China Classification Society (CCS) type approval
EU MED B+D Type Approval
Germanischer Lloyd (GL) Type Acceptance Approval
Russian Classification Society (RS) Type Approval
Support Track Control

SCS

STEEING CONTROL SYSTEM

HLD-SC 200 / HLD-TCS 600

Beijing Highlander Digital Technology Co., Ltd.

SCS
Steering control system

HLD- SC 200 Ship Steering Control System is based on years of intensive research & development by Beijing Highlander digital Technology Co; Ltd. The new generation digital steering control system had been type approved by China Classification Society (CCS) and the first made in China Heading Control System(Autopolot)(HCS) to achieve Germanisher Lloyds (GL) and EC MED (Wheelmark) type acceptance. Heading Control System is adaptive to different types of vessels and loading conditions. The precision control results in less rudder movements, not only reduces the wear and tear on machinery but also increases fuel efficiency.

【Features】

Wide range of applications

System is based on Modular design. All modules are of a standard size or a multiple of the standard size. Different combinations of modules can be used to meet different needs, such as simple manual steering control, sophisticated automatic track control single rudder system, dual rudder system, azimuth thrusters, Z-pellers systems and redundancy steering system

High reliability

Built-in test equipment has detection capabilities to identify abnormalities. Control channel galvanic isolation ensures that the control channels are independent of each other.

Precision & Economic Control modes

Advanced control algorithms ensures follow-up mode error is less than or within 0.3 degree. In the automatic control mode, steering error is maintain at less than 0.3 degrees under Sea State 3. Reduction in the number of rudder commands and avoidance of large rudder angle changes significantly reduces fuel consumption and reduces wear and tear on the steering gear machinery.

User Friendly Human Interface

Operators can obtain system information and conditions easily from the integrated display including setting of control parameters. Menu is provided in English and Chinese languages. Night vision mode is incorporated for optimum operation.

Fully digital design

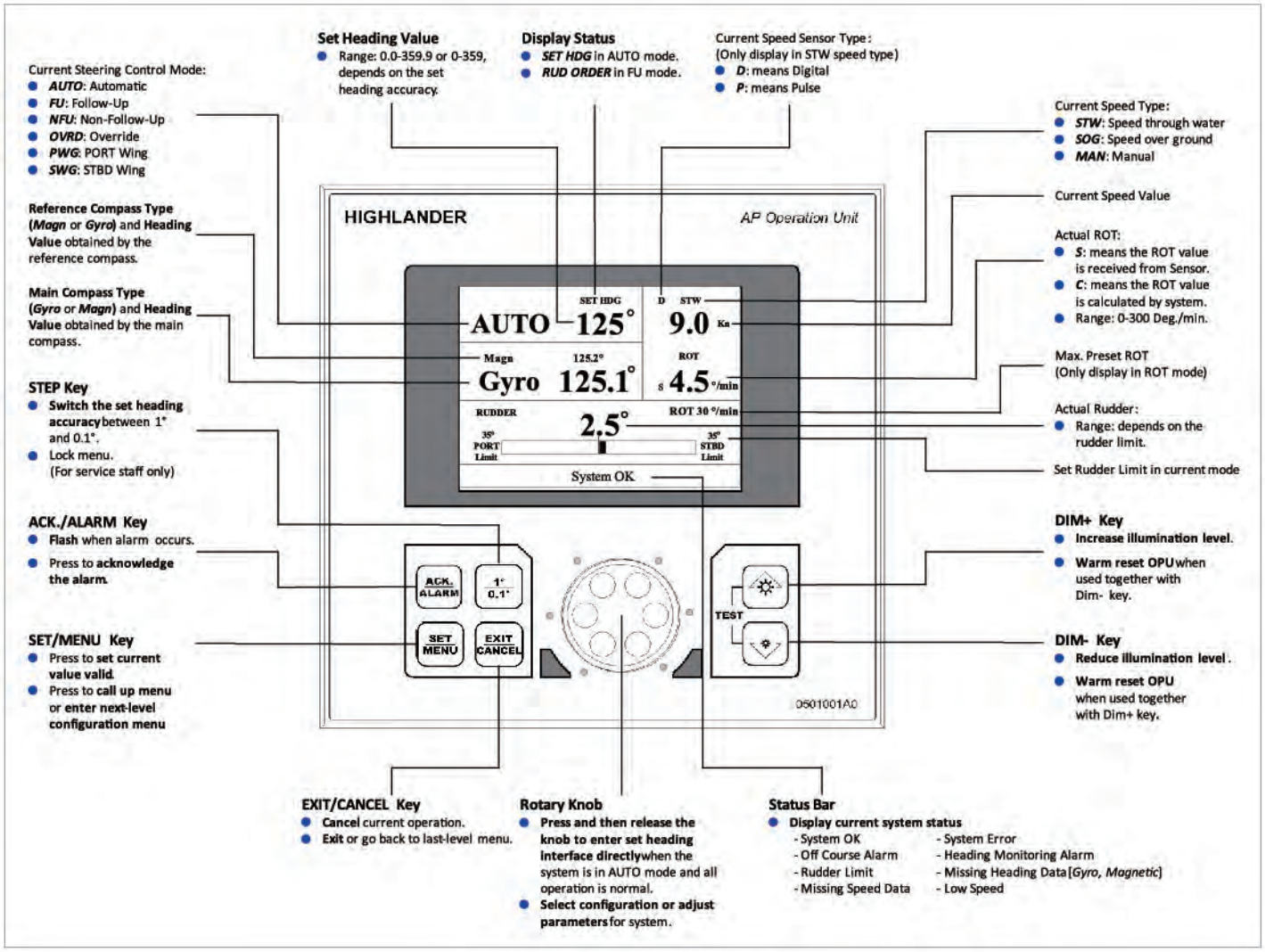
Interface is IEC 61162-1 standards providing output to VDR and inputs for two heading sources.

Easy installation and maintenance

Specialized calibration technologysimplifies calibration of the rudder angle feedback unitinstallation. Built-in test equipment (BITE) function provides fault localization and reduction of maintenance time.

【Steering Modes】

Steering Mode	Steering Mode
Non-follow-up	NFU mode is used for direct control of the solenoid valve. Emergency steering control can be achieved in this mode.
Follow-up	FU control is achieved by FU handwheel. The rudder position is constantly feedback to ensure that it closely follows the position where the handwheel is steered.
Heading Control	Under this mode, the steering course is controlled by a heading reference derived from a heading sensor.
Override	Overrides the automatic control for any emergency situation.
Track Control	Track information from HLD-ECDIS 100 ECDIS is sent to the autopilot for track control steering.



Autopilot Operator's display

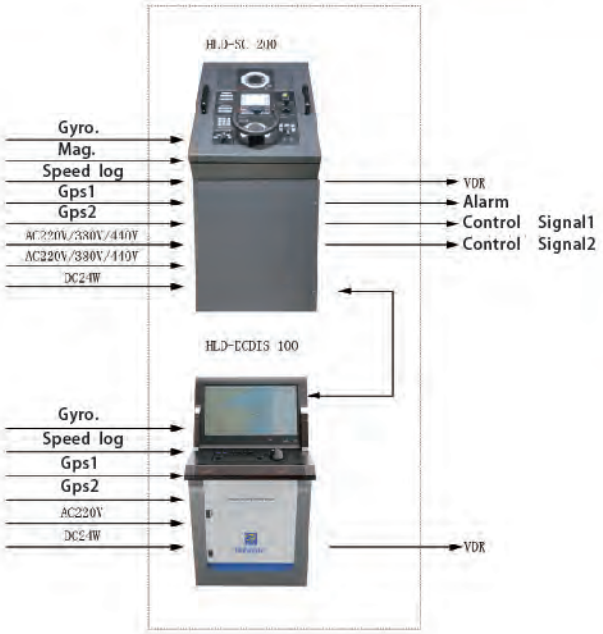
Performance Standard: MSC.64(67) Annex3 Chapter3、4、6、7、8;
ISO11674-2006

【HLD-TCS600 Tracking Control System】

In combination with Highlander HLD-ECDIS 100, HLD-SC 200 is able to provide track control steering accroding to IMO CAT B+C TCS.

HLD-TCS600 functions

- HLD-TCS600Track Control System optimized Great Circle and Rhumb line Navigation to achieve the shortest route and optimize fuel efficiency.
- HLD-TCS600Track Control System provides checks on the planned route to ensure safety navigation.
- HLD-TCS600 Track Control System maintains the navigation of the vessel within the track and turn radius for safety navigation. Meets IMO Requirement for CAT B & CAT C Track Control System with HLD ECDIS 100.



【Technical Specifications】

Power Input

- 220/380/440V AC
- 24V DC (18~36V DC) for alarms

Consumption

- 40W

Temperature

- Working: -15°C~55°C
- Storage:-25°C~85°C

Signal Input: NMEA

- Gyrocompass
- Magnetic compass
- Speed Log

Signal Output

- **Steering Gear**
  Switching ON/OFF Contacts (max; 48w)
  Analogue Output: +/-10 V DC Maximum 5mA) for proportional steering gear
- **VDR**
  NMEA
- **Alarm Outputs**
  NMEA Alarm messages:
  System failure
  Hydraulic failure
  Invalid Heading Information
  Off Course Alarm
  Rudder Limit
- **Display**
  Steering mode:
  Handwheel, BFU
  Tiller, Override
  Tiller
  Current Course
  Set Course
  Speed
  ROT
  udder Command
  Rudder Limit
  System Information

【System Components& Function】

NFU Tiller

NFU Tillers are used for direct control of solenoid valve. It may be used in emergency steering mode. Tillers can be configured as synchronous or asynchronous control of dual rudder system. NFU tillers can be installed on the bridge wing control consoles for remote control.

Override NFU Tiller

When the Override NFU Tiller is activated under the autopilot control mode, it overrides the autopilot control of the rudder to change course without the requirement to change the steering mode.

Steering mode selector switch

Selects the mode of steering control.

FU Handwheel

It provides dynamic responsive steering of the ship. Rudder follows the command of the FU handwheel through the feedback loop in control amplifier.

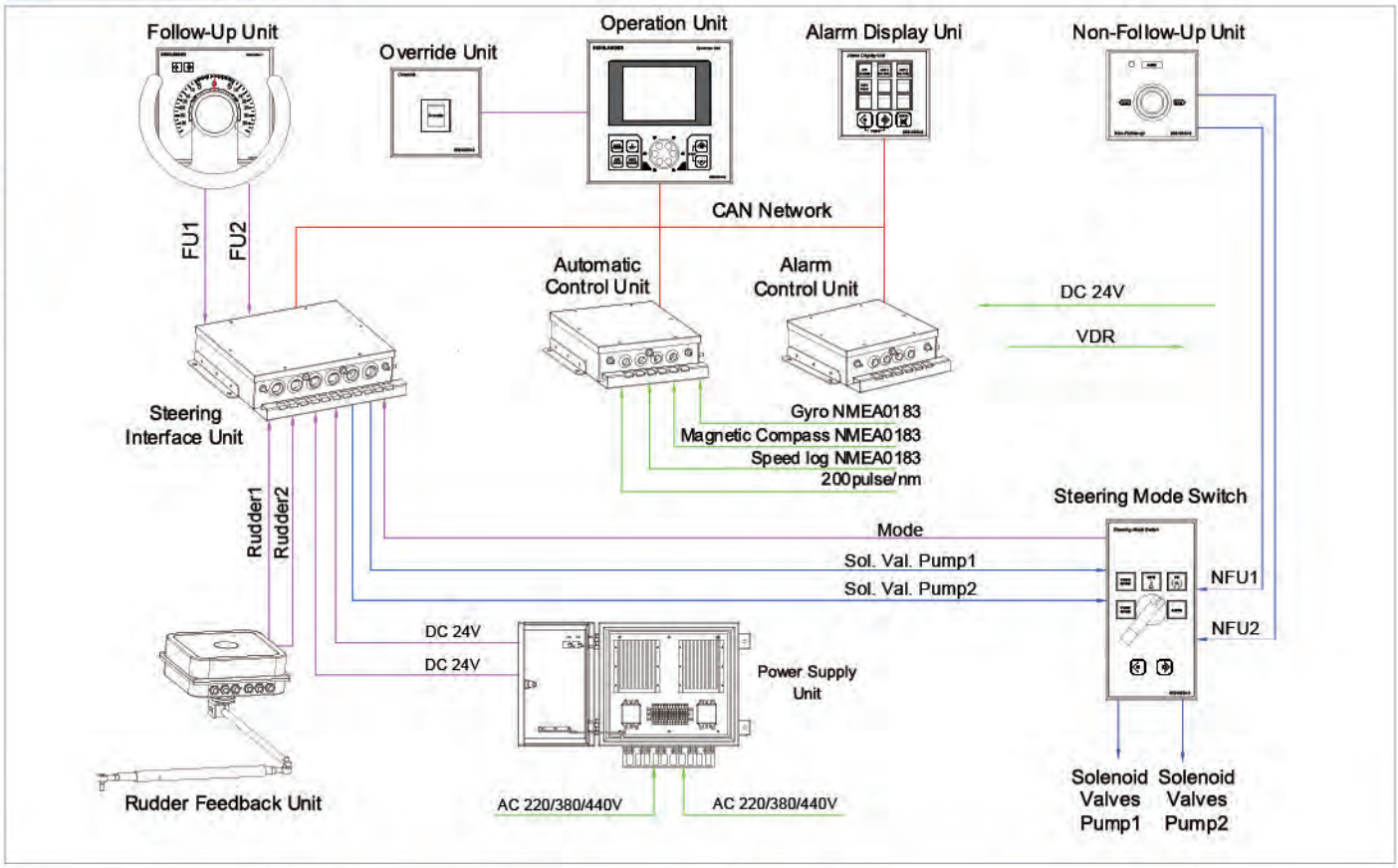
Automatic Pilot

Autopilot comprises of the operator unit and the automation unit. The autopilot receives its heading control signal from a heading sensor or a track control system and using the advance adaptive algorithm calculations, maintains the ship on the set course track while adapting to the sea and ship' s conditions automatically.

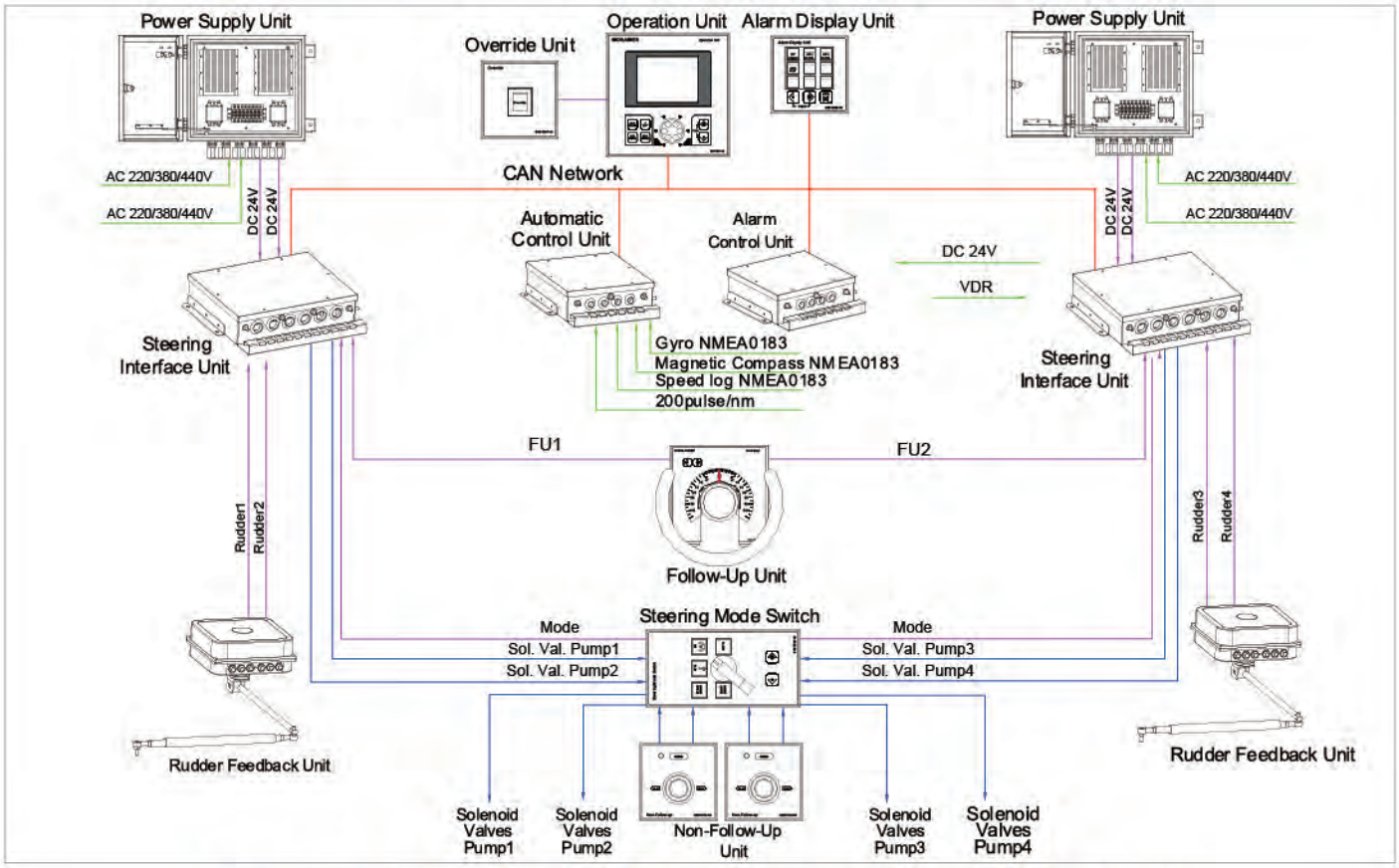
Feedback System

Feedback unit comprises of the feedback unit and the mechanical linkage. The feedback system provides the rudder position information to the feedback amplifier for comparison on the difference between the steering command and rudder position.

【Typical Configaration】



"Auto/Follow-up/Non-follow-up" Steering Control System for Single Rudder



"Auto/Follow-up/Non-follow-up" Steering Control System for Dual Rudder

Standard Configuration

- Manual Steering System

Power Supply Unit	HLD-PSU 200
Steering Mode Switch	HLD-SW 200
Follow-Up Unit	HLD-FU 200
Non-Follow-Up Unit	HLD-NFUV 200
Rudder Feedback Unit	HLD-RF 200
Steering Interface Unit	HLD-SI 200

- Alarm System

Alarm control Unit	HLD-AL 200
Alarm Display Unit	HLD-AD 200

- Manual Steering System

Automation Control Unit	HLD-AC 200
Automation Operation Unit	HLD-OP 200

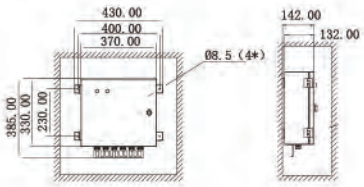
Optional

Override Unit	HLD-OV 200
Relay	HLD-RE 200
Steering Gear Pump Selection Unit	HLD-RPS 200
Extended Alarm Display Panel	HLD-EAD 200
Remonte Steering Control Unit	HLD-WS 200
Steering Compass Repeater	HLD-RP 200
Starter	HLD-SST 200
Alarm Control and Local Steering Unit	HLD-SAC 200
Steering Gear Alarm Display Unit	HLD-SADU 200
Steering Cosole	HLD-ST 200

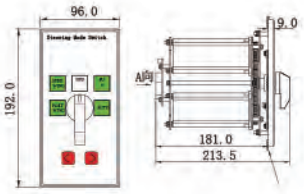
【Dimensional Drawings】

Manual Steering control System

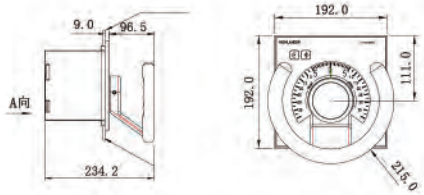
Power Supply Unit
HLD-PSU 200



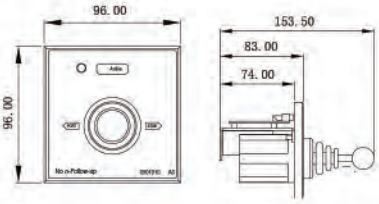
Steering Mode Switch
HLD-SW 200



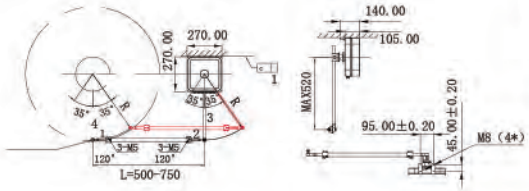
Follow-Up Unit
HLD-FU 200



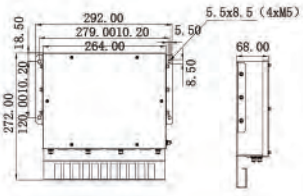
Non-Follow-Up Unit
HLD-NFUV 200



Rudder Feedback Unit
HLD-RF 200

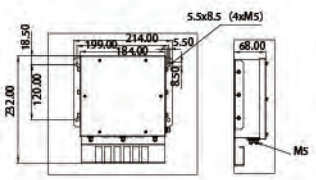


Steering Interface Unit
HLD-SI 200

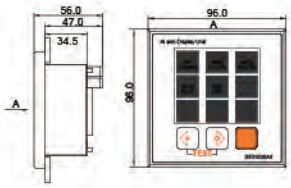


Alarm System

Alarm control Unit
HLD-AL 200

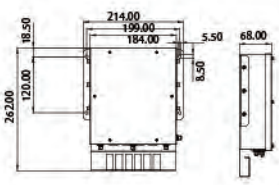


Alarm Display Unit
HLD-AD 200

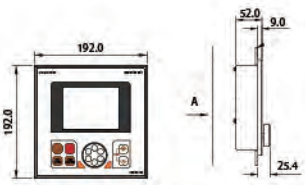


Auto. Steering Control System

Automation Control Unit
HLD-AC 200



Automation Operation Unit
HLD-OP 200



24 Hours
Tel: 400 088 3335
Fax:+86 10 82150083
E-mail:service@highlander.com.cn

Beijing Highlander Digital Technology Co.,Ltd.
Add:C1902, SPTower, Tsinghua Science Park. Haidian District Beijing. China
Tel:+86 10 82158018 Fax: +86 10 82150083
Website:www.highlander.com.cn Post code: 100084