

LEVELMASTER[®] H8

Electro pneumatic level and draught gauging



General Information

The new generation of Levelmaster is named H8 and is the successor of the well-known CALM system. Level gauging using the electro-pneumatic principle, so called 'bubble measuring', has always been known as a very robust and reliable method.

Kockum Sonics now release its fourth generation of the electro-pneumatic system concept. We have combined the latest and best sensors and microprocessors in order to produce an electro-pneumatic system that combines low cost and very high performance.

The heart of the system is the integrated sensor and control unit (SCU). It takes care of all data acquisition, calibration, control and transmission. The SCU is developed by Kockum Sonics and tailor made to suit electro-pneumatic tank and draught gauging. Each pressure sensor has been calibrated for non-linearity and temperature shift in order to provide optimal performance. While in operation the system auto calibrates at pre set intervals, which maintains the system accuracy. The SCU is adaptive and precisely adjusts the needed air output for each tank.

The system is designed to:

- Simplify operation
- Increase accuracy
- Reduce investment costs
- Reduce maintenance costs

Features and Benefits:

The new Levelmaster H8 is packed with new and improved technology. First of all the system is fully modularised making for very easy service. Secondly the new Levelmaster H8 software driver makes integration with other systems easy and straightforward. All collected data can be made available over a standard TCP/IP network. The software driver is also used to monitor the status of the system. Diagnostics can be run from any connected computer with the driver installed.

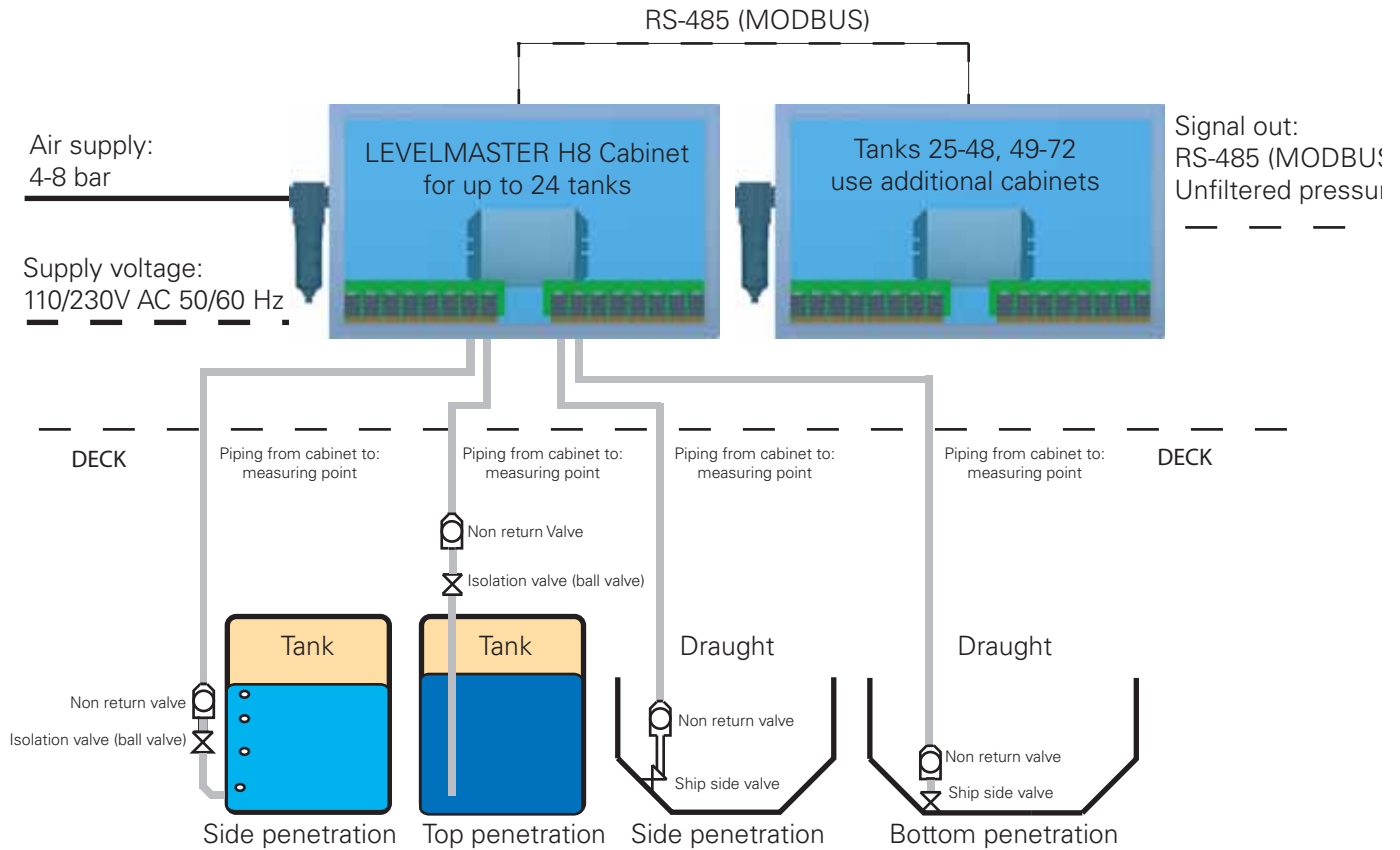
- High accuracy with automatic system calibration
- Adaptive level sensing
- Automatic purge
- High update speed
- Low air consumption
- No electrical parts in EX zone
- Small dimensions
- Low investment cost
- Easy installation
- Maintenance free

Parts and Components:

LEVELMASTER H8 cabinet

The Levelmaster H8 system will be delivered with all components mounted in a powder coated steel cabinet. Ready for connection to the main air supply, electric power and to the piping for the individual tanks or draughts.

System Layout



Measuring principle

The Levelmaster H8 system uses the electro pneumatic principle. This is a well proven and reliable method, it keeps the installation as well as the maintenance costs down. To obtain a higher cost efficiency, the system is designed in such a way that each pressure transmitter (needed for measuring of the hydrostatical pressure) is engaged for a number of tanks. One pressure transmitter can handle up to six tanks. A Digital Flow Controller adjusts the airflow by varying the main valve's duty cycle

Calibrated and ready to go

For optimal performance each Sensor and Control Unit (SCU) is factory calibrated for nonlinearity and temperature shift. In addition to the precalibration the system auto calibrates while in operation in order to maintain its accuracy throughout its life cycle.

Output

Tank level (pressure) data is available on two serial outputs RS-485 or optionally analogue outputs 4 - 20 mA.

The following items are included:

The system is delivered with all components mounted in a powder coated steel cabinet (stainless steel optional). Up to 24 measuring points per cabinet;

- Cabinet in powder coated steel (stainless steel optional)
- Sensor and Control Unit, SCU
- Digital Flow Controller
- Valve Block and Internal piping
- Main Pressure Regulator with filter and auto drain
- Serial communication, 2x RS485
- Analogue input modules (optional)
- Analogue output modules (optional)
- Membrane air dryer (optional)

Features and Benefits

Adaptive Level Sensing

Levelmaster H8 is an intelligent system. It automatically senses and compares measured levels making the system adaptive. When the level in the tank increases, more air is given in order to ensure that the tank filling speed does not have an effect on the measurement.

Automatic Leakage Detection

If the ship pipes to the tanks are not completely air tight, the Levelmaster H8 system will detect the leaks. At small leaks the system reacts by purging the tank with longer intervals in order to minimise the effect on the measurement. The error will be negligible. In addition, a warning signal is given.

Automatic System Calibration

One very important feature of the system is the automatic system calibration. It dramatically improves the accuracy of the measurement. The whole system is calibrated every 20 minutes.

Automatic System Purging (Cleaning)

Levelmaster H8 system automatically purges the pipes at preset intervals in order to keep them clean.

LEVELMASTER H8 Software Driver

As an alternative, one of the RS-485 serial communication ports can be connected to a computer equipped with the LEVELMASTER H8 driver. The driver can re-transmit the data over a standard TCP/IP network making the level and draught data available on the ships network. Each and every measuring point can be examined for status.

LEVELMASTER H8 Diagnostics

The status of the system can be monitored and checked by an application called LEVELMASTER Diagnostics (as a part of the software driver). Simply connect a computer to the USB port on the SCU and launch the application. The SCU (sensor and control unit) is equipped with LED's to give a quick overview of the system status.

Density Measurement (optional)

Measuring of the liquids actual density by using two sounding pipes where the distance between the outlets is known and constant.

Installation Components

Non return valve

In order to increase the safety of the system it is strongly recommended that a non-return valve is installed as close to the tank as possible. The non-return valve, with very low pressure drop, is especially developed by Kockum Sonics for electro pneumatic level gauging. The non-return valve prevents the fluid in the tank from migrating in to the piping between the Levelmaster H8 cabinet and the sensing point if the cabinet should be turned off. (See the system layout on the opposite page.)

Isolation valve (ball valve)

Kockum Sonics recommends that a isolation valve is installed close to the tank, making it easy to test the piping between the cabinet and the sensing point for air tightness. In the case of installing a sensing point in a tank with a side penetration, an isolation valve is necessary in order to make troubleshooting or service feasible without emptying the tank. (See system layout on the opposite page.)

Piping from cabinet to sensing point

Kockum Sonics has gained broad experience in installing air pipes from the Levelmaster H8 cabinet to the sensing points in the tanks. We can provide solutions in stainless steel, copper or plastic piping. If this is of interest, please contact Kockum Sonics and we will provide you with a complete solution.



Technical Data

LEVELMASTER H8 Cabinet

Dimensions (cabinet)

without Air Conditioning Package	300 x 500 x 210 mm (H x W x D)
with Air Conditioning Package	300 x 565 x 210 mm (H x W x D)
Weight	20 Kg
Enclosure	IP 54

Power supply	110 / 230V 50 / 60Hz AC (optional 24V DC, max 36 VA)
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Air Supply:	4 – 8 bar dry and clean instrument air
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Environmental conditions

Temperature:	-40°C to +70°C (Transport and storage) 0°C to +55°C Operating
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Pressure Sensors

Number of sensors	4 Gauge / differential
Pressure range	4 bar

System performance

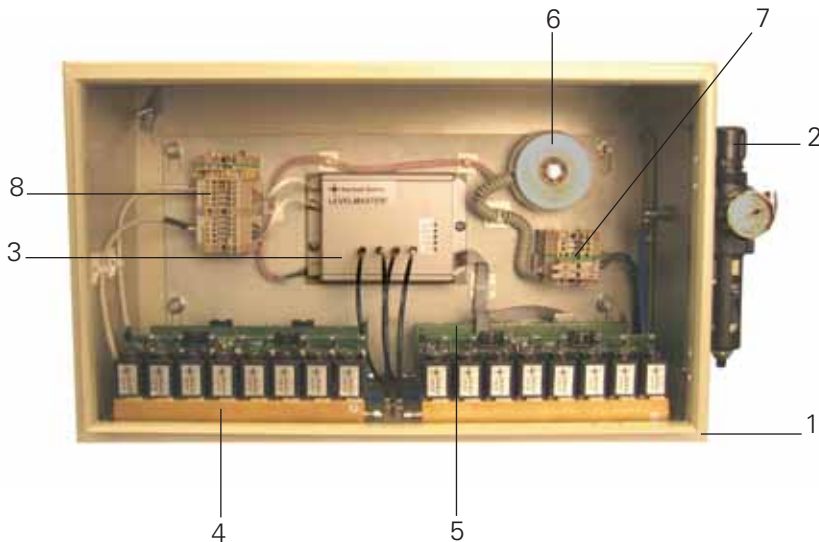
Max tank height	35 m (standard), other range optional
Typical accuracy	+/- 1 cm
Max total system error	+/- 0.15 %FS +15°C to +45°C +/- 0.25 %FS 0°C to +55°C
Updating time:	7 sec
Analogue outputs	(optional 24 x 4 – 20 mA)

Serial communication

Com1	RS-485
Com2	RS-485
USB	Shared with COM1. When a unit is connected to the USB port, it will disable the RS-485 interface on Com1.

Module based system for easy service

Kockum Sonics had easy maintenance and service in mind when developing the Levelmaster H8 system. The system comprises of a total of five active modules. Each of them are easily dismantled and replaced if necessary. See below:



Item	Description
1	Cabinet
2	Air treatment unit
3	SCU (Sensor & control unit)
4	Valve block
5	Valve card
6	Power supply
7	Power terminal
8	Communication terminal

Subject to alteration without notice.

TYFON®

The original!

From classic “honks” to complete acoustic systems

A Kockum Sonics whistle is not only high-quality design. It also contains the experience of more than 1 million TYFON® installations!

Audibility is determined not simply by the strength of sound emanating from the whistle – much more is entailed to overcome absorption, distortion and local noise. This quality is the result of more than 80 years of development. The TYFON® fulfils all current IMO and national authority regulations.

Our strength is your benefit!





The complete package

A wide range of TYFON® models is available.

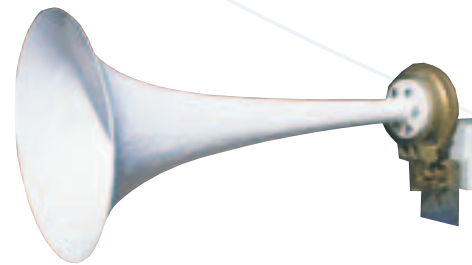
Irrespective of whether one is needed for a small yacht, working boat, super tanker, bulk carrier or for a cruising vessel such as the Queen Mary, there is a TYFON® for you.

TYFON® can be electric or driven by air.

The complete package consists of an electric or pneumatically operated TYFON®, together with a signalling system consisting of a controller, bell and gong, lights etc.

TYFON®

Compressed air driven whistles suitable for all kinds of vessels. All models are equipped with low consumption electro-pneumatic valves and choke-type air flow regulators for high or low pressure air supplies. The two solenoid valves and lanyard provide three safety back-up measures with thermostat controlled heating as standard.



ELECTRO-TYFON®

An electrically driven sound emitter with a patented, unique, vertically extended front, to avoid excessive sound levels on the bridge (IMO) by an unsymmetrical sound distribution.



ELECTRONIC TYFON®

Driven by a twin-unit electro-dynamic special driver. The sound signal is created in the micro-computer based amplifier. A microphone can be added for use as a PA.



BELL AND GONG

Available as both electronically and electromechanically operated.



Accessories

All items required to provide an optimum signalling system, e.g. signal controller, contactor box, thermostat, all types of push buttons, filter, manoeuvre lantern etc.

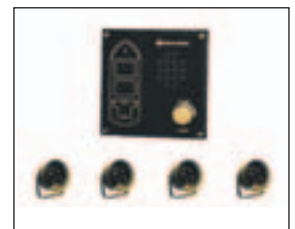


Service

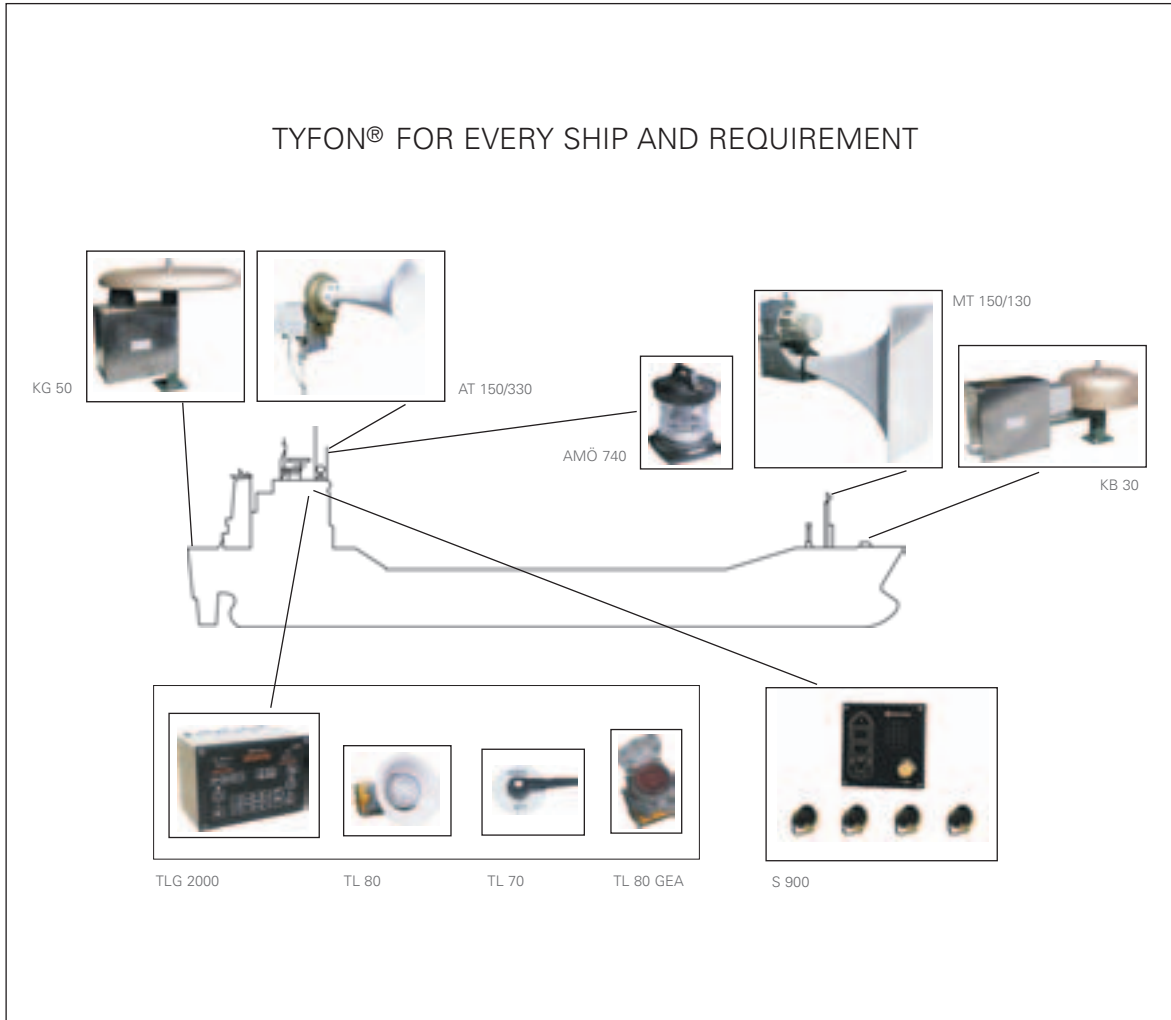
Kockum Sonics' world wide network of representatives and wholly-owned subsidiaries are always ready to support you with service and spare parts.

SOUND SIGNAL SURVEILLANCE

The S900 system is an external bridge wing microphones feeding amplifiers and loud speakers allow internal environmental sound monitoring. When connected to a signal controller, the system will not detect the ship's own whistle.



TYFON® the acoustic signalling system



Kockum Sonics your partner in
marine service!



LOADMASTER® X 5

The ship officers choice

KOCKUM SONICS RELEASES A NEW LOADING COMPUTER

Finally the shipping industry can reap the rewards of more than 60 years of combined knowledge in loading computers. Kockum Sonics presents LOADMASTER X5 (X stands for crossover) merging two solutions in to the ultimate one. LOADMASTER X5 proves that the sum can be grater than the parts. Today Kockum Sonics posses a unique knowledge and experience in loading computer development, counting more than 8500 loading computer installations.

Kockum Sonics has no intentions in reducing the efforts in constantly pushing the envelope in loading computer development and co-operates closely with sailing masters, naval architects and classification societies in order to provide the best solution and meeting all the requirements in every case.

LOADMASTER® X5 WHAT'S THE DIFFERENCE?

Today LOADMASTER X5 has a user interface that is unparalleled in user friendliness. It is designed to be simple enough for inexperienced users to operate yet it still provides a full range of powerful opportunities for experienced users. With the Type Approved LOADMASTER X5 you will be in possession of the most powerful and versatile cargo planning and stability software available.

Our strength is your benefit!

LOADMASTER BASIC PROGRAM

WE MAKE A DIFFERENCE FROM THE START

LONGITUDINAL STRESS

The basic program covers all your needs regarding longitudinal strength and ensures that your condition is compliant with all regulation.

INTACT STABILITY

The basic program ensures that the vessel condition is compliant with all intact stability regulation.

SIMULATION

For years the chief officer has struggled to get a proper work order to the crew. One that he knows does not result in a critical situation with respect to strength and stability. Today the officer can plan the loading/discharging sequence in a graphical mode. Overview and modification of the sequence is quick and easy. Tank bars are moved with the mouse and added/deleted from the work area via drag and drop functions.

Calculations can be done over and over again until the most optimum sequence is found. Reports and work orders are generated easily. The simulation option drastically reduces turn around times in port. An investment with payback time calculated in hours.

TANK GAUGING ONLINE INTERFACE

Automatic online connection to the tank gauging system gives the operator full control of the cargo, ballast and fuel flow. The loading computer can sound the alarm at certain pre-defined ullages. Flow can be controlled for each tank or by cargo type. Alarms for draft, trim and list can be pre-defined.

REPORTS

The basic program covers all your reporting needs. Making administration a breeze and reducing turn around times in port to an absolute minimum. The Pump log handles the pumping sequence. Rate, quantity and time/date will be recorded. The officer will be reminded each hour to check logged data. Numerous reports are available depending on ship. Examples are ullage report, stability report, strength report and cargo report. The Port Log is a part of our report gallery and easily adapted to ship owners standard.

PACKAGES FOR ANY TYPE OF SHIP



TANKER PACKAGE

- Graphical loading/discharging sequence simulation and prediction
- Complete oil calculation according to ASTM
- Direct damage calculation of damage stability
- Cargo Doc covering all your reporting needs
- Safety pump stop trigger



LNG / LPG PACKAGE

- Liquefied fraction calculation
- Vapor fraction Calculation
- Summary calculation
- Extended ullage report
- ASTM tabled



BULK PACKAGE

- Grain calculations complying with IMO grain code
- Flooded holes check according to IACS regulation S17
- Trim/list/draft auto loading for planning
- Auto bulk distribution
- Auto load and ballast distribution
- Ballast exchange



RO/RO PACKAGE

- Powerful and user friendly graphical interface for loading and unloading
- Drag and drop loading
- Loading plans and loading plans editor
- Manual or automatic import of booking lists



CONTAINER PACKAGE

- Powerful and user friendly graphical interface for loading and unloading
- Dangerous goods
- Edifact/Baplie translator
- Lashmaster lashing optimizer
- Visibility calculation
- Booking list import and export



RIG/MULTIPURPOSE/FPSO PACKAGE

- Crane program
- Mooring line tension
- Riser load tension
- Oil/Water interface calculation



OPTIONS AVAILABLE ON REQUEST

DIRECT CALCULATION OF DAMAGE STABILITY

The option direct damage calculation calculates a damage condition in a second and allows the ship to be loaded with the maximum amount of cargo in accordance with IMO criteria and IACS UR L5.

ANNUAL SUPPORT AGREEMENT

The support agreement gives our customers access to free phone and fax support every minute of the year. Any program updates or enhancements are distributed on request.

TAILOR MADE SOLUTIONS

Kockum Sonics policy is always to exceed client expectations and continuously develop features that fulfil customer needs. If you would like a specific option developed for your vessel we will be most pleased to develop it for you. Our strength is your benefit!

Always ready to support you!



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