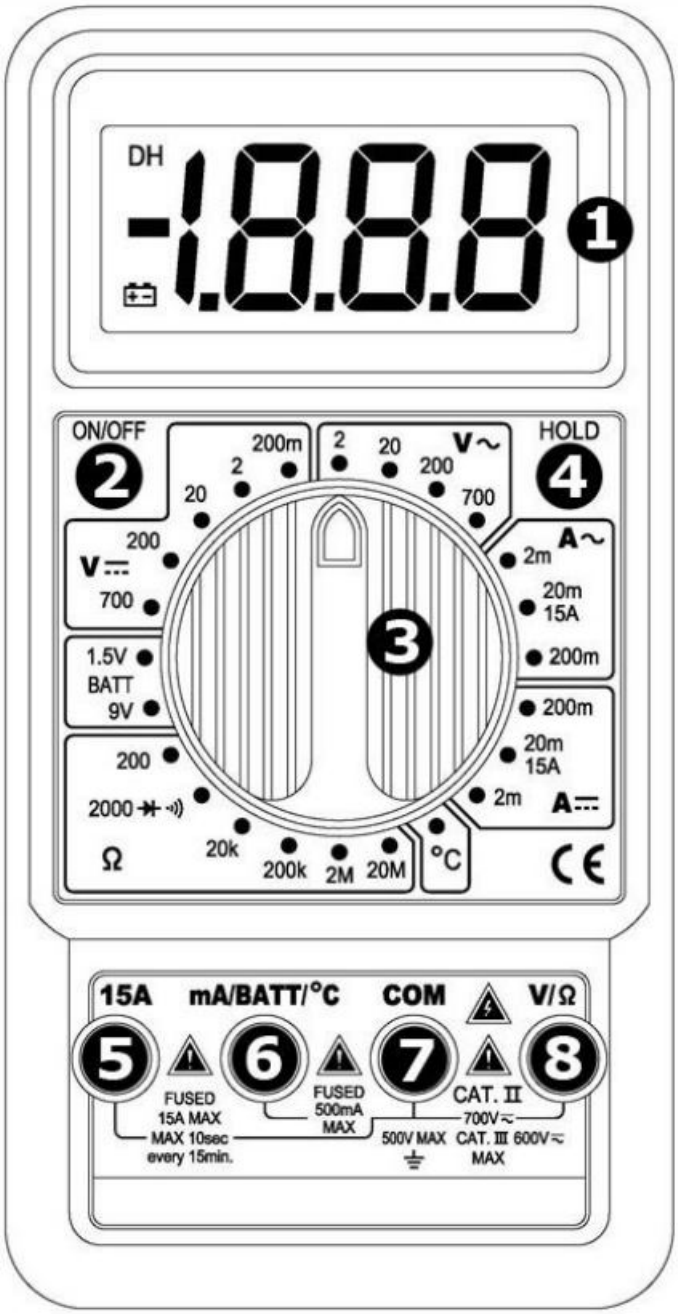
velleman DVM892N Digital Multi Meter User Manual

Velleman DVM892N Digital Multi Meter User Manual

DVM892N

CAT. II 700 V / CAT. III 600 V


DH
-1.8.8.8
1
ON/OFF
2
HOLD
4
3
200m
2
20
200
700
V~
V⎓
A~
A⎓
2m
20m
15A
1.5V
BATT
9V
2000
20k
200k
2M
20M
°C
Ω
15A
mA/BATT/°C
COM
V/Ω
5
6
7
8
FUSED
15A MAX
MAX 10sec
every 15min.
FUSED
500mA
MAX
500V MAX
CAT. II
700V~
CAT. III 600V~
MAX

USER MANUAL

Contents

1 1. Introduction
2 2. Used Symbols
3 3. General Guidelines
4 4. Maintenance
5 5. During Use
6 6. General Description
7 7. Overvoltage/Installation Category
8 8. Pollution Degree
9 9. Specifications
  9.1 9.1 DC VOLTAGE
  9.2 9.2 AC VOLTAGE
  9.3 9.3 DC CURRENT
  9.4 9.4 AC CURRENT
  9.5 9.5 RESISTANCE
  9.6 9.6 DIODE AND CONTINUITY
  9.7 9.7 BATTERY TEST
  9.8 9.8 TEMPERATURE
10 10. Voltage Measurement
  10.1 10.1 DC VOLTAGE MEASUREMENT
  10.2 10.2 AC VOLTAGE MEASUREMENT
11 11. Current Measurement
  11.1 11.1 DC CURRENT MEASUREMENT
  11.2 11.2 AC CURRENT MEASUREMENT
12 12. Resistance Measurement
13 13. Diode and Continuity Testing
14 14. Battery Testing
15 15. Temperature Measurement
16 16. Battery and Fuse Replacement
17 17. Troubleshooting
18 Documents / Resources
19 Related Posts

1. Introduction

To all residents of the European Union Important environmental information about this product

This symbol on the device or the package indicates that disposal of the device after its lifecycle could harm the environment. Do not dispose of the unit (or batteries) as unsorted municipal waste; it should be taken to a specialized company for recycling. This device should be returned to your distributor or to a local recycling service. Respect the local environmental rules. If in doubt, contact your local waste disposal authorities. Thank you for choosing Velleman! Please read the manual thoroughly before bringing this device into service. If the device was damaged in transit, do not install or use it and contact your dealer.

2. Used Symbols

	AC (Alternating Current)
	DC (Direct Current)
	Both AC and DC
	**Risk of Electric shock.** A potentially hazardous voltage is possible.
	**Caution: risk of danger,** refer to the user manual for safety information. **Warning**: a hazardous condition or action that may result in injury or death **Caution**: condition or action that may result in damage to the meter or equipment under test
	Double insulation (class 2-protection)
	Earth
	Fuse
	Capacitor
	Diode
	Continuity

3. General Guidelines

Refer to the Velleman® Service and Quality Warranty on the last pages of this manual.

	**This symbol indicates: Read instructions** Not reading the instructions and manual can lead to damage, injury or death.
	**This symbol indicates: Danger** A hazardous condition or action that may result in injury or death
	**This symbol indicates: Risk of danger/damage** Risk of a hazardous condition or action that may result in damage, injury or death
	**This symbol indicates: Attention; important information** Ignoring this information can lead to hazardous situations.
	**WARNING:** To avoid electrical shock **always** disconnect the test leads prior to opening the housing. To prevent fire hazards, only use fuses with the same ratings as specified in this manual. **Remark:** refer to the warning on the battery compartment
	Avoid cold, heat and large temperature fluctuations. When the unit is moved from a cold to a warm location, leave it switched off until it has reached room temperature. This to avoid condensation and measuring errors.
	Protect this device from shocks and abuse. Avoid brute force when operating.
	Pollution degree 2-device. For indoor use only. Keep this device away from rain, moisture, splashing and dripping liquids. Not for industrial use. **Refer to §8 Pollution degree**.
	Keep the device away from children and unauthorised users.
	**Risk of electric shock during operation.** Be very careful when measuring live circuits.

	There are no user-serviceable parts inside the device. Refer to an authorized dealer for service and/or spare parts.
	This is an installation category CAT III measuring instrument. Refer to **§7 Overvoltage/installation category.**
	Read this addendum and the manual thoroughly. Familiarise yourself with the functions of the device before actually using it.
	All modifications of the device are forbidden for safety reasons. Damage caused by user modifications to the device is not covered by the warranty.
	Only use the device for its intended purpose. Using the device in an unauthorized way will void the warranty. Damage caused by disregard of certain guidelines in this manual is not covered by the warranty and the dealer will not accept responsibility for any ensuing defects or problems.
	WARNING – To avoid electric shock, fire or personal injury: • Connect the common test lead before the live test lead and remove the live test lead before the common test lead. • Disconnect the power and discharge all high-voltage capacitors before you measure resistance, continuity, capacitance or a diode junction. • When using the temperature probe, do not connect the probe to live circuits.

4. Maintenance

There are no user-serviceable parts inside the device. Refer to an authorized dealer for service and/or spare parts. Before performing any maintenance activities, disconnect the test leads from the jacks. For instructions on replacing battery or fuse, refer to §11 Battery and fuse replacement. Do not apply abrasives or solvents to the meter. Use a damp cloth and mild detergent for cleaning purposes.

5. During Use

Risk of electric shock during operation. Be very careful when measuring live circuits.

- Never exceed the limit value for protection. This limit value is listed separately in the specifications for each range of measurement.
- Do not touch unused terminals when the meter is linked to a circuit which is being tested.
- Never use the meter with CAT II installations when measuring voltages that might exceed the safety margin of 700 V above earth ground. Never use the meter with CAT III installations when measuring voltages that might exceed the safety margin of 600 V above earth ground.
- Set the range selector at its highest position if the intensity of the charge to be measured is unknown beforehand.
- Disconnect the test leads from the tested circuit before rotating the range selector in order to change functions.
- When carrying out measurements on a TV set or switching power circuits, always remember that the meter may be damaged by any high amplitude voltage pulses at test points.
- Always be careful when working with voltages above 60 VDC or 30 VAC rms. Keep your fingers behind the probe barriers at all times during measurement.
- Never perform resistance, diode or continuity measurements on live circuits. Make sure all capacitors in the circuit are depleted.

6. General Description

Refer to the illustration on page 2 of this manual:

1. Display
   3 ½ digits, 7 segments, LCD: 61 x 26 mm
2. On-off
3. Rotary switch This switch is used to select functions and desired ranges as well as to turn the meter on/off.
4. Hold button In any range, press this button to freeze the last reading. Press again to unfreeze.
5. “15A” jack Insert the red test lead in this connector in order to measure a max. current of 15 A.
6. “mA/BATT/°C” jack Insert the red test lead in this connector in order to measure current (except 15 A), the battery and temperature.
7. “COM” jack Insert the black (negative) test lead.
8. “V” jack Insert the red (positive) test lead in this connector to measure voltage and resistance.

7. Overvoltage/Installation Category

DMMs are categorized depending on the risk and severity of transient overvoltage that might occur at the point of test. Transients are short-lived bursts of energy induced in a system, e.g. caused by lightning strike on a power line.

The existing categories according EN 61010-1 are:

CAT I	A CAT I-rated meter is suitable for measurements on protected electronic circuits that are not directly connected to mains power, e.g. electronics circuits, control signals…
CAT II	A CAT II-rated meter is suitable for measurements in CAT I-environments and mono-phase appliances that are connected to the mains by means of a plug and circuits in a normal domestic environment, provided that the circuit is at least 10 m apart from a CAT III- or 20 m apart from a CAT IV-environment. E.g. household appliances, portable tools…
CAT III	A CAT III-rated meter is suitable for measurements in CAT I- and CAT II-environments, as well as for measurements on (fixed) mono- or poly-phased appliances which are at least 10 m apart from of a CAT IV-environment, and for measurements in or on distribution level equipment (fuse boxes, lighting circuits, electric ovens).
CAT IV	A CAT IV-rated meter is suitable for measuring in CAT I-, CAT II- and CAT III-environments as well as on the primary supply level. Note that for all measurements on equipment for which the supply cables run outdoors (either overhead or underground) a CAT IV meter **must** be used.

Warning: This device was designed in accordance with EN 61010-1 installation category CAT II 700 V and CAT III 600 V. This implies that certain restrictions in use apply that are related to voltages and voltage peaks which can occur within the environment of use. Refer to the table above.

This device is only suitable for measurements up to 700 V in CAT II and up to 600 V in CAT III

8. Pollution Degree

IEC 61010-1 specifies different types of pollution environments, for which different protective measures are necessary to ensure safety. Harsher environments require more protection, and the protection against the pollution which is to be found in a certain environment depends mainly on the insulation and the enclosure properties. The pollution degree rating of the DVM indicates in which environment the device may be used.

Pollution degree 1	No pollution or only dry, nonconductive pollution occurs. The pollution has no influence. (only to be found in hermetically sealed enclosures)
Pollution degree 2	Only nonconductive pollution occurs. Occasionally, temporary conductivity caused by condensation is to be expected. (home and office environments fall under this category)
Pollution degree 3	Conductive pollution occurs, or dry nonconductive pollution occurs that becomes conductive due to condensation that is to be expected. (industrial environments and environments exposed to outside air - but not in contact with precipitation)
Pollution degree 4	The pollution generates persistent conductivity caused by conductive dust or by rain or snow. (exposed outdoor environments and environments where high humidity levels or high concentrations of fine particles occur)

Warning: This device was designed in accordance with EN 61010-1 pollution degree 2. This implies that certain restrictions in use apply that are related to pollution which can occur within the environment of use. Refer to the table above.

This device is only suitable for measurements in Pollution degree class 2 environments.

9. Specifications

This device is not calibrated when purchased! Regulations concerning environment of use: Use this meter only for measurements in CAT I, CAT II and CAT III environments (see §7) Use this meter only in a pollution degree 2 environment (see §8) Ideal working conditions include: temperature: 0 °C to 40 °C (32 °F to 104 °F) relative humidity: max. 80 % altitude: max. 2000 m (6560 ft)

voltage ……. 700 V fuse protection
F500 mA/1000 V, 6 x 32 mm
F15 A/1000 V, 6 x 32 mama
power supply ….. 1 x 9 VDC 6LR61 (incl.)
display……. LCD, 1999 counts
display dimensions …. 61 x 26 mm
over-range …..yes
continuity buzzer …yes
transistor test ….. no
diode test…….yes
low-battery indication …yes

ranging mode …. manual
data hold ….yes
backlight …….. no
auto power-off …yes
dimensions …. 165 x 85 x 37 mm
weight (with battery) … ± 215 g
storage environment
temperature …. -20 °C to 60 °C
humidity … < 90 % RH
test lead probe (incl.)… CAT III 600 V, 15 A; L = 80 cm

9.1 DC VOLTAGE

	Do not measure circuits that may contain voltages > 700 V	
range	**resolution**	**accuracy**
200 mV	0.1 mV	± (0.5 % rdg + 2 digits)
2000 mV	1 mV	
20 V	10 mV	
200 V	100 mV	
700 V	1 V	± (0.8 % rdg + 2 digits)

Overload protection: 700 V DC or AC rms
Impedance: 10 MΩ

9.2 AC VOLTAGE

	Do not measure circuits that may contain voltages > 700 V	
range	**resolution**	**accuracy**
2000 mV	1 mV	± (0.8 % rdg + 3 digits)
20 V	10 mV	
200 V	100 mV	
700 V	1 V	± (1.2 % rdg + 3 digits)

Average sensing, calibrated to rms of sine wave
Frequency range: 40-500 Hz
Overload protection: 700 V DC or AC rms
Impedance: 10 MΩ

9.3 DC CURRENT

	Do not measure circuits that may contain voltages > 700 V	
range	**resolution**	**accuracy**
2 mA	1 µA	± (1.2 % rdg + 2 digits)
20 mA	10 µA	
200 mA	100 µA	± (1.5 % rdg + 2 digits)
15 A	10 mA	± (2.0 % rdg + 3 digits)

Overload protection: F500 mA/1000 V, F15 A/1000 V fuse
Note: 15 A up to 10 seconds

9.4 AC CURRENT

	Do not measure circuits that may contain voltages > 700 V	
range	**resolution**	**accuracy**
2 mA	1 µA	± (1.5 % rdg + 3 digits)
20 mA	10 µA	
200 mA	100 µA	± (2.0 % rdg + 3 digits)
15 A	10 mA	± (2.5 % rdg + 5 digits)

Average sensing, calibrated to rms of sine wave
Frequency range: 40-500 Hz
Overload protection: F500 mA/1000 V, F15 A/1000 V fuse
Note: 15 A up to 10 seconds

9.5 RESISTANCE

	Do not conduct resistance measurements on live circuits	
range	**resolution**	**accuracy**
200 Ω	0.1 Ω	± (1.0 % rdg + 3 digits)
2 kΩ	1 Ω	± (1.0 % rdg + 2 digits)
20 kΩ	10 Ω	
200 kΩ	100 Ω	
2 MΩ	1 kΩ	
20 MΩ	10 kΩ	± (1.5 % rdg + 3 digits)

Overload protection: 700 V DC or AC rms

9.6 DIODE AND CONTINUITY

	Do not conduct diode or continuity measurements on live circuits	
range	**description**	**test condition**
	display reads the approximate forward voltage of the diode	forward DC current ± 1 mA reversed DC voltage ± 3.0 V
	built-in buzzer sounds if resistance < 50 Ω	open-circuit voltage ± 3.0 V

Overload protection: 700 V DC or AC rms

9.7 BATTERY TEST

range	accuracy	load current	resolution
1.5 V	± (5.0 % rdg + 5 digits)	100 mA	1 mV
9 V		5 mA	10 mV

Overload protection: F500 mA/1000 V

9.8 TEMPERATURE

range	accuracy		resolution
°C	-50 to 150 °C	± (3 °C + 1 digit)	1 °C
	150 to 800 °C	± (3 % + 1 digit)	

NiCr-NiSi sensor
Overload protection: F500 mA/1000 V

10. Voltage Measurement

	Do not measure circuits that may contain voltages > 700 V
	Use extreme caution when measuring voltages higher than 60 VDC or 30 VAC rms. Always place your fingers behind the protective edges of the test probes while measuring!

10.1 DC VOLTAGE MEASUREMENT

1. Connect the red test lead to the “V” jack and the black lead to the “COM” jack.
2. Set the rotary switch in the desired V position. If the voltage to be measured is unknown beforehand, you should set the range switch in the highest range position and then reduce gradually until the ideal resolution is obtained.

3. Connect the test leads to the source being measured.
4. Read the voltage value on the LCD display along with the polarity of the red lead connection.

Notes

- If the range is not known beforehand, set the selector switch to a high range and lower gradually.
- An over-range is indicated by 1 or -1. Set to a higher range.
- The maximum input current is 700 V rms.

10.2 AC VOLTAGE MEASUREMENT

1. Connect the red test lead to the “V” jack and the black test lead to the “COM” jack.
2. Set the rotary switch in the appropriate V~ position.
3. Connect the test leads to the source to be measured.
4. Read the voltage value on the LCD display.

Notes

- See DC Voltage Measurement

11. Current Measurement

	Do not measure circuits that may contain voltages > 700 V
	Use extreme caution when measuring voltages higher than 60 VDC or 30 VAC rms. Always place your fingers behind the protective edges of the test probes while measuring!

11.1 DC CURRENT MEASUREMENT

1. Connect the red test lead to the “mA/BATT/°C” jack and the black test lead to the “COM” jack (switch the red lead to the “15A” jack for measurements between 200 mA and 15 A).
2. Set the rotary switch in the desired A position.
3. Open the circuit in which the current is to be measured and connect the test leads to the circuit IN SERIES.
4. Read the current value and the polarity of the red lead connection on the LCD display.

Notes

- If the range is not known beforehand, set the selector switch to a high range and lower gradually.
- An over-range is indicated by 1 or -1. Set to a higher range.
- The maximum input current is 700 V rms.

11.2 AC CURRENT MEASUREMENT

1. Connect the red test lead to the “mA/BATT/°C” jack and the black test lead to the “COM” jack (switch the red lead to the “15A” jack for measurements between 200 mA and 15 A).
2. Set the rotary switch in the desired A~ position.
3. Open the circuit in which the current is to be measured and connect the test leads to the circuit IN SERIES.
4. Read the current value and the polarity of the red lead connection on the LCD display.

Notes

- See DC Current Measurement

12. Resistance Measurement

Do not conduct resistance measurements on live circuits. Make sure all capacitors in the circuit are depleted.

1. Connect the red test lead to the “V” jack and the black test lead to the “COM” jack (the red lead has a positive polarity “+”).
2. Set the rotary switch in the appropriate “” range position.
3. Connect the test leads to the resistor to be measured and read the LCD display.
4. If the resistance being measured is connected to a circuit, turn off the power and discharge all capacitors before applying the test probes.

13. Diode and Continuity Testing

Do not conduct diode or continuity measurements on live circuits. Make sure all capacitors in the circuit are depleted.

1. Connect the red test lead to “V” jack and the black one to the “COM” jack (the red lead has a positive polarity “+”.).
2. Set the rotary switch in the position.
3. Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode of the diode. The approx. forward voltage drop of the diode will be displayed. If the connection is reversed, the display will merely show a “1”.

For continuity testing, if continuity exists, the built-in buzzer will sound.

14. Battery Testing

Do not conduct diode or continuity measurements on live circuits. Make sure all capacitors in the circuit are depleted.

1. Connect the red test lead to “mA/BATT/°C” and the black one to “COM”.
2. Set the range switch in the desired “1.5V” or “9V” position.
3. Connect the test leads to two points of the source to be tested and read the LCD display.

15. Temperature Measurement

1. Connect the red banana plug to “mA/BATT/°C” and the black one to “COM”.
2. Set the range switch in the desired “°C” position.
3. Put the probe into the field to be measured and read the LCD display.

16. Battery and Fuse Replacement

	**WARNING:** To avoid electrical shock **always** disconnect the test leads prior to opening the housing. To prevent fire hazards, only use fuses with the same ratings as specified in this manual. **Remark:** refer to the warning on the battery compartment
	There are no user-serviceable parts inside the device. Refer to an authorized dealer for service and/or spare parts.
	Equipment must be isolated or disconnected from the HAZARDOUS LIVE voltage before access (referring to battery replacement by operator).

- When”  ” is displayed, the battery should be replaced.
- Fuses rarely need replacement and blown fuses almost always result from human error.

  To replace the battery or fuse:
- Switch of the meter.
- Remove the two screws on the bottom of the case and gently open the housing.
- Remove the old battery and insert a new one.
- Close the housing and fasten the screws.

  Battery: 1x 9 VDC 6LR61, make sure to respect the polarity

  Fuses: F500 mA/1000 V and F15 A/1000 V, 6 x 32 mm

Make sure the meter is closed tight and put the protective edge back in place before using the meter.

17. Troubleshooting

If the device beeps continuously while measuring continuity, this means that the F500 mA/1000 V internal fuse is defective. Replace this fuse. Keep in mind that a low battery level could lead to incorrect measurements. Replace the battery on a regular basis. (tip: the reduced luminosity of the backlight/LCD display indicates a low battery level)

Use this device with original accessories only. Velleman Group NV cannot be held responsible in the event of damage or injury resulting from (incorrect) use of this device. For more info concerning this product and the latest version of this manual, please visit our website **www.velleman.eu**. The information in this manual is subject to change without prior notice.

© COPYRIGHT NOTICE
The copyright to this manual is owned by Velleman Group nv. All worldwide rights reserved. No part of this manual may be copied, reproduced, translated or reduced to any electronic medium or otherwise without the prior written consent of the copyright holder.

Velleman® Service and Quality Warranty
Since its foundation in 1972, Velleman® acquired extensive experience in the electronics world and currently distributes its products in over 85 countries.
All our products fulfil strict quality requirements and legal stipulations in the EU. In order to ensure the quality, our products regularly go through an extra quality check, both by an internal quality department and by specialized external organisations. If, all precautionary measures notwithstanding, problems should occur, please make appeal to our warranty (see guarantee conditions).

General Warranty Conditions Concerning Consumer Products (for EU):

- All consumer products are subject to a 24-month warranty on production flaws and defective material as from the original date of purchase.
- Velleman® can decide to replace an article with an equivalent article, or to refund the retail value totally or partially when the complaint is valid and a free repair or replacement of the article is impossible, or if the expenses are out of proportion. You will be delivered a replacing article or a refund at the value of 100% of the purchase price in case of a flaw occurred in the first year after the date of purchase and delivery, or a replacing article at 50% of the purchase price or a refund at the value of
  50% of the retail value in case of a flaw occurred in the second year after the date of purchase and delivery.
- **Not covered by warranty:**
  – all direct or indirect damage caused after delivery to the article (e.g. by oxidation, shocks, falls, dust, dirt, humidity…), and by the article, as well as its contents (e.g. data loss), compensation for loss of profits;
  – consumable goods, parts or accessories that are subject to an aging process during normal use, such as batteries (rechargeable, non-rechargeable, built-in or replaceable), lamps, rubber parts, drive belts… (unlimited list);
  – flaws resulting from fire, water damage, lightning, accident, natural disaster, etc.…;
  – flaws caused deliberately, negligently or resulting from improper handling, negligent maintenance, abusive use or use contrary to the manufacturer's instructions;
  – damage caused by a commercial, professional or collective use of the article (the warranty validity will be reduced to six (6) months when the article is used professionally);
  – damage resulting from an inappropriate packing and shipping of the article;
  – all damage caused by modification, repair or alteration performed by a third party without written permission by Velleman®.
- Articles to be repaired must be delivered to your Velleman® dealer, solidly packed (preferably in the original packaging), and be completed with the original receipt of purchase and a clear flaw description.
- Hint: In order to save on cost and time, please reread the manual and check if the flaw is caused by obvious causes prior to presenting the article for repair. Note that returning a non defective article can also involve handling costs.
- Repairs occurring after warranty expiration are subject to shipping costs.
- The above conditions are without prejudice to all commercial warranties.
  The above enumeration is subject to modification according to the article (see article's manual).

Made in PRC
Imported by Velleman nv
Legen Heirweg 33, 9890 Gavere, Belgium
www.velleman.eu

Documents / Resources

	velleman DVM892N Digital Multi Meter [pdf] User Manual DVM892N, Digital Multi Meter, DVM892N Digital Multi Meter, Meter

Manuals+,