Manual HDO – UK/US

VET-HDO®-MONITOR

High Definition Oscillometry

Non Invasive Blood Pressure measurement in dogs and cats

VET-HDO®-MONITOR

MD PRO

MD / BT PRO

MD Equine

TECHNICAL DATAS

SAP – DAP – MAP 15 – 300 mmHg
Heart Rate 550 bpm
Valve accuracy 15 – 300 mmHg
Gain – Signal amplification
Loop funktion
PC remote control

An important element of:

Routine examinations
Search for diagnosis
Controlai disease / treatment
Monitoring SVR
(Stroke Vascular Resistance)
Monitoring during anesthesia

SUPPLY ITEMS

VET HDO MD PRO
VET HDO MD/BT PRO Bluetooth
for small animals
VET HDO MD/BT Equine
✓ BOX
✓ MDSWIN / HDO Manual
✓ USB 2.0 Transfer cable

optional:
BT1000 external Bluetooth-Adapter

✓ Power supply
INPUT 100 V – 240 V; 0,4 A 47– 63Hz;
Output 5 V 1.75 mA

Battery powered possible
4 x AA LR6 1,5 V
Rechargeable Batteries
4 X AA 1,5 V; min. 2400 mA
Powerbank 2600 mA

SUPPLY ITEMS

Modell:
❑ VET HDO MD PRO
❑ VET HDO MD PRO / BT
❑ VET HDO MD PRO / TAB usb
❑ VET HDO MD PRO / TAB BT
❑ VET HDO MD Equine / TAB BT

Serial Number: _ _ _ _ _ _ _ _ _ _ _ _

BT1000 Serial Number _ _ _ _ _ _ _ _

Cuffs: Tail measurement is required
✓ Standard at VET HDO MD PRO

C1 – Cat and small dogs	❑ ✓
D1 – Small dogs	❑ ✓
D2 – Large dogs	❑ ✓
H1 – Equine	❑

MDSWIN Software for analysis
HDO Firmware 2.44
WIN 8 / WIN 10
32 / 64 Bit

WARRANTY

Each System is warranted against manufacturers' defects in workmanship and materials, under requirement use and with proper maintenance for a period of two (2) years after the date of original purchase.

Date of purchasing HDO

_ _ . _ _ . 2 _ _ _

Distributed by:

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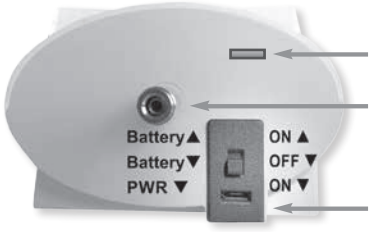
TECHNICAL DATA SHEET

Function and operation of each part: Brief explanations of each function	See user manual Hardware HDO- for Software MDSwin- US / UK / DE / IT / ESP / NL
Raw materials: Generic name and their standards of each part mentioned in #1	Rawmaterials_HDO-US / UK / DE / IT / ESP / NL
Electrical Standard / Classification	
Manufacturer	S + B medVET GmbH , Neuer Weg 4 64832 Babenhausen, Germany
Normal rated voltage of mains power supply (optional)	110-240V AC 1,5 A 50/60 Hz power supply for VET HDO Monitor 6V DC (internal batteries: 4x 1,5V AA // or external power supply 6V DC)
Normal rated voltage of the device HDO MD PRO	
Electrical power consumption VET HDO Monitor	5 Watt
Type of Protection	Class II
Degree of protection against electrical shock Degrees of protection provided by enclosures (IP Code). Protection of patient against electrical shock classification of the applied part (HUMAN)	IP 30 Applied part type B without defi-proof Power supply already approved, class 3internal pump not safety relevant because powered with SELV (safety extra-low voltage)
Isulation class	Isulation class C
Ambient conditions	EN 60601-1:2008
Storage/transport	+10 bis +40°C 30-75% atm humiidity 700-1060 hPa
System/Block Diagram	
Block diagramm	see: Blockdiagram MD_UK,Schematic MD_US
System diagram (Isolations diagram)	see: Isolationdiagram_MD, HDO is isolated
Controll	
Test and test standard	CE 0535 o test the electrical safety and the accuracy of data according the relevant standards IEC/EN 60601-1, IEC/EN 1060-1+ 1060-3, Biocompability is shown by ISO 10993-1, A risk management has been performed according DIN EN ISO 14971
S + B medVET have entrust the European Notified Body EUROCAT and METRONIC with identification	and their standard related to performance, function and working of device
In-house test method	see: user manual hardware / software
Warning for use	see: Flowchart of production
Production flow chart	
(if there are several manufacturing plants, indicate which plant covers which process)	after 4 minuten in Standby,
General	Shut down by deconnect the Powersupply
Shut down with Powersupply / Shut down with Batterypowered	Label according to 
In the interest of environmental protection, please dispose of the device and batteries in accordance with national of local regulations or environmental protection and recycling	

SETUP / DEFAULT



USB-Mini
Data Cable

Hose adapter /
Connection cuff

power connection
micro USB 5V
PWR =
power supply
or power bank

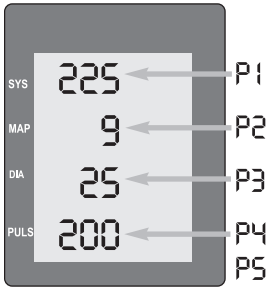
Standby function will be after
3,5 min. active.

The HDO is sleeping but ready
and continues to consume electricity!

START

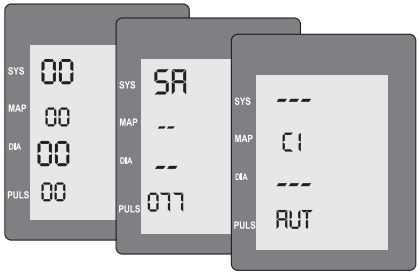
Activate device

Changes of the basic settings possible
via Function menu parameter FP



P0	Adjust the parameters after the first measurement 1 on / 0 off	
P1	Inflates up to 225 mmHg	150 bis 300
P2	Deflation rate 9 mmHg/sec.	3 bis 18
P3	Deflates up to 25 mmHg/end of measurement	15 bis 50
P4	Gain 70 / 100 / 140 / 200 / 280 / 400 / 560 / 640	
P5	Cuff selection C1 / D1 / D2 / H1	
	(H1 is only shown by HDO Equine)	

KEYBOARD



START — Starts the system

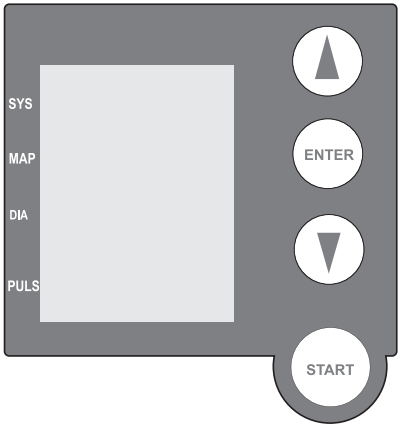
0 There is no data in the memory
1-60 There is still data in the memory

▲ ▼ — Scroll between the Cuffs C1 / D1 / D2

ENTER — confirm cuff

The system is ready to measure.

START — starts the measurement



Scroll up

Changes the window and enter the function menu

Scroll down

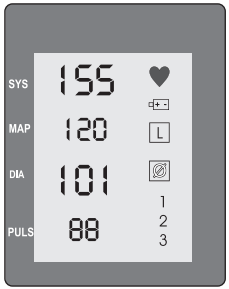
Start - Stop - Abort

START — system wake up, system is booting

ENTER — one click: confirms the selected cuff
double click:
starts the function menu/submenu Parameters

START — starts mesurement
In active measurement:
press START for stop a active measurement
or finsih / function menu exit

DISPLAY



♥ Flashes - system records

Appears - weak battery

L Automatic cycle (loop) is activated

Display of average data

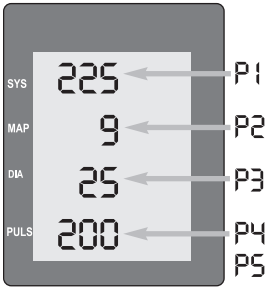
1 2 3 There are at least 1/2/3 or more measurements saved in the memory

With 3 and more values an average will be calculated FA

FH Function History = Displays data in the memory
FA Function Avarage = Displays the averages
FC Function Clear = Deletes all data
FE Function Erase = Deletes single data of your choice
FL Function Loop = Set up automatic intervals (Loop)
FP Function Parameter = Set up parameters

Up and down between functions

BASIC SETTINGS

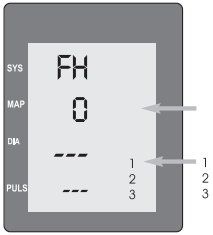


Changes to the basic setting possible via function menu FP

PARAMETER

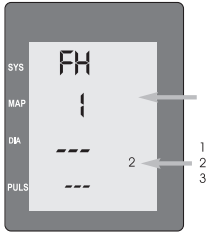
P0 Adjust the parameters after the first measurement 1 on / 0 off
P1 Inflates up to 225 mmHg 150 bis 300
P2 Deflation rate 9 mmHg/sec. 3 bis 18
P3 Deflates up to 25 mmHg/end of measurement 15 bis 50
P4 Gain 70 / 100 / 140 / 200 / 280 / 400 / 560 / 640
P5 Cuff selection C1 / D1 / D2

FUNCTION MENU HISTORY



No data in the memory

1 flashes when the **second** measured value recorded and automatically was saved.



Values and positions are displayed alternatengly

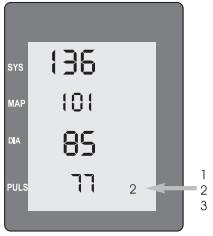
First measured value in the system maximum 60 values saved

There are 2 values in the memory (history)

Up and down between values 1– 60

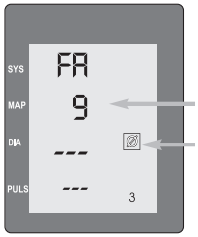
ENTER — back to the function menu

START — function menu exit



Always the last value measured will be displayed
There are 2 values in the memory

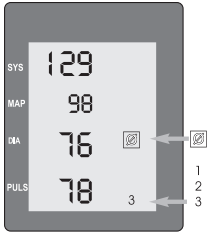
FUNCTION MENU AVERAGE



Average Value and total number of values are displayed alternatengly

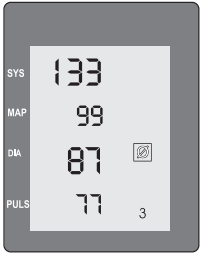
Average of 9 measurements

They are average values in the system



There are at least 3 measurements in the memory. This is the minimum for an average calculation.

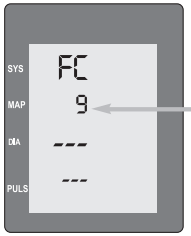
Up and down between average of each position



ENTER — back to function menu

START — function menu exit

FUNCTION MENU CLEAR



Delete all data

START

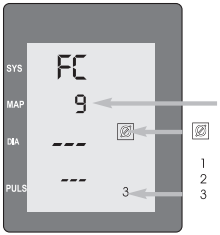
ENTER

starts a new function mode

Flashes

ENTER

submenu data

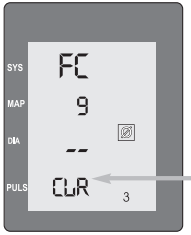


There are 9 measurements in the memory

Flashes

1
2
3

Flashes



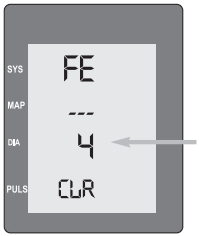
Deletes all data

Flashes

START

function menu exit

FUNCTION ERASE



Deletes single data of your choice

ENTER

Submenu of the parameter FE

Fourth Value

ENTER

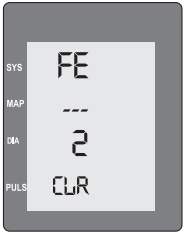
Changes
single-reading and position

Up / Down between
readings

ENTER

Confirms single-reading

Display flashes



Deletes reading

(Now FR will display the average of the remaining measurements)

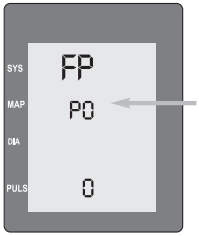
ENTER

back to the display or

START

function menu exit

FUNCTION MENU PARAMETER

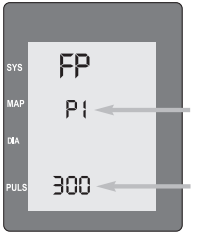


Change Pre-settings

ENTER — submenu of parameter FP

P0 – automatic AUT
0 – automatic AUT off
1 – automatic AUT on

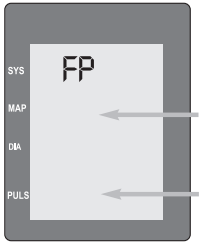
ENTER — changes between parameters



P0 Automatic AUT 0 = off 1= on	P1 inflate up to 150–300 mmHg	P2 deflate up to 10–50 mmHg
P3 deflation rate 3–18 mmHg / sec.	P4 Scan with a gain of 70–640 Gain	P5 Cuff C1/D1/D2

flashes:
the value can be changed.

Up/Down between values



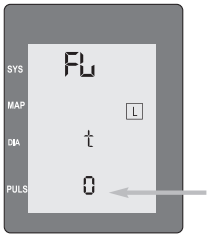
ENTER — confirms pre-set value

ENTER — Value is set/saved

Confirm all 4 parameters with

START — function menu exit

FUNCTION MENU LOOP



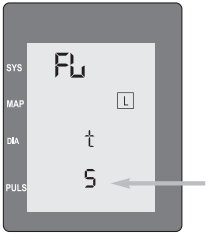
Automatic measuring interval 1–9 min.

ENTER — Input start time „t“ 1–60 min.

Display: loop active

Flashes 0 = no loop activated

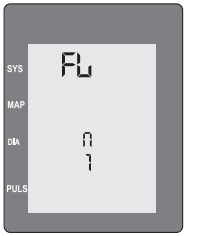
Up/down between minutes



Flashes– Value is set to 5 minutes.
Every 5 minutes a measurement is automatically taken.

ENTER — confirm set value

n = interval of number of measurements consecutively 1–9

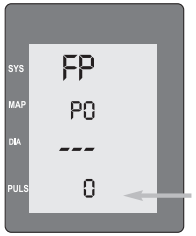


Up / down between the values

ENTER — confirm set value

START — function menu exit

FUNCTION AUT



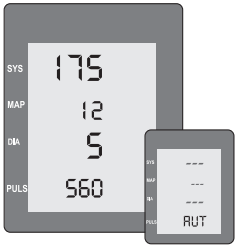
Calculatory measurement

0 – AUT Messung **AUS**
1 – AUT Messung **AN**

After switching on, the HDO is preset.
(see basic setting of the system)

What does AUT mean?
AUT is an automatic calculatory measurement
which **is not saved!**

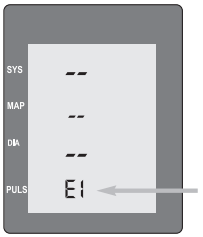
An AUT measurement matches the HDO setup of the function parameters Pump up Pmax higher and gain (gain / magnification) of the determined values from the first measurement. The basic setting of the parameters depends on the cuff selection.



Which setting has been selected by the HDO is alternately shown in the display with the measurement. If no change is made, the default setting is optimized. An AUT measurement is always the first measurements after the start and is only displayed and not saved!

AUT stands for one
Calculatory measurement

E-ERROR DISPLAY



Error E1 - E6

Measurement is not saved!

E 1 abort by the user
E 2 too many artefacts
E 3 Signal amplitude too small, Gain (magnification like a magnifying glass) is automatically increased by one step
E 4 Deflation rate is too slow
E 5 – – –
E 6 cuff error:
- Wrong cuff selected and connected
- laid out too loosely
- Cuff defective
- Valve defective

INFO: The HDO shuts off after 5 seconds if no pressure of 20 mmHg was reached or if it was to Inflate for more than 8 seconds choose inflation pressure.

BASICS OF HDO TECHNOLOGY

HDO High Definition Oscillometry has been one for several years patented and commercially available technology for accurate Measurement of systolic, diastolic and mean arterial pressure.

HDO is an evolution of oscillometry and works with high-speed processors and sensors.
It replaces previous technologies (Doppler, conventional oscillometry eg PetMap, Cardell, V20 or Memoprint).

This was the first time that the previous trade fair restrictions were met be lifted by non-invasive blood pressure monitors.
The measurement accuracy of the new technology was added the most diverse species against invasive measuring systems (Gold Standard) confirmed.

PWA PULSE WAVE ANALYSIS

By using the MDSWIN software analysis, each measurement can be followed in real time on the PC monitor. These pulse waves are further evaluated at the end of a measurement and the overall result then appears as a graphic on the screen.

Each measurement is in the form of values but also as graphics automatically stored in the patient file created for this purpose and can therefore be used later evaluated further.

This technique, due to its 32bit processor capacity a high-frequency direct analysis of the incoming Signals, which in turn leads to a programming of the electronic valves in real time (several times per microsecond), on the other hand allows the assessment of the individual pulse waves similar to the resolution in a CT.

Artifacts and arrhythmias only rarely disturb a measurement or are now assessable. Due to the simultaneous amplitude representation in real time during the measurement can be additional parameters be visually analyzed.

MORE INFORMATIONS:
www.hdo-analyse.com
www.submedvet.de
Download portal nach Registrierung:
http://www.vethdo.com

HDO 02-19-005 UK / US