veratron

TIMELESS INSTRUMENTS

VIEWLINE 85MM TACHOMETERS

USER MANUAL
rev. AA

EN

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CONTENT

PART NUMBERS

TACHOMETERS WITH LCD

Part Number	Dial Color	Range	Diameter
A2C59512390 A2C59512396	Black White	3000 RPM	85 mm
A2C59512391 A2C59512397	Black White	4000 RPM	85 mm
A2C59512392 A2C59512398	Black White	5000 RPM	85 mm
A2C59512393 A2C59512399	Black White	6000 RPM	85 mm
A2C59512394 A2C59512400	Black White	7000 RPM	85 mm
A2C59512395 A2C59512401	Black White	8000 RPM	85 mm

TACHOMETERS WITHOUT LCD

Part Number	Dial Color	Range	Diameter
A2C59512430 A2C59512433	Black White	3000 RPM	85 mm
A2C59512431 A2C59512434	Black White	4000 RPM	85 mm
A2C59512432 A2C59512435	Black White	6000 RPM	85 mm

SAFETY INFORMATION

- No smoking! No open fire or heat sources!

- The product was developed, manufactured and inspected according to the basic safety requirements of EC Guidelines and state-of-the-art technology.
- The instrument is designed for use in grounded vehicles and machines as well as in pleasure boats, including non-classified commercial shipping.
- Use our product only as intended. Use of the product for reasons other than its intended use may lead to personal injury, property damage or environmental damage. Before installation, check the vehicle documentation for vehicle type and any possible special features!
- Use the assembly plan to learn the location of the fuel/hydraulic/compressed air and electrical lines!

- Note possible modifications to the vehicle, which must be considered during installation!
- To prevent personal injury, property damage or environmental damage, basic knowledge of motor vehicle/shipbuilding electronics and mechanics is required.
- Make sure that the engine cannot start unintentionally during installation!
- Modifications or manipulations to Veratron products can affect safety. Consequently, you may not modify or manipulate the product!
- When removing/installing seats, covers, etc., ensure that lines are not damaged and plug-in connections are not loosened!
- Note all data from other installed instruments with volatile electronic memories.

SAFETY DURING INSTALLATION
- During installation, ensure that the product's components do not affect or limit vehicle functions. Avoid damaging these components!
- Only install undamaged parts in a vehicle!
- During installation, ensure that the product does not impair the field of vision and that it cannot impact the driver's or passenger's head!
- A specialized technician should install the product. If you install the product yourself, wear appropriate work clothing. Do not wear loose clothing, as it may get caught in moving parts. Protect long hair with a hair net.
- When working on the on-board electronics, do not wear metallic or conductive jewelry such as necklaces, bracelets, rings, etc.
- If work on a running engine is required, exercise extreme caution. Wear only appropriate work clothing as you are at risk of personal injury, resulting from being crushed or burned.
- Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit. If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries!

Short circuits can cause fires, battery explosions and damages to other electronic systems. Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.
- If working on gasoline boat motors, let the motor compartment fan run before beginning work.
- Pay attention to how lines and cable harnesses are laid so that you do not drill or saw through them!
- Do not install the product in the mechanical and electrical airbag area!
- Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- When working underneath the vehicle, secure it according to the specifications from the vehicle manufacturer.
- Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65 mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws,

keyhole saws or files. Deburr edges. Follow the safety instructions of the tool manufacturer.
- Use only insulated tools, if work is necessary on live parts.
- Use only the multimeter or diode test lamps provided, to measure voltages and currents in the vehicle/machine or boat. Use of conventional test lamps can cause damage to control units or other electronic systems.

SAFETY AFTER INSTALLATION
- Connect the ground cable tightly to the negative terminal of the battery.
- Reenter/reprogram the volatile electronic memory values.

ELECTRICAL CONNECTION
- Note cable cross-sectional area!
- Reducing the cable cross-sectional area leads to higher current density, which can cause the cable cross-sectional area in question to heat up!
- When installing electrical cables, use the provided cable ducts and harnesses; however, do not run cables parallel to ignition cables or to cables that lead to large electricity consumers.
- Fasten cables with cable ties or adhesive tape. Do not run cables over moving parts. Do not attach cables to the steering column!
- Ensure that cables are not subject to tensile, compressive or shearing forces.
- If cables are run through drill holes, protect them using rubber sleeves or the like.
- Use only one cable stripper to strip the cable. Adjust the stripper so that stranded wires are not damaged or separated.
- Use only a soft soldering process or commercially available crimp connector to solder new cable connections!

- The electrical indicator outputs and cables connected to them must be protected from direct contact and damage. The cables in use must have enough insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measures to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, uninsulated cables and contacts is prohibited.

- Check all functions.
- Use only clean water to clean the components. Note the Ingress Protection (IP) ratings (IEC 60529).

- Make crimp connections with cable crimping pliers only. Follow the safety instructions of the tool manufacturer.
- Insulate exposed stranded wires to prevent short circuits.
- Caution: Risk of short circuit if junctions are faulty or cables are damaged.
- Short circuits in the vehicle network can cause fires, battery explosions and damages to other electronic systems. Consequently, all power supply cable connections must be provided with weldable connectors and be sufficiently insulated.
- Ensure ground connections are sound.
- Faulty connections can cause short circuits. Only connect cables according to the electrical wiring diagram.
- If operating the instrument on power supply units, note that the power supply unit must be stabilized and it must comply with the following standard: DIN EN 61000, Parts 6-1 to 6-4.

MECHANICAL INSTALLATION

⚠ **WARNING**

Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit.
If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries! Short circuits can cause fires, battery explosions and damages to other electronic systems. Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.

BEFORE THE ASSEMBLY

1. Before beginning, turn off the ignition and remove the ignition key. If necessary, remove the main circuit switch

2. Disconnect the negative terminal on the battery. Make sure the battery cannot unintentionally restart.

3. Place the device at least 300 mm away from any magnetic compass.

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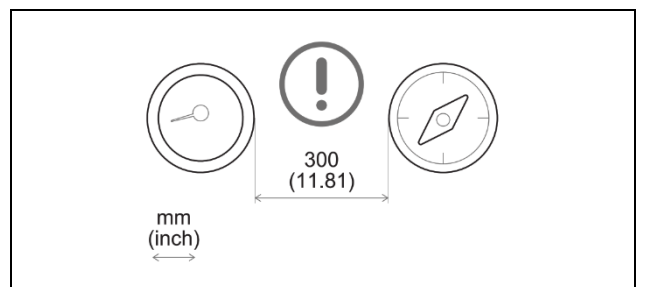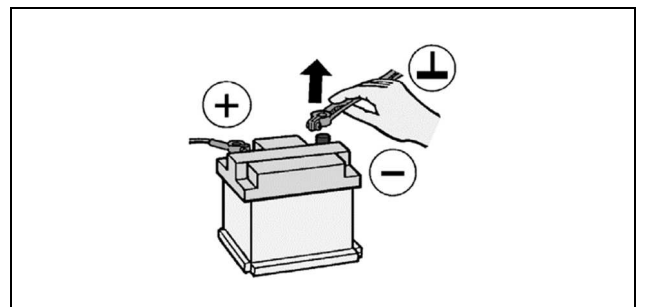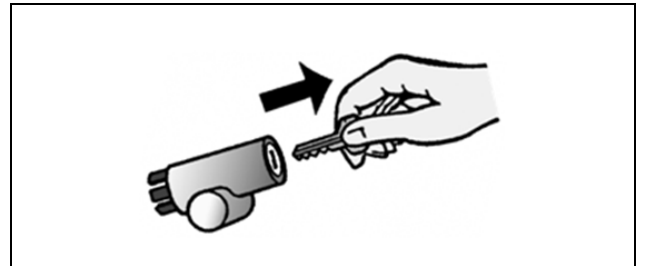
INSTALLATION WITH SPINLOCK

Conventional assembly. (Instrument is put into the drill hole from the front).
The panel thickness may be within a range of 2 to 18 mm.
The drill hole must have a diameter of 81 to 86 mm.

⚠ WARNING

- Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65 mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws, keyhole saws or files. Deburr edges. Follow the safety instructions of the tool manufacturer.

1. Create a circular hole in the panel considering the device dimensions.

2. Remove the spinlock and insert the device from the front.

3. For 85 mm instruments, the fastening nut can be mounted at position A or B. This allows you to fix the gauge in different panel bores.

   <u>Version A</u>
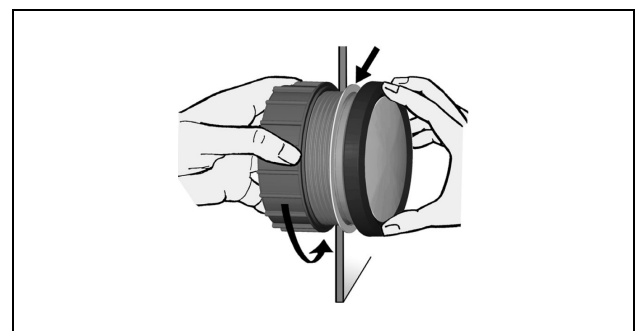   Panel bore 80.5 – 81 mm
   <u>Version B</u>
   Panel bore 85.5 – 86 mm
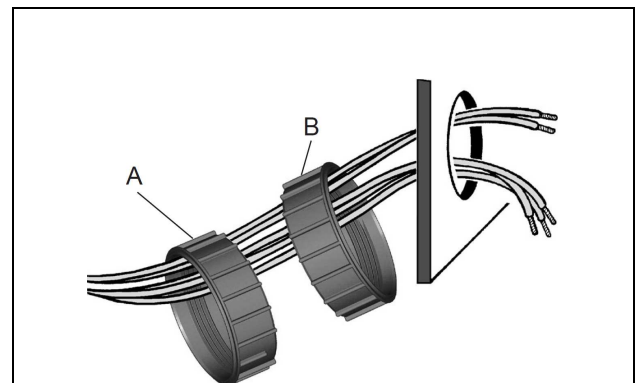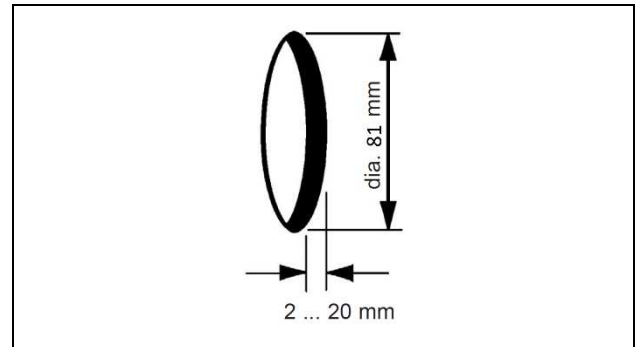
4. Align the instrument and hand-tighten the fastening nut. Ensure that the nut is not tightened with a torque greater than 4 Nm.

5. Make sure the seal lays flat between the panel and the front ring.

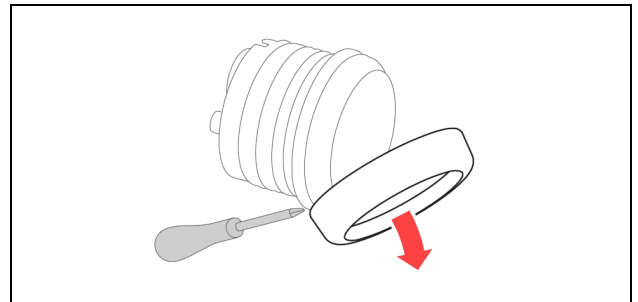# FLUSH MOUNTING

The recommended panel thickness is 1.5 to 3 mm.
The drill hole must have a diameter of 75.4 mm.
Ensure that the installation location is level and has no sharp edges.
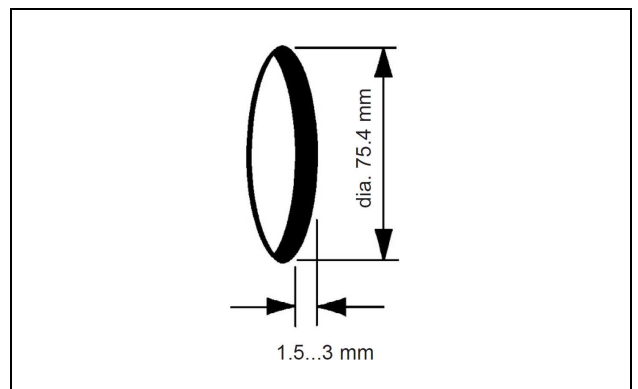
⚠ **WARNING**

- Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65 mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws, keyhole saws or files. Deburr edges. Follow the safety instructions of the tool manufacturer.

1. Gently remove the bezel using a screwdriver.
   Note: the bezel cannot be used after removal since it might be damaged.

2. Create a circular hole in the panel considering the device dimensions.

3. Place the flush mount seal A2C53215641 (not included) on the instrument glass.

4. Put the instrument into the drill hole from the back.

5. Adjust the instrument so that the gauge is level and fasten it to the stud bolts on the rear side of the panel, using the flush mount fixing bracket A2C59510864 (not included).

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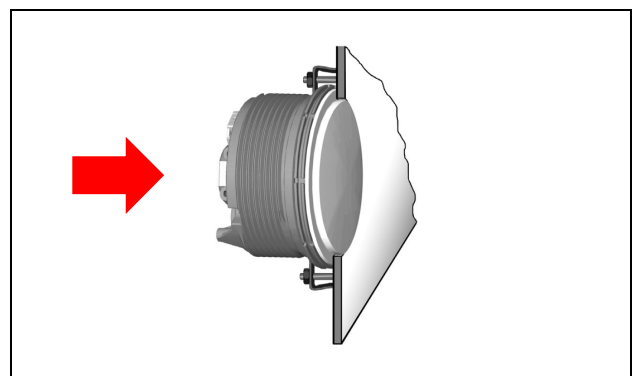
INSTALLATION WITH BRACKETS

Conventional assembly. (Instrument is put into the drill hole from the front).
The panel width may be within a range of 2 to 13 mm.
The drill hole must have a diameter of 81 mm.
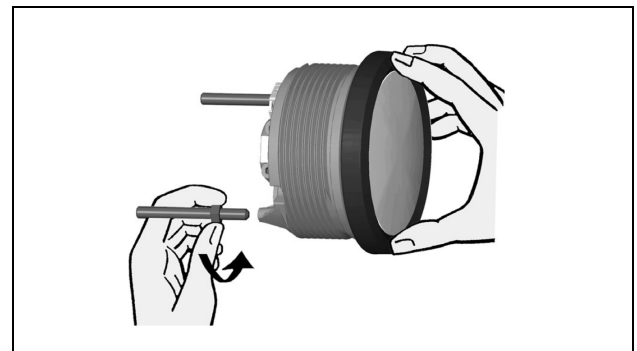
⚠ **WARNING**

- Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65 mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws, keyhole saws or files. Deburr edges. Follow the safety instructions of the tool manufacturer.

1. Create a circular hole in the panel considering the device dimensions.

2. Remove the spinlock and insert the device from the front.
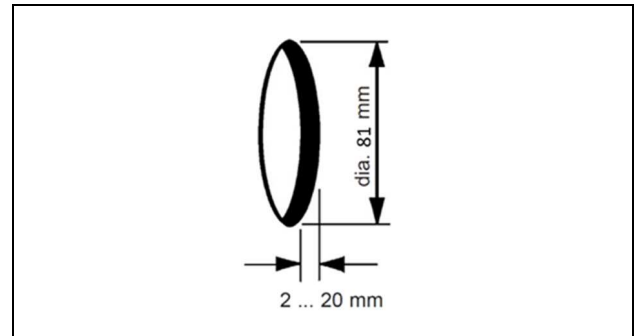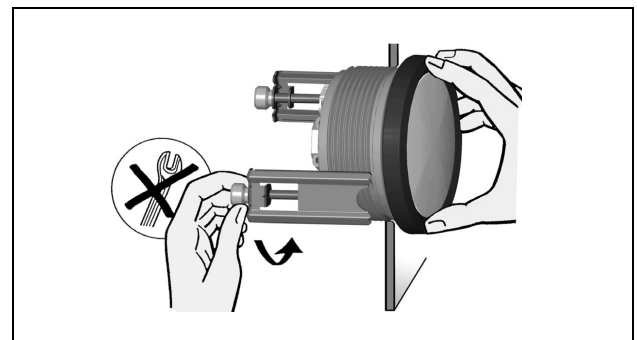

3. Screw the stud bolts into the provided drill holes in the enclosure.

   Max. stud bolt torque is 1.5 Nm.

4. Place the bracket on the stud bolt and hand-tighten the knurled nut.

5. Make sure the seal lays flat between the panel and the front ring.

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ELECTRICAL INSTALLATION

⚠WARNING
• Refer to the safety rules described in the electrical connections section of the safety information chapter of this document!

Depending on the configuration, insert the cable into the 8-pin and 14-pin contact enclosure according to the following pin assignment.

The contacts must audibly lock into place.

Now insert the plug into the gauge.

Note the inverse polarity protection nose in the process.

PINOUT 8-PIN CONNECTOR

Pin No.	Wire color	Description
1	Red	KL. 30 – Battery Power 12 / 24 V
2	Black	KL. 31 – Ground
3	Black / Blue	Sensor ground
4	Brown	KL. 15 – Ignition plus
5	Green	Sensor signal
6	Blue / Red	KL. 58 – Illumination
7	Yellow / Black	Programming port Tx
8	Yellow / Red	Programming port Rx
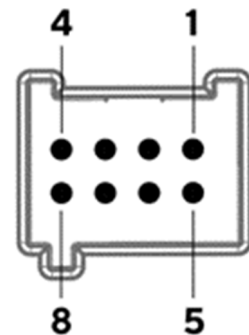
PINOUT 14-PIN CONNECTOR
These connections apply for the tachometer versions with LCD only.

Pin No.	Wire color	Description
1 - 10	–	N.C.
11	Black / Green	Configuration key
12	Red / Green	Mode key
13	Red	Alarm output* (Not available on the standard VL gauges)
14	–	N.C.
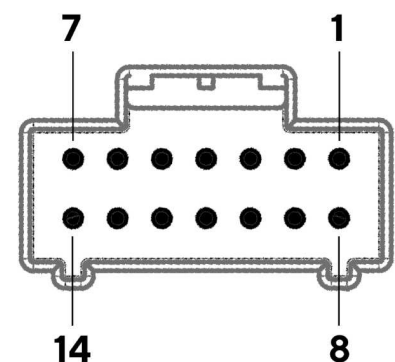
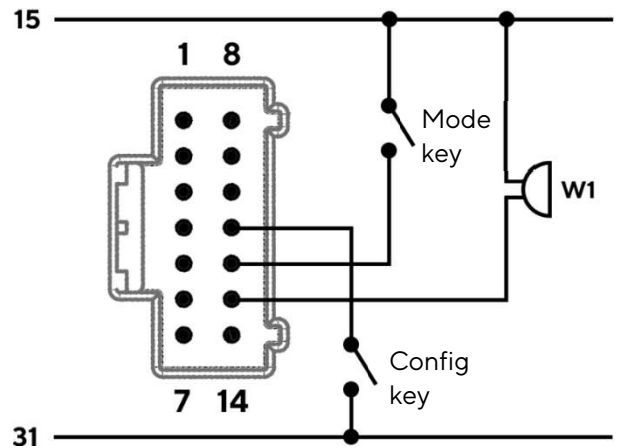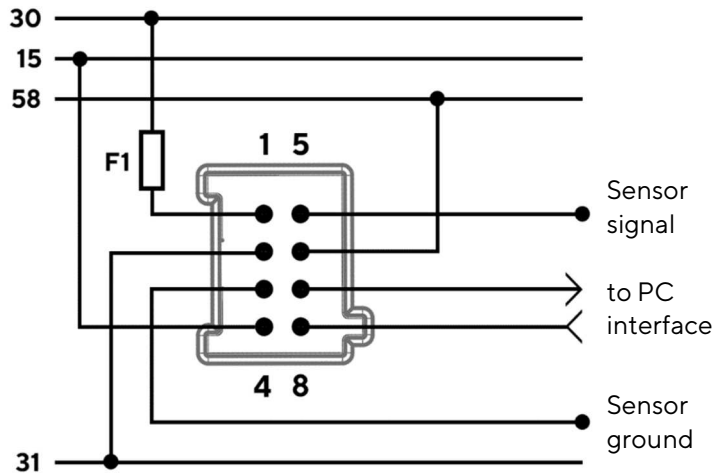* Open Collector – 100mA max.

CONNECTION DIAGRAMS

TACHOMETER WITH LCD

Designations in the wiring diagrams:

30 – Term. 30 – steady-state plus 12 V
15 – Term. 15 – connected (ignition) plus
58 – Term. 58 - lighting

31 – Term. 31 - ground
F1 – Fuse 5A quick-response
W1 – Alarm output (max. 100 mA)

TACHOMETER WITHOUT LCD

Designations in the wiring diagrams:

30 – Term. 30 – steady-state plus 12 V
15 – Term. 15 – connected (ignition) plus
58 – Term. 58 - lighting

31 – Term. 31 - ground
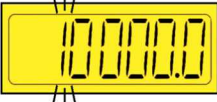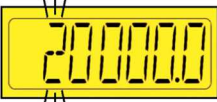**F1** – Fuse 5A quick-response

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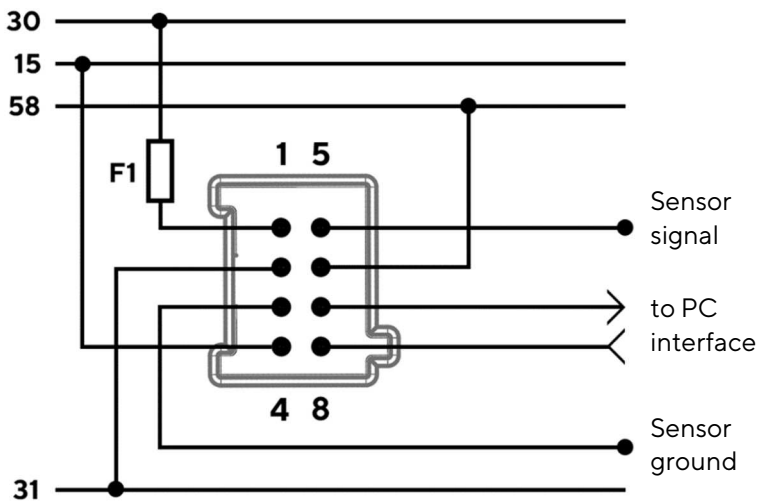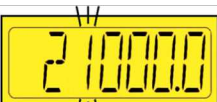
CONFIGURATION WITH LCD

BASICS

Press the key briefly (< 2sec.) to change the currently displayed value.
Press the key longer (> 2sec.) to change to the next value.
The display returns to normal operating mode if a key is not pressed for 30 seconds.
Any settings you have made are not saved.
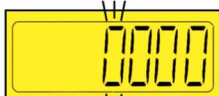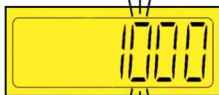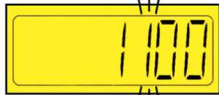
SETTING THE IMPULSE NUMBER

1. Activate T. 30 (8-pin – Pin1)
2. Deactivate T. 15 (8-pin – Pin4)
3. Press and hold Config key (14-pin – Pin 11)
4. Activate T. 15
5. Release Config key

	PULSE
Press and hold Config Key.	
Set impulse number is displayed, the first digit flashes.	10000.0
Press Config key briefly.	
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0".	20000.0
Press and hold Config Key.	
The next lower digit flashes.	20000.0
Press Config key briefly.	
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0".	21000.0
Continue until the complete impulse number is set.	
Press and hold Config Key.	
Deactivate T. 15. This saves the impulse number in the display.	PULSE

SETTING THE UNIT AND ALARM THRESHOLD

1. Activate T. 30 (8-pin – Pin1)
2. Deactivate T. 15 (8-pin – Pin4)
3. Press and hold Mode key (14-pin – Pin 12)
4. Activate T. 15
5. Release Mode key

	UNIT
Press and hold Mode key.	
By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format.	**-24h-**
Press and hold Mode key.	
	UNIT
Press Mode key briefly.	
	WARN
Press and hold Mode key.	
Set alarm threshold is displayed; the first digit flashes.	**0000**
Press Mode key briefly.	
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0".	**1000**
Press and hold Mode key.	
The next lower digit flashes.	**1000**
Press Mode key briefly.	
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0".	**1100**
Continue until the complete alarm threshold is set.	
Press and hold Mode key.	
Deactivate T. 15. This saves the unit and the alarm threshold in the display.	**WARN**

CONFIGURATION WITHOUT LCD

1. Activate Term. 30 (8-pin – Pin 1)
2. Deactivate Term. 15 (8-pin – Pin 1)

Set the impulse number according to the following table.

Ensure that switch position "1" points toward the center of the instrument.

Select switch position "XXX" if you want to set an impulse number with the optional PC software.

Please contact your Veratron partner for more information.
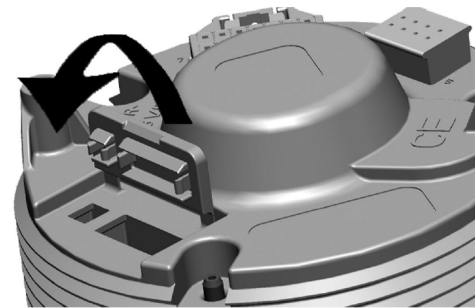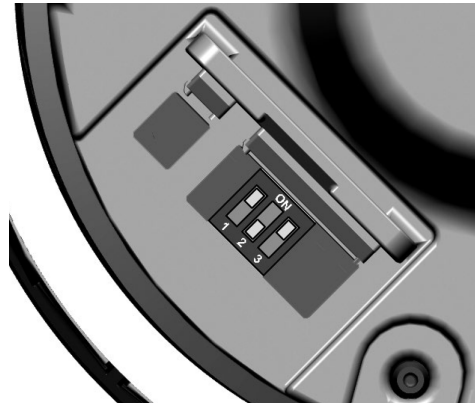
Puls./Rev.	Switch 1	Switch 2	Switch 3
XXX	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
8	1	1	1

LCD OPERATION

DISPLAY INDICATOR SELECTION

1. Activate T. 30 (8-pin – Pin1) 2. Activate T. 15 (8-pin – Pin4)	
Total operating hours	`h 000123`
Press Mode key briefly.	
Trip hours	`h T 12.5`
Press Mode key briefly.	
Clock	`12:03`
Press Mode key briefly.	
On–board voltage	`V 13.4`

SETTING THE BRIGHTNESS

1. Activate T. 30 (8-pin – Pin1) 2. Activate T. 15 (8-pin – Pin4)	
Press the Mode key repeatedly until the on–board voltage is displayed	
	`V 13.4`
Press and hold Mode key.	
Press the Mode key repeatedly until the desired brightness is reached The brightness can be set between 0 (OFF) to 10.	`ILL 5`
	`ILL 9`
Press and hold Mode key.	
The desired brightness is now permanently set.	`V 13.4`

RESETTING THE TRIP COUNTER

1. Activate T. 30 (8-pin – Pin1)	
2. Activate T. 15 (8-pin – Pin4)	
Press the Mode key repeatedly until the trip hours are displayed.	
	ʰT 12.5
Press and hold Mode key.	
	ʰT 0.0
Trip is now deleted.	

SETTING THE CLOCK

1. Activate T. 30 (8-pin – Pin1)	
2. Activate T. 15 (8-pin – Pin4)	
Press the Mode key repeatedly until the time is displayed.	
	12:03
Press and hold Mode key.	
Set time is displayed; the first digit flashes.	12:00
Press Mode key briefly.	
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0".	22:00
Press and hold Mode key.	
The next lower digit flashes.	22:00
Press Mode key briefly.	
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0".	23:00
Continue until the correct time is set.	
Press and hold Mode key.	
Clock is set. **Important:** If the permanent power (Term. 30) is disconnected, the clock no longer runs.	23:00

TECHNICAL DATA

Nominal Voltage	12 V / 24 V
Operating Voltage	8 – 32 V with overvoltage and reverse polarity protection
Current consumption	< 175 mA with warning LED
Pulse count range	0.5–399 Imp/U (Default: 6Imp/U) programmable via LCD or with optional PC Software.
Sensors	Hall sensor (no open Collector) Inductive sensor Blocking oscillator (no open Collector) Alternator Term. W Ignition Term. 1 Lightning Coil
LCD size	37 x 11 mm
Protection class	IP 67 front side, IP 52 rear side acc. IEC60529
Lens	PMMA double lens
Housing	Ø85 mm – Polycarbonate (PC), flame retardant acc. UL94-V0
Installation depth	50 mm
Bezels	PC (black, white) or ABS (chrome) – several color and shapes
Dial	Backlit, different colors (black, white)
Pointer	Backlit, white on black dials; red on white dials 240° deflection angle
Illumination	Dial: LED amber (605 nm) Pointer: LED red (632 nm)
Warning LED	Red (632 nm)
Operating temperature	–20°C to +85°C with chrome bezel –40°C to +70°C
Storage temperature	–40°C to +80°C with chrome bezel –40°C to +70°C
Connector	Tyco / Hirschmann MQS connector 8/14 pins
Mounting	Spinlock Nut – locking height 0.5 – 18 mm Optional Studs and Brackets – locking height 2 – 13 mm
Certifications	CE, Reach, RoHS

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ACCESSORIES

Description	Part Number
Adapter cable 8-poles	A2C59512947
Adapter cable 14-poles	A2C59512950
Spinlock Nut 85 mm	A2C5321223801
Flush mount – mounting kit	A2C59510864
Flush mount seal	A2C53215640
Bracket assembly mounting kit	A2C59510854
Connector set 8 pins	A2C59510850
Blind plug for 52 mm	A2C5312164501
Bezel – Round, Black	A2C5319291101
Bezel – Round, White	A2C5319291601
Bezel – Round, Chrome	A2C5319291401
Bezel – Triangular, Black	A2C5319291701
Bezel – Triangular, White	A2C5319292001
Bezel – Triangular, Chrome	A2C5319291801
Bezel – Flat, Black	A2C5319291101
Bezel – Flat, White	A2C5319291201
Bezel – Flat, Chrome	A2C5319291001

Visit http://www.veratron.com for the complete list of accessories.

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