GESAB

A Brand from Sweden
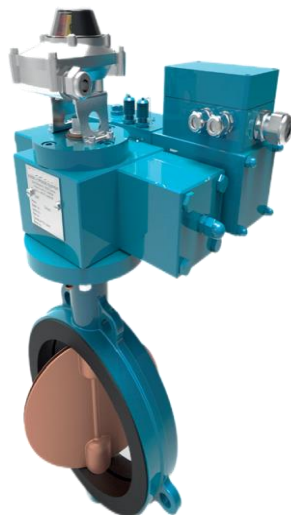
Valve Remote Control System

Tank Level Gauging System

Anti-heeling System

Product Configuration

www.gesab.net

System Introduction

The **Gesab** Valve Remote Control & Tank Level Gauging & Anti-heeling System is a general automation system developed to solve any automation task on board.

Development of the system started back in 1985. At that time the first computer based tank contents computer was launched. Subsequently the concept was extended to include valve and pump control data alarm acquisition. By this MAS (Marine Automation System) was born. Ongoing development of the systems has led to today's system.

GESAB not only produces and supplies complete heating systems but also produces and supplies Valve remote control & tank level gauging system and anti-heeling system.

This addition is the development of functions / sub systems for Valve remote control and tank level measuring system:

The Cargo system
The system includes the following elements:
- Level and tank contents gauging by means of radar based sensors.
- Tank top pressure gauging.
- Temperature gauging.
- Level, indication, pressure and temperature alarms.
- Tank heating control.
- Remote control of pumps and valves.
- Automatic control of pumps and valves.
- Hydraulic / electric actuator with high performance double butterfly / wafer valves
- Hydraulic power unit automatic control
- Volume indicator for submerged valve feedback in solenoid valve control cabinet
- Independent high level alarms.

Ballast and bilge system
The system includes the following elements:
- Level and tank contents gauging by using electronic level sensors.
- Draft, trim and heel gauging.
- Level, contents, pressure and temperature alarms.
- Automatically control of pumps and valves.
- Transfer of tank contents information to loading and stability computer.
- Hydraulic / electric actuator with Centre type valves
- Hydraulic power unit automatic control
- Flow switch for submerged valve feedback in solenoid valve control cabinet
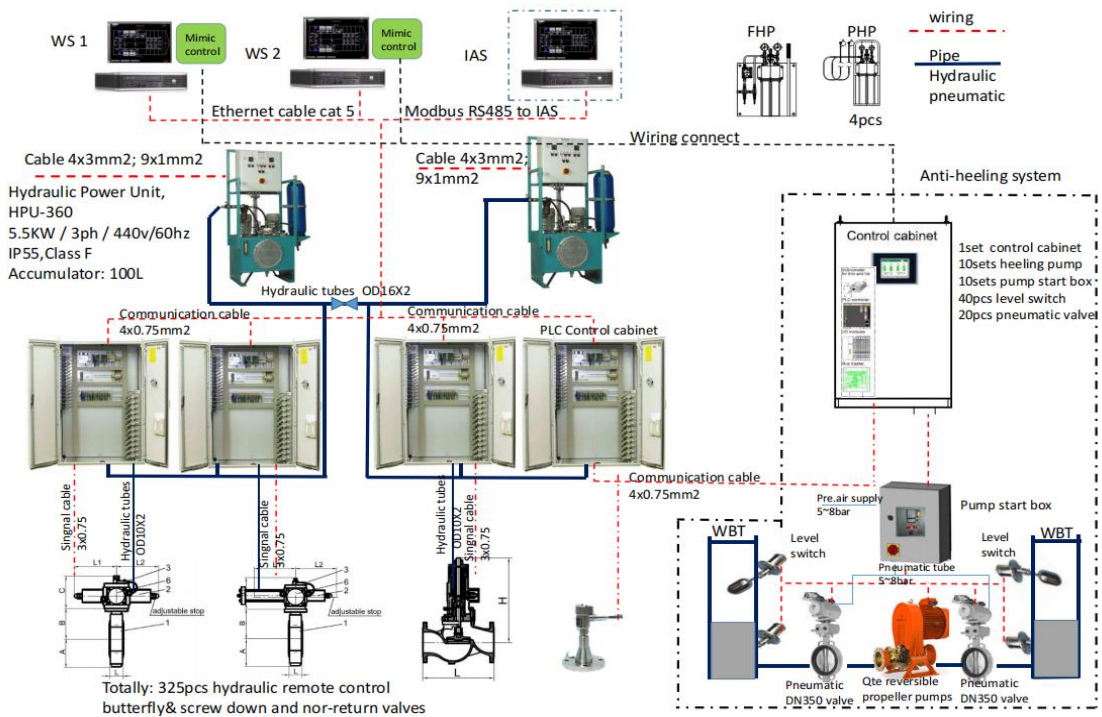
Fuel and oil systems

The system includes the following elements:

- Level and tank contents gauging by using electronic level sensors.
- Temperature gauging.
- Level, contents, pressure and temperature alarms.
- Remote control of pumps and valves.
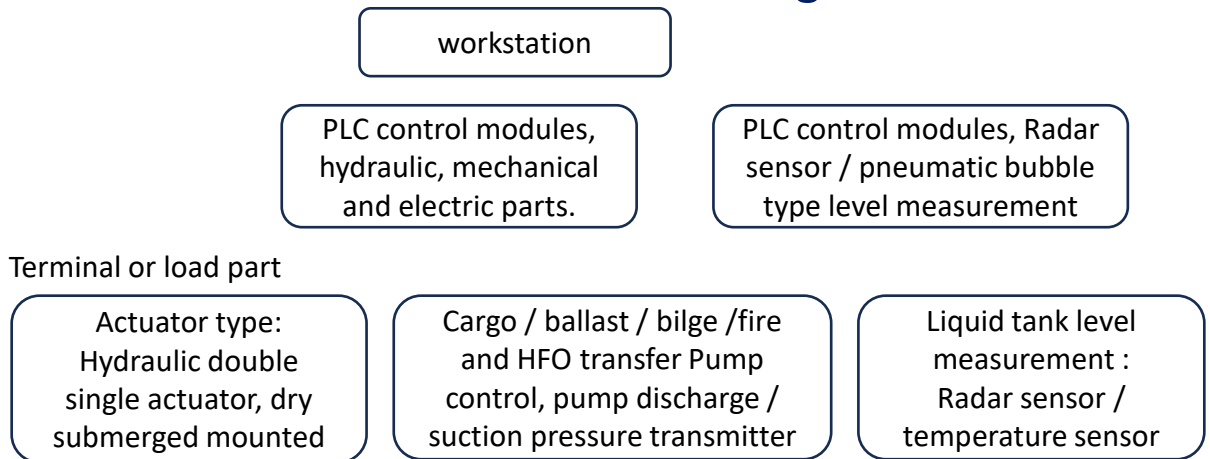- Automatically control of pumps and valves.

The above mentioned systems are often integrated to form one total system.

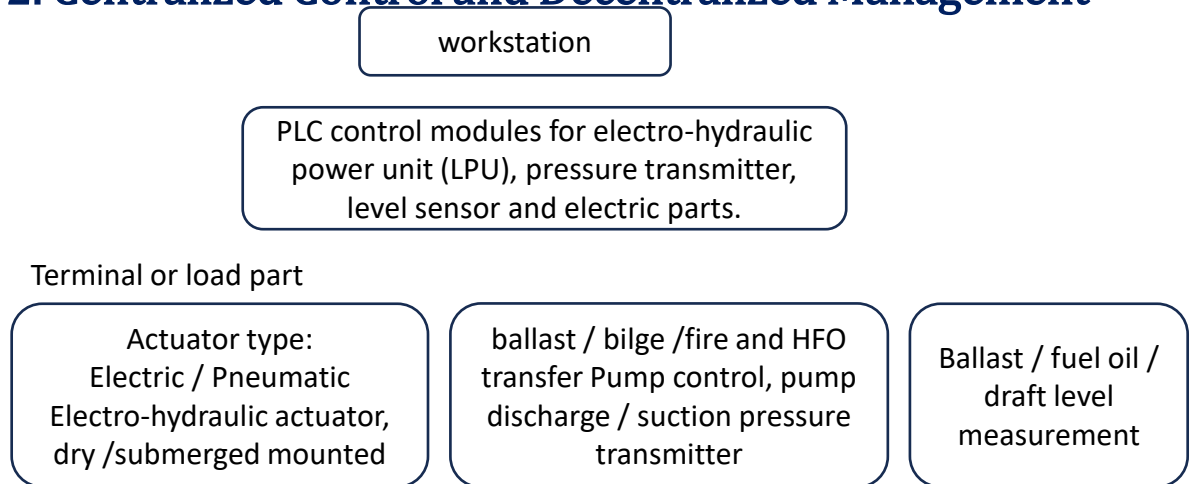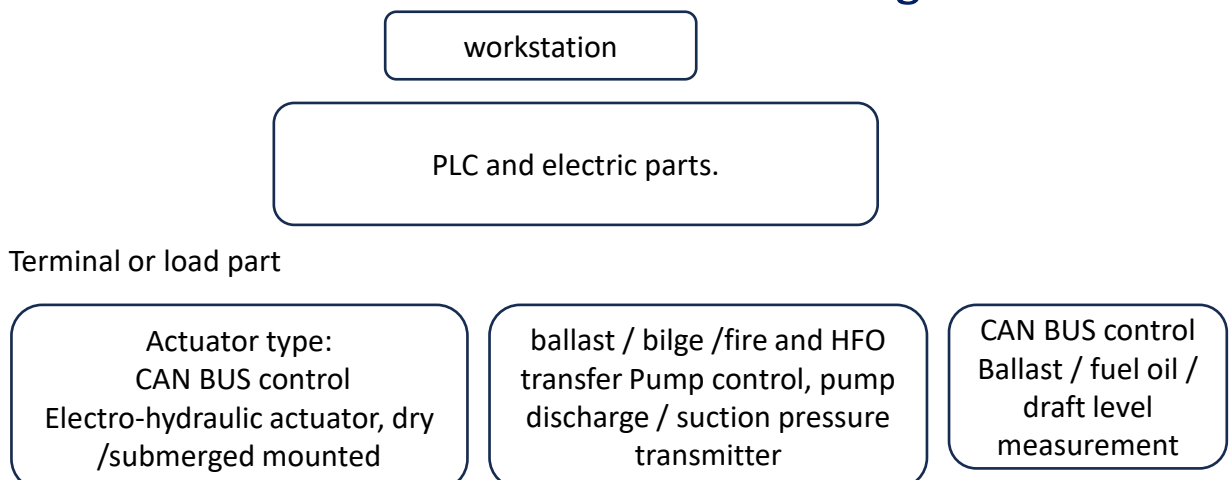## System Configuration for VRC, LGS, AHTS

WS 1 — Mimic control — WS 2 — Mimic control — IAS

FHP   PHP

wiring
Pipe
Hydraulic pneumatic

4pcs

Ethernet cable cat 5   Modbus RS485 to IAS

Wiring connect

Cable 4x3mm2; 9x1mm2

Hydraulic Power Unit,
HPU-360
5.5KW / 3ph / 440v/60hz
IP55,Class F
Accumulator: 100L

Cable 4x3mm2;
9x1mm2

Anti-heeling system

Control cabinet

1set control cabinet
10sets heeling pump
10sets pump start box
40pcs level switch
20pcs pneumatic valve

Hydraulic tubes OD16X2

Communication cable
4x0.75mm2

Communication cable
4x0.75mm2

PLC Control cabinet

Communication cable
4x0.75mm2

Pre.air supply
5~8bar

Pump start box

WBT

Level switch

Pneumatic tube
5~8bar

Level switch

WBT

Singnal cable 3x0.75
Hydraulic tubes OD10X2

Singnal cable 5x0.75

Hydraulic tubes OD10X2
Singnal cable 3x0.75

adjustable stop

adjustable stop

Totally: 325pcs hydraulic remote control
butterfly& screw down and nor-return valves

Pneumatic
DN350 valve

Qte reversible
propeller pumps

Pneumatic
DN350 valve

Current Typical Control Mode

1. Centralized Control Centralized Management

workstation

PLC control modules, hydraulic, mechanical and electric parts.

PLC control modules, Radar sensor / pneumatic bubble type level measurement

Terminal or load part

Actuator type: Hydraulic double single actuator, dry submerged mounted

Cargo / ballast / bilge /fire and HFO transfer Pump control, pump discharge / suction pressure transmitter

Liquid tank level measurement : Radar sensor / temperature sensor

2. Centralized Control and Decentralized Management

workstation

PLC control modules for electro-hydraulic power unit (LPU), pressure transmitter, level sensor and electric parts.

Terminal or load part

Actuator type: Electric / Pneumatic Electro-hydraulic actuator, dry /submerged mounted

ballast / bilge /fire and HFO transfer Pump control, pump discharge / suction pressure transmitter

Ballast / fuel oil / draft level measurement

3. Decentralized Control Decentralized Management

workstation

PLC and electric parts.

Terminal or load part

Actuator type: CAN BUS control Electro-hydraulic actuator, dry /submerged mounted

ballast / bilge /fire and HFO transfer Pump control, pump discharge / suction pressure transmitter

CAN BUS control Ballast / fuel oil / draft level measurement

1. Centralized Control Centralized Management

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Control Station

OS1

OS2

MS 1180

Lan Cable

Power Source

Control Cable

PLC & Solenoid Valve Cabinet

Hydraulic power unit

Pneumatic type

Pipe

Pipe

Control block

Tank and draft level measurement

Hydraulic Actuator

VRCS:
Hydraulic power unit
Solenoid valve cabinet
Hydraulic actuator

TLGS:
Pneumatic bubble type
Radar sensor
Temperature transmitter

Commonly used Vessel:
Liquid / Gas ship, Offshore

GESAB

Control Station

OS1

OS2

Lan Cable

Control Cable

PLC & Solenoid Valve Cabinet

cable

Wire 2x2x0.75

Wire 2x2x0.75

Level sensor
Level transmitter

Floating type
Level sensor

LPU

Electro-Hydraulic Actuator

VRCS:
Relay control cabinet
PLC control
Valve control modules
Electro-hydraulic unit

TLGS:
Electronic pressure transmitter
Temperature transmitter
inclinometer sensor
Pump control

Commonly used Vessel:
Bulk carrier, Container ship, PSV, Offshore

3, Decentralized Control Decentralized Management

Control Station

OS1

OS2

Lan Cable

Power Source

PLC BOX

Wire 2x2x0.75

CAN control box

Communication

CAN control box

Electro-Hydraulic Actuator

Floating type
Level sensor

Level sensor
Level transmitter
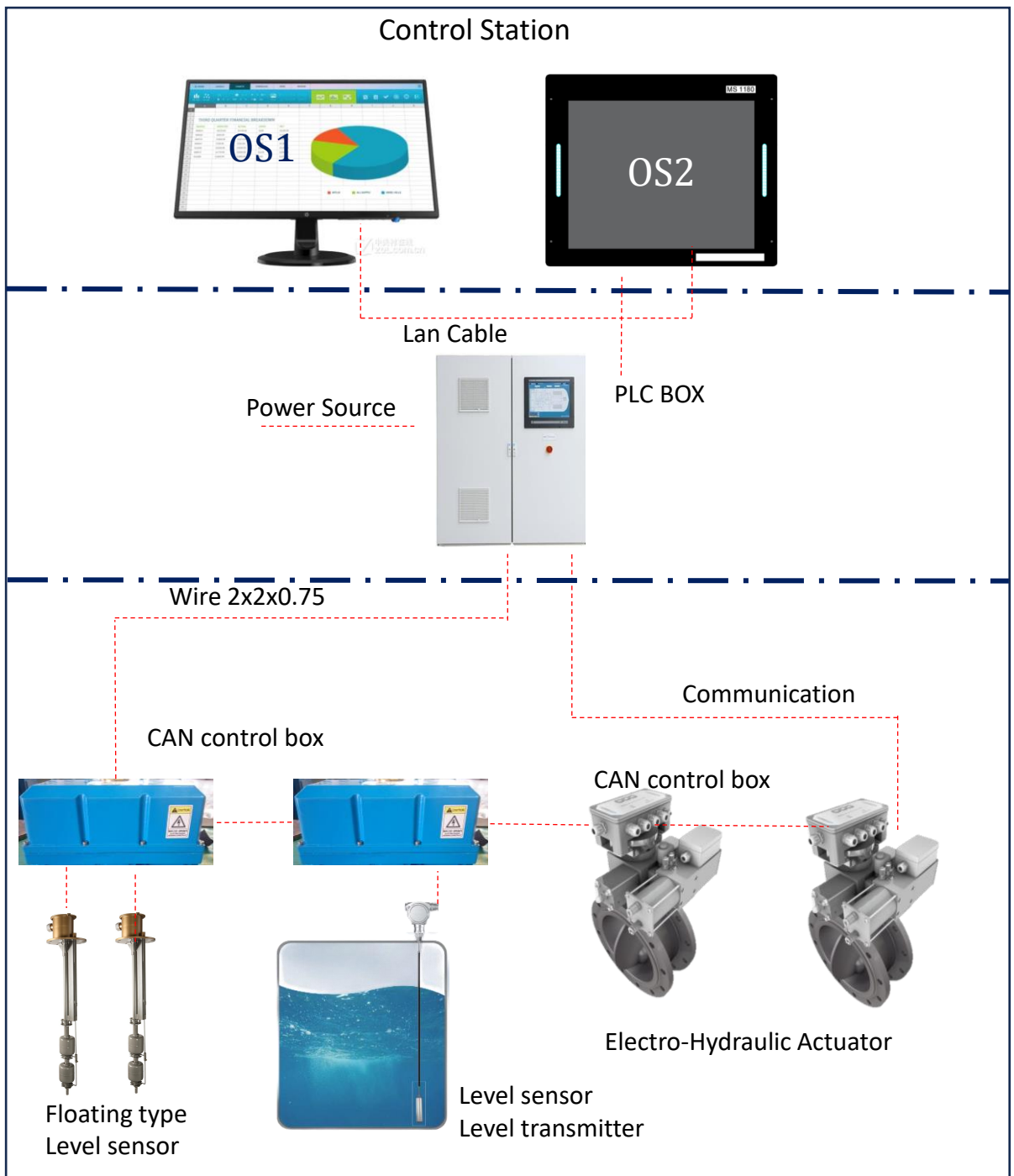
VRCS:
PLC control box

Electro-hydraulic unit
With CAN control card

Commonly used Vessel:
Container, Semi-submersible ship, Offshore

TLGS:
CAN control box
Electronic pressure transmitter
Temperature transmitter
 inclinometer sensor
Pump control
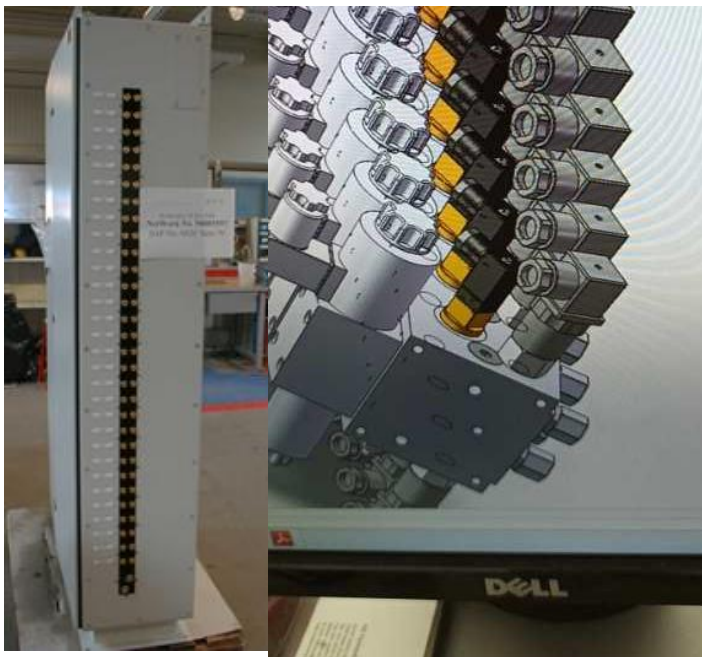
GESAB - Hydraulic Power Unit (HPU)

The hydraulic power units, built from standard components.
Clean and compact design with manual or full automatic operation which meet requirements from the classification and approval authorities.
1 separate control boxes for motor / pump units.
Standard features:

a) Oil storage tank : 100L / 160L / 260L / 400L
b) 2 x electric motor (ABB 2.2KW / 3KW / 4KW)
c) 2 x gear pump, pump capacity 9L/min (Marzocchi)
d) 4 x pressure relay switch ATOS for motor self-start /stop
e) 1 x relief valve ATOS
f) 1 x reduce valve ATOS for working pressure
g) 1 x electric control box (Schneider, APT, Siemens)
h) 1 x level switch for oil level
i) 1 x level switch for automatic stop (low low level)
j) Standard Accumulator from 10 L to 50 L per single or double
k) 1x Pointer type top mounted oil level sight.
l) Remote start/stop operation.
m) Selector switch (between service and standby motor).
n) Power on lamps.
o) Pump running lamps.
p) Prepared for 10, 20, 32 or 50L built-on accumulators.

GESAB – Solenoid Valve Cabinet (SVC)

The hydraulic power units, built from standard components.
Clean and compact design with manual or full automatic operation which meet requirements from the classification and approval authorities.
1 separate control boxes for motor / pump units.
Standard features:

a) Oil storage tank : 100L / 160L / 260L / 400L
b) 2 x electric motor (ABB 2.2KW / 3KW / 4KW)
c) 2 x gear pump, pump capacity 9L/min (Marzocchi)
d) 4 x pressure relay switch ATOS for motor self-start /stop
e) 1 x relief valve ATOS
f) 1 x reduce valve ATOS for working pressure
g) 1 x electric control box (Schneider, APT, Siemens)
h) 1 x level switch for oil level
i) 1 x level switch for automatic stop (low low level)
j) Standard Accumulator from 10 L to 50 L per single or double
k) 1x Pointer type top mounted oil level sight.
l) Remote start/stop operation.
m) Selector switch (between service and standby motor).
n) Power on lamps.
o) Pump running lamps.
p) Prepared for 10, 20, 32 or 50L built-on accumulators.

GESAB – Remote control valve
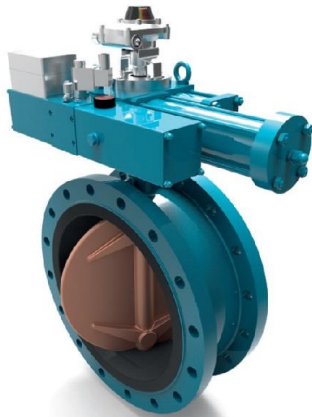
- Hydraulic actuator with valve
- Electro-hydraulic actuator with valve
- Pneumatic actuator with valve

LPU

Design of double acting actuators

- 90° turn actuator
- For dry and submerged conditions
- Suitable for marine applications
- Coating: 2 components epoxy
- Compact design
- Low maintenance
- Low cost
- Local position
- Satisfies all requirements by major approval authorities
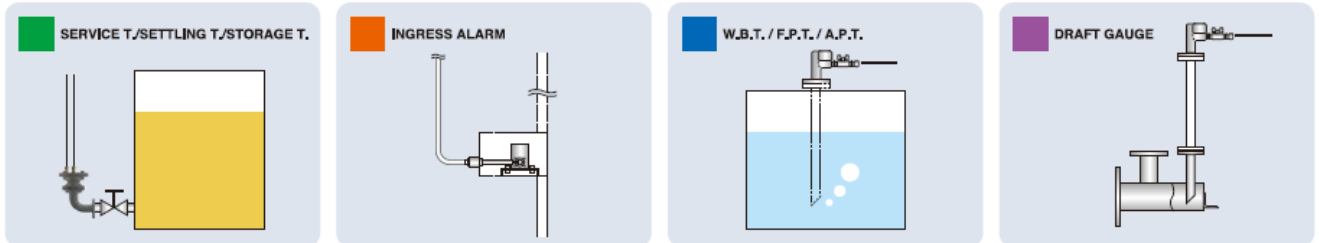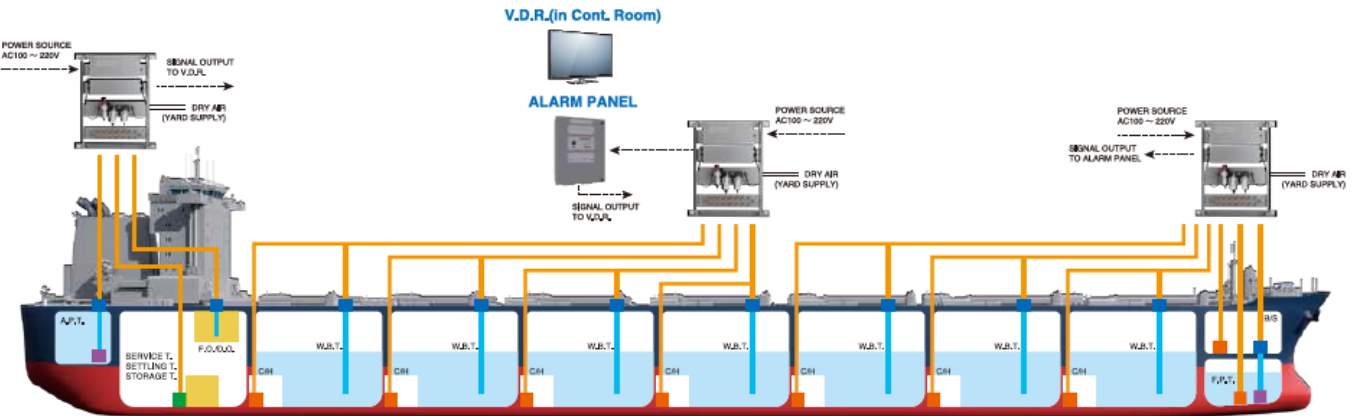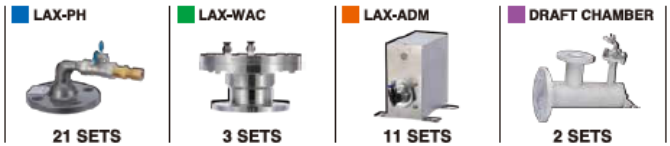- Electric limit switch IP65 or IP68
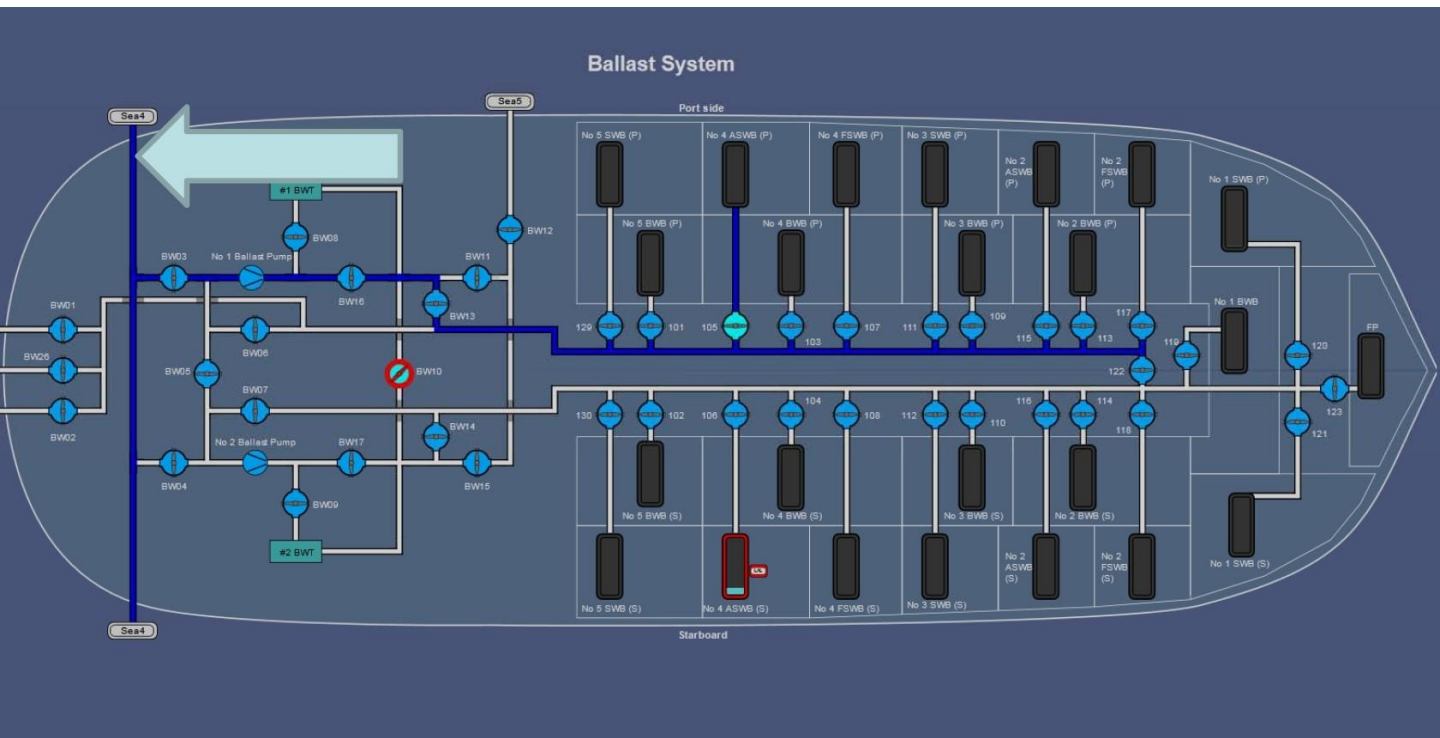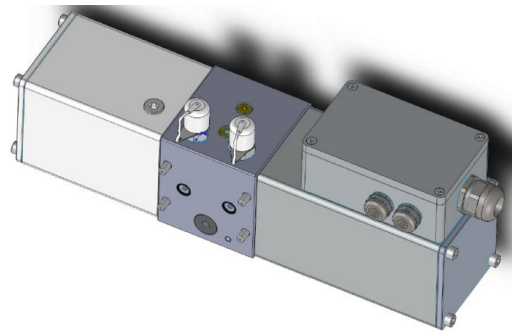
GESAB – Level Transmitter

GESAB

1 - Electric pressure transmitter
2 - Pneumatic pressure transmitter
3 - Radar level transmitter
4 - Float switch for level alarm

Measuring range 0~30m
Suitable for
- Sea and fresh water
- Fuel oil
- Lubricating oil
- Petroleum products
- Chemical

1

4

2

3

LAX-PH	LAX-WAC	LAX-ADM	DRAFT CHAMBER
21 SETS	3 SETS	11 SETS	2 SETS

: φ 8 (t1.0) COPPER PIPE
: 20A PIPE (YARD SUPPLY)

V.D.R.(in Cont. Room)

ALARM PANEL

POWER SOURCE AC100 ~ 220V

SIGNAL OUTPUT TO V.D.R.

DRY AIR (YARD SUPPLY)

POWER SOURCE AC100 ~ 220V

SIGNAL OUTPUT TO V.D.R.

DRY AIR (YARD SUPPLY)

POWER SOURCE AC100 ~ 220V

SIGNAL OUTPUT TO ALARM PANEL

DRY AIR (YARD SUPPLY)

A.P.T.

SERVICE T. SETTLING T. STORAGE T.

F.O./D.O.

W.B.T.

W.B.T.

W.B.T.

W.B.T.

W.B.T.

W.B.T.

W.B.T.

F.P.T.

SERVICE T./SETTLING T./STORAGE T.	INGRESS ALARM	W.B.T. / F.P.T. / A.P.T.	DRAFT GAUGE

GESAB – Anti-heeling system

"GESAB" Anti-heeling system is used to keep the ship in lateral ballance through the deloyment of ballast water when the ship is subjected to large single side troque. When the ship is loading and unloading cargo, the ship's heeling angle reaches the set value, the anti-heeling system will automatically put into operation, and the water in the ballance tank will be transported from on side to the opposide side, so as to keep the ship ballanced. When the ship's heel angle is close to horizontal, the pump will stop automatically and the corresponding remote control valve will be closed.