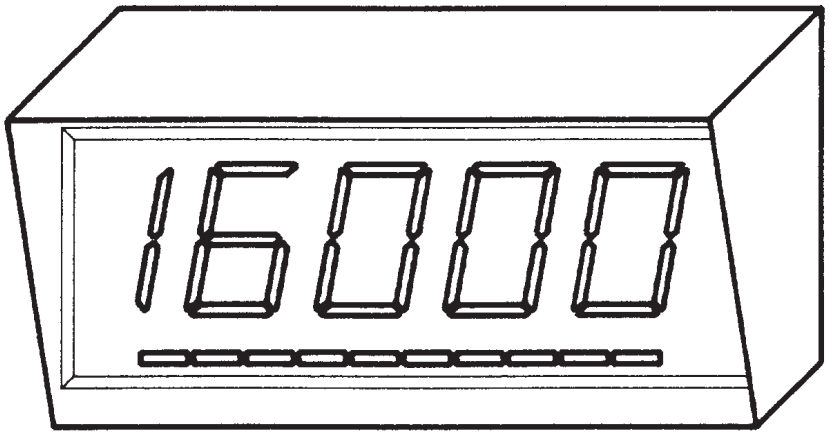
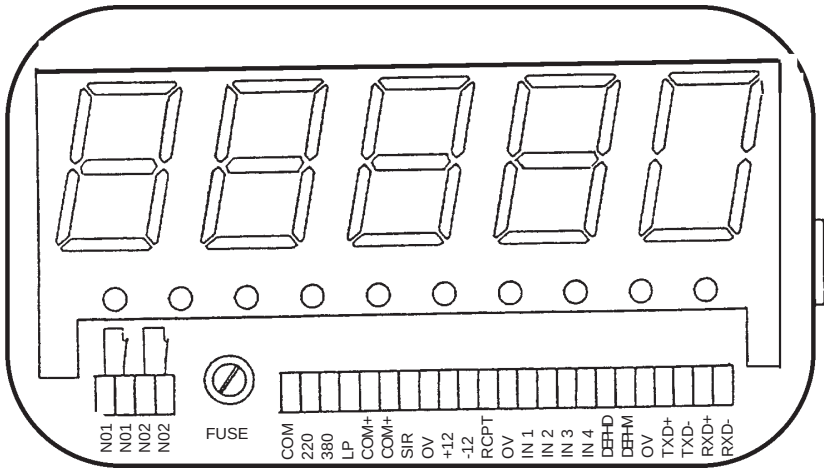
technical sheet	DYNASAFE scareboard display and "intelligent" monitor for electronic load cell HF87 series	ref.: T 2246 GB rev;no.: 1 date: 05/03 page: 1/6





DB9 for
RS 232 and

configuration keyboard

N0 1: trip point N°1
N0 2: trip point N°2

COM: negative
220: 220 Vac, single phase
380: 380 Vac, single phase

LP: flashing light (negative)
COM+: common (positive) for alarm
COM+: common (positive) for alarm
SIR: alarm (negative)

O V: load cell
+12: load cell
-12: load cell
RCPT: load cell

O V: common for tare and memory
IN 1: tare
IN 2: memory input
IN 3: memory display
IN 4: clear memory

DEPHD: down
DEPHM: up
O V: common for direction sensor
TXD +: transmit data +
TXD -: transmit data -
RXD +: receive data +
RXD -: receive data -

Application:

This microprocessor controlled monitor has been designed for use with strain gauge electronic load cells.

Description:

Entirely controlled by microprocesor, the function of this monitor is to act as an intelligent interface between the electronic signal from the load cell and the power contactor of the lifting system.

Models

There are 2 models:
Standard **HF87/1** and advanced **HF87/2.** (The notation /. refers to the height of the digits).

Display functions:

- 4 1/2 digit red LED.
- Barchart: 10 digit red LED, displaying the gross weight (load+tare).
- Tare: allowing the display to be zeroed when using lifting equipment accessoreis or when making a series of successive loadings.
- Enter memory: register into memory the load displayed.
- Memory display: display the total of the values held in memory;
- Clear memory: delete the values held in memory.
- Parameters of the rate of increase.
- Calibration through the programming console or the DYNASAFE console.

Features common to both models:

- Dynamic effects damper controlled by microprocessor which continuously monitors the signal from the load cell and calculates the actual value of the effort applied.
- Display the following functions:
  - frequency value in Hz from the load cell.
  - error messages
  - scrolling menu for programming

- Access to the load cell functions and set the parameters, via a keyboard connected through a DB9 plug.
- Automatic adjustable trip points.
- Memory: date, hour, minute
  - last overload*
  - system bypass*
  - commissioning of the system*
  - last usage of the system*
- RS232 output socket for connection to DYNASAFE console*.
- Overload simulation.
- Output for 2 relays.
- Outputs for visual and audible alarms.
- Confirmation of the overload detector:
  (Used to avoid operation of the alarms when lowering, because the dynamic effort on the dead end is greater on lowering than on lifting).

Additional features of the advanced model HF87/2/.:

- Overload memory: total number of overloads*.
  last 50 overloads*:
  overload value, date, hour, minute.
- Set the working group according to the F.E.M. standards (9.511 and 9.755)*.

The calculation of the working group is possible since the HF87/2/.monitor stores the working time and the number of operations required for each UP and DOWN movement, taking into account the % of the load in relation to the maximum capacity of the overhead crane (see page 6).

NOTE:
The HF87/2 /. monitor is supplied with software on disquette to allow (via the console) the control by P.C. (IBM compatible) of all the features stored in the memory (see page 6).

Technical specification:

- Power supply: 220 or 380 Vca single phase
  option: 110 Vac, single phase
- Input signal: frequency signal from 500 to 10,500 Hz
- Trip point power of the output relays:
  up to 380 Vac/10 A
- 3 trip points (see graph on page 5/6)
- Personalised parameters (see graph on page 5)
- Alarm output power:
  . Flashing light: 18 Vdc/80 mA max
  . Audible alarm: 18 Vdc/30 mA max.
- Temperature range: from -20°C to +70°C
- PVC box which connects to a DIN rail.

Note:

Load monitoring using several load cells linked together may be carried out using the HF84 frequency conditioner (see data sheet T-2245).

Options:

- With or without integrated printer.
- Power supply 12 and 24 Vdc
- Radio connection.

Codes and dimensions:

CODE	MODEL	LENGTH (mm)	HEIGHT (mm)	WIDTH (mm)	DIGITS (mm)
43588	HF 87 / 1 / 1	220	120	90	32
43618	HF 87 / 1 / 2	360	160	90	63
43638	HF 87 / 1 / 3	600	300	120	125
55728	HF 87 / 2 / 1	220	120	90	32
55758	HF 87 / 2 / 2	360	160	90	65
43658	HF 87 / 2 / 3	600	300	120	125

Definitions:

S-HI = Safety trip point
- – Value of signal in kg.
- – Its value is generally set at 110 % of the nominal capacity of the lifting system, but it may be adjusted to any point within the nominal capacity.
- – It takes account of the real value of the load and not the undulatory value.
- – It sets off the safety and alarm systems at the precise moment when the real value of the load exceeds the trip point.

HI-HI = Final safety trip point
- – Value of signal in kg.
- – By default, its value is set at 30 % over the safety trip point (S-HI). This value can be adjusted to a different level as required.
- – It takes account of the undulatory value of the load and not the real value.
- – It sets off the safety and alarm systems at the precise moment when the undulatory value of the load exceeds the trip point.

S-LO = Intermediate trip point
- – Value of signal in kg.
- – Optional trip point: if it is not used it sets itself automatically at the same point as S-HI.
- – Its value may be set at any level between 0 and the S-HI trip point.
- – It takes account of the real value of the load and not the undulatory value.
- – It sets off the safety and alarm systems at the precise moment when the real value of the load:
  exceeds the trip point, when in configuration "HI" (see page 5).
  falls below the trip point, when in configuration "LO" (see page 5).

HYS S-HI & HYS S-LO = Hysteresis, when in configuration HI (rEL-HI)
- – The value, in kg, by which it is necessary to reduce the loading to reset the trip points after they have been activated.

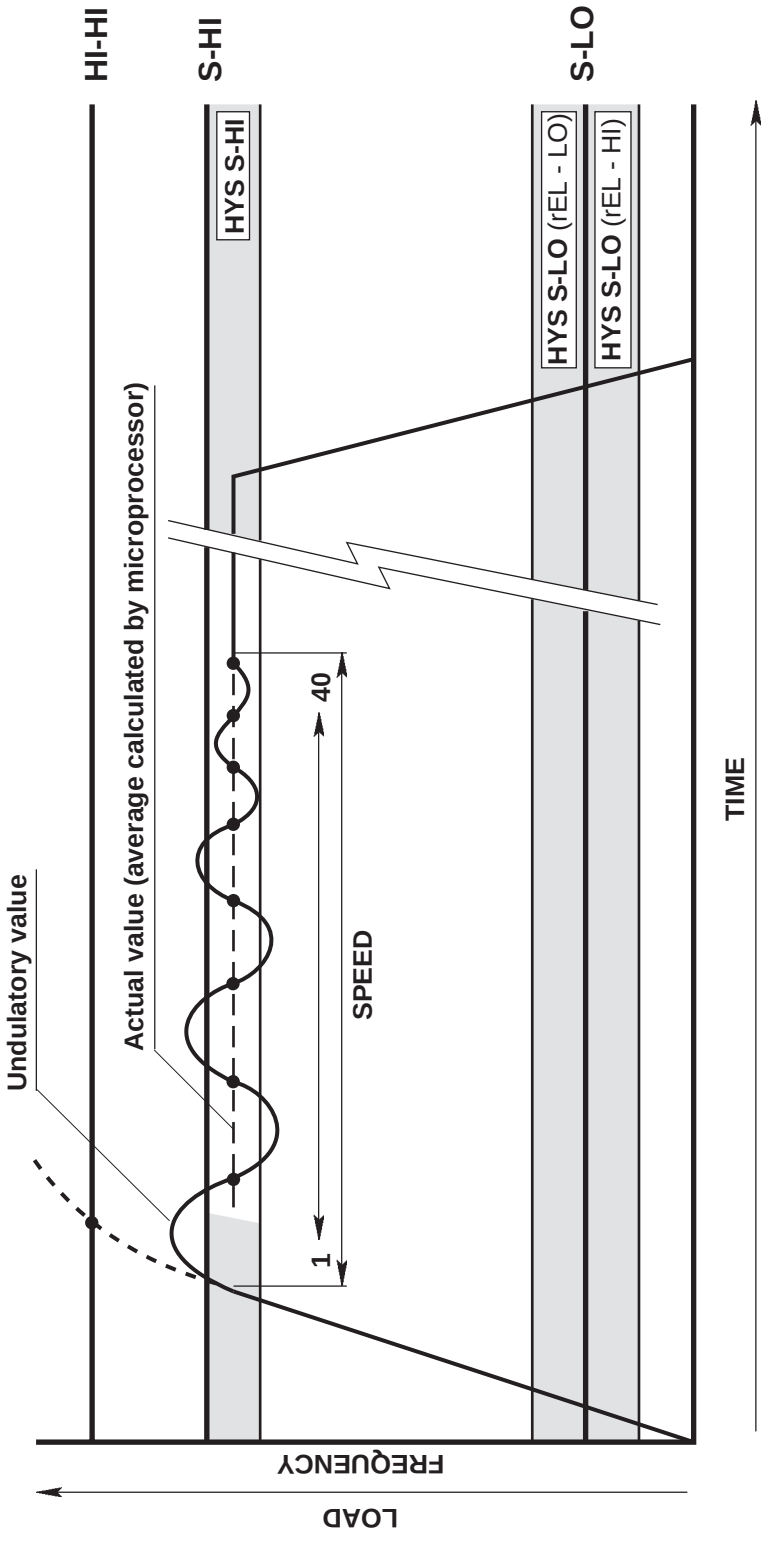
HYS S-LO = Hysteresis, when in configuration LO (rEL-LO)
- – The value, in kg, by which it is necessary to increase the loading to reset the trip points after they have been activated (function: slack wire rope).

rEL-LO and rEL-HI = Configuration of the intermediate trip point
- – The intermediate trip point S-LO may be set up in two ways:
  - **rEL-HI:** the relay is operated at the moment when the real value of the load exceeds the trip point. In this case the trip point serves as an intermediate trip point. For example: not possible to use the fast speed functions where the load handled exceeds a certain value.
  - **rEL-LO:** the relay is operated at the moment when the real value of the load falls below the trip point. In this case the trip point serves as a "slack wire rope" detector. For example, when using a lifting accessory such as a spreader bar or special clamps, it is possible to automatically stop lowering at the moment when the accessory touches the ground. In this way, we may avoid problems with wire rope guiding when coming off the winch drum.

SPED = Speed of calculation
- – By default, the value is set at 20, on an arbitrary scale of 1 to 40 (40:slow ; 1: fast).
- – Calculation of the real value of the load compared to its undulatory value may be carried out from a greater or lesser figure. The greater the sampling the more complex and precise the calculation. On the other hand, the reaction time of the relays will be longer.

Graphic representation of a loading cycle.

The frequency signal received by the monitor is directly proportional to the value of the load.



Tables of data held in memory (examples)

Date actioned: 16/6/1994 — Table of data

1) Type of monitor	: HF87/2/2.	ver.: 2.10
2) Date system commissioned	: 9/6/94	12:2
3) Number of lifting system	: 0	
4) Configuration		
– Speed	: 20	
– Relay	: 0	
– Hysteresis HI	: 500	
– Hysteresis LO	: 500	
5) Value of the adjusted trip points		
– S-LO	: 2000	
– S-HI	: 3000	
– S-HIHI	: 4000	
6) Number of overloads detected	: 108	
7) Date of last overload	: 9/6/1994	12:8
8) Date of system bypass	: 9/6/1994	12:7
9) Date when loaded into memory	: 9/6/1994	12:8
10) Date when data set to zero	: 1/6/1994	10:5

Crane stress records

	0 - 50 %	50 - 63 %	63 - 80 %	80 - 100 %	sup. 100 %	
Up	126508	15109	32084	2267	146	secs.
Down	103569	14226	45096	4358	90	secs.

	0 - 50 %	50 - 63 %	63 - 80 %	80 - 100 %	sup. 100 %	
Up	15235	1260	4200	290	15	imp
Down	16221	1320	3900	320	12	imp

Total operating time: 95 h 24 m 13 s

SWP calculations for HF 87/2/.

Table of last 50 overloads

	Date	Hour	Value		Date	Hour	Value		Date	Hour	Value
1)	9/6/1994	12: 8	3162	18)	9/6/1994	12: 1	3080	35)	9/6/1994	11:56	3001
2)	9/6/1994	12: 8	3159	19)	9/6/1994	12: 1	3152	36)	9/6/1994	11/56	3052
3)	9/6/1994	12: 7	3092	20)	9/6/1994	12: 1	3050	37)	9/6/1994	11:56	3146
4)	9/6/1994	12: 7	3119	21)	9/6/1994	12: 1	3119	38)	9/6/1994	11:56	3121
5)	9/6/1994	12: 7	3436	22)	9/6/1994	12: 1	3001	39)	9/6/1994	11:56	3001
6)	9/6/1994	12: 4	3078	23)	9/6/1994	12: 1	3195	40)	9/6/1994	11:56	3137
7)	9/6/1994	12: 4	3261	24)	9/6/1994	12: 0	3133	41)	9/6/1994	11:55	3019
8)	9/6/1994	12: 4	3037	25)	9/6/1994	12: 0	3113	42)	9/6/1994	11:55	3061
9)	9/6/1994	12: 4	3123	26)	9/6/1994	12: 0	3001	43)	9/6/1994	11:55	3164
10)	9/6/1994	12: 4	3231	27)	9/6/1994	11:57	3001	44)	9/6/1994	11:54	3113
11)	9/6/1994	12: 3	3208	28)	9/6/1994	11:57	3155	45)	9/6/1994	11:54	3064
12)	9/6/1994	12: 3	3039	29)	9/6/1994	11:57	3085	46)	9/6/1994	11:54	3154
13)	9/6/1994	12: 3	3001	30)	9/6/1994	11:57	3176	47)	9/6/1994	11:54	3094
14)	9/6/1994	12: 3	3150	31)	9/6/1994	11:57	3193	48)	9/6/1994	11:54	3118
15)	9/6/1994	12: 3	3001	32)	9/6/1994	11:57	3083	49)	9/6/1994	11:54	3114
16)	9/6/1994	12: 2	3086	33)	9/6/1994	11:56	3081	50)	9/6/1994	11:54	3101
17)	9/6/1994	12: 2	3102	34)	9/6/1994	11:56	3001				