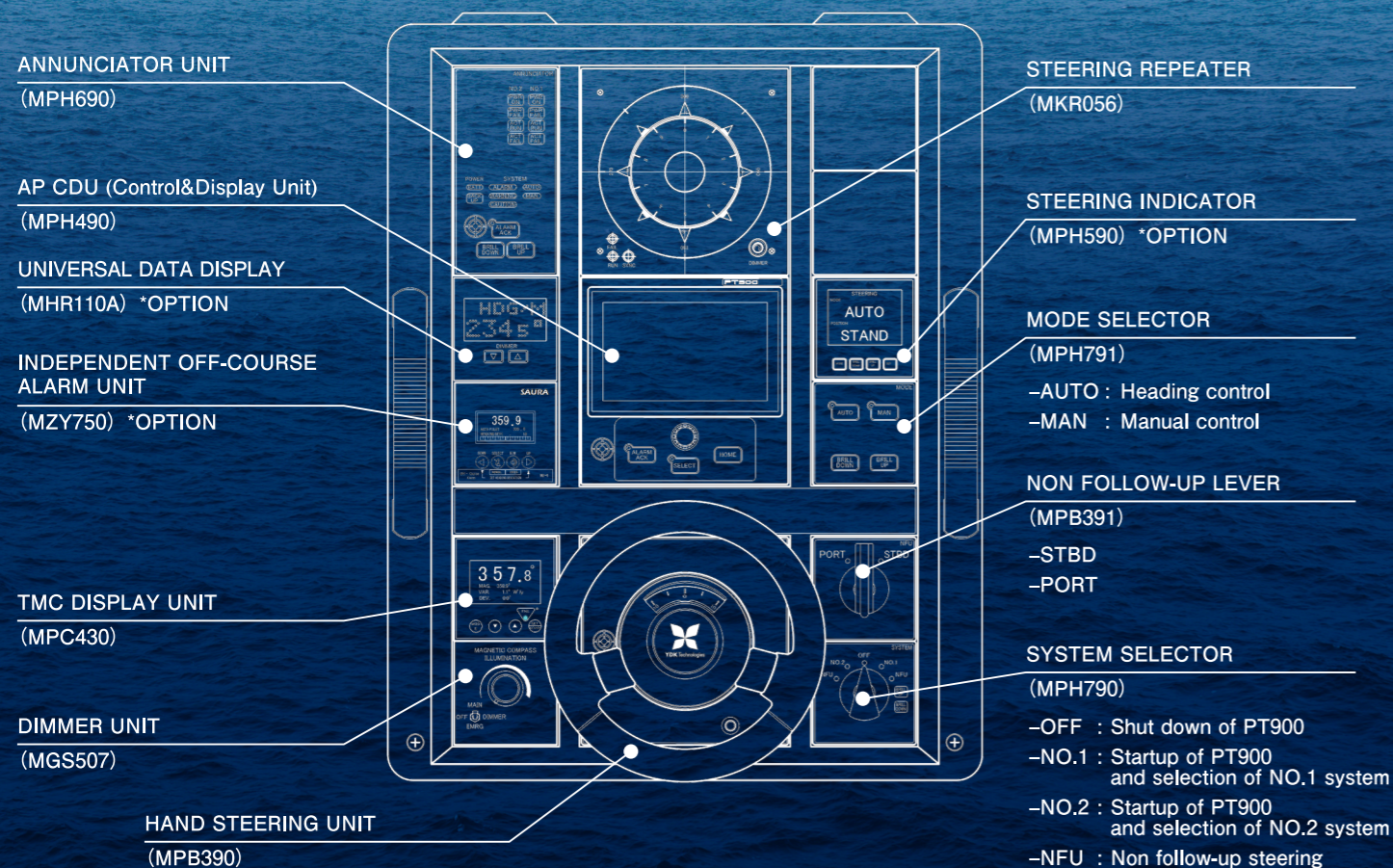
This Autopilot can be adapted from small vessels to large vessels.

### 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)

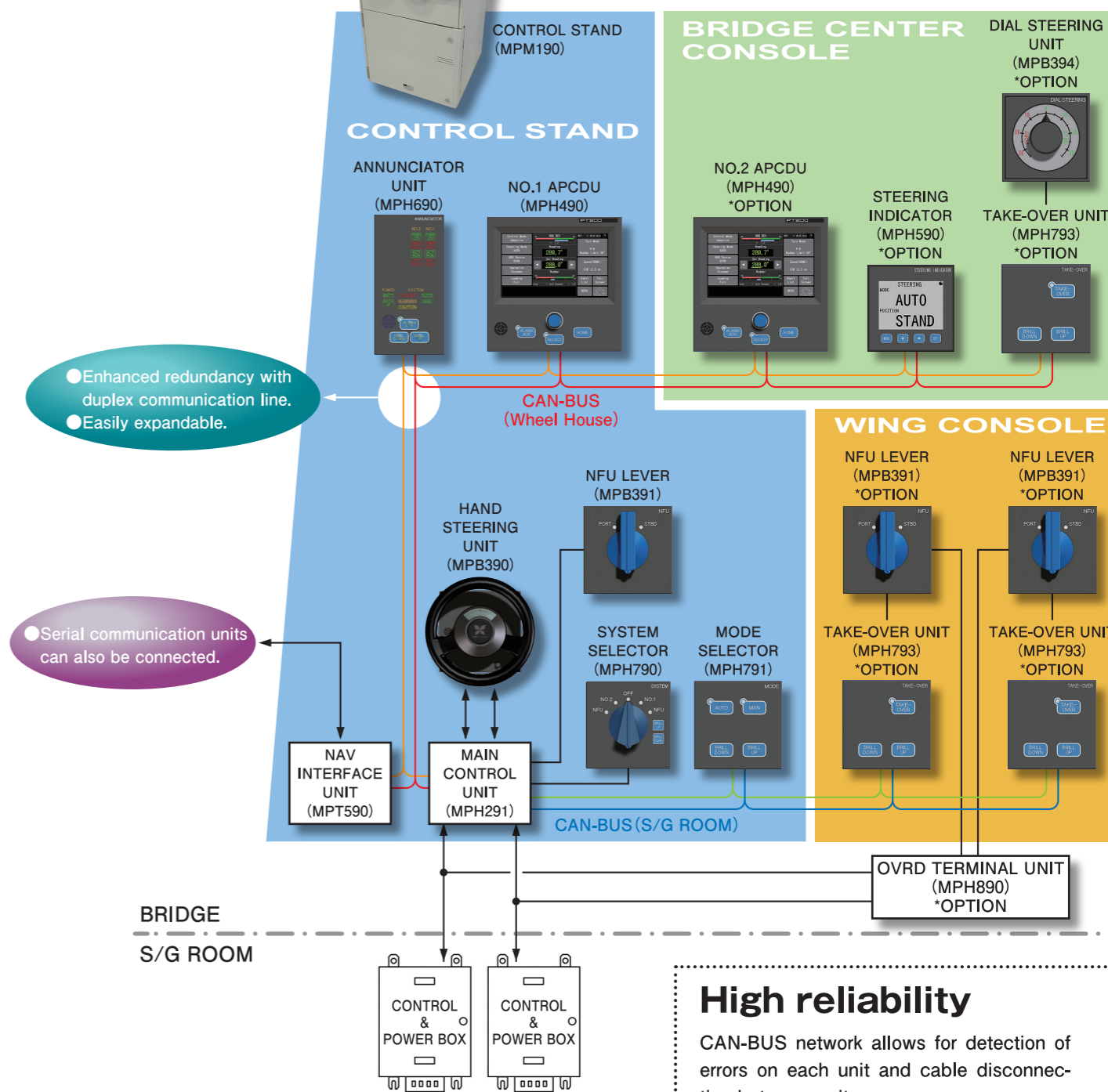
## AUTO PILOT PT900

### CONTROL STAND UPPER PANEL



## Flexible system configuration

Each unit which is functionally separated is equipped with CAN-BUS 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

The indication pattern depends on the steering mode  
 AUTO/TRACK : Heading deviation  
 CRS : Course deviation  
 MAN/NFU : Rate Of Turn

**Control mode**

- Adaptive
- PID

**Steering mode**

- AUTO · MAN · CRS
- TRACK · NFU

**Selected compass**

- GYRO
- MAG · THD

**OPERATION mode**

- Economy
- Precision1
- Precision2

**DRAFT mode**

- Full
- Middle
- Ballast

**Control Mode**  
Adaptive

**Steering Mode**  
AUTO

**HDG Source**  
GYRO

**Operation**  
Economy

**Loading**  
Full

**Rate Of Turn**  
ROT: -> 10.0°/min

**Turn Mode**  
P-D  
Rudder Limit 20°

**Speed**  
Speed (SDME)  
STW 12.5 kn

**Alert button**

**Full Screen button**

**MENU button**

**Display mode**

**Heading**

- Tape repeater indication is available.
- Course indication helps to easily recognize the heading deviation.

**Turn mode**

**Speed**

**Alert button**

**Full Screen button**

**MENU button**

**Display mode**

**Rudder angle**

- Order and feedback rudders angle are indicated on here.

**Guidance area**

- Guidance is indicated here while the particular alerts appear.

**Course setting dial**  
Changes the set heading/course

**Alert ack Key**  
Stops the buzzer in the event of an alert and allows the alert item to be acknowledged

**HOME Key**  
Return to HOME screen

**SELECT Key**  
Select this unit. Pressing the key when set heading can be changed, transfers current Gyrocompass heading into the set heading display.

## 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)

Time	STA	Description	ACK
14-03-30 07:53:13	141	Alarm No.1 Servo Head Failure	ACK
14-03-29 13:56:13	141	Warning L.OJ HDG CH2 COMM error	ACK
14-03-30 08:02:20	555	Alarm No.1 Actuator failure	ACK

Go to Log

Heading: 280.7°  
Set Heading: 278.4°

Control Mode : Adaptive  
Steering Mode : AUTO  
HDG Source : GYRO  
Operation : Economy  
Loading : Full  
Turn Mode : P-D RUDD LIM 20°  
Speed (SDME) : STW 12.5kn  
HDG DEV : -> 6.5°  
ROT : -> 20.0°/min  
Rudder : Order <-13.0°  
:Feedback <-11.0°

MENU Home

## 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.

2-1 Equipment status Log

Date 2014-03-30 08:58:48

SYS SEL No.1

Control ADPT / AUTO Economy / Full

HDG SRC. GYRO Turn Mode P-D RUDD LIM 10°

Operation : Full

Loading : Full

Turn Mode : P-D RUDD LIM 20°

Speed (SDME) : STW 12.5kn

HDG DEV : -> 6.5°

ROT : -> 20.0°/min

Rudder : Order <-13.0°  
:Feedback <-11.0°

Time 07:58:13

Heading 280.7°  
Set Heading 278.4°

Control Mode : Adaptive  
Steering Mode : CRS  
HDG Source : GYRO  
Operation : Economy  
Loading : Full  
Turn Mode : P-D RUDD LIM 10°  
Speed (SDME) : STW 12.5kn  
HDG DEV : -> 2.3°  
ROT : -> 10.0°/min  
Rudder : Order <-10.0°  
:Feedback <-8.0°

Prev Page Next Page

Back Home



## Full screen mode

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

ROT: -> 10.0°/min

HDG DEV: P 7.2°

Heading: 270 280 290

Steering Mode: AUTO

Set Heading: 286.0°

Turn Mode: P-D Rudder Limit 20°

HDG Source: GYRO

Alert: Normal

Speed (SDME): STW 12.5kn

Rudder: 35

Order: -> 10.0° Feedback: -> 7.9°

## Various display (for PT900A)

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

3-1 Heading & Rudder angle graph

Heading: 60.7°  
Set Heading: 62.5°

Control Mode: Adaptive  
Steering Mode: AUTO  
HDG Source: GYRO  
Operation: Economy  
Loading: Full  
Turn Mode: P-D order: 5.0MM  
Speed (SDME): STW 12.5kn  
HDG DEV: <- 1.8°  
ROT: -> 0.2°/min  
Rudder: Order -> 1.2°  
:Feedback -> 1.0°

Back Home

## 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 change the brightness of all units, simultaneously.

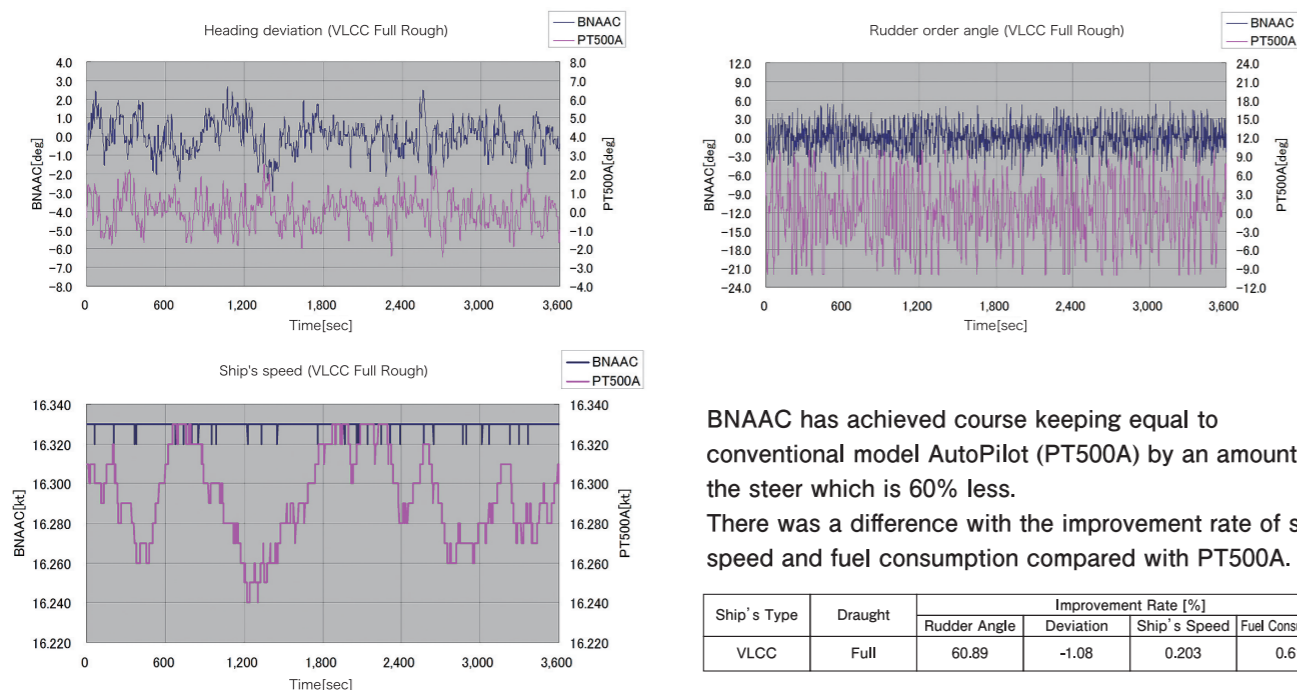
Day Dusk Night



## PT900 fuel saving function

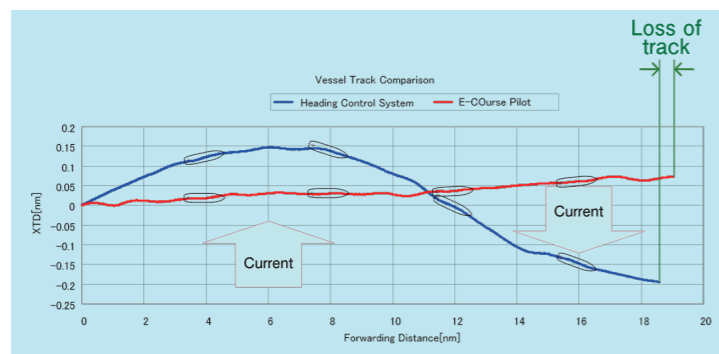
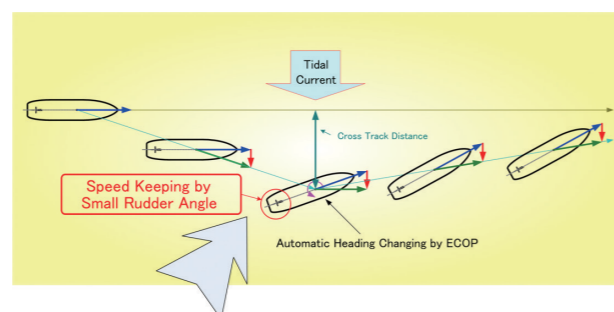
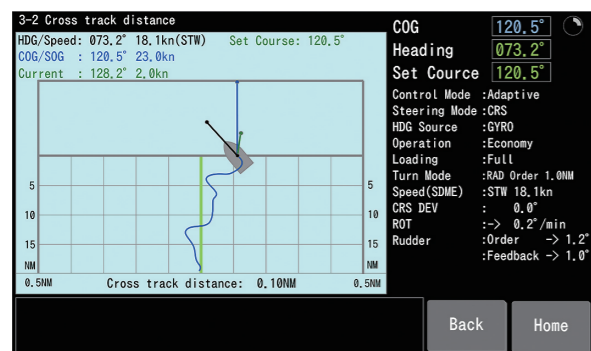
### Batch Noise Adaptive Autopilot Controller (BNAAC)

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



### 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.

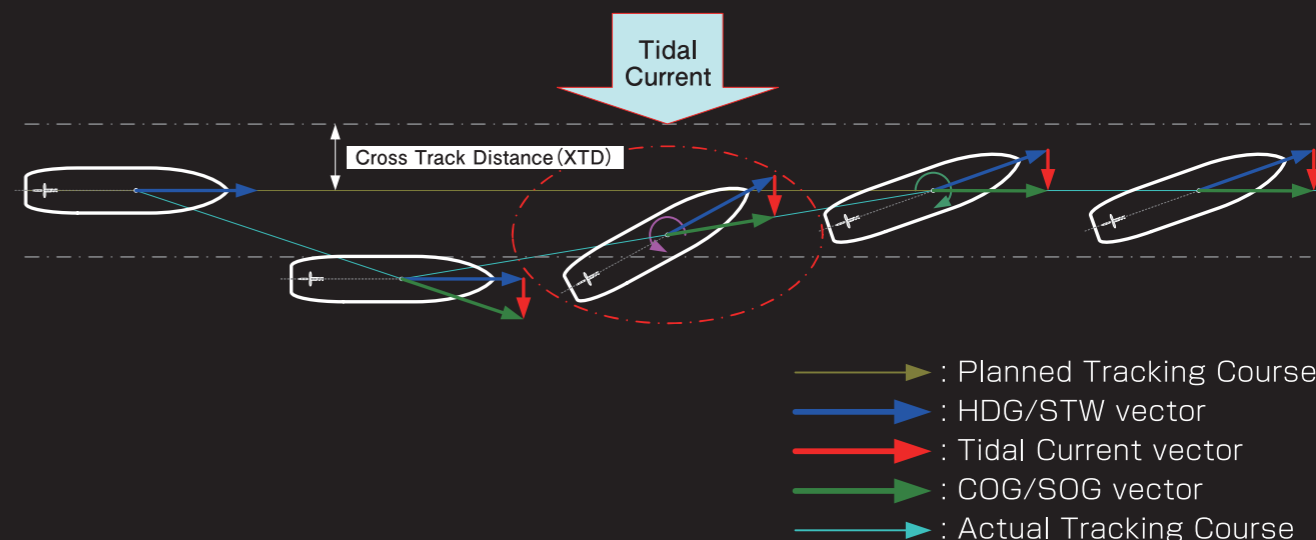


## Track Control System \*OPTION

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



# PT900 component models

PT900□-□-□-□□

Systems :  
 1 : 1 system  
 2 : 2 systems

Steering gear  
 S : single rudder  
 T : twin rudder

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

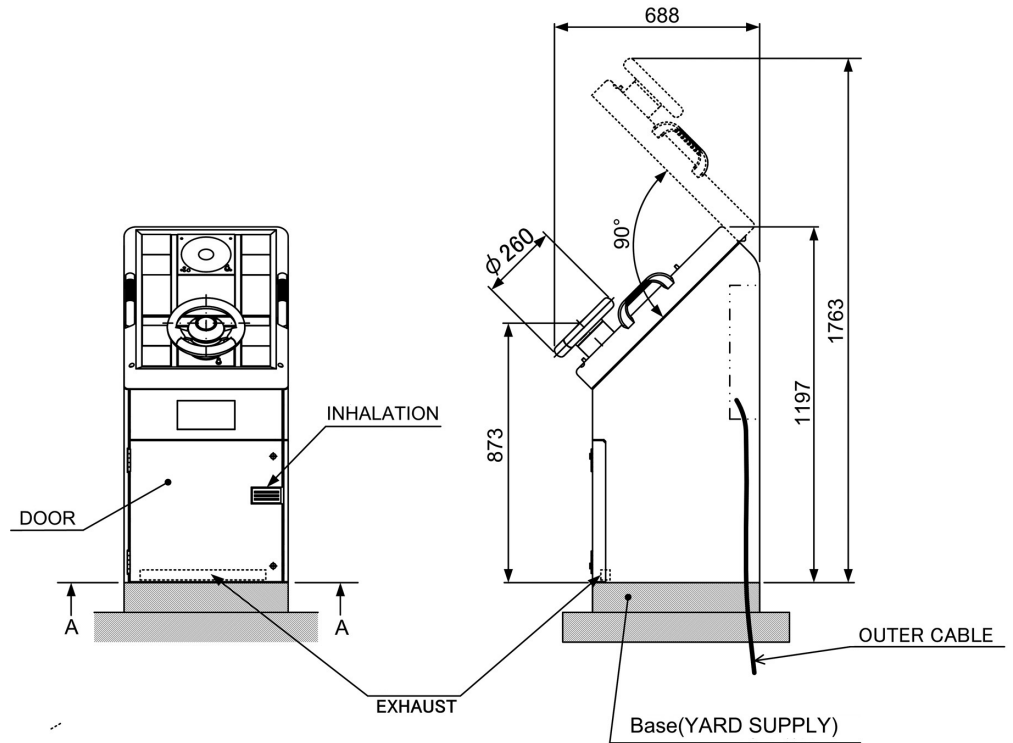
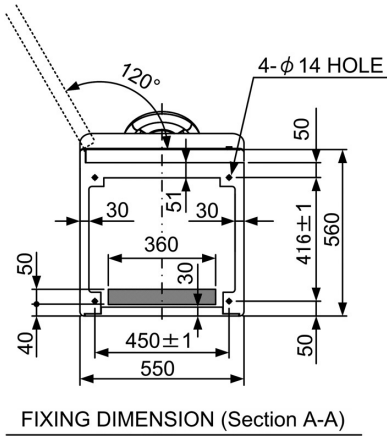
S : Stand-alone steering stand  
 K : Stand built-in CMZ900 Gyro compass  
 P : Panel mounting type (Console mounting type)  
 Q : INS concept type (Control stand and Console mounting)

## Control model

A : PT900 Adaptive control type  
 D : PT900 PID control type

# PT900 Outline

MODEL	MPM190
MASS	100kg



## YDK Technologies Co., Ltd.

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