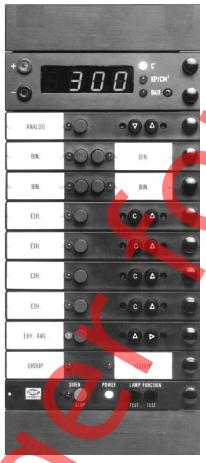
DEIF A/S

Alarm and monitoring system

Type MALLING 845

4921230013C



- Flexible cassette system with exchangeable modules, easily installed and serviced
- Input modules for binary and analog sensors and output module for control of siren and group alarms
- Common digital instrument
- Indicating instruments may be connected to all analog modules
- Over 1000 marine installations
- Type approved by major classification societies

CE

Application

The alarm and monitoring system type MALLING 845 is CE marked for residential, commercial and light industry plus industrial environment, and is applied for:

Measurement and monitoring

The alarm and monitoring system type MALLING 845 is designed to measure and monitor analog and binary values such as temperature, pressure, tank level, etc. in machinery and auxiliary equipment, primary on board ships.

Alarm indication

When the preset alarm limits are exceeded, external audible/visual indicators are activated. Red LEDs and legend plates identify the individual alarms.

Functions

Alarm sequence

- arisen alarm

When an alarm arises, the alarm and monitoring system activates the common siren relay, and affected channels are marked by red flashing of the LEDs.

- siren reset

The siren signal is reset by means of a common push-button. The individual alarms can not be acknowledged on the actual function modules until the siren has been stopped.

- alarm ack./steady alarm

When acknowledged, the LEDs change to a steady light which remains, until the condition has returned to normal. The alarm and monitoring system indicates all newly arisen alarms by flashing LED until acknowledged.

Read-out

Analog measuring values and alarm limits plus the measuring unit are easily read on the common digital instrument. The display is activated by means of push buttons in the front plates of the relevant modules.

Function test

- lamp test
- common function test
- individual function test

Lamp test and common function test may be carried out from the siren and test module. Individual function test, independent of an alarm inhibit if any, may be carried out from the individual modules.

Time delay

Most standard function modules are available in a "DL" version with a continuously adjustable time delay, 1..25 s.

Alarm limits

The individual alarm limits of analog channels are set by means of a screwdriver through small holes in the front plates, easily accessible beside those push-buttons used to read out the alarm limits on the digital instrument.

Alarm inhibit

An alarm may be inhibited if the alarm is unwanted for e.g. low lubricating oil pressure during shutdown of an engine. For all binary, Pt100Ω and 4..20mA channels the alarms may be inhibited by a make contact, which may be common to a number of alarm channels.

Group alarm

The alarms are normally split up into groups according to their importance and are shown on the group alarm modules, on a group alarm panel on the bridge and possibly in the accommodation as well. The group alarm panel is equipped with a lamp for each group plus a buzzer.

Every time a new alarm arises in a group, the relevant group lamp will start flashing at full intensity and the buzzer is activated. When reset on the bridge, the buzzer is stopped and the flashing is dimmed to the light intensity determined by the dimmer. When the siren is reset in the control room, the flashing of the group lamp changes to a steady light, remaining until all alarms in the group have been remedied. The group outputs of the individual channels in each group are connected in parallel to the input of the relevant group amplifier.

Construction

System components

An alarm and monitoring system type MALLING 845 consists of one or more cassettes mounted with common auxiliary modules and individual function modules. Connections to and from the system plus internal codings are made by means of screw terminals on the rear of the cassettes. The cassettes are mutually connected by means of extension cables with connectors.

Cassettes

The standard cassette is a 19" rack for vertical mounting, designed to accommodate 21 modules. A smaller version (a "half cassette") accommodates 12 modules.

As modules

The alarm and monitoring system type MALLING 845 may be delivered as separate modules, however DEIF A/S does not guarantee the performance of systems configured by another company.

Ready-wired systems

Larger systems are typically delivered as prewired systems supplied with fixed cables and terminals to be mounted in a control desk. Internal wiring, codings and settings plus final test are carried out according to the customer's alarm and measuring points list.

Bulkhead mounting

The systems may furthermore be delivered mounted in a cabinet for bulkhead mounting. A power supply and a duty selector switch may be mounted, if required. Please contact DEIF A/S for further information.

Common auxiliary modules

- siren and test module: The siren and test module contains the most important common functions of the system: siren relay, push-buttons for SIREN STOP, COMMON FUNCTION TEST and LAMP TEST plus LEDs for "SIREN" and "POWER ON". An external push-button for reset of siren may be connected.
- earth fault module: The earth fault module monitors the leakage to earth.
- group alarm module: By means of the group alarm modules the alarms may be grouped according to their priority and function. Two alarm groups per group alarm module.
- blank module: The blank modules are used to cover spare places in the cassette.

Binary function modules

The binary alarm modules are designed to monitor potential free (ON/OFF) alarm contacts in thermostats, pressure monitors and level switches, etc. Each binary alarm module contains two alarm circuits.

Analog function modules

- Pt100Ω modules: Standard analog temperature modules for Pt100Ω sensor are designed to measure and monitor e.g. cooling water and lubricating oil temperatures.
- 4..20mA modules: Standard analog modules for 4..20mA transducers are used to measure e.g. signals from pressure and temperature transducers.
- alarm limits: Each analog module for Pt100Ω and 4..20mA is provided with one low and one high alarm limit.

Instrument module

The analog measuring values and alarm limits with the measuring unit are easily read on the common digital instrument. Measuring values are shown in a large, red 7-segment display. The display is activated by means of push buttons in the front plates of the relevant modules. The instrument module occupies two spaces in the cassette.

Exhaust temp. monitoring

For each of the cylinders of the diesel engine the system monitors that the exhaust gas temperature does neither exceed an adjustable, fixed high alarm limit, nor deviates too much from the other exhaust gas temperatures.

- cylinder exhaust temp. module: The temperature after each cylinder is measured by means of a cylinder exhaust temperature module in conjunction with a NiCr-Ni thermocouple.
- average value module: The average temperature value is calculated by means of an average value module.
- deviation alarm: The individual cylinder temperatures are compared with the average value and an alarm will be released, if the deviation exceeds the preset value. Allowable deviation from the average value is conveniently set during the sea trial at an average temperature corresponding to normal service conditions.
- temperature equalization: As the individual cylinder temperatures may differ from each other due to thermodynamic conditions in the engine and the various placings of the temperature sensors, each cylinder temperature module is provided with an equalizing potentiometer by means of which the contribution of the individual cylinders to the average value may be adjusted. During the sea trial the contributions of the individual cylinders are set to the average value.

  In order to avoid unwanted alarms caused by heavy variations of the temperature during start and stop, the deviation alarms are automatically inhibited at low temperatures. In case of sensor failure the monitoring of the relevant cylinder temperature may be by-passed.
- direct connection: NiCr-Ni temperature sensors may be connected by means of a compensating cable from the sensors to the alarm cassette.
- connection through comp. box: A better and less expensive installation is, however, usually obtained by using ordinary installation cables between a common junction box by the engine frame and the alarm cassette. Normally an existing junction box may be used. Compensation of the ambient temperature is carried out by means of a Pt100Ω module in conjunction with a Pt100Ω sensor in the junction box.
- high temperature module: To monitor the temperature after the turbocharger a high temperature module with one high alarm set point but without deviation alarm may be used.

Slave lamps

Smaller installations, e.g. on the bridge, are sometimes delivered for connection of slave lamps in the engine room or on the bridge wings. A number of function modules are available in a version with outputs for external lamps. Slave panels may be delivered as standard cassettes mounted with LED indication modules.

Maintenance

Troubleshooting and repair is possible simply by interchanging and exchanging the modules. Spare modules should be calibrated and tested by DEIF. In an emergency it will normally be possible to exchange electronic parts locally, however, a certain number of spare modules on board is recommended.

External auxiliary equipment

The alarm and monitoring system type MALLING 845 meets - in conjunction with a group alarm panel on the bridge and an extension alarm system in the engineers' accommodation - the requirements of the classification societies to periodically unattended machinery space (see user manual).

Power supply units

Power supply type 849.041 or type 468E3-041 (220V AC/24V DC, 10A) is supplied as a separate unit, applied to change to an alternative 24V DC voltage source on failure of primary voltage. Alarm contact for voltage failure.

Technical specifications

Supply voltage:	24V DC ±20% from transformer/rectifier or battery.					
Allowable ripple voltage:	±20% at 24V.					
Power consumption	15mA per module in normal condition (average for typical configuration). 40mA per module in alarm condition (average for typical configuration).					
Max. load of siren relay:	2A, 24V.					
Galvanic separation:	Between siren relay and circuits. Insulation at 500V DC > 1MΩ.					
Time delay:	Standard: 1 s. "..DL" versions: 1..25 s., continuously adjustable, symmetrical delay.					
Alarm inhibit:	Inhibit is activated by a make contact between the inhibit input of the relevant channel and 0V. Inhibit inputs for channels in the same inhibit group are connected together.					
Analog outputs:	0..1V, max. 2mA for external instruments (if any)					
Load of sensor contact:	**Binary function modules** 1.5mA (closed contact), 20V (open contact).					
Max. load per group output:	**Group alarm modules** 500mA. Internal current limiter.					
Sensitivity:	**Earth fault module** Leakage resistance R < 25kΩ will release an alarm. Back to normal at R > 50kΩ.					
Standard temperature ranges:	**Instrument module** 100°C, 600°C.					
Standard pressure ranges: (Bar or Kp/cm²).	0...1.000	0...1.600	0...2.50	0...4.00	0...6.00	0...10.00
	0...16.00	0...25.0	0...40.0	0...60.0	0...100.0	0...160.0

General technical specifications	
Temperature:	-10...55°C (nominal), -25...70°C (operating), -40...70°C (storage)
Climate:	Class HSE, to DIN 40040
Vibration, shock and humidity:	According to the requirements of the classification societies.
EMC:	To EN 50081-1/2 and EN 50082-1/2
Materials:	Front plates: black noryl. Fire retarding and self-extinguishing to UL94 (V0). All metal parts made out of corrosion preventing material.
Connections:	Screw terminals on the rear of the cassette. Cable dimensions: 2.5 mm² (multi-stranded), 4 mm² (single-stranded).
Code pins:	35 pcs included on delivery per cassette.
Protection:	Front: IP31, to EN 60529 and IEC 529 Terminals: IP00, to EN 60529 and IEC 529

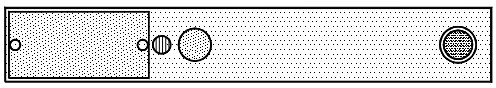
Alarm and monitoring system type MALLING 845 - components

Type	Description	Weight (g)	Consumption (mA)	
			Normal	Alarm
845.71-CE 845.73-CE	Cassette for 21 modules. H x w x d = 483 x 132 x 210 mm Cassette for 12 modules. H x w x d = 303 x 132 x 210 mm	2750 1850		
845.41-03 845.41-06 845.41-30	Extension cable, 0.3m Extension cable, 0.6m Extension cable, 3.0m	37 70 320		
845.71-1 845.73-1	Fixed cable with terminals, for 845.71-CE, 2.5m or order specified Fixed cable with terminals, for 845.73-CE, 2.5m or order specified	4000 3000		
845.10B	Binary module (ON/OFF) with 2 alarms, N/C sensor	76	7.6	37.3
845.10BDL	Binary module (ON/OFF) with 2 alarms, N/C sensor, 1..25 s.	80	7.6	37.3
845.101	Binary module (ON/OFF) with 2 alarms, N/O sensor	88	9.5	42
845.101DL	Binary module (ON/OFF) with 2 alarms, N/O sensor, 1..25 s.	92	9.5	42
845.11B	Analog temperature module, Pt100Ω, -15..150°C	92	19	31
845.114	Analog temperature module, Pt100Ω, -15..200°C	90	18	32
845.15B	Analog module, 4..20mA	90	22-38	34-50
845.15BDL	Analog module, 4..20mA, 1..25 s.	92	22-38	34-50
845.20	Siren and test module	82	19	55
845.202	Group relay module, 1 group, with reset	70	3	35
845.25	Group alarm module, 2 groups	93	4.5	33[1]
845.31	Instrument module, digital, for pressure and temperature	226	47/95	
845.4	Blank module	33		
845.60	Cylinder temperature module, NiCr-Ni, 0..600°C Deviation from average value, direct connection	100	12	27
845.601	Cylinder temperature module, NiCr-Ni, 0..600°C Deviation from average value, through compensation box	100	12	27
845.61	High temperature module, NiCr-Ni, 0..600°C Direct connection	92	10	25
845.611	High temperature module, NiCr-Ni, 0..600°C Through compensation box	90	10	25
845.69B	Average value module	80	10	10
845.971	Earth fault module	76	5	17
845.L2	Indicating module with 2 slave lamps	56	0	30
845.S	Test and indicating module	61	15	30
	Resopal plate, white, ungraved (h x w: 18 x 38 mm). If engraved plates are required, please specify text.	0.6		
	Rivet, white plastic (2 pcs per plate included on delivery)			

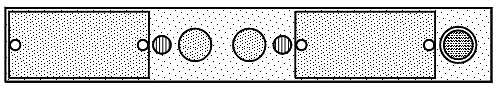
1) Excluding external lamps

Front plates

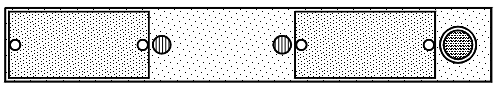
Instrument module



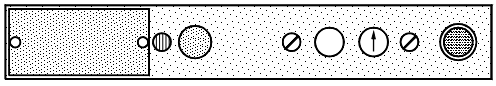
Group relay module



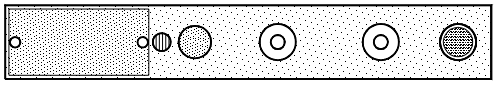
Binary module (ON/OFF)
Test and indicating module



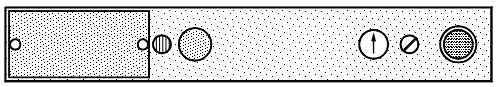
Group alarm module
Indicating module with 2 slave lamps



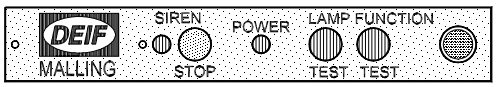
Analog modules, Pt100Ω and 4…20 mA
Cylinder temperature and average value modules



Earth fault module



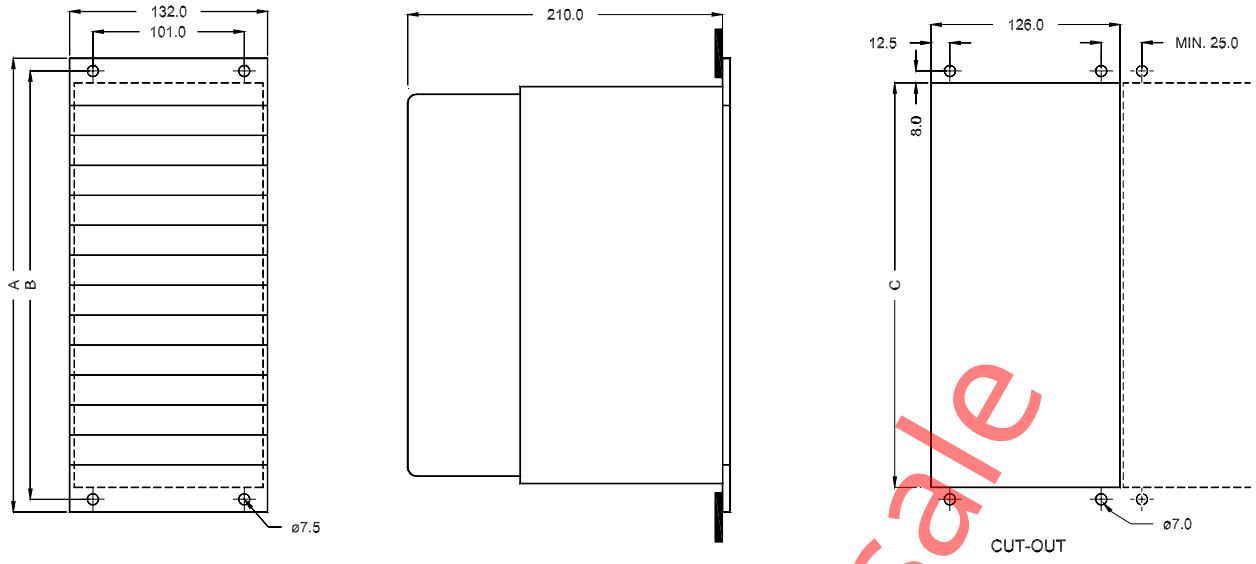
High temperature module



Siren and test module

Dimensions

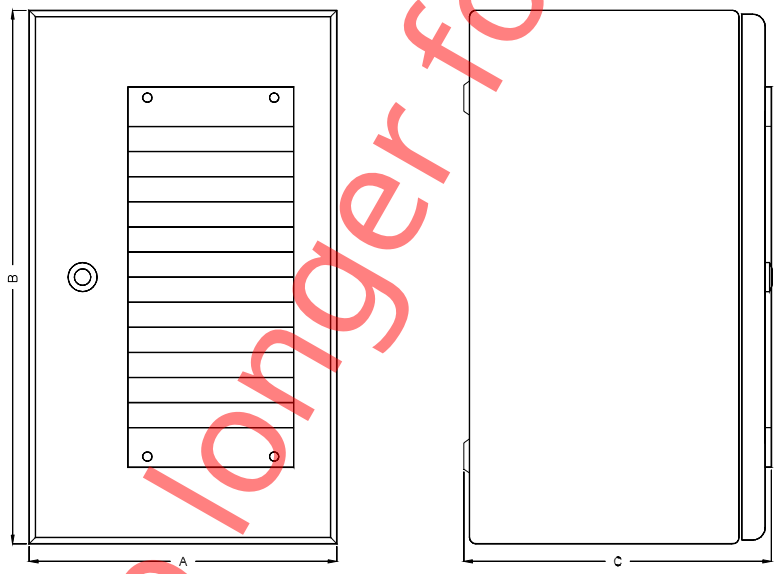
All dimensions in mm



Type MALLING 845 cassette (flush mounting)

Cassette	A	B	C	Average weight (approx.)	
“Small”, for 12 modules	303	286	270	2.9 kg	With typical selection of modules
“Big”, for 21 modules	483	466	450	4.7 kg	With typical selection of modules

All dimensions in mm



Type MALLING 845 in cabinet (bulkhead mounting)

Cabinet (example)	A	B	C	Average weight (approx.)	
”Small”, for 12 modules	425	245	242	6.8 kg	Cabinet without modules
”Big”, for 21 modules	540	305	242	9.9 kg	Cabinet without modules

Order specifications

Example 1: **As components**
Please state quantity and type number for all components plus text for engraved plates.

Example 2: **Ready-wired system for flush mounting**
List of alarms and measuring points (if possible using DEIF form). Wiring diagram if available. Length of fixed cable plus text for engraved plates.

Example 3: **System supplied in cabinet for bulkhead mounting**
List of alarms and measuring points or wiring diagram plus text for engraved plates.

Due to our continous development we reserve the right to supply equipment which may vary from the described.

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