

VDO

**INSTRUMENTATION &
ENGINE MONITORING SYSTEMS**

TAS





WHO IS TAS AUTOMOTIVE

TAS is a proud supplier of components and Parts in southern Africa, with a comprehensive range of best-of-breed products. TAS currently operates throughout South Africa, and Some of African Countries not limited to do business Internationally.

Time Access is a leading supplier of Biometric Time Attendance & Access Control Products (fingerprint readers & handscanning recorders used for access control and time and attendance), handscan systems and fingerprint readers which have become a major product in time management. There are no licence fees for our time and attendance software and the T&A software is included (no charge) with all computerised time management systems.

Majority of our biometrics computerised time management systems can be fitted to Access control. This means that Time and Access Control Systems are able to provide you with a complete time management solution for your business.

Why Choose us?

From the hardware and software for initial workforce clocking right through to payroll integration, TAS can provide a total solution to suit the size and complexity of your organisation.

Time access systems world-class support organisation is consistent with the business critical nature of the applications it provides.


When you buy any TAS product, you buy the peace of mind that it is backed by a substantial, well-established, reputable service provider with on-site support teams in Johannesburg.

HOW TO USE THE CATALOGUE

Vehicle Listing (Fuel Pump Section)

Vehicle	Model	Engine	Year	Part No.	Type
AUDI					
Audi	A3 1.8	AGN	98 on	E22-041-095Z	S/Pot
Audi	A3 1.8	AGN	98 on	405-058-005-011Z	Unit
Audi	A3 1.8 T	AGU	98 on	E22-041-095Z	S/Pot
Audi	A3 1.8 T	AGU	98 on	405-058-005-011Z	Unit
Audi	A6 2.4	AGA	97-01	E22-041-094Z	S/Pot
Audi	A6 2.6	ABC	94-97	405-052-003-002G	Pump
Audi	A6 2.8	ACK	97-01	405-052-003-002G	Pump
Audi	A6 2.8	ACK	97-01	E22-041-094Z	S/Pot
Audi	A6 2.8 F	AAH	94-97	405-052-003-002G	Pump

Part Listing (Sample I)



Ammeter - with Internal Shunt

Suitable for most engines. Monitors charge and battery condition

Voltage independent - suitable for xw

Ammeters with internal shunt are easily identified by the heavy duty threaded terminals. Heavy duty wire must be used for wiring

Illumination globe holder not included


For 24V application use globe 999-065-002

For 12V application use globe 999-065-001

Globe holder Part No. 999-067-001

Part No.	Range	Diameter
190-037-001C	-30/+30Amp	52mm
190-037-002C	-60/+60Amp	52mm
190-037-003C	-100/+100Amp	52mm

Part Listing (Sample 2)

993-784-025A	Universal Fuel Pump	Part number
	In-tank - complete with pump, filter & wiring harness Outlet Position: Straight Pressure: 3.5Bar Daihatsu Charade 1.3V, 16V Honda Accord, Civic, VTEC, CR-V, Legend Hyundai Accent, S-Coupe, Elantra, Sonata Jeep Cherokee, XJ, Grand, Wrangler Mazda 323 all, MX-3, MX-5, MX-6 Mitsubishi Colt 1.3, GLi 1.6, GTi 16V Nissan 200SX, Maxima QX, Pick-up Opel Astra 1.4, 1.6, 2.0 16V Toyota all models with in-tank pumps	Part name Part information Vehicle make, model and derivative
		Part image/illustration

Listed Abbreviations

Abbreviations	Meaning
PCD	Pitch circle diameter
Ω	Ohm
Amp	Ampere
mA	Milliampere
V	Volt
W	Watt
psi	Pascal
kPa	Kilopascal

Abbreviations	Meaning
Min	Minimum
Max	Maximum
Unit	Complete assembly
Pump	Fuel pump only
L/Pump	Lift pump
S/Pot	Swirl pot with pump



PARTS LISTING - COCKPIT INTERNATIONAL

Classic round instruments using state-of-the-art technology.

The cockpits of trucks, construction and agricultural machinery or stationary machine panels can no longer be imagined without the classic VDO round instruments. The wide range, robust design and extensive years of experience are what makes these instruments "classics".

Section Content

- Ammeters
- Clocks
- Fuel Gauges - Lever
- Fuel Gauges - Tubular
- Hourmeters
- Pressure Gauges
- Pressure Senders
- Pressure Switches
- Speedometers
- Sensors
- Tachourmeters
- Tachometers
- Temperature Gauges
- Temperature Exhaust/Pyrometers
- Temperature Senders
- Temperature Switches
- Voltmeters

Parts Listing - Cockpit International

Ammeters



Ammeter - with Internal Shunt

Suitable for most engines. Monitors charge and battery condition

Voltage independent - suitable for 12V and 24V

Ammeters with internal shunt are easily identified by the heavy duty threaded terminals
Heavy duty wire must be used for wiring

Illumination globe holder not included

For 24V application use globe 999-065-002

For 12V application use globe 999-065-001

Globe holder Part No. 999-067-001

Part No.	Range	Diameter
190-037-001C	-30/+30Amp	52mm
190-037-002C	-60/+60Amp	52mm
190-037-003C	-100/+100Amp	52mm

Clocks



Quartz Clocks

The VDO Quartz clock offers accurate timing to within ± 1 second per day.

The crystallographic properties of quartz ensure that the electric current is precisely regulated for accurate timing.

Electric Clocks

Part No.	Voltage	Diameter
370-214-031-001G	12V	52mm
370-214-031-003G	24V	52mm

Fuel Gauges - Lever



Lever

Suitable for use with petrol and diesel fuel

Illumination 12V and 24V included

Fuel Gauges 10 - 180 Ohm (Ω)

Part No.	Range	Diameter	Voltage
301-030-001C	0-1/1	52mm	12V
301-040-001C	0-1/1	52mm	24V

For tank units with 10 - 180 Ω resistance

With ISO symbol

Empty 10 Ω , full 180 Ω

Parts Listing - Cockpit International



Fuel Gauges - Lever - Continued



Sender (Adjustable Float Arm)

Part No.	Specifications	Length
220-003	Empty 10Ω, full 180Ω	150 - 600mm

Sender (Plastic Adjustable Includes Warning Contact)

Part No.	Specifications	Length
A2C59510	Empty 10Ω, full 180Ω	145 - 400mm

Fuel Gauges - Tubular



Fuel Gauges (Tubular)

Part No.	Range	Diameter	Voltage
301-030-002C	0-1/1	52mm	12V
301-040-002C	0-1/1	52mm	24V

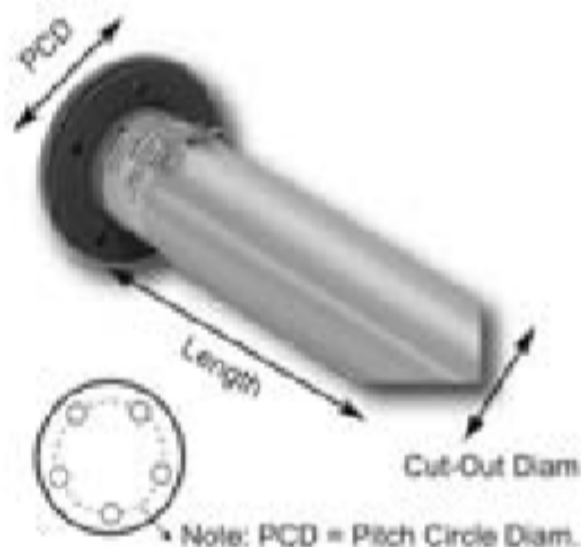
With ISO symbol for fuel level

For tubular tank units, adjustable resistance range

Full 3Ω, empty 90Ω

Tubular Type Senders Pitch Circle Diameter (PCD)

Part No.	PCD	Cut-Out Diameter	Voltage	Length	Notes
224-082-008-008R	54mm	42mm	12V/24V	189.5mm	
224-011-000-037X	54mm	42mm	12V/24V	370.0mm	
224-817-008-004R	54mm	42mm	12V/24V	380.0mm	With warning contact
224-011-000-039X	54mm	42mm	12V/24V	390.0mm	
224-082-005-117R	54mm	42mm	12V/24V	498.5mm	
224-082-005-012R	54mm	42mm	12V/24V	555.0mm	
224-082-005-129R	54mm	42mm	12V/24V	665.0mm	
224-817-008-011C	54mm	42mm	12V/24V	737.5mm	With warning contact
224-082-005-161R	54mm	42mm	12V/24V	914.0mm	



Tubular Type Senders (Heavy Duty)

Part No.	PCD	Cut-Out Diameter	Voltage	Length
X10-224-009-039	80mm	57mm	12V/24V	596.0mm
X10-224-009-029	80mm	57mm	12V/24V	741.0mm
X10-224-009-040	80mm	57mm	12V/24V	1086.0mm
X10-224-009-072	80mm	57mm	12V/24V	1387.0mm

Tubular Type Senders (Insulated Versions)

Part No.	PCD	Cut-Out Diameter	Voltage	Length
X10-224-021-001	80mm	57mm	12V/24V	536.0mm
X10-224-021-006	80mm	57mm	12V/24V	846.0mm
X10-224-021-005	80mm	57mm	12V/24V	1045.0mm

Please note: All 54mm PCD have an aluminium body

Please note: All 80mm PCD have a steel body

Fuel Gauges - Tubular - Continued



Accessories

Part No.	Description	PCD
2-250-234	Gasket, cork	54mm
2-251-006	Gasket, cork	80mm
2-251-016	Gasket, rubber	80mm
1403141	Flange only	
1403145	Flange & gasket	54mm

Hourmeters



Hourmeter (Electronic)

Suitable for all vehicles and machines.

Available with 360° minute hand sweep or as counters only.

Part No.	Range	Diameter	Voltage	Notes
331-810-012-002G	0-99999.9hrs	52mm	12V/24V	No light
331-810-012-007G	0-99999.9hrs	52mm	24V	With light

No Minute Hand, Black Bezel

Part No.	Range	Diameter	Voltage
331-810-012-001X	0-99999.9hrs	52mm	12V/24V



Accessories

Part No.	Description	Thread
230-112-001-002C	Pressure switch	1/8"-27NPTF

70kPa - 5W - N/O 6V-24V



Hourmeter (Vibration Type)

For control of motors and engines as well as for recording the operating time of machinery not connected to an electric power supply but generating vibrations in service

Part No.	Description
D611008	52mm
D611010	60mm
D611012	52mm with anti-vibration mounting kit
D761120	60mm bracket
D761130	72mm bracket
D761143	Vibration ring assembly

Installation is simple as no source of current is required

Vibration-proof clockwork operating with high accuracy

Metering capacity 99.999 hours with minute read-out

Suitable for installation in openings of different diameters with mask or damper ring

Waterproof and tropicalised

Fit for service in ambient temperatures from -15 - +60°C

Designed for flush and surface mounting



Pressure Gauges



Pressure Gauges, Engine Oil Pressure 500kPa

Suitable for all vehicles and machines

Illumination 12V or 24V included

Note: Not recommended for petrol or water

Part No.	Range	Diameter	Voltage
350-030-016C	0-500kPa	52mm	12V
350-040-016C	0-500kPa	52mm	24V

With ISO symbol

500kPa = 72.5psi

Sender Only 500kPa

Part No.	Range	Thread	Voltage
360-081-029-004C	500kPa	1/8"-27NPTF	12V/24V

Sender/Switch Combination

Part No.	Range	Thread	Switch Point
360-081-030-049C	500kPa	1/8"-27NPTF	50kPa

Refer to your engine manufacturers manual for correct oil pressure

Note: 500kPa = 72.5psi

Pressure Gauges, Engine Oil Pressure 1000kPa

Part No.	Range	Diameter	Voltage
350-030-017C	0-1000kPa	52mm	12V
350-040-017C	0-1000kPa	52mm	24V

With ISO symbol

1000kPa = 145psi

Sender Only 1000kPa

Part No.	Range	Thread	Voltage
360-081-029-012C	1000kPa	1/8"-27NPTF	12V/24V

Sender/Switch Combination

Part No.	Range	Thread	Switch Point
360-081-030-052C	1000kPa	1/8"-27NPTF	50kPa

Refer to your engine manufacturers manual for correct oil pressure

Note: 1000kPa = 145psi

Pressure Gauges, Transmission Oil Pressure

Part No.	Range	Diameter	Voltage
350-030-005C	0-25Bar	52mm	12V
350-040-005G	0-25Bar	52mm	24V

With ISO symbol

25Bar = 2500kPa = 360psi

Sender Only 2500kPa

Part No.	Range	Thread	Voltage
360-081-038-003C	0-25Bar 360psi	1/8"-27NPTF	12V/24V

Pressure Gauges - Continued



Pressure Gauge (Mechanical)

Suitable for most vehicles and machines. Can be used on most non-aggressive gases and liquids. Supplied with nut and cone for 3/16" PVC tubing. Globe holder not included

For 12V application use globe Part No. 999-065-001

For 24V application use globe Part No. 999-065-002

Globe holder Part No. 999-067-001

Part No.	Range	Diameter
150-035-019G	0-700kPa	52mm
150-035-020G	0-1000kPa	52mm
150-035-022G	0-2500kPa	52mm



Turbo Boost Gauge (Mechanical)

Suitable for all vehicles

Supplied with nut and cone for 3/16" PVC tubing

Illumination 12V included

Part No.	Range	Diameter
150-015-001K	0 - +3Bar	52mm



Accessories

Part No.	Description	Length
150-005	Pressure pipe kit	2m
150-006	Pressure pipe kit	5m
150-007	Pressure pipe kit	6m



Boost/Vacuum Gauge (Mechanical)

Suitable for all vehicles

Illumination 12V included

Part No.	Range	Diameter
150-035-001G	-1 - +1.5Bar	52mm



Vacuum Gauge (Mechanical)

Suitable for most vehicles

Supplied with nuts and cones for 3/16" tubing

Illumination 12V included

Part No.	Range	Diameter
150-077-005	-30 - 0Hg	52mm

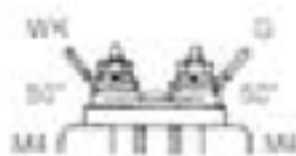
Pressure Senders



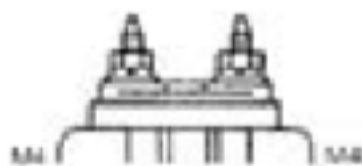
(A)



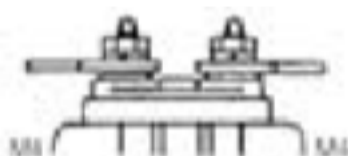
(B)



(C)

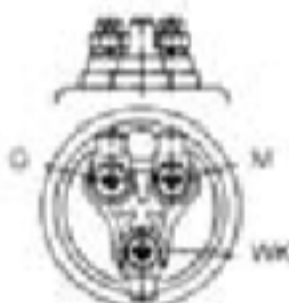


(E)



(F)

6.3x0.8 mm (2x)



(G)

Oil Pressure Senders

Without Warning Contact - Common Ground

Part No.	Range	Thread	Type
360-081-029-004C	500kPa	1/8"x27NPTF	(A)
360-081-029-012C	1000kPa	1/8"x27NPTF	(A)

Refer to your engine manufacturers manual for correct oil pressure ratings

Note: 500kPa = 72.5psi, 1000kPa = 145psi

Rated Voltage: 6 - 24V

Operating Temperature: -25 - +100°C
(up to +120°C for 1hr max at threaded connector)

Resistance range: 10 - 184Ω

Oil Pressure Senders (With Switch)

With Warning Contact - Common Ground

Part No.	Range	Switch Point	Thread	Type
360-081-030-049C	500kPa	40kPa	1/8"x27NPTF	(B)
360-081-030-052C	1000kPa	50kPa	1/8"x27NPTF	(B)
360-081-030-025C	500kPa	40kPa	M18x1.5	(C)
360-081-030-032C	1000kPa	50kPa	M14x1.5	(B)

Note: 500kPa = 72.5psi, 1000kPa = 145psi

Rated Voltage: 6 - 24V

Operating Temperature: -25 - +100°C
(up to +120°C for 1hr max at threaded connector)

Resistance range: 10 - 184Ω

Switching capacity of warning contact: 5W max non-inductive

Oil Pressure Senders (Single Station)

Without Warning Contact (Insulated) Return

Part No.	Range	Thread	Type
360-081-032-001C	500kPa	1/8"x27NPTF	(B)
360-081-032-014C	1000kPa	1/8"x27NPTF	(B)
360-081-032-025C	200kPa	1/8"x27NPTF	(C)
360-081-038-002C	2500kPa	3/8"x18NPTF	(F)
360-081-038-003C	2500kPa	1/8"x27NPTF	(E)

Note: 200kPa = 29psi, 500kPa = 72.5psi, 1000kPa = 145psi, 2500kPa = 362.5psi

• Rated Voltage: 6 - 24V

• Operating Temperature: -25 - +100°C
(up to +120°C for 1hr max at threaded connector)

• Resistance range: 10 - 184Ω

• Overpressure safety: 30Bar or 50Bar max
(short period only for 2 seconds)

Pressure Senders - Continued



Oil Pressure Senders (With Switch)

With Warning Contact (Insulated) Return

Part No.	Range	Switch Point	Thread	Type
360-081-039-002C	500kPa	80kPa	1/8"x27NPTF	(G)
360-081-039-003C	1000kPa	80kPa	1/8"x27NPTF	(G)

Note: 500kPa = 72.5psi, 1000kPa = 145psi

Rated Voltage: 6 - 24V

Operating Temperature: -25 - +100°C
(up to +120°C for 1hr max at threaded connector)

Resistance range: 10 - 184Ω

Overpressure safety: 30Bar or 50Bar max
(short period only for 2 seconds)

Switching capacity of warning contact: 5W max non-inductive

Oil Pressure Senders (Dual Station)

Without Warning Contact (Insulated) Return

Part No.	Range	Thread	Type
362-081-001-001K	500kPa	1/8"x27NPTF	(F)
362-081-001-002K	1000kPa	1/8"x27NPTF	(F)
362-081-002-001K	2500kPa	1/8"x27NPTF	(F)

Note: 500kPa = 72.5psi, 1000kPa = 145psi, 2500kPa = 362.5psi

Rated Voltage: 6 - 24V

Pressure Switch



(A)



(E)



(F)



(G)

Heavy Duty Pressure Switch (Non-Insulated)

Part No.	Switch Point	Thread	Contacts	Type
230-112-001-001C	100kPa	M10x1	Close as pressure rises	(A)
230-112-001-002C	70kPa	1/8"x27NPTF	Close as pressure rises	(A)
230-112-003-012C	600kPa	1/8"x27NPTF	Close as pressure falls	(A)
230-112-003-013C	70kPa	1/8"x27NPTF	Close as pressure falls	(A)

Note: 70kPa = 10.15psi, 100kPa = 14.50psi, 600kPa = 87psi

Rated Voltage: 6 - 24V

Operating Temperature: -25 - +120°C
(up to +140°C for 1 hour max at threaded connector)

Heavy Duty Pressure Switch (Insulated)

Part No.	Switch Point	Thread	Contacts	Type
230-112-002-001C	50kPa	1/8"x27NPTF	Close as pressure rises	(E)
230-112-005-006C	50kPa	M10x1	Close as pressure falls	(E)
230-112-005-011C	150kPa	M10x1	Close as pressure falls	(F)
230-112-007-005C	30kPa	M14x1.5	Open as pressure rises	(G)

Note: 30kPa = 4.35psi, 50kPa = 7.25psi, 150kPa = 21.75psi

Rated Voltage: 6 - 24V

Operating Temperature: -25 - +120°C
(up to +140°C for 1 hour max at threaded connector)

Pressure Switch - Continued



Adjustable Pressure Switch (Insulated)

Part No.	Terminal	Adjustable Range	Contacts
105-018	Screw	10-100kPa	Close as pressure rises
105-020	Blade	10-100kPa	Close as pressure rises
105-021	Blade	100-1000kPa	Close as pressure rises
105-022	Blade	1000-2000kPa	Close as pressure rises
105-023	Blade	2000-5000kPa	Close as pressure rises
105-024	Blade	10-100kPa	Close as pressure falls
105-025	Blade	100-1000kPa	Close as pressure falls
105-026	Blade	1000-2000kPa	Close as pressure falls
105-027	Blade	2000-5000kPa	Close as pressure falls

Over Pressure Rating up to 30000kPa
 Max Voltage 42V-DC
 Threads: All M10 x 1T

Speedometers



Floodlit illumination. 12V globe included

Field adjustable to suit 500 to 400.000 imp/km by pulse setting or auto-calibration function through LCD readout via reset button

Total distance 999,999.9 not resettable

Speed display analogue; odometer and trip distance LC-display trip distance 99,999.99 resettable

Signal source Hall effect, inductive or blocking oscillator sender units

For 24V application use globe 999-065-002 (2 required)

Note: 140mm Speedometer Impulse Ratio programmable (1000-60000 pulses/km (via software))

Part No.	Range	Diameter	Voltage
437-035-001C	0-60km/h	80mm	12V/24V
437-035-002G	0-120km/h	80mm	12V/24V
437-035-003C	0-200km/h	80mm	12V/24V
437-035-012C	0-80km/h	80mm	12V/24V
437-055-001G	0-60km/h	100mm	12V/24V
437-055-002G	0-120km/h	100mm	12V/24V
437-025-002C	0-125km/h	140mm	24V

Note: 8-way socket connector Part No.: Z863103
 8 x terminal Part No.: Z863016

Sensors



Speed Sensors (Hall Effect)

Pulse Sensors for Electronic Tachographs/Speedometers 3 Blade

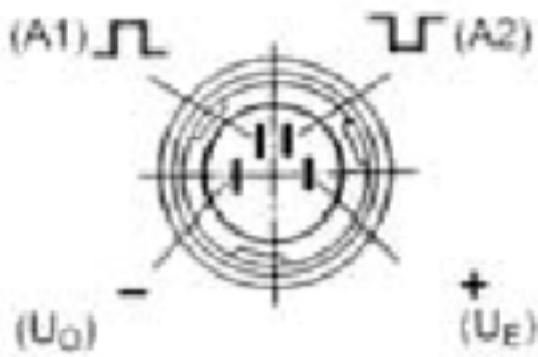
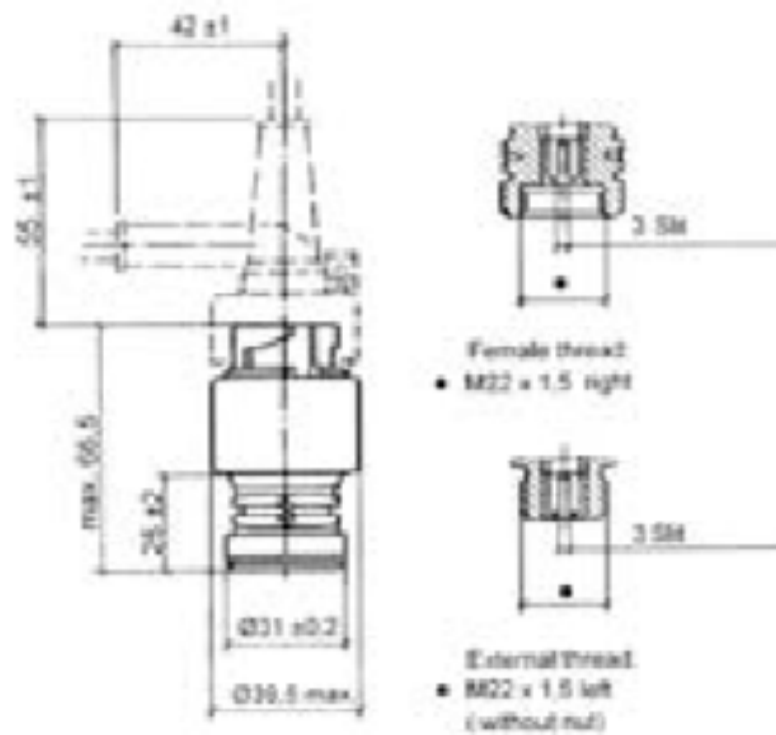
For instruments which require an electrical pulse (single pulse) for inquiry of the speed and/or the distance

Output: Single pulse. Pulses/Revolution: 8 (s- and V-pulse)

Pulse Ratio: 30-70%...70-30%. Operating Voltage: 6.5V...16V

Part No.	Pulses	Thread
2155-01000000	8	M22x1.5 right (female)
2155-02000000	8	M22x1.5 left (external) no nut
A731012	8	7/8"-18UNF Male/Female in line

A-SPEC-731 Sender cable connector bayonet plug kit, 3-way spade



4xBlade connector 3 x 0.8

Pulse Sensors for Electronic Tachographs 4 Blade

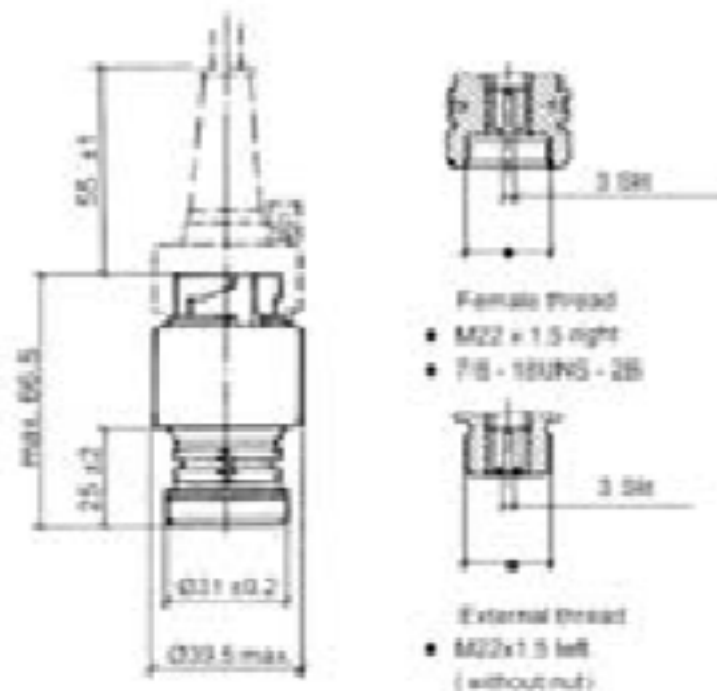
For instruments which require an electrical pulse (dual pulse inverse) for inquiry of the speed and/or the distance

Output: Dual pulse inverse. Pulses/Revolution: 8 (s- and V-pulse)

Pulse Ratio: 30-70%...70-30%. Operating Voltage: 6.5V...16V

Part No.	Pulses	Thread
2159-01000000	8	M22x1.5 right (female)
2159-02000000	8	M22x1.5 left (external) no nut

A-SPEC-737 Sender cable connector bayonet plug kit, 4-way spade



Sensors - Continued



Speed Sensors (Hall Effect) Pulse Sensors For Electronic Tachographs/Speedometers

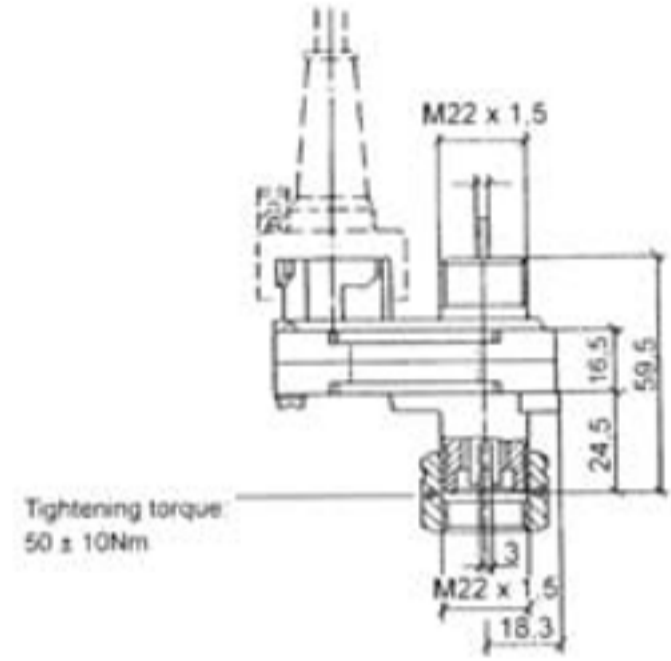
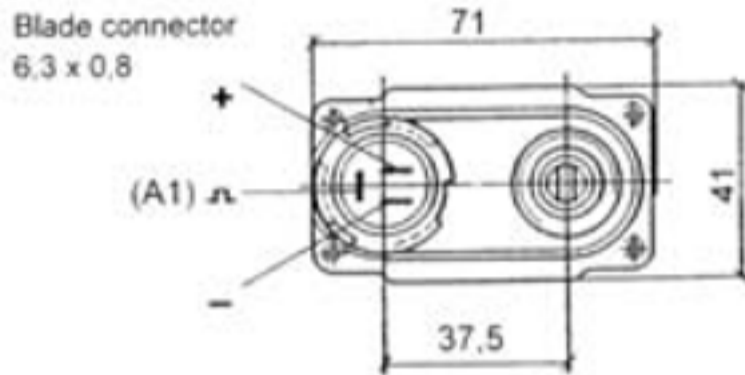
For instruments which require an electrical pulse (single pulse) for inquiry of the speed and/or the distance

For applications requiring an additional mechanical takeoff

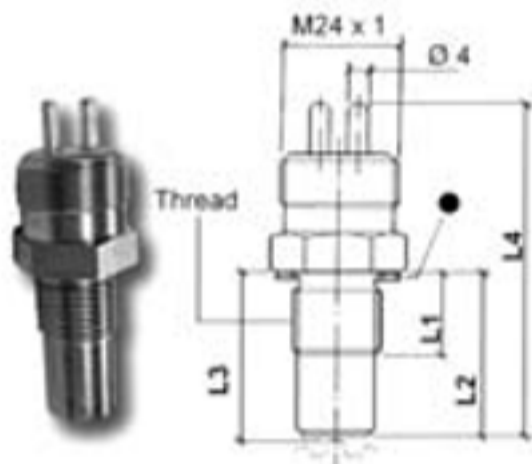
Output: Single pulse. Pulses/Revolution: 8 (s- and V-pulse)

Pulse Ratio: 30-70%...70-30%. Operating Voltage: 6.5V...16V

Part No.	Pulses	Thread (Input & Output)
2157-03000000	8	M22x1.5



Tightening torque
50 ± 10Nm



Speed Sensors (Hall Effect) Senders - Inductive Push On

Electrical Connection: 2-pole, insulated return

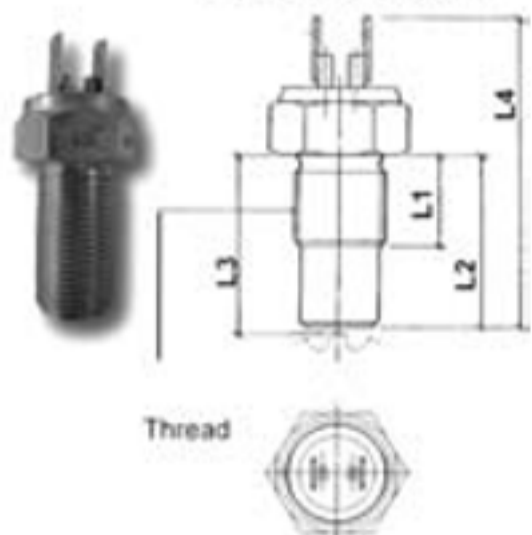
Rated Voltage: Independent

Interior Resistance: Ri 1050Ω ± 100Ω

Test Voltage: 500V

Insulating Resistance: 500kΩ min

Part No.	Signal	Thread	L1	L2	L3	L4
340-804-005-002C	Sine	M18x1.5	24.9	26.5	27.65	63
340-804-005-007C	Sine	M18x1.5	15	35	36	71



Speed Sensors (Hall Effect) Senders - Inductive Blade

Electrical Connection: 2-pole, insulated return

Rated Voltage: Independent

Interior Resistance: Ri 1050Ω ± 100Ω

Test Voltage: 500V

Insulating Resistance: 500kΩ min

Part No.	Signal	Thread	L1	L2	L3	L4
340-804-006-007C	Sine	M18x1.5	24.9	26.5	27.65	63

Tachourmeters



Tachourmeters - Electronic with LCD Hourmeter

Suitable for most petrol and diesel engines

Adjustable through LCD and reset button

Field programmable to 1, 2, 3, 4, 5, 6, 8 or 12-cylinder/4 stroke, 1, 2, 3 or 4-cylinder/2 stroke ignition and alternator pick-up ('W' terminal)

Also suitable for signal from generator or inductive sender unit

Incorporated hourmeter shows true engine hours

Operating hours 99, 999.9. Pulse range 0.5-200 pulses per rev

Illumination 12V included

For 24V application use globe 999-065-002 (2 required)

Tachourmeters

Part No.	Range	Diameter	Voltage
333-035-010G	3000 RPM	80mm	12V/24V
333-035-011G	4000 RPM	80mm	12V/24V
333-035-014C	6000 RPM	80mm	12V/24V
333-055-002G	3000 RPM	100mm	12V/24V

Note: 8-pin plug required which is not included in kit, PN. Z2863103

Terminal PN. Z2863016 x 8-pin

Tachometers



Tachometers - Electronic

Suitable for most petrol and diesel engines. Field programmable to suit 4, 6 or 8-cylinder/4 stroke ignition and alternator pick-up (Terminal 'W')

For 24V application use globe 999-065-002 (2 required)

Tachometer

Part No.	Range	Diameter	Voltage
333-035-017G	6000 RPM	52mm	12V
333-035-018G	8000 RPM	52mm	12V
333-035-001G	3000 RPM	80mm	12V
333-065-001G	3000 RPM	80mm	24V
333-035-002C	4000 RPM	80mm	12V
333-045-002C	4000 RPM	80mm	24V
333-035-003C	7000 RPM	80mm	12V
333-035-022C	10000 RPM	80mm	12V
333-065-001G	3000 RPM	100mm	12V

Note: 8-pin plug required which is not included in kit, PN. Z2863103

Terminal PN. Z2863016 x 8-pin

Generator Sender

Part No.	Signal Output	Thread
340-807-001-001C	With distance pulse output	M22x1.5
340-808-001-002G	Output 1.0V ac current per 100 RPM	M22x1.5



Temperature Gauges



Temperature Gauges - Electric

Suitable for most vehicles and machines

Illumination 12V or 24V included

Temperature Gauges - Water

Part No.	Range	Diameter	Voltage
310-030-002C	40 - 120°C	52mm	12V
310-040-002C	40 - 120°C	52mm	24V

With ISO symbol

40 - 120°C = 100 - 250°F

Sender Only

Part No.	Range	Thread	Terminal
323-801-005-001D	40 - 120°C	1/8"-27NPTF	Button

22.7 - 287.4Ω

Sender/Switch Combination

Part No.	Range	Thread	Switch Point
323-803-001-001D	40 - 120°C	M14x1.5	100°C
323-803-001-011D	40 - 120°C	5/8"-18UNF	95°C
323-803-001-016D	40 - 120°C	M14x1.5	94°C

40 - 120°C = 100 - 250°F

Temperature Gauges - Engine Oil

Part No.	Range	Diameter	Voltage
310-030-003C	50 - 150°C	52mm	12V
310-040-003C	50 - 150°C	52mm	24V

With ISO symbol

50 - 150°C = 120 - 300°F

Sender Only

Part No.	Range	Thread	Terminal
323-801-009-001D	50 - 150°C	1/8"-27NPTF	Button

18.6 - 322.8Ω

Sender/Switch Combination

Part No.	Range	Thread	Switch Point
323-803-002-002D	50 - 150°C	M14x1.5	120°C
323-803-002-007D	50 - 150°C	M14x1.5	120°C
323-803-014-002D	50 - 150°C	M14x1.5	130°C

Temperature Gauges - Continued



Temperature Gauge - Transmission Oil (Cylinder Head - Air Cooled Engine)

Part No.	Range	Diameter	Voltage
310-030-004C	60 - 200°C	52mm	12V
310-040-004C	60 - 200°C	52mm	24V
With ISO symbol			
60 - 200°C = 140 - 392°F			



Sender Only

Part No.	Range	Thread	Terminal
323-801-003-001D	60 - 200°C	M10x1.5	Button
323-801-028-001C	60 - 200°C	M14x1.5	Screw
14.3 - 581Ω			



Temperature Gauges (Mechanical)

Suitable for most vehicles and machines. Process connection is 1/8"-27NPTF threaded removable thermowell

Temperature is transmitted via capillary tube

Coil up excess capillary tubing - do not cut to shorten!

Illumination globe holder not included

For 12V application use globe 999-065-001

For 24V application use globe 999-065-002

Globe holder Part No. 999-067-001

Temperature Gauge (Water Gauge)

Part No.	Range	Diameter	Capillary Length
180-035-002G	40 - 120°C	52mm	1600mm
180-035-004G	40 - 120°C	52mm	2600mm
180-035-005G	40 - 120°C	52mm	4000mm
180-035-006G	40 - 120°C	52mm	6000mm
180-035-008G (oil)	50 - 150°C	52mm	2600mm



Accessories

Part	Description	Thread
1-801-078	Block Adapter	1/8"x27NPTF
Note: Suitable for all the above temperature gauges		

Temperature Exhaust/Pyrometer



Temperature Exhaust/Pyrometer - Electric

Suitable for most exhaust systems

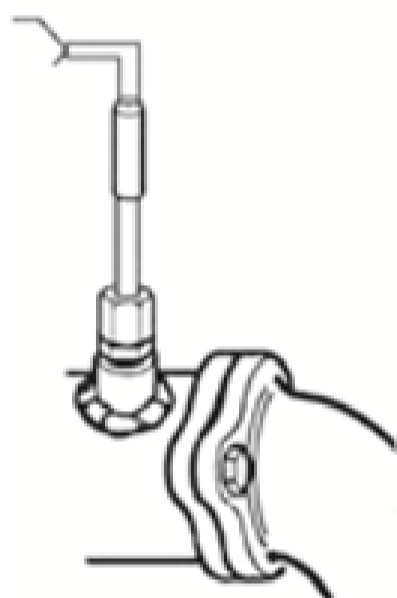
Thermocouple connection is by 1/4"-18NPTF compression fitting

Illumination 12V included

Pyrometer Electronic Kit

Part No.	Range	Diameter	Voltage
397-015-003	0 - 900°C (37.6mV @ 900°C)	52mm	12V

Complete Kit - consisting of instrument and thermocouple, 5m loom and weld boss



Thermocouple should be fitted 100mm after Turbo.



Temperature Senders



Senders - To Suit VDO Instruments 40 - 120°C

The senders listed hereunder are for use with all instruments listed in this publication

Selection is simple: just match the range of the instrument with the range of the sender unit



Water Temperature Senders

To suit all VDO temperature gauges with range 40 - 120°C

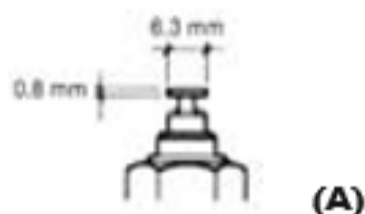
Related Voltage: 6 - 24V

Temperature response time: 3 minutes minimum after switching on operating current

Part No.	Range	Thread	Type
323-801-005-001D	40 - 120°C	1/8"×27NPTF	(A)
323-801-001-016D	40 - 120°C	1/2"-14NPTF	(B)
323-801-001-026N	40 - 120°C	M14×1.5	(B)

40 - 120°C = 100 - 250°F

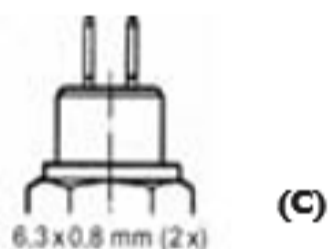
Temperature Senders - Continued



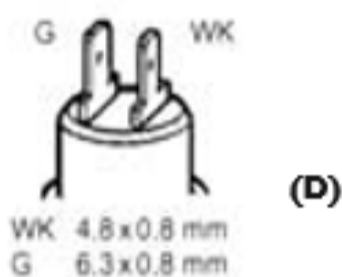
(A)



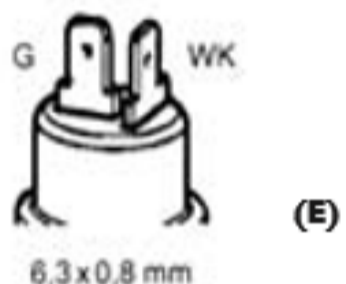
(B)



(C)



(D)



(E)

Water Temperature Senders (With Switch)

Contact rating 3W					
Related Voltage: 6 - 24V					
Temperature response time: 3 minutes minimum after switching on operating current					
Switching capacity: 1.2 - 3W non-inductive					
Break Point: 5°C max below make point					
Contacting Mode: Slow-acting					
Type of contact: Switch closes at switch point					
Part No.	Range	Switch	Point	Thread	Type
323-803-001-001D	40 - 120°C	100°C	NO	M14x1.5	(D)
323-803-001-004D	40 - 120°C	90°C	NO	M14x1.5	(D)
323-803-001-008D	40 - 120°C	110°C	NO	M14x1.5	(D)
323-803-001-011D	40 - 120°C	95°C	NO	5/8"-18UNF	(D)
323-803-001-016D	40 - 120°C	94°C	NO	M14x1.5	(D)
323-803-004-002D	40 - 120°C	105°C	NO	M14x1.5	(E)
40 - 120°C = 100 - 250°F					
Note: NO = Normally open - contact closes at switch point					

Temperature Sender Unit (Insulated Return - Single Station)

Related Voltage: 6 - 24V			
Temperature response time: 3 minutes minimum after switching on operating current			
Part No.	Range	Thread	Type
323-805-001-001K	40 - 120°C	M14x1.5	(C)
323-805-001-002	40 - 120°C	5/8"-18UNF	(C)

Temperature Sender Unit (Insulated Return - Dual Station)

Related Voltage: 6 - 24V			
Temperature response time: 3 minutes minimum after switching on operating current			
Part No.	Range	Thread	Type
325-805-003-001	40 - 120°C	1/4"-18NPTF	(C)

Senders - To Suit VDO Instruments 50 - 150°C

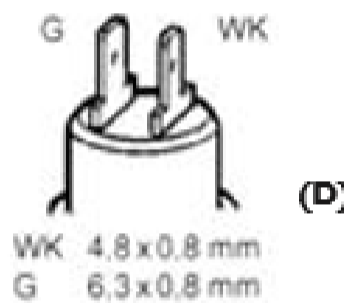
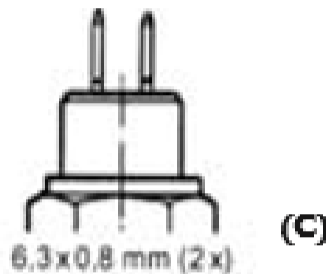
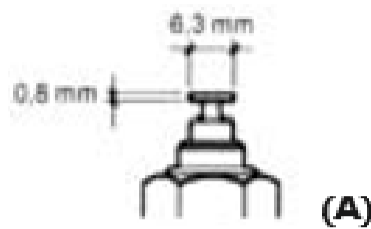
The senders listed hereunder are for use with all instruments listed in this publication
Selection is simple: just match the range of the instrument with the range of the sender unit

Oil Temperature Sender Only

To suit all VDO temperature gauges with range 50 - 150°C	
Related Voltage: 6 - 24V	
Temperature response time: 3 minutes minimum after switching on operating current	



Temperature Senders - Continued



Part No.	Range	Thread	Type
323-801-009-001D	50 - 150°C	1/8"-27NPTF	(A)
323-801-010-003D	50 - 150°C	M12x1.5	(A)
323-801-004-002N	50 - 150°C	M14x1.5	(F)

50 - 150°C = 120 - 300°F

Sender/Switch Combination

Related Voltage: 6 - 24V

Temperature response time: 3 minutes minimum after switching on operating current

Switching capacity: 1.2W - 3W non-inductive

Break Point: 5°C max below make point

Contacting Mode: Slow-acting

Type of contact: Switch closes at switch point

Part No.	Range	Switch Point	Thread	Thread
323-803-014-002D	50 - 150°C	130°C NO	M14x1.5	(D)
323-803-002-007D	50 - 150°C	130°C NO	M14x1.5	(D)

50 - 150°C = 120 - 300°F

Note: NO = Normally open - contact closes at switch point

Temperature Sender Unit (Insulated Return)

Related Voltage: 6 - 24V

Temperature response time: 3 minutes minimum after switching on operating current

Part No.	Range	Thread	Type
323-805-003-001N	50 - 150°C	M14x1.5	(C)

50 - 150°C = 120 - 300°F

Temperature Switches



Temperature Switches (Insulated Return)

Rated Voltage: 6 - 12V

Switching Capacity: 100/120W

Make Point: Contact close as temperature rises

Break Point: Contact open as temperature falls

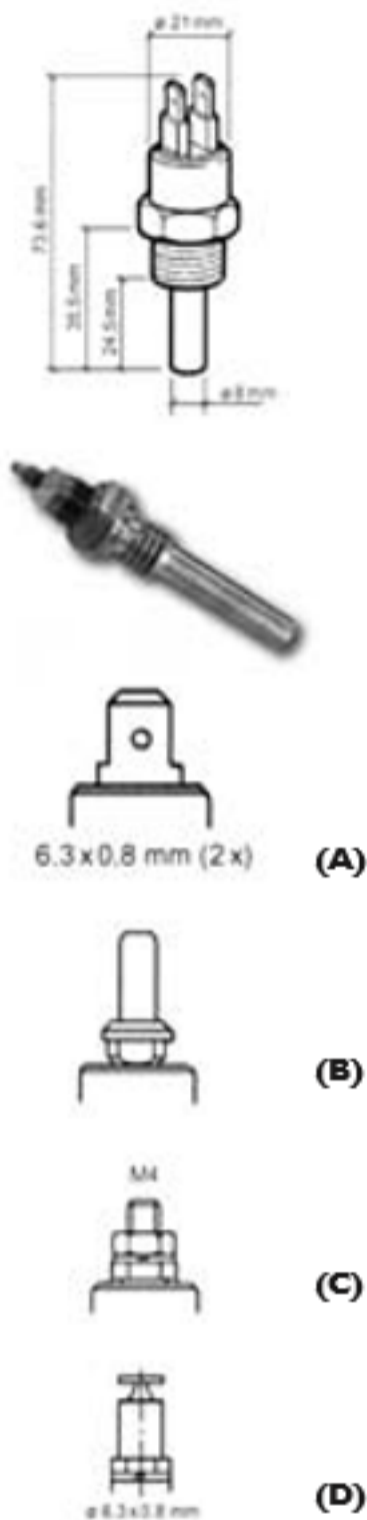
2-fold blade x 0.8DIN 46244

Part No.	On	Off	OP. Max	Thread
X10-232-001-001+	64°C	60°C	110°C	M14x1.5
X10-232-001-002*	82°C	74°C	110°C	M14x1.5
X10-232-001-007*	96°C	92°C	110°C	M14x1.5
X10-232-001-010*	105°C	100°C	110°C	M18x1.5

+ Switching capacity 120W

* Switching capacity 100W

Temperature Switches - Continued



Temperature Switches (Common Ground)

Rated Voltage: 6 - 12V
 Switching Capacity: 1.2W - 3W non-inductive
 Type of Contact: Contact closes at switch point
 Contacting mode: Slow-acting
 Break Point: 5°C max below make point

Part No.	Switch Point	OP. Max	Thread	Type
232-011-005-003D	90°C	120°C	M10x1.5	(C)
232-011-005-004D	170°C	220°C	M10x1.5	(C)
232-011-005-017D	150°C	200°C	M10x1.5	(C)
232-011-005-019D	96°C	120°C	1/8"-27NPTF	(C)
232-011-005-030D	185°C	230°C	M10x1.5	(D)
232-011-017-010D	110°C	160°C	M14x1.5	(A)
232-011-017-017D	85°C	120°C	M14x1.5	(A)
232-011-017-032D	120°C	130°C	M14x1.5	(A)
232-011-017-034D	100°C	160°C	M14x1.5	(A)
232-011-017-038D	55°C	120°C	M14x1.5	(A)
232-011-017-040D	70°C	120°C	M14x1.5	(A)
232-011-017-135D	102°C	150°C	M14x1.5	(B)
232-011-019-003D	195°C	250°C	M10x1.5	(C)

Rated Voltage: 6 - 12V
 Switching Capacity: 3W non-inductive
 Type of contact: Contact open at switch point
 Contacting mode: Slow-acting
 Break Point: 5°C max below make point

Part No.	Switch Point	Op. Max	Thread	Type
232-011-020-026D	103°C	120°C	M14x1.5	(B)

Voltmeter



Voltmeter

Suitable for all engines and machines
 Monitors charge and battery condition
 Illumination 12V or 24V included

Part No.	Range	Voltage	Diameter
332-030-001C	8 - 16V	12V	52mm
332-040-001C	18 - 32V	24V	52mm



TECHNICAL INFORMATION - COCKPIT INTERNATIONAL INSTALLATION

Detailed technical information on VDO Cockpit International.

Due to the intricacies involved in the installation of the VDO Cockpit International range of instruments, Control Instruments Automotive in this section gives you, the technician, all the necessary information required for successful installation.

Section Content

Technical information

- Installation Instructions
 - Fuel Level Sender Kit (Float Arm Type)
 - VDO Fuel Gauge (Tubular Type Sensor)
 - Hourmeter
 - Oil Pressure Gauge (VDO Oil Pressure Gauge)
 - Oil Pressure Gauge (Sensor Installation)
 - Pyrometer
 - Electronic Speedometer (80mm & 100mm Diameter)
 - Electronic Speedometer (140mm Diameter)
 - Tachometer (electronic 52mm Diameter)
 - Tachometer (80mm & 100mm Diameter)
 - Tachometer with Operating Hour Counter (80mm & 100mm Diameter)
 - Gauge for Oil Temperature
 - Gauge for Engine Coolant
 - Voltmeter

Installation Info - Cockpit International

Fuel Level Sender Kit (Float Arm Type)

Parts List

Item	Description	Qty
1.	Fuel Level Sender	1
2.	Float Arm	1
3.	Gasket	1
4.	Fitting Instructions	1

Note: Mounting Flange P/N 1403145
(Must be ordered separately)

Caution:

Read these instructions carefully before installation.

- VDO recommends that the fuel sender and the fuel gauge be wired together and the fuel gauge be wired together and checked for compatibility prior to installing fuel sender into tank.
- Do not deviate from assembly or wiring instructions.
- Always disconnect positive battery lead before making any electrical connections.
- When making modifications to fuel tanks, remove the tank from the vehicle and empty, clean and dry the tank.
- Before drilling any holes into the tank, place the sender assembly on top of the tank to judge proper hole placement allowing float arm clearance inside of tank.
- After drilling, make sure all chips and other foreign matter have been removed from the tank.

Fuel Sender Ohms Range:

Part No. 220.003 Empty = 10Ω - Full 180Ω

The unit can be adjusted to read accurately in tanks from 150mm - 600mm deep.

Calibration and Installation

Tank unit depths of 150mm - 600mm - No disassembly of the sender bracket is necessary.

From Table 1:

H = Tank unit height

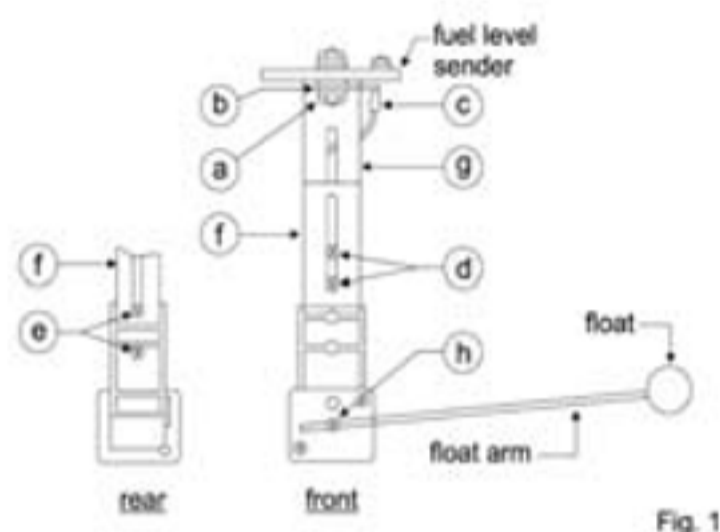
L = body length 'g' & 'f'

R = arm length from 'b' point to float centre.

1. Using Table 1, check tank depth size on 'H' column and corresponding 'L' & 'R'.
2. Loosen the two screws 'd' and adjust the plastic housing up or down until the proper dimension 'L' is obtained, then re-tighten screws securely.

Float Arm Installation:

1. To install the float arm assembly, loosen screw 'h', remove the short piece of rod, and discard it.
2. Insert the float rod until the proper length 'R' from Table 1 is met, then tighten the screw securely.
3. Allow 25mm - protrude out from the 'h' point (opposite of the float arm) see Fig 2 on the next page.
4. Carefully cut off any excess rod with a bolt cutter or similar tool, taking care not to damage the assembly.



Tank unit depths below 400mm

1. Remove two screws 'd' and discard.
2. Remove two screws 'e' from the plastic housing and reserve for later use.
3. Carefully remove bracket 'f' from the plastic housing and discard it.
4. Replace bracket 'f' with bracket 'g' in the housing and loosely re-install the two screws in 'e' into housing.
5. Using Table 1, check tank depth size on 'H' column and corresponding 'L' & 'R'.
6. Slide housing up or down until dimension 'L' is reached, then tighten screws securely.
7. To install the float arm assembly, loosen screw 'h' remove the short piece of rod, and discard it.
8. Insert the float rod until the proper length 'R' from Table 1 is met, then tighten the screw securely.
9. Allow 25mm - protrude out from the 'h' point (opposite of the float arm) see Fig 2.
10. Carefully cut off any excess rod with a bolt cutter or similar tool, taking care not to damage the assembly.

Note:

Make sure the float is installed as shown in Fig. 1. If installed backwards, the fuel gauge will indicate 'full' when the tank is empty, and 'empty' when the tank is full.

Installation Info - Cockpit International

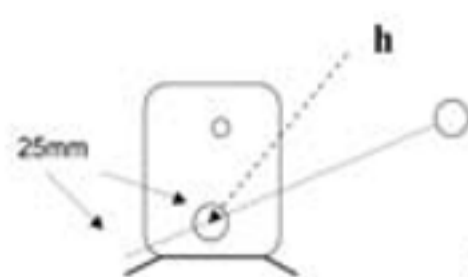


Fig. 2

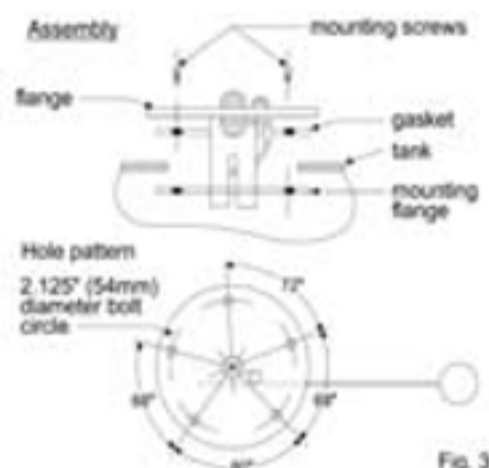


Fig. 3

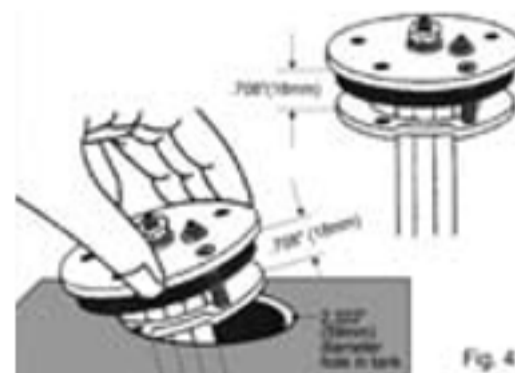


Fig. 4

Left - Caution: Make certain float arm has a clear field of motion before tightening screws in flange assembly.

Fuel sender installation inside the tank

To install the tank unit sender into the fuel tank using a flange kit:

1. Refer to Fig. 3 and slide the rubber gasket up to the bottom of the fuel sender flange.
Next, slide the second flange over fuel sender to bottom of rubber gasket.
Align the pre-threaded holes in mounting flange and rubber gasket with those in fuel sender flange.
Use 25mm screw - loosely attach mounting flange.
Do not tighten completely.

2. Refer to Fig. 4 and slip the fuel sender assembly into the 59mm hole in the tank, turning until it goes into the tank.
3. Tighten all screws until flange is fully seated onto the gasket.
4. Hook up gauge sensor wire to center stud terminal.
5. Hook up ground wire to small terminal.

Welding Flange Application

Cut a 43mm hole in the top of the tank.

Table 1 (Dimensions in mm)

H	L	R
160	90	94
165	92.5	97
170	95	100
175	97.5	103
180	90	106
185	92.5	109
190	95	112
195	97.5	115
200	100	118
205	102.5	121
210	105	124
215	107.5	127
220	110	130
225	112.5	133
230	115	136
235	117.5	139
240	120	142
245	122.5	145
250	125	148
255	127.5	151
260	130	154
265	132.5	157

H	L	R
272	135	160
275	137.5	163
280	140	166
285	142.5	169
290	145	172
295	147.5	175
300	150	178
305	152.5	181
312	155	184
315	157.5	187
320	160	190
325	162.5	193
330	165	196
335	167.5	199
340	170	202
345	172.5	205
350	175	208
355	177.5	211
360	180	214
365	182.5	217
370	185	220
375	187.5	248

H	L	R
380	190	252
385	192.5	256
390	195	260
395	197.5	264
400	200	268
405	202.5	272
410	205	276
415	207.5	280
420	210	284
425	212.5	288
430	215	292
435	217.5	296
440	220	300
445	222.5	304
450	225	308
455	227.5	312
460	230	316
465	232.5	320
470	235	324
475	237.5	328
480	240	332
485	242.5	336

H	L	R
490	245	340
495	247.5	344
500	250	348
505	252.5	352
510	255	356
515	257.5	360
520	260	364
525	262.5	368
530	265	372
535	267.5	376
540	270	380
545	272.5	384
550	275	388
555	277.5	392
560	280	396
565	282.5	400
570	285	404
575	287.5	408
580	290	412
585	292.5	416
590	295	420
595	297.5	424

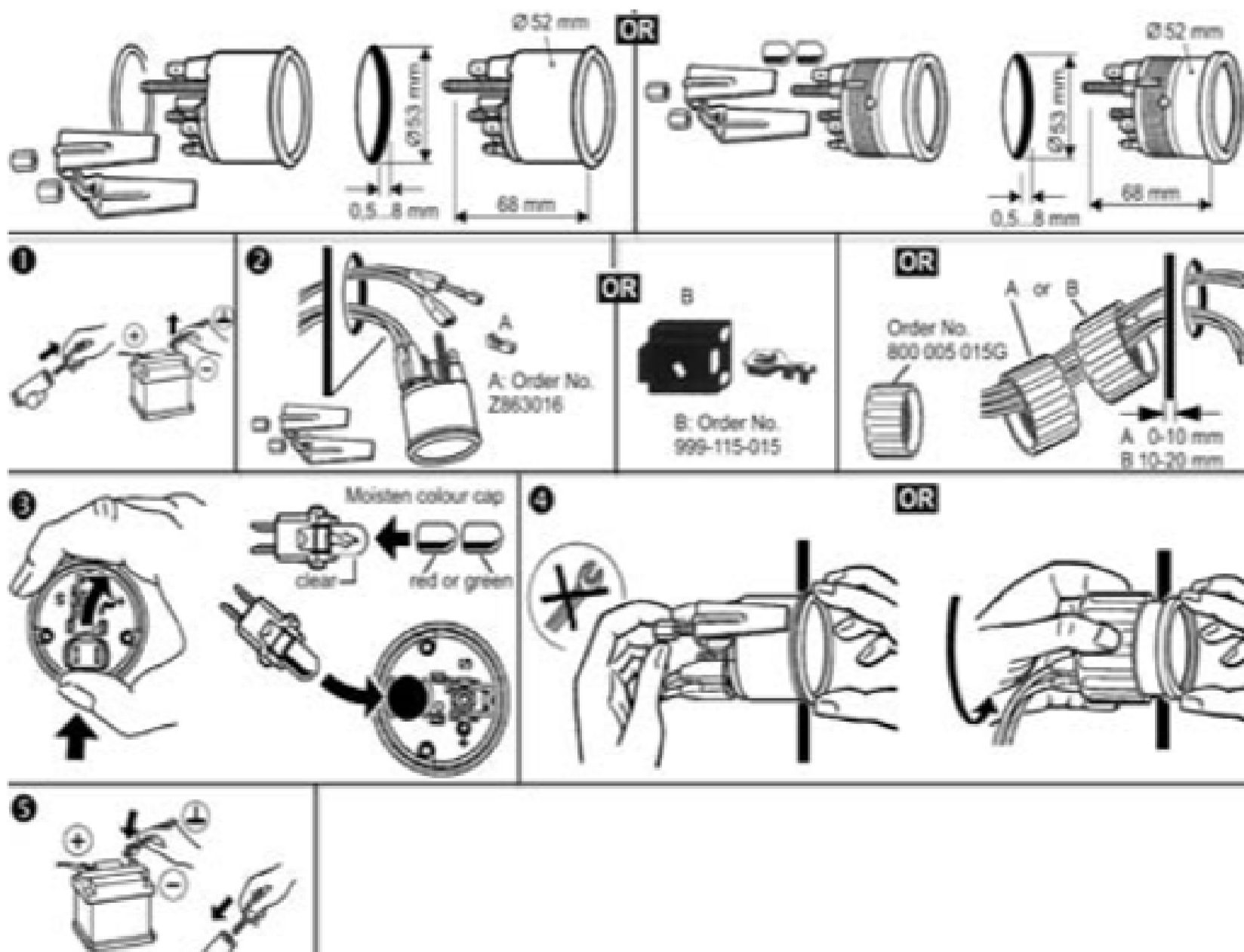
Add 25mm to all values of "R"

Installation Info - Cockpit International

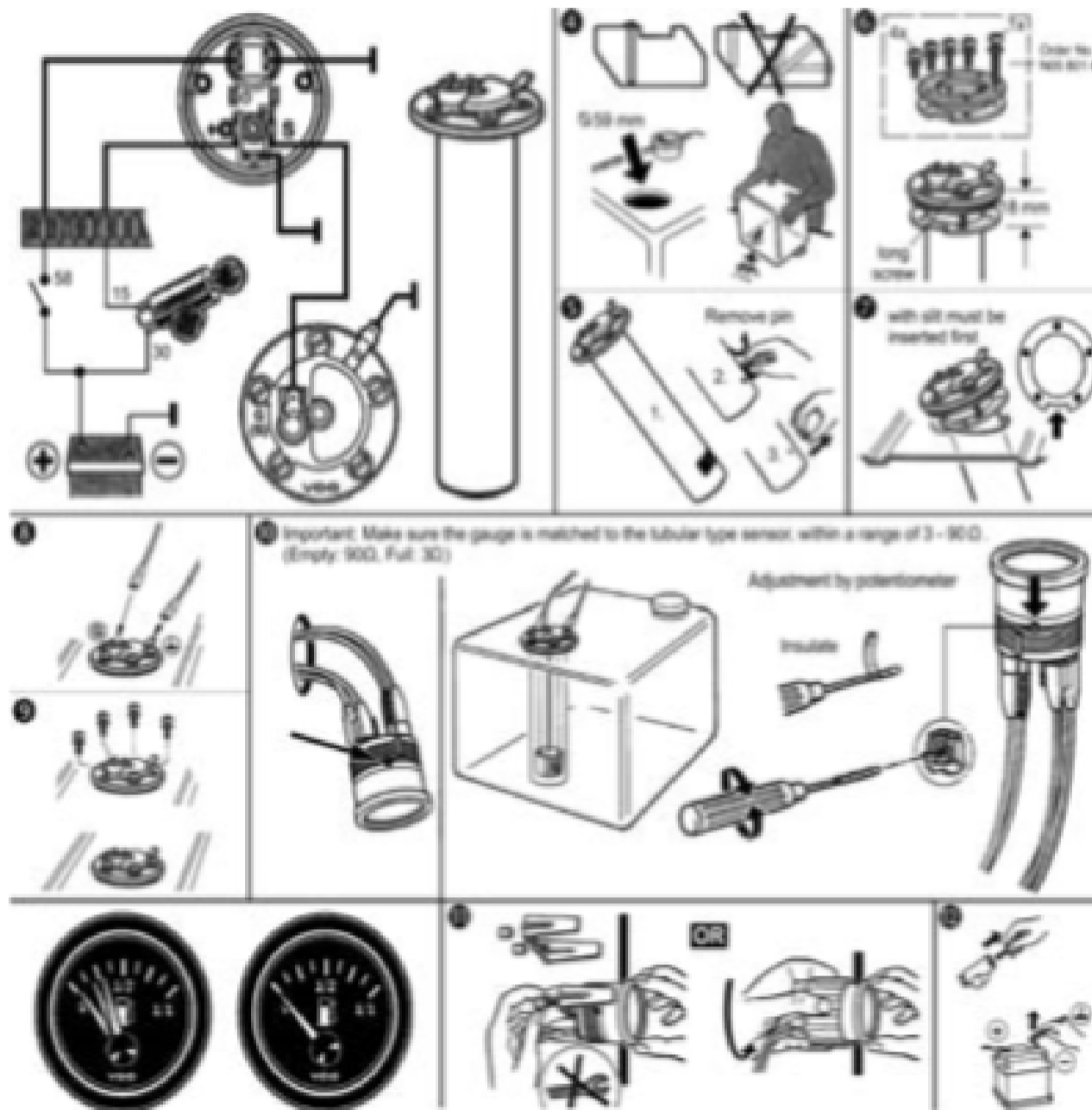
VDO Fuel Gauge (Tubular Type Sensor)

⚠ Safety Instructions

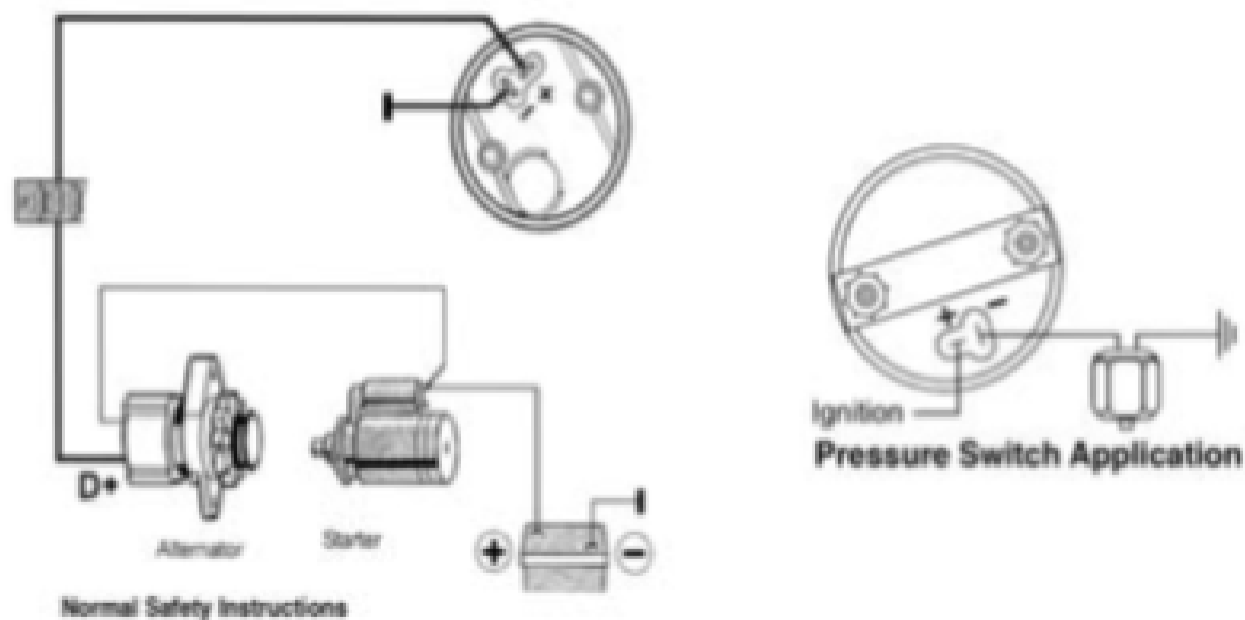
- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires, battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International



Hourmeter

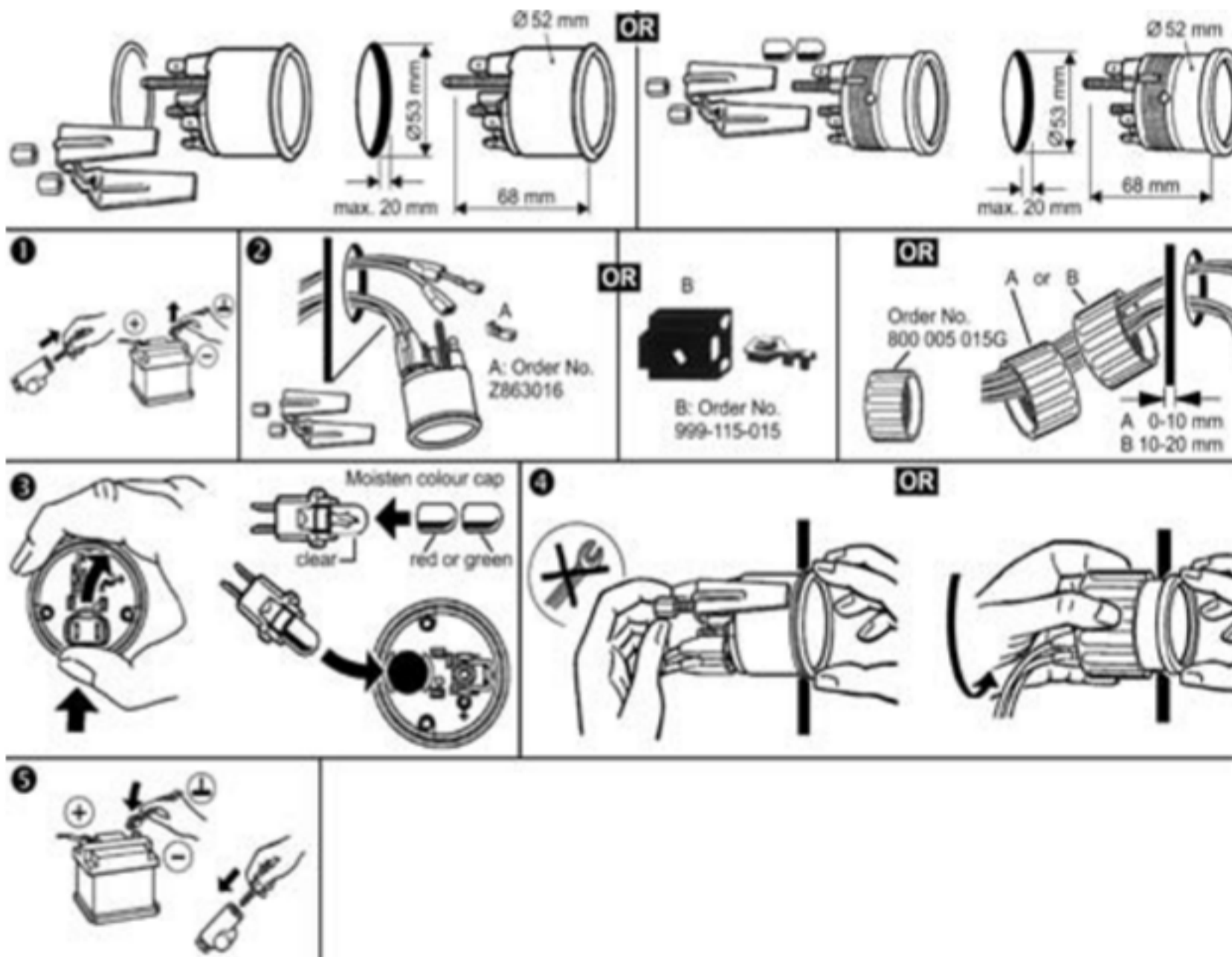


Installation Info - Cockpit International

Oil Pressure Gauge (VDO Oil Pressure Gauge)

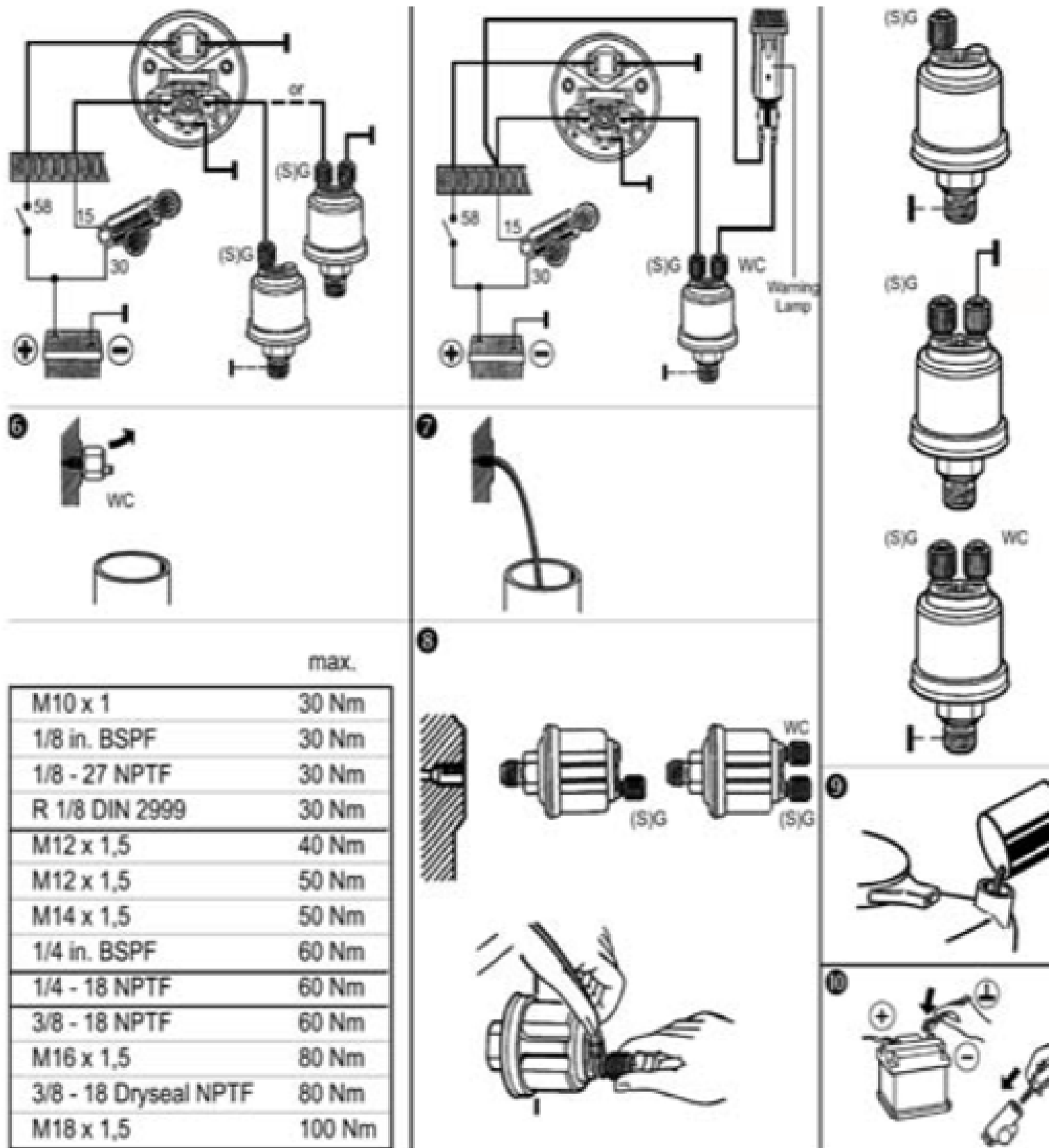
⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



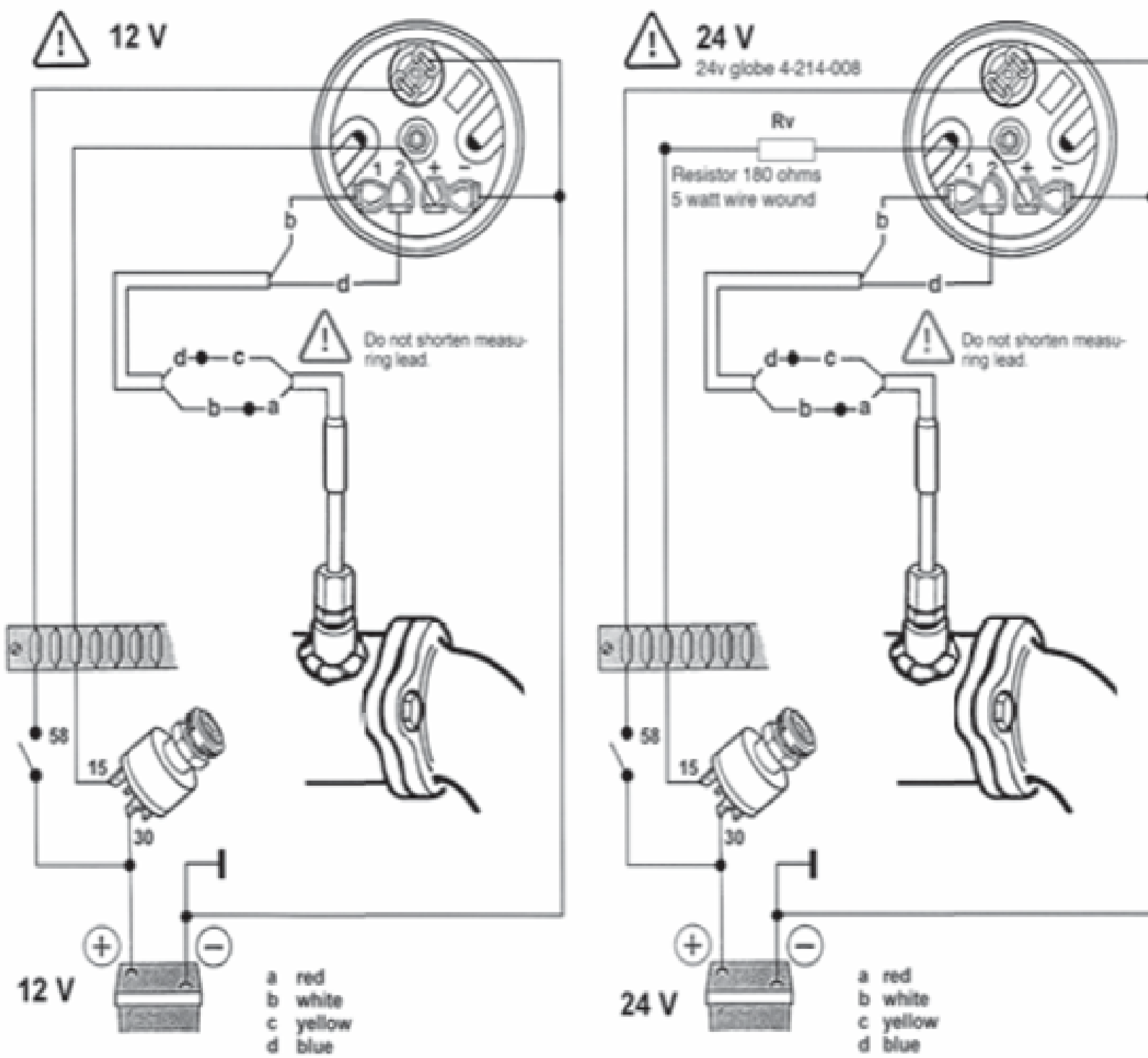
Installation Info - Cockpit International

Oil Pressure Gauge (Sensor Installation)

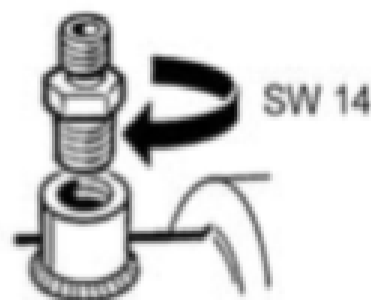
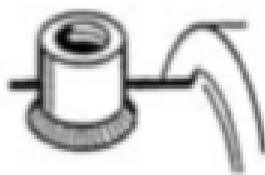
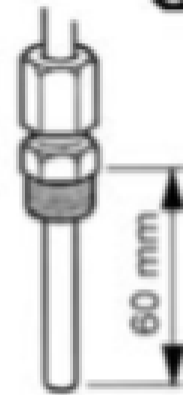
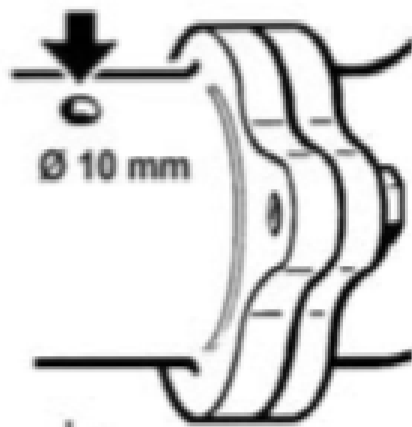


Installation Info - Cockpit International

Pyrometer

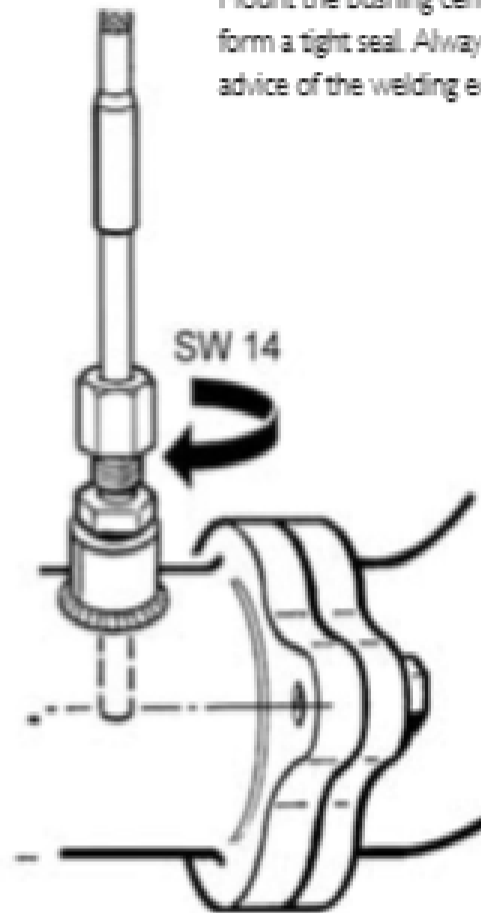


Installation Info - Cockpit International



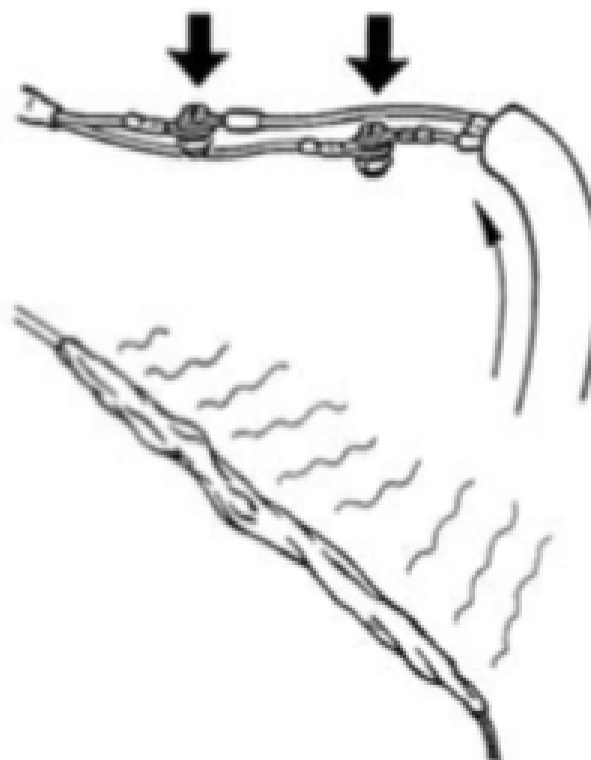
Install the sensor in the exhaust pipe near the elbow flange. Max adjustment depth up to the middle of exhaust pipe: 60mm.

Mount the bushing centrally and weld on. The weld must form a tight seal. Always follow the safety instructions and advice of the welding equipment manufacturer.



Slide the heat-shrinkable sleeve over the cable connections and then heat with a hot-air fan over the entire length until it shrinks.

Always follow the safety advice of the hot-air fan manufacturer.



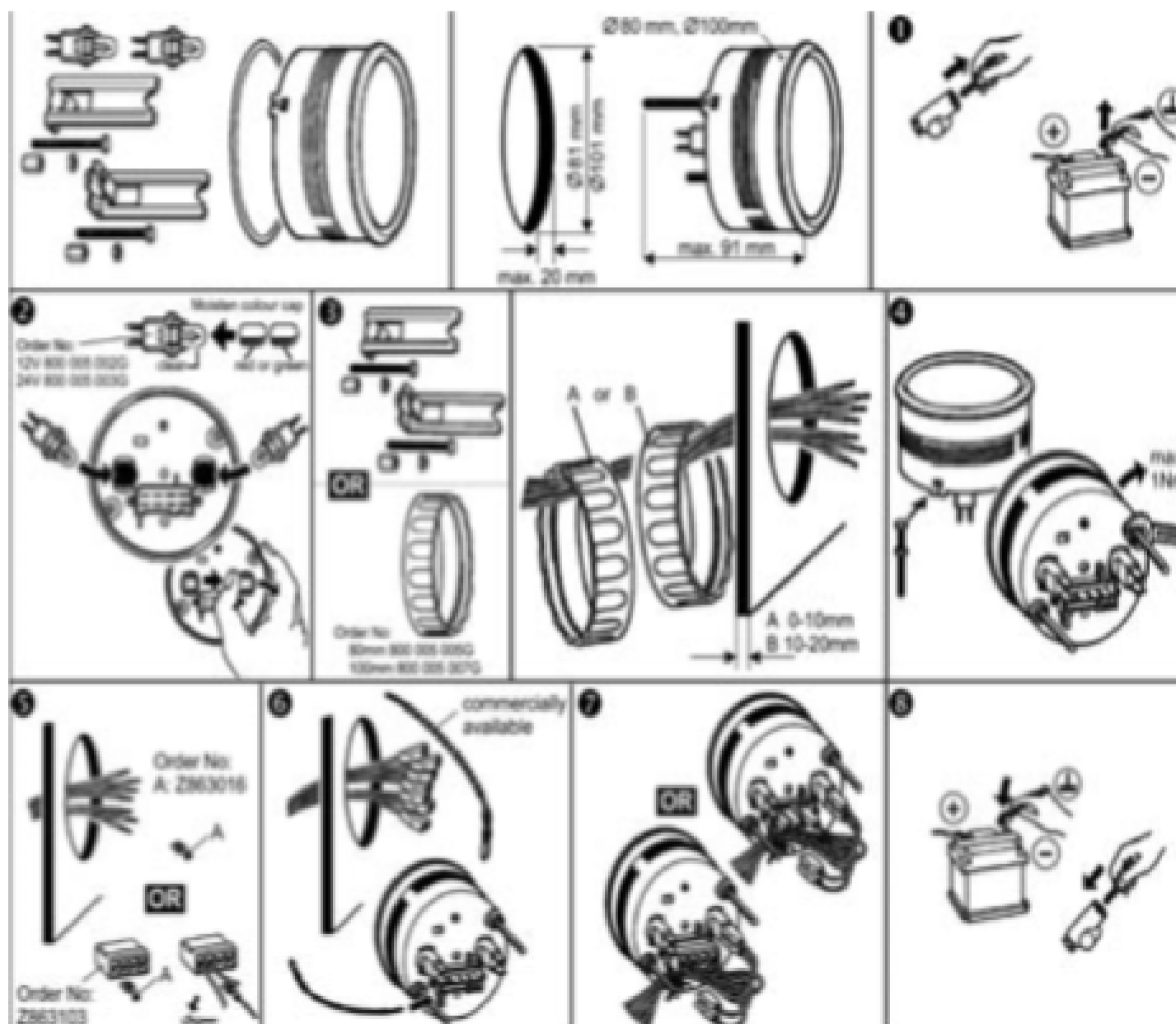
Ac
Go

Installation Info - Cockpit International

VDO Electronic Speedometer (80mm & 100mm Diameter)

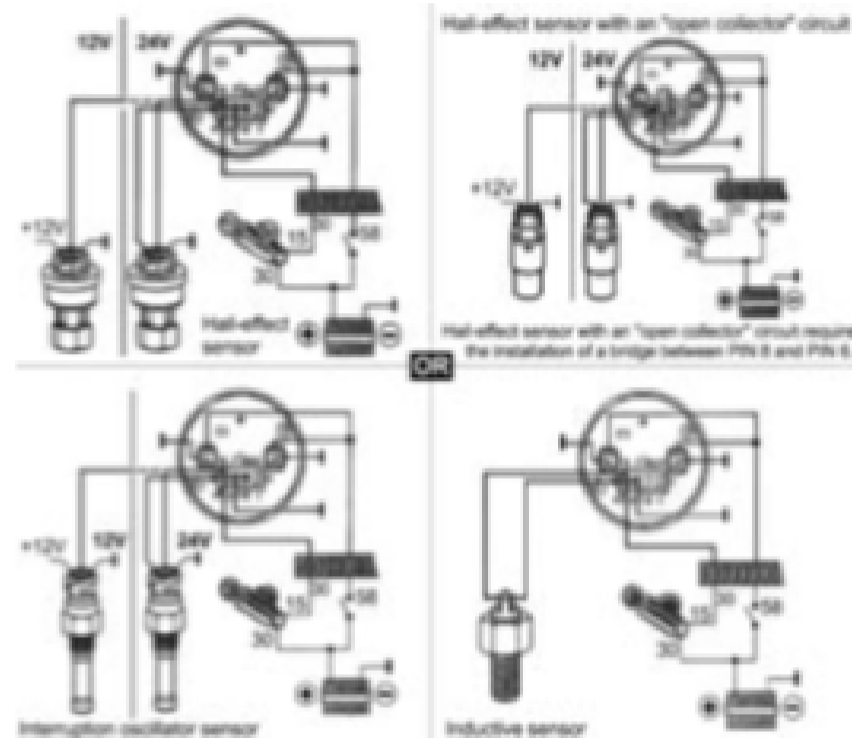
⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International

Operation



Calibration

After selection of the function 'AUTOCL' the display changes to 'BUTTON' after three seconds.

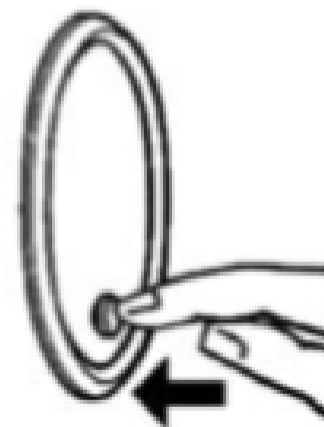
Caution:

Ask the passenger to do the calibration! No speed is displayed during the measuring drive! Start the vehicle and drive to measuring track. Exactly at the beginning of the track, push the button briefly. The determined pulse/distance ratio is displayed if it is between 500 and 399 990 pulses (e.g. P 50 000, which corresponds to pulse/distance ratio 50 000). The calibration is completed if the display changes to total or partial distance display. Repeat the calibration if the display flashes 'F00' (no pulses). The sequence is the same as described above.



Total Distance

The total distance function counts the kilometres or miles travelled up to a maximum of 999 999.9. This display cannot be reset.



You may select the function desired by pressing the push button briefly.

Partial Distance

The partial distance is indicated by the symbol 't' in the left section of the display. The kilometres or miles travelled are indicated up to a maximum of 9999.9.

The partial distance is set to 0 by pressing down the push button for longer than 2 seconds.

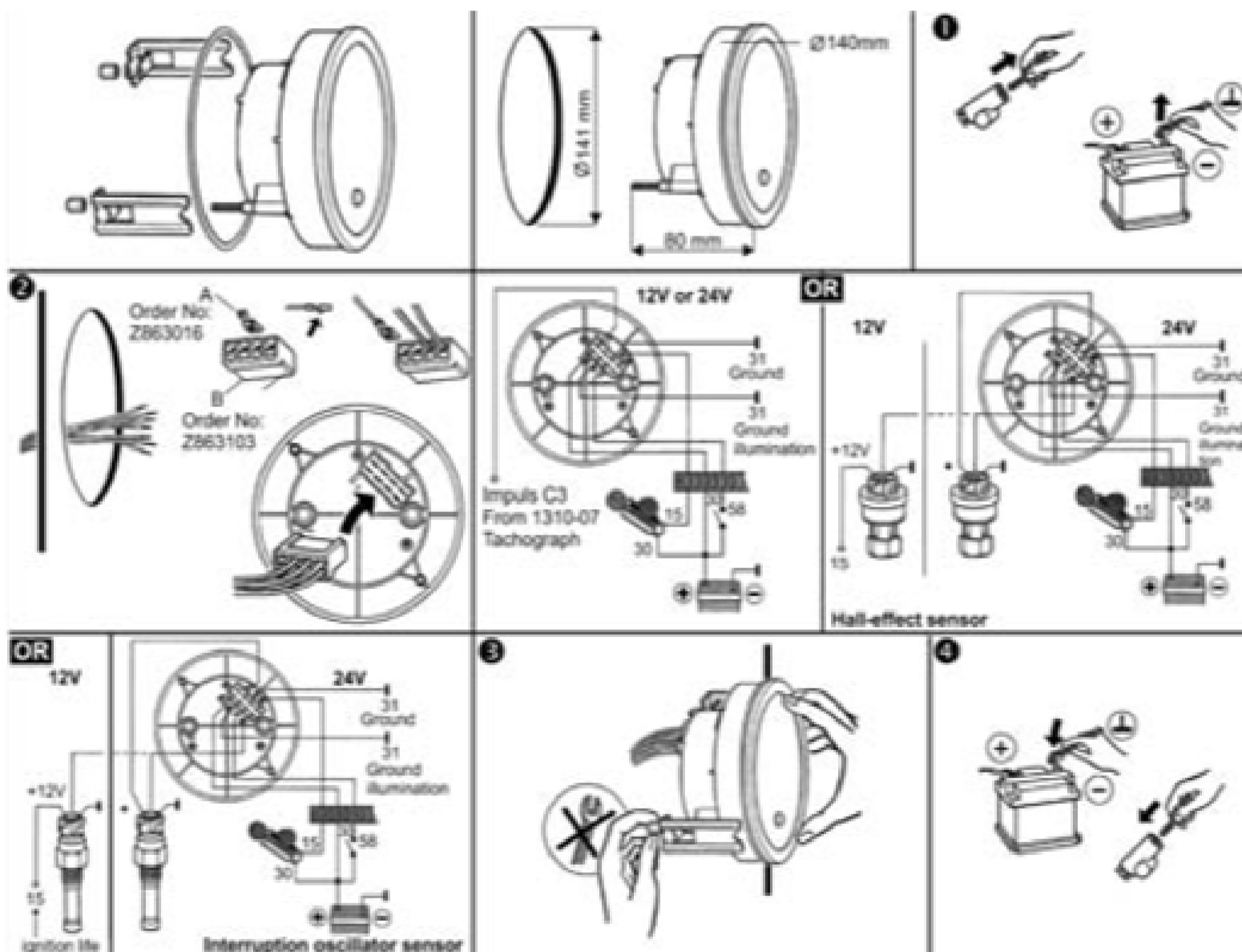
Note: The partial distance is reset when the total distance is also being displayed by pressing the push button down for longer than 2 seconds.

Installation Info - Cockpit International

VDO Electronic Speedometer (140mm Diameter)

⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International

Setting the Vehicle - Specific Impulse Ratio



To adjust the vehicle-specific impulse ratio, switch off 30 and 15, and then switch them on again:

1. Pull the instrument plug out.
2. Keep the button at the front pressed.
3. Switch on ignition and plug connection plug in again.
 - After approximately 3 seconds the indication 8000 appears.
 - The vehicle-specific impulse ratio can now be set (range adjustable from 1000 to 60 000).
 - To change the ratio by 10 impulses per km or mile, press the button briefly.
 - To change the ratio by 100 impulses per km or mile, keep the button pressed.
 - To set ratio is stored instantly.
 - To return to normal mode, switch the ignition off and on again.

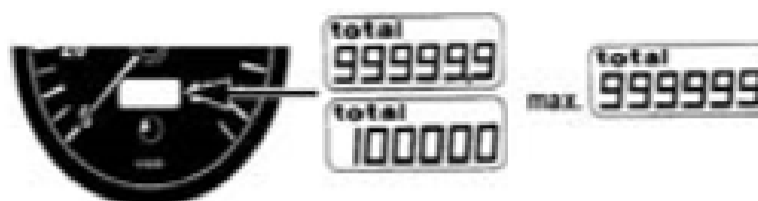
Note:

Respect the tolerances per directive 675/443/EEC when calibrating the speed indication. In Germany a reference to them is made in §57 StVZO, chapter 4, which states:

- The vehicle is tested at the following speeds: 40km/h, 80km/h and 120km/h or 80% of the maximum speed specified by the manufacturer if it is lower than 150km/h.
- The error limit of the instrument used for the measurement of the effective vehicle speed shall not exceed +/- 1%.
- If a measuring track is used, it shall be level and dry, and have a sufficiently non-skid surface.
- The displayed speed shall never be lower than the effective speed. At the speeds specified above, and at the intermediate values, the difference of speed V1 displayed by the speedometer and effective speed V2 shall have the following equation:

$$0 \leq V1 - V2 \leq \frac{V2}{10} + 4 \text{ km/h}$$

Total Distance



The total distance function counts the kilometres or miles travelled up to a maximum of 999 999. This display cannot be reset.

Trip Distance

The kilometres or miles travelled are indicated up to a maximum of 999 999.9. The trip distance is set to 0 by pressing the button down for longer than 2.5 seconds.

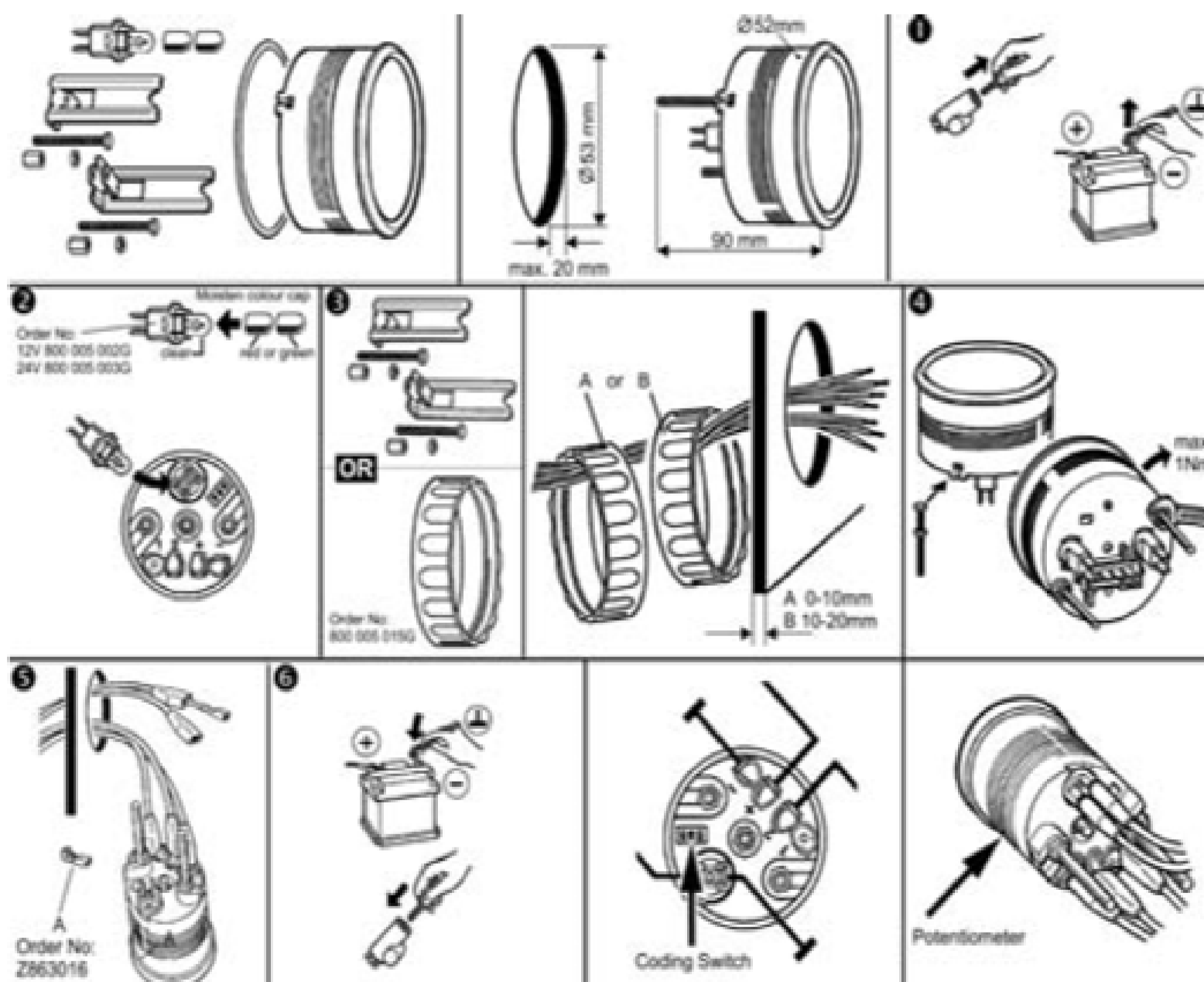


Installation Info - Cockpit International

Tachometer (Electronic 52mm)

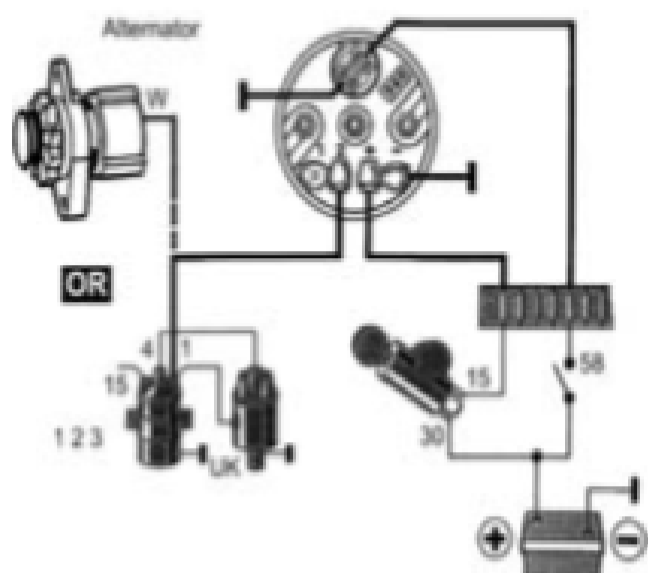
⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International

Sensor Installation



For petrol engines with other types of ignition systems that are not equipped with a conventional ignition (e.g. transistor coil ignition systems, electronic and fully electronic ignition systems), please ask for information on the tachometer connection from the manufacturer of the vehicle, engine or ignition system.

Adjustment

Basic adjustment prior to installation.

To calibrate the VDO tachometer, there are three options:

1. Select the number of cylinders (4, 6, 8 cylinders) for petrol engines, ignition coil Cl. I (only one ignition coil!) using a coding switch.
2. Select the pulses per revolution for connection Cl. W (alternating current) of the alternator for diesel engines, using a coding switch. Please ask for information on the pulses per revolution from the vehicle manufacturer.
3. Make fine adjustment using reference data only for connection Cl. W (alternating current) of the alternator for diesel engines, using a potentiometer. Caution: Readjustment of the potentiometer Cl. I for petrol engines results in malfunction indications.

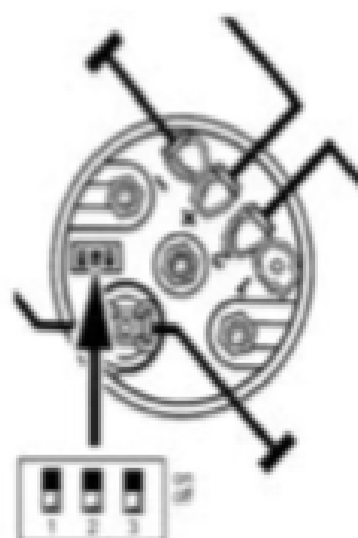
Note:

In its status for delivery, the unit is adjusted to Cl. I 4 cylinders.

I

Select number of cylinders for petrol engines (4 stroke), using a coding switch.

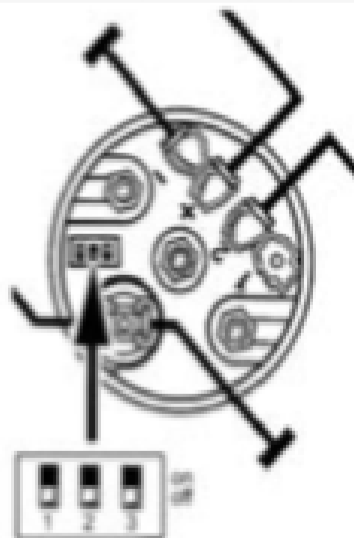
Petrol engine Cl. I (one ignition coil)				
Switch			Cylinders - stroke	
1	2	3		
on	off	off	4	4
on	off	on	6	4
on	on	off	8	4
on	on	on	8	4



II

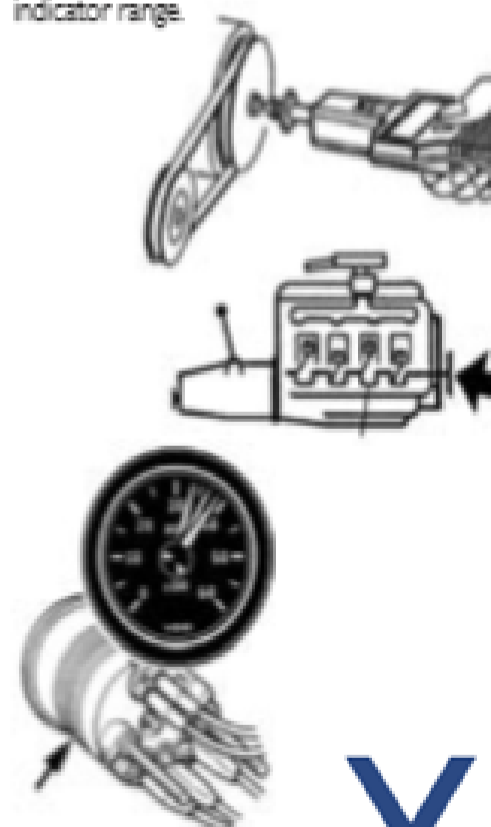
Select pulses per revolution, connection Cl. W (alternating current) for diesel engines, using a coding switch.

Diesel engine Cl. W				
Switch			RPM	
1	2	3	6000	6000
off	off	off	6-12	6-6
off	off	on	12-17	6-13
off	on	off	17-24	12-18
off	on	on	17-24	12-18



III

Fine adjustment only for a connection Cl. W (alternating current) for diesel engines, using a potentiometer. Adjust tachometer with a service tachometer. Fine adjustments can be performed only between 30% and 100% of the indicator range.



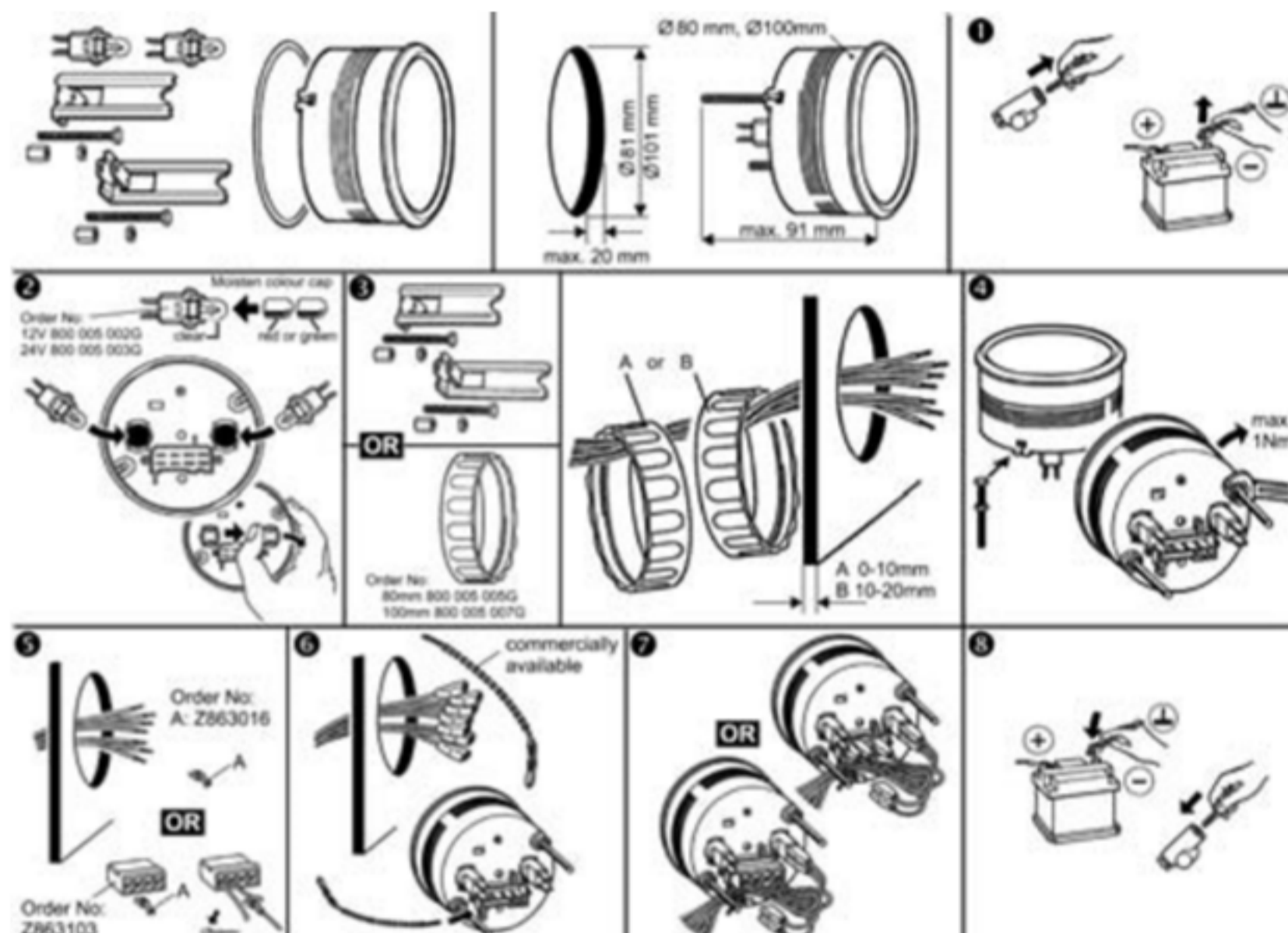
VDO

Installation Info - Cockpit International

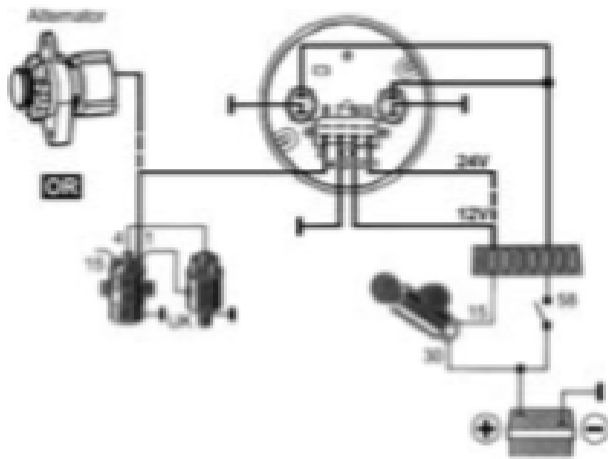
Tachometer (80mm & 100mm Diameter)

⚠ Safety Instructions

- Before installing disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International



For petrol engines with other types of ignition systems that are not equipped with a conventional ignition (e.g. transistor coil ignition systems, electronic and fully electronic ignition systems), please ask for information on the tachometer connection from the manufacturer of the vehicle, engine or ignition system.

Adjustment

Basic adjustment prior to installation

To calibrate the VDO tachometer, there are three options:

1. Select the number of cylinders (4, 6, 8 cylinders) for petrol engines, ignition coil CL 1 (only one ignition coil) using a coding switch.
2. Select the pulses per revolution for connection CLW (alternating current) of the alternator for diesel engines, using a coding switch. Please ask for information on the pulses per revolution from the vehicle manufacturer.
3. Make fine adjustment using reference data only for connection CLW (alternating current) of the alternator for diesel engines, using a potentiometer.

Caution: Readjustment of the potentiometer CL 1 for petrol engines results in malfunction indications.

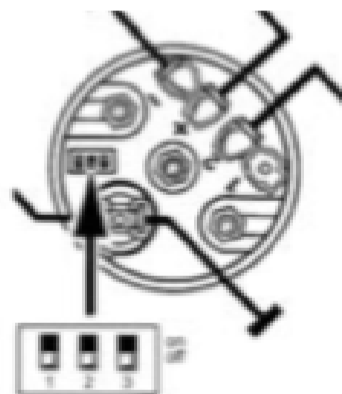
Note:

In its status for delivery, the unit is adjusted to CL 1.4 cylinders.

I

Select number of cylinders for petrol engines (4 stroke), using a coding switch.

Petrol engine CL 1 (one ignition coil)				
Switch			cyl -stroke	
1	2	3		
on	off	off	4	4
on	off	on	6	4
on	on	off	8	4
on	on	on	8	4

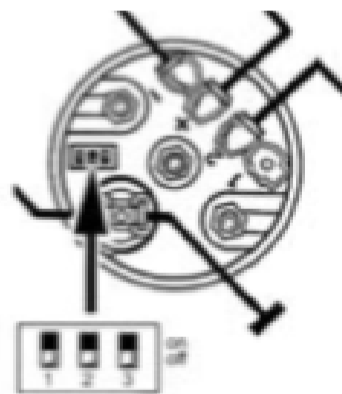


II

Select pulses per revolution, connection CLW (alternating current) for diesel engines, using a coding switch.

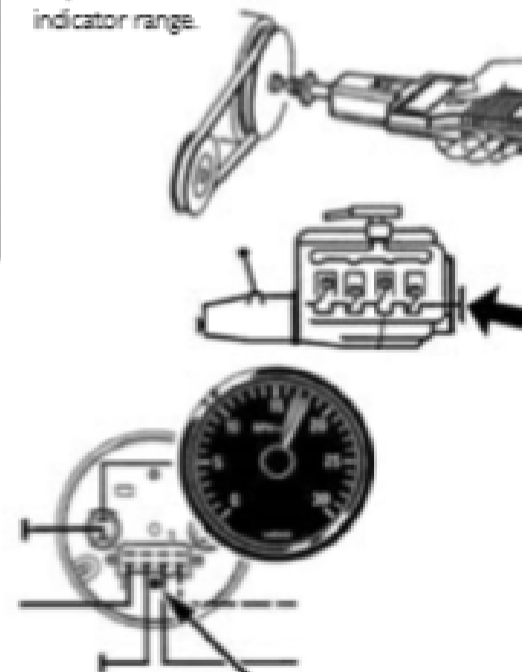
Diesel engine CL W							
Switch			RPM				
1	2	3	3000	4000	6000	7000	8000
off	off	off	8-12	6-8	5-12	7-10	6-8
off	off	on	12-17	9-13	12-17	10-15	9-13
off	on	off	14-25	13-20	17-24	14-21	13-18
off	on	on	18-25	13-20	17-24	14-21	13-18

pulses/revolution



III

Fine adjustment only for a connection CLW (alternating current) for diesel engines, using a potentiometer. Adjust tachometer with a service tachometer. Fine Adjustments can be performed only between 30% and 100% of the indicator range.

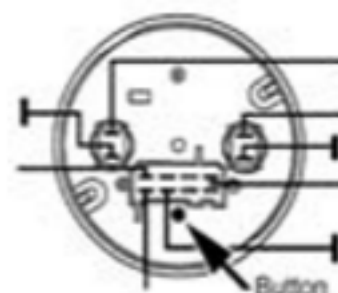
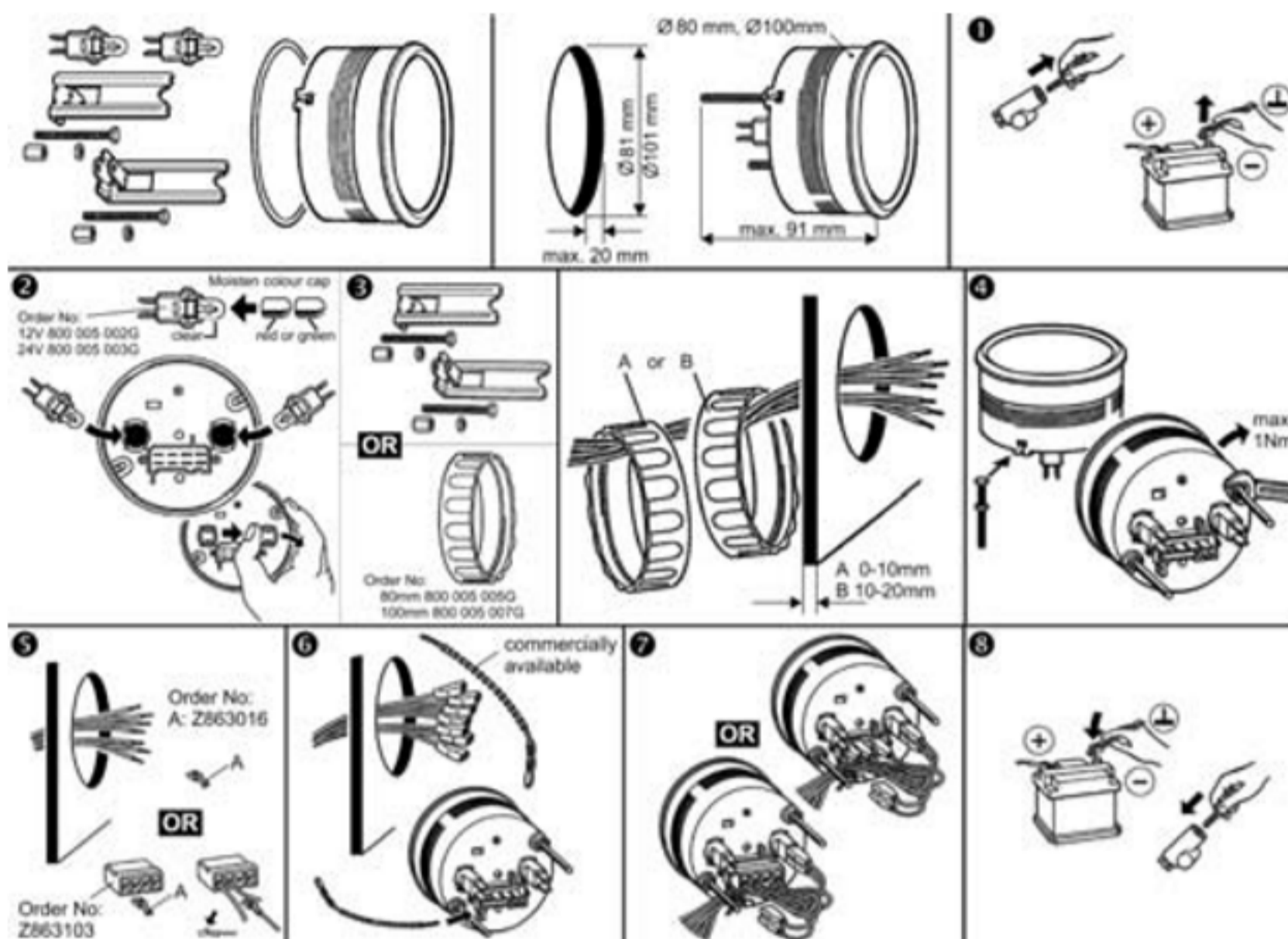


Installation Info - Cockpit International

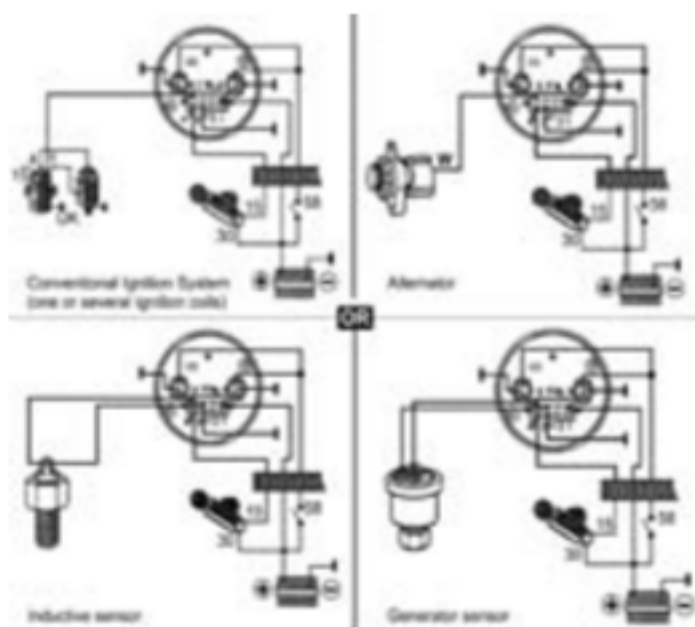
Tachometer with operating hour counter (80mm and 100mm)

⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires, battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International



Adjustment

To calibrate the VDO tachometer, there are three methods:
 'SELECT': Select the number of cylinders for petrol engines (3- and 4 stroke). Conventional ignition system R.I.I (only one ignition coil!). For other conventional ignition systems (e.g. transistor coil ignition systems, electronic and fully electronic systems), please ask for details on the tachometer connection from the vehicle manufacturer or ignition system manufacturer.
 'PULSE': The pulse number per revolution is known: T.I.I (also several ignition coils), T.I.W, inductive sensor, generator sensor.
 'ADJUST': precise tuning using a reference.

Display of the operating hours

The operating hour counter indicates the accumulated operating hours up to a maximum of 99,999.9 hours.

Press and hold down the button on the rear side of the unit and switch on the operating voltage (ignition) at the same time. If you continue to hold down the button, the 'SELECT', 'PULSE' and 'ADJUST': display will change every two seconds. To select one of these functions, release the button as soon as the corresponding function appears in the display and then wait approx. five seconds.

Adjustment



'SELECT'

This function is used to adjust the number of cylinders and the stroke (2- or 4 stroke). Hold down the button on the rear side of the unit and switch on the operating voltage. As soon as SELECT appears in the display, release the button.

Press the button to make the following adjustments:

4 stroke 1; 2; 3; 4; 5; 6; 7; 8; 12 cylinders
 2 stroke 1; 2; 3; 4 cylinders

Example of the display: '4 - 8C'
 = 4 stroke 8 cylinders. Following the adjustment, the unit returns automatically to the normal function, when the button is no longer pressed (operating hour counter).



'PULSE'

$$\frac{\text{pulse}}{\text{revolution}} = \frac{2 \times \text{number of cylinders}}{\text{stroke} \times \text{ignition coil}}$$

(2-stroke or 4-stroke)

Select the function and then release the button. After a few seconds, the individual digits will begin to flash in regular sequence. Press the button to change the flashing digits. This function can also be used to check the selected pulse number of revolution.

The unit returns automatically to the normal function when the button is no longer pressed (operating hour counter).



'ADJUST'

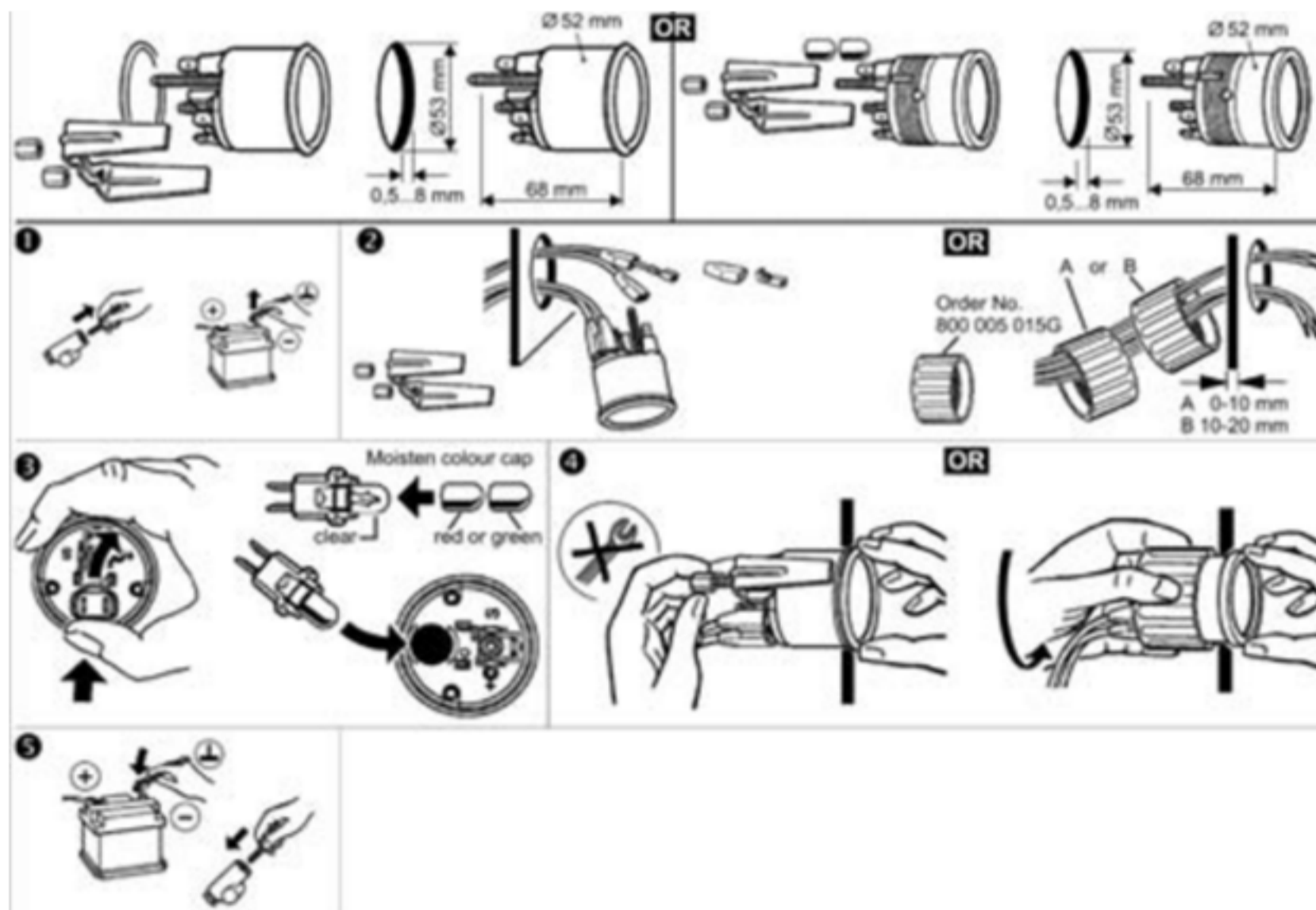
Perform this function with the aid of a sampling tachometer! The adjustment can be made only between 30% and 100% of the display range. The reading in the display changes from UP to DN (Up and down). If you press and hold down the button, the travel of the indicator will increase. At first, the change is very slow and becomes faster the longer the button is held down. If the button is not pressed again following the adjustment, the unit will return to the normal function approx. (operating hour counter).

Installation Info - Cockpit International

Gauge for Oil Temperature

⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International

Sensor Installation Location

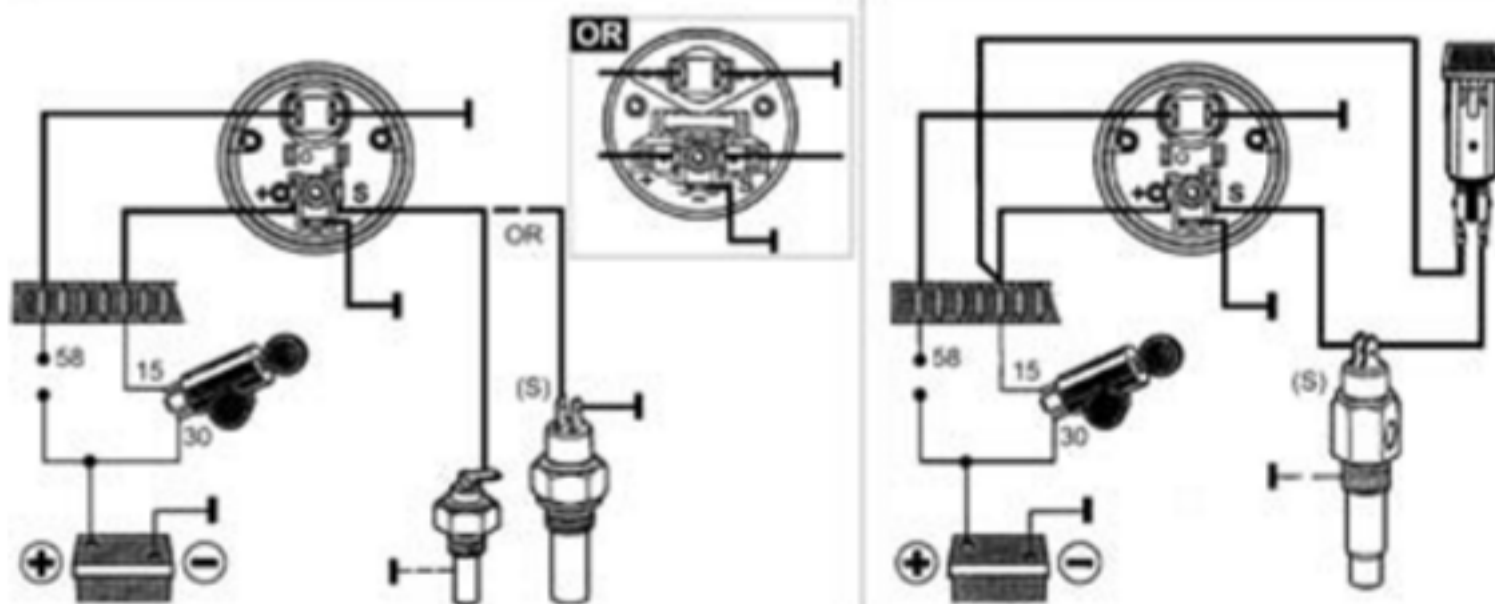
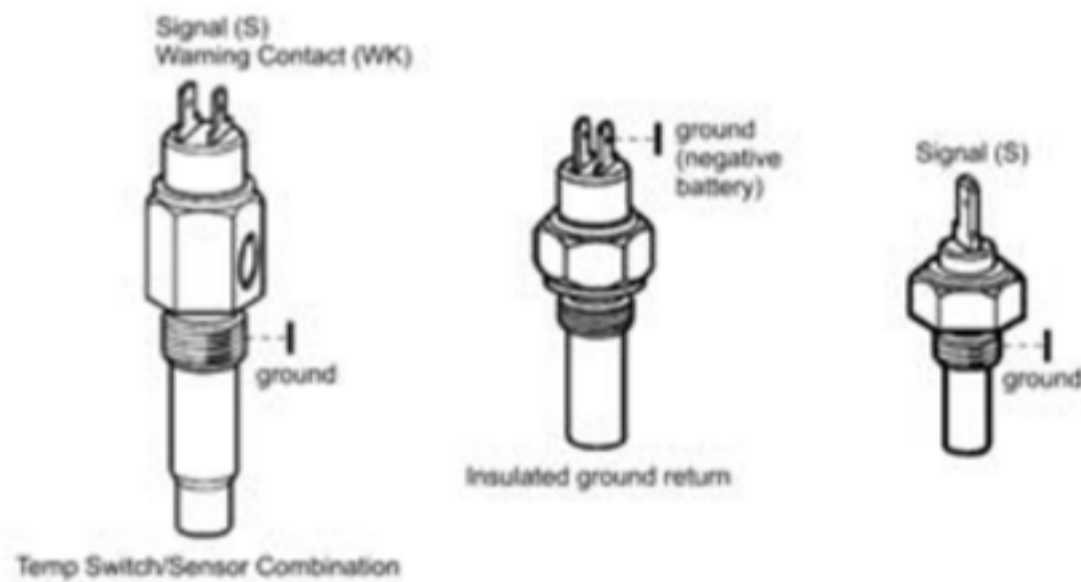
Engine oil temperature must be measured from inside the oil pump, being the hottest point area on an engine.

⚠ Safety Instructions

- Only install the sensor when the engine is cold.
- Replace any oil lost during installation process, to the correct level and composition specified by the automobile manufacturer.
- Make sure that the correct amount of torque is applied (Nm max). See table below.

Maximum Tightening Torque (Nm Max)

M10 x 1	10 Nm
M10 x 1,5	10 Nm
1/8 - 27 NPTF	10 Nm
M12 x 1,5	15 Nm
1/2 - 20 Gang	15 Nm
M14 x 1,25	20 Nm
M14 x 1,5	20 Nm
5/8 - 18 UNF - 3A	20 Nm
1/2 In.20 Whit. S	20 Nm
1/4 - 18 NPTF	20 Nm
M16 x 1,5	30 Nm
M18 x 1,5	30 Nm
M20 x 1,5	30 Nm
M22 x 1,5	30 Nm
M24 x 1,5	30 Nm
M26 x 1,5	30 Nm
1/2 - 14 NPTF	30 Nm
3/8 - 18 NPTF	30 Nm
R1/2	30 Nm
R3/8	30 Nm
3/8 - 18 Dryseal NPTF	30 Nm
3.4 - 16 UNF - 3A	30 Nm

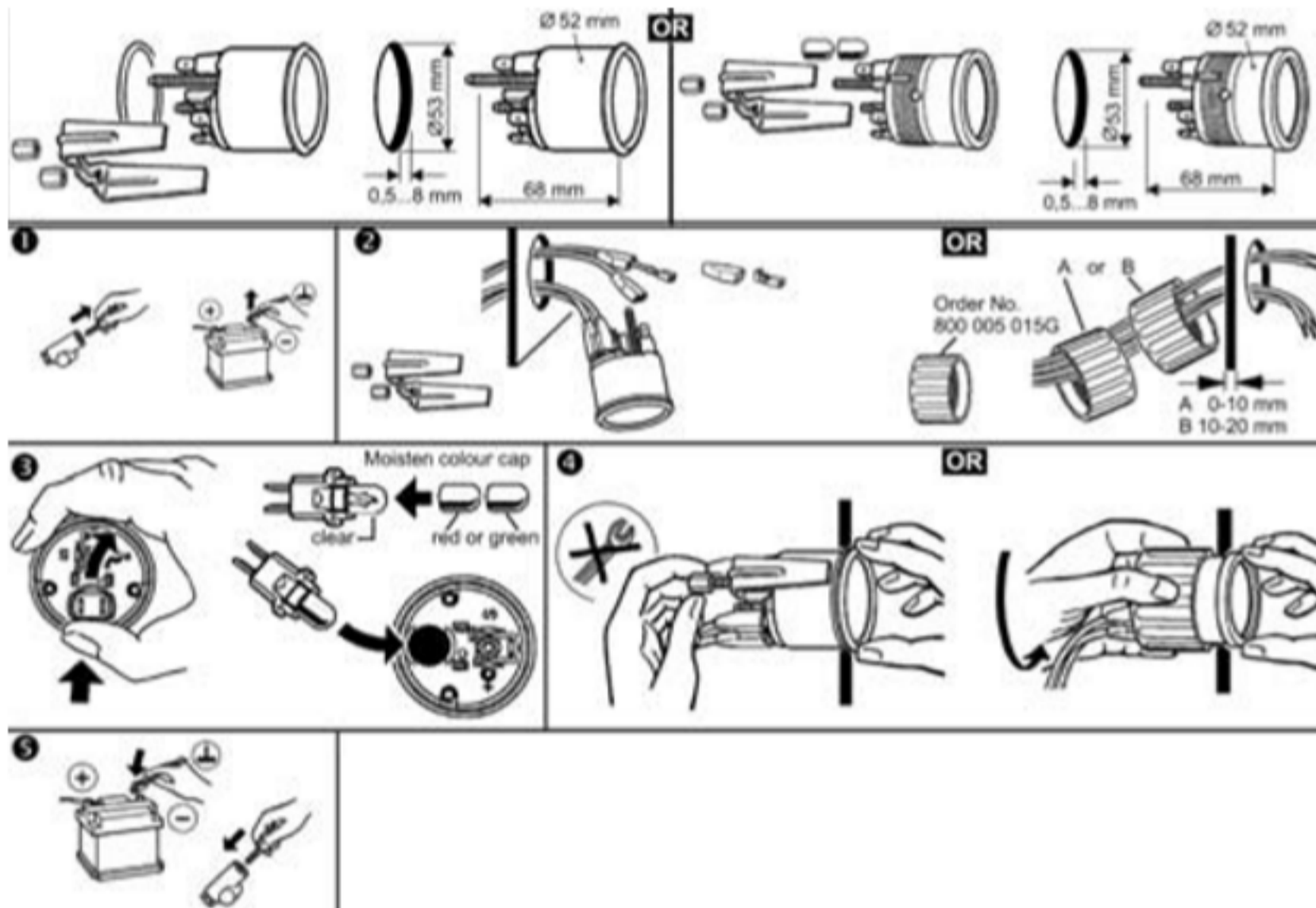


Installation Info - Cockpit International

Gauge for Engine Coolant

⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).



Installation Info - Cockpit International

Sensor Installation Location

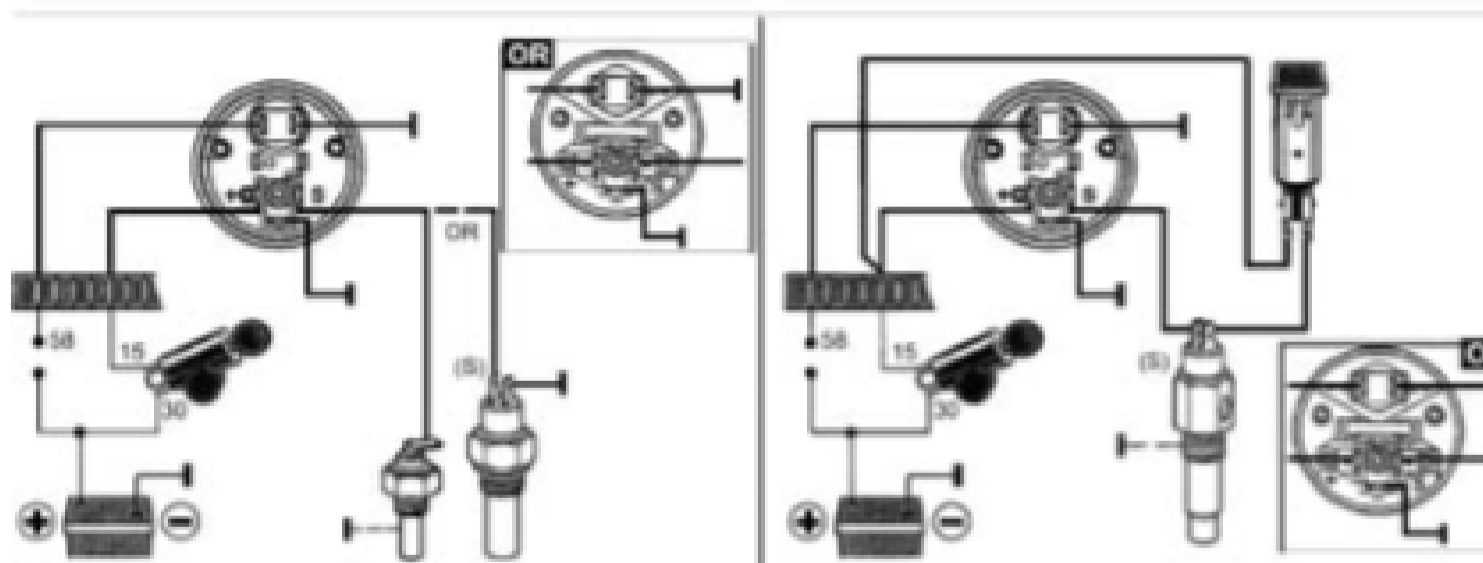
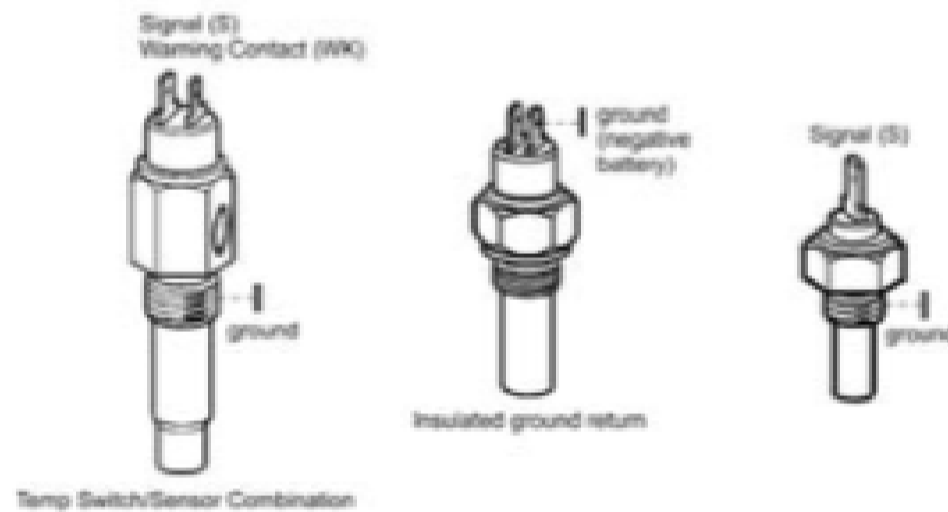
Install sensor in the place provided by the automobile manufacture in the coolant circulation system (e.g. in place of the temperature warning switch).

⚠ Safety Instructions

- Only install the sensor when the engine is cold.
- Replace any oil lost during installation process, to the correct level and composition specified by the automobile manufacturer.
- Make sure that the correct amount of torque is applied (Nm max). See table below.

Maximum Tightening Torque (Nm Max)

M10 x 1	10 Nm
M10 x 1,5	10 Nm
1/8 - 27 NPTF	10 Nm
M12 x 1,5	15 Nm
1/2 - 20 Gang	15 Nm
M14 x 1,25	20 Nm
M14 x 1,5	20 Nm
5/8 - 18 UNF - 3A	20 Nm
1/2 in. 20 Whit. S	20 Nm
1/4 - 18 NPTF	20 Nm
M16 x 1,5	30 Nm
M18 x 1,5	30 Nm
M20 x 1,5	30 Nm
M22 x 1,5	30 Nm
M24 x 1,5	30 Nm
M26 x 1,5	30 Nm
1/2 - 14 NPTF	30 Nm
3/8 - 18 NPTF	30 Nm
R1/2	30 Nm
R3/8	30 Nm
3/8 - 18 Dryseal NPTF	30 Nm
3/4 - 16 UNF - 3A	30 Nm

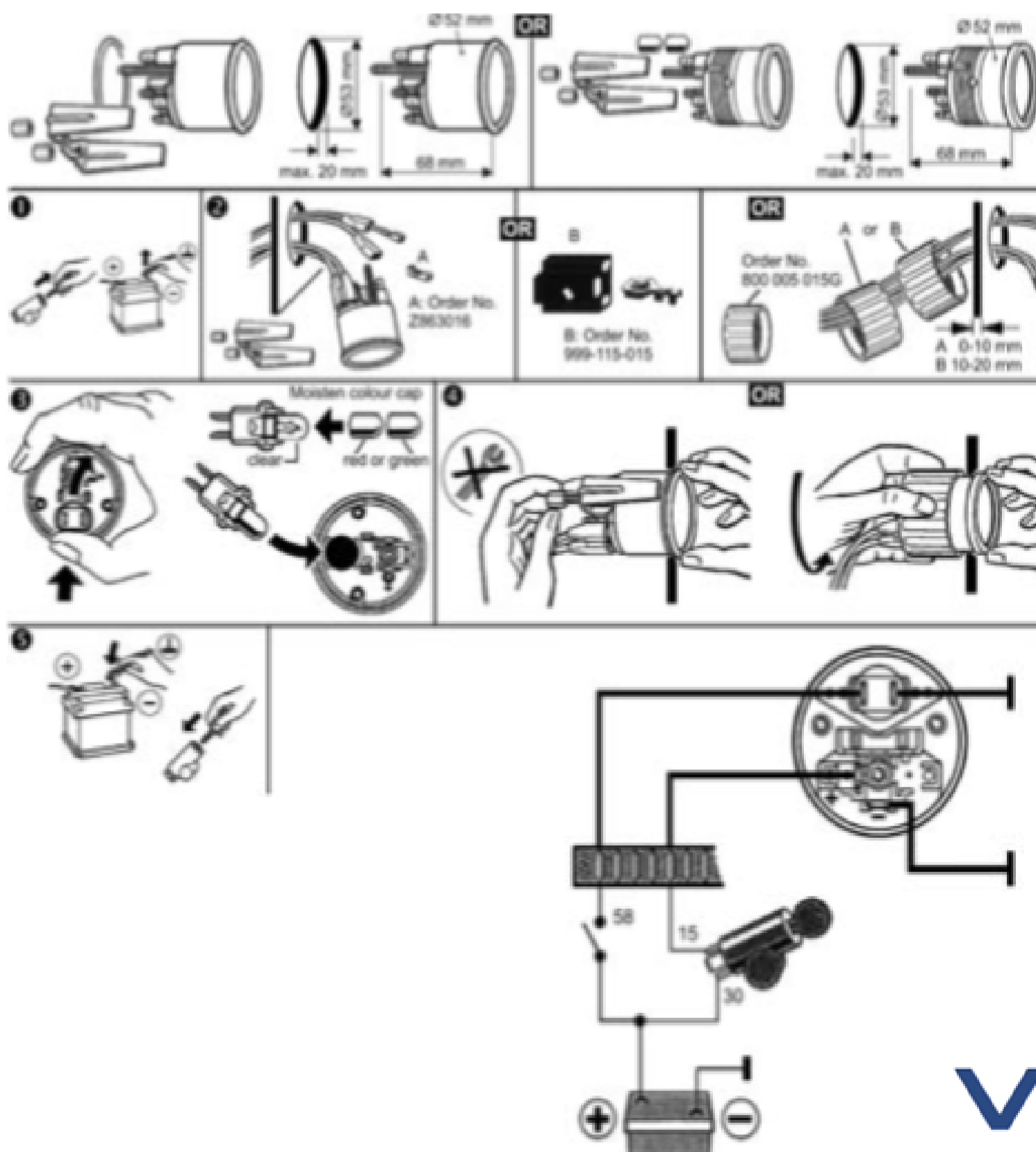


Installation Info - Cockpit International

Voltmeter

⚠ Safety Instructions

- Before installing, disconnect the negative pole of the battery to prevent a short circuit, which can cause cable fires, battery explosion and damage to electronic storage systems.
- Note that when the battery is disconnected, all electronic memory values will be lost and must be programmed again on connection.
- Be very cautious when working on a running engine as one can sustain serious injuries (including bruises and burns).
- Do not wear loose-fitting clothes!
- When installing the equipment unit, make sure there is sufficient clearance behind the installation opening. Use a drill to pre-drill the installation opening and complete it using a compass saw or piercing saw (follow the safety instructions of the hand tool manufacturer).





PARTS LISTING - VIEWLINE ALL-WEATHER

The future of analogue instrumentation

Viewline is the new standardised instrument platform for special-purpose vehicles and machines. With modular solutions in three housing variations, it supplies more functions, more flexible installation and design options, as well as space-saving combi instruments - something unique in this sector. Viewline also offers a great deal of freedom to customise the cockpit and is the natural choice for an attractive price/performance ratio.

VDO's aim was to be forward-looking in the design concept of Viewline so that it would bring with it:

- A high degree of installation
- Freedom and flexibility

Trouble-free exchange or conversion to Viewline is therefore possible at any time. A safe and convenient solution for the instrument series has already been prepared for customers who would like to change to Viewline.

As an experienced and reliable partner of leading boat manufacturers, assistance during the planning stage is given. This allows seamless integration and optimum deployment of all the advantages which Viewline offers.

* Please note: All Viewline single lenses are in the process to be phased out and replaced by double lenses.

Section Content

- Ammeters
- Clocks
- Freshwater Gauge
- Fuel
- Hourmeter
- Oil Temperature
- Outside Temperature
- Pressure Gauge
- Pyrometer
- Pitot Speedometer
- Rudder Angle
- Speedometer
- Sumlog
- Synchroniser
- Tachometers
- Temperature Gauges
- Trim Gauge
- Turbo Boost
- Voltage Gauge
- Wastewater
- Water Pressure Gauges
- Water Temperature

Parts Listing - Viewline All-Weather

Ammeters



Ammeter - Without Shunt

The Viewline ammeter provides an overview of the engines electrical system
The level of current being drawn and the supply current are clearly displayed
Voltage independent - suitable for 12V only

Illumination 12V included

To be used with a 60mV shunt

Part No.	Range	Diameter	Colour/Lens
A2C59510400	-60/+60Amp	52mm	Black SL
A2C59510401	-100/+100Amp	52mm	Black SL
A2C59510402	-150/+150Amp	52mm	Black SL
A2C59510421	-60/+60Amp	52mm	Black DL
A2C59510422	-150/+150Amp	52mm	Black DL

White Gauge Option

Part No.	Range	Diameter	Colour/Lens
A2C59510404	-60/+60Amp	52mm	White SL
A2C59510405	-100/+100Amp	52mm	White SL
A2C59510423	-60/+60Amp	52mm	White DL
A2C59510424	-150/+150Amp	52mm	White DL



Shunt Resistors

Part No.	Range
A2C59514041	-60mV/30A
A2C59514043	-60mV/60A
A2C59514045	-60mV/100A
A2C59514047	-60mV/150A

Clocks



Electrical adjustment

Changeable front bezel

LED illumination

Flush mount possibility

Part No.	Diameter	Volt	Colour/Lens
A2C59513445	52mm	12V	Black DL
A2C59513446	52mm	24V	Black DL

White Gauge Option

Part No.	Diameter	Volt	Colour/Lens
A2C59513443	52mm	12V/24V	White DL
A2C59513444	52mm	12V/24V	White DL
A2C59513449	52mm	12V	White DL

Parts Listing - Viewline All-Weather

Freshwater Gauge



Freshwater (No Sender)

The Viewline water tank gauge indicates the level of freshwater

Capacity sensors can be fitted with a maximum depth of up to 1500mm

Anti-fog double lens

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59514676	0-1/1	Cap 20mA	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C5954677	0-1/1	Cap 20mA	52mm	12V/24V	White DL

Sender

Part No.	Length	Signal
N02-200-320	80 - 600mm	Cap 20mA
N02-200-322	600 - 1200mm	Cap 20mA
N02-200-324	1200 - 1500mm	Cap 20mA

Fuel



Fuel (No Sender)

The Viewline fuel gauge provides information about the fuel level in the tank and can be used with all tank sensors

Lever Type

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514084	10 - 180Ω	52mm	12V/24V	Black DL

Tubular Type

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514081	90 - 0.5Ω	52mm	12V/24V	Black DL

White Gauge Option (Lever Type)(Chrome Bezel)

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514185	10 - 180Ω	52mm	12V/24V	White DL

White Gauge Option (Tubular Type)

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514183	90 - 95Ω	52mm	12V/24V	White DL

Parts Listing - Viewline All-Weather

Hourmeter



The Viewline hourmeter makes it easy to stick to a proper maintenance schedule. It is only activated when the engine is running so only genuine engine operating hours are counted

Anti-fog double lens with illumination

Part No.	Light	Diameter	Volt	Colour/Lens
A2C59512654	Yes	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Light	Diameter	Volt	Colour/Lens
A2C59512453	Yes	52mm	12V/24V	Black DL

Oil Temperature



Oil Temperature (No Sender)

Integrated function LED

Changeable front bezel

LED illumination

Flush mount possibility

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514163	50 - 150°C	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514233	50 - 150°C	52mm	12V/24V	White DL

Temperature Sender

Part No.	Range	
323-801-009-001D	50 - 150°C	1/8"-27NPT

Outside Temperature



Outside Temperature (No Sender)

Integrated function LED

Changeable front bezel

LED illumination

Flush mount possibility

Anti-fog double lens

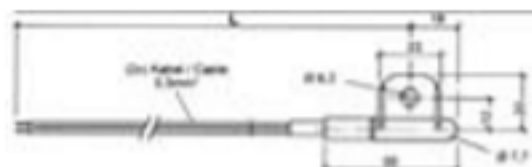
Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59510429	-25 - 50°C	2K Ω	52mm	12V	Black DL

White Gauge Option

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59510431	-25 - 50°C	2K Ω	52mm	12V	White DL

Parts Listing - Viewline All-Weather

Outside Temperature - Continued



Temperature Sensor

Part No.	Range	Cable Length
323-809-010-005C	-40 - 85°C	3000mm
Operational value 0°C = 4082Ω ± 26Ω		

Pressure Gauge



Pressure (No Sender)

The Viewline pressure gauge detects fluctuations in engine and gearbox oil pressure and changes in turbocharger boost

Part No.	Range	Diameter	Volt	ISO Symbol	Colour/Lens
A2C59510250	0-10Bar	52mm	12V/24V	Brake	Black SL
A2C59510261	0-500kPa	52mm	12V/24V	Oil	Black SL
A2C59510262	0-1000kPa	52mm	12V/24V	Oil	Black SL
A2C59510329	5Bar/80psi	52mm	12V/24V	Oil	Black DL
A2C59510330	10Bar/150psi	52mm	12V/24V	Oil	Black DL
A2C59510332	30Bar/430psi	52mm	12V/24V	Gear	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	ISO symbol	Colour/Lens
A2C59510276	0-500kPa	52mm	12V/24V	Oil	White SL
A2C59510279	0-2500kPa	52mm	12V/24V	Gear	White SL
A2C59510340	5Bar/80psi	52mm	12V/24V	Oil	White DL
A2C59510341	10Bar/150psi	52mm	12V/24V	Oil	White DL
A2C59510342	25Bar/350psi	52mm	12V/24V	Gear	White DL

Pyrometer



Pyrometer (No Sender)

The Viewline pyrometer indicates the exhaust temperature at the end of the exhaust pipe (up to 900°C)

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510407	100 - 900°C	52mm	12V/24V	Black SL
A2C59510425	100 - 900°C	52mm	12V/24V	Black DL
Instrument only				

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510408	100 - 900°C	52mm	12V/24V	White SL
A2C59510426	100 - 900°C	52mm	12V/24V	White DL

Spares

Part No.	Description
N03-320-264	Sender
N03-320-266	Weld Boss
N03-320-268	Cable 4m

Parts Listing - Viewline All-Weather

Pitot Speedometer



Pitot Speedometer

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59513851	0-90km/h (50km)	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59513846	0-90km/h (50km)	52mm	12V/24V	White DL

Rudder Angle



Rudder Angle (No Sender)

The gauge shows the position of the rudder at all times and is available in 52 and 85mm diameters

Anti-fog double lens

Part No.	Input	Angle	Diameter	Volt	Colour/Lens
A2C59514154	3-180Ω	+40°	52mm	12V/24V	Black DL
A2C59512410	3-180Ω	+45°	85mm	12V/24V	Black DL

White Gauge Option

Part No.	Input	Angle	Diameter	Volt	Colour/Lens
A2C59514230	3-180Ω	+40°	52mm	12V/24V	White DL
A2C59512411	3-180Ω	+45°	85mm	12V/24V	White DL



Sender

Part No.	Description
440-102-001-001D	Single Station
440-102-002-001D	Dual Station

Speedometer



Speedometer (No Sender)

Integrated warning LED

Changeable front bezel

LED illumination

Flush mount possibility

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510462	0-60km/h	85mm	12V/24V	Black SL
A2C59510463	0-80km/h	85mm	12V/24V	Black SL
A2C59510464	0-120km/h	85mm	12V/24V	Black SL
A2C59510465	0-200km/h	85mm	12V/24V	Black SL
A2C59510466	0-300km/h	85mm	12V/24V	Black SL
A2C59510467	0-30mph/50km/h	85mm	12V/24V	Black SL
A2C59510517	0-120km/h	110mm	12V/24V	Black SL

Parts Listing - Viewline All-Weather

Speedometer - Continued

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510518	0-200km/h	110mm	12V/24V	Black SL
A2C59510519	0-300km/h	110mm	12V/24V	Black SL
A2C59510524	0-220mph/360km/h	110mm	12V/24V	Black SL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510477	0-200km/h	85mm	12V/24V	White SL
A2C59510484	0-140mph/220km	85mm	12V/24V	White SL

Sumlog



Sumlog (No Sender) Hall/NMEA

The classic electronic route distance calculator with new technology for all pleasure boats
Display with various functions: water temperature, depth
(NMEA, time, on-board voltage, trip, distance etc.)

Anti-fog double lens

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510499	12kn	85mm	12V/24V	Black DL
A2C59510500	50kn	85mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510502	12kn	85mm	12V/24V	White DL
A2C59510503	50kn	85mm	12V/24V	White DL

Sender (Triducer)

Part No.	Description
X11-719-000-053	Transom mount
X11-719-000-058	Hull mount

Synchroniser



On pleasure boats with double engine installations, the Viewline synchroniser is an indispensable aid in guaranteeing the correct synchronous running of both drive units

Anti-fog double lens

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59510497	+500 RPM	W, I, Ind	85mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59510498	+500 RPM	W, I, Ind	85mm	12V/24V	White DL

Parts Listing - Viewline All-Weather

Tachometers



Tachometer - No LCD

Changeable front bezel

Flush mount possibility

Ideal solution if a space-saving gauge in a panel or in the engine compartment is required

Part No.	Input	Range	Diameter	Volt	Colour/Lens
A2C59510440	W, Coil	0-4000 RPM	52mm	12V/24V	White DL
A2C59510441	W, Coil	0-6000 RPM	52mm	12V/24V	White DL
A2C59510442	W, Coil	0-8000 RPM	52mm	12V/24V	White DL
A2C59510528	W, Coil	0-3000 RPM	85mm	12V	White DL
A2C59510529	W, Coil	0-4000 RPM	85mm	12V	White DL
A2C59510530	W, Coil	0-6000 RPM	85mm	12V	White DL
A2C59510531	W, Coil	0-3000 RPM	85mm	12V/24V	Black SL
A2C59510532	W, Coil	0-4000 RPM	85mm	12V/24V	Black SL
A2C59510533	W, Coil	0-7000 RPM	85mm	12V/24V	Black SL
A2C59510534	W, Coil	0-10000 RPM	85mm	12V/24V	Black SL

Input

Part No.	Input	Range	Diameter	Volt
A2C59510541	W, Coil	0-7000 RPM	110mm	12V/24V
A2C59510542	W, Coil	0-10000 RPM	110mm	12V/24V

White Gauge Option

Part No.	Input	Range	Diameter	Volt	Colour/Lens
A2C59510537	W, Coil	0-7000 RPM	85mm	12V/24V	White SL
A2C59510538	W, Coil	0-10000 RPM	85mm	12V/24V	White SL
A2C59510440	W, Coil	0-4000 RPM	52mm	12V/24V	White DL
A2C59510441	W, Coil	0-6000 RPM	52mm	12V/24V	White DL
A2C59510442	W, Coil	0-8000 RPM	52mm	12V/24V	White DL
A2C59510528	W, Coil	0-3000 RPM	85mm	12V/24V	White DL
A2C59510529	W, Coil	0-4000 RPM	85mm	12V/24V	White DL
A2C59510530	W, Coil	0-6000 RPM	85mm	12V	White DL



Tachometer - with LCD

Indicates engine revolution, engine hours, voltage and clock

Integrated warning LED

Changeable front bezel

LED illumination

Flush mount possibility

Part No.	Input	Range	Diameter	Volt	Colour/Lens
A2C59510446	W, I, Ind, Hall	0-4000 RPM	85mm	12V/24V	Black SL
A2C59510448	W, I, Ind, Hall	0-6000 RPM	85mm	12V/24V	Black SL
A2C59510451	W, I, Ind, Hall	0-10000 RPM	85mm	12V/24V	Black SL
A2C59510508	W, Ind, Hall 0	0-3000 RPM	110mm	12V/24V	Black SL
A2C59510509	W, I, Ind, Hall	0-4000 RPM	110mm	12V/24V	Black SL

Parts Listing - Viewline All-Weather

Tachometers - Continued

Part No.	Input	Range	Diameter	Volt	Colour/Lens
A2C59510488	W, I, Ind, Hall	0-6000 RPM	85mm	12V/24V	Black DL
A2C59510490	W, I, Ind, Hall	0-8000 RPM	85mm	12V/24V	Black DL
A2C59510511	W, I, Ind, Hall	0-6000 RPM	110mm	12V/24V	Black SL
A2C59510513	W, I, Ind, Hall	0-8000 RPM	110mm	12V/24V	Black SL

Tachometer - with LCD (White Gauge Option)

Part No.	Input	Range	Diameter	Volt	Colour/Lens
A2C59510491	W, Ind, Hall	0-3000 RPM	85mm	12V/24V	White DL
A2C59510492	W, I, Ind, Hall	0-4000 RPM	85mm	12V/24V	White DL
A2C59510494	W, I, Ind, Hall	0-6000 RPM	85mm	12V/24V	White DL
A2C59510496	W, I, Ind, Hall	0-8000 RPM	85mm	12V/24V	White DL

Temperature Gauges



The Viewline temperature gauge displays any sudden rise in coolant temperature, helping to prevent serious damage and the associated expenses

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514156	60 - 200°C	52mm	12V/24V	Black DL

Sender

Part No.	Range	Thread	Type
323-801-003-001D	60 - 200°C	M10x1.5	Button
323-801-028-001C	60 - 200°C	M14x1.5	Screw

Trim Gauge



Trim

The Viewline trim gauge provides information about the position of the stern-drive in relation to the boat's stern

In this way, the skipper knows at all times whether the drive is in a raised or lowered position

Furthermore, he can always optimise the boat's trim. Connect to existing sender

Anti-fog double lens

± 3.6° angle degree accuracy over the entire display area.

Part No.	Input	Diameter	Volt	Colour/Lens
A2C59514180	84 - 5Ω	52mm	12V	Black DL

White Gauge Option

Part No.	Input	Diameter	Volt	Colour/Lens
A2C59514244	84 - 5Ω	52mm	12V	White DL

Parts Listing - Viewline All-Weather

Turbo Boost



Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510247	0-2Bar	52mm	12V/24V	Black SL
A2C59510328	0-2Bar/30psi	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514228	0-2Bar	52mm	12V/24V	White DL
A2C59510339	0-2Bar/30psi	52mm	12V/24V	White DL

Sender

Part No.	Range	Thread	Volt
360-081-032-025C	200kPa	1/8"x27NPTF	12V/24V

Voltage Gauge



Voltage

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59512543	8 - 16V	52mm	12V	Black SL
A2C59510362	8 - 16V	52mm	12V	Black DL
A2C59510317	18 - 32V	52mm	24V	Black SL
A2C59512458	18 - 32V	52mm	24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59510318	8 - 16V	52mm	12V	White SL
A2C59510364	8 - 16V	52mm	12V	White DL
A2C59510365	18 - 32V	52mm	24V	White DL

Wastewater



Wastewater (No Sender)

The Viewline water tank gauge indicates the level of wastewater.

Capacity sensors can be fitted with a maximum depth of up to 1500mm.

Anti-fog double lens

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59510435	0-1/1	4-20mA	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Input	Diameter	Volt	Colour/Lens
A2C59510436	0-1/1	4-20mA	52mm	12V/24V	White DL

Parts Listing - Viewline All-Weather

Wastewater - Continued

Sender

Part No.	Length	Signal
N02-240-902	80 - 600mm	4-20mA
N02-200-904	600 - 1200mm	4-20mA
N02-240-906	1200 - 1500mm	4-20mA

Water Pressure Gauges



Water Pressure Gauges

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59513849	0-2Bar	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59513851	0-2Bar	52mm	12V/24V	White DL

Water Temperature



Water Temperature (No Sender)

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514170	40 - 120°C	52mm	12V/24V	Black DL
A2C59514173	40 - 120°C	52mm	12V/24V	Black DL

White Gauge Option

Part No.	Range	Diameter	Volt	Colour/Lens
A2C59514237	40 - 120°C	52mm	12V/24V	White DL
A2C59514239	40 - 120°C	52mm	12V/24V	White DL



TECHNICAL INFORMATION - VIEWLINE ALL-WEATHER INSTALLATION

Detailed technical information on
VDO Viewline All-Weather.

Due to the intricacies involved in the installation of the VDO Viewline All-Weather range of instruments, Control Instruments Automotive in this section gives you, the technician, all the necessary information required for successful installation.

Section Content

Technical information

- Installation Instructions
 - Viewline Installation 52mm
 - Viewline Installation 85mm
 - Viewline Installation 110mm

Installation Info - Viewline All-Weather

Viewline Installation 52mm

Safety Instructions:

- 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 VDO 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 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 jewellery 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: 65mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tool, saber saws, keyhole saws or files. Debur 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 the conventional test lamps can cause damage to control units or other electronic systems.
- The electrical indicator outputs an cables connected to them must be protected from direct contact and damage. The cables in use must have sufficient insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measure to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, un-insulated cables and contacts is prohibited.



No Smoking!
No open fire or lights!

Installation Info - Viewline All-Weather

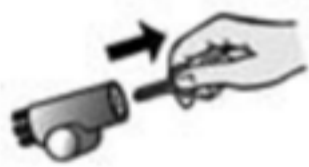
⚠ Safety after Installation

- Connect the ground cable tightly to the negative terminal of the battery.
- Reenter/reprogram the volatile electronic memory terminal of the battery.
- Check all functions.
- Use only clean water to clean the components. Note the Ingress Protection (IP) ratings (IEC 60529).

⚠ 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!
- 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 electronics 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 stabilised and it must comply with the following standard: DIN EN 61000, Parts 6-1 to 6-4.

Procedures for Installing VDO Viewline Instruments



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



Disconnect the negative terminal on the battery.

Make sure the battery cannot unintentionally restart.

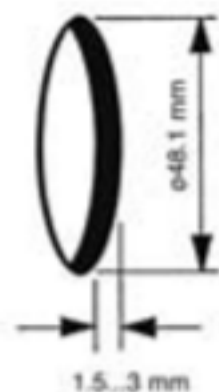
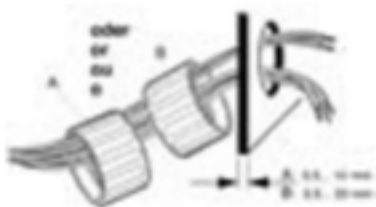
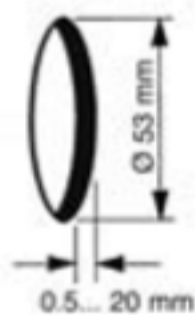
- Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit. If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries! Short circuits can cause fires, battery explosions and damages to other electronic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



If installing the instrument near a magnetic compass, note the magnetic safe distance to the compass.

Installation Info - Viewline All-Weather

Viewline Installation 52mm - Continued



The following rings may be installed as alternatives to the supplied front ring

Front ring, flat; black	A2C53186040
Front ring, flat; white	A2C53186022
Front ring, flat; chrome	A2C53186023
Front ring, flat; black	A2C53186024
Front ring, triangular; white	A2C53186025
Front ring, triangular; chrome	A2C53186026
Front ring, round; black	A2C53186027
Front ring, round; white	A2C53186028
Front ring, round; chrome	A2C53186029

Place the new front ring on the instrument and press it on until it is flush with the instrument glass.

Conventional assembly. (Instrument is put into the drilled hole from the front).

The panel width may be within a range of 0.5 to 20mm.

The drill hole must have a diameter of 53mm.

- ⚠ 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: 65mm.
- ⚠ Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws, keyhole saws or files. Debur edges. Follow the safety instructions of the tool manufacturer.

For 52mm instruments, the fastening nut can be mounted at position A or B. This allows you to realise various clamping heights.

Version A
Clamping height 0.5 - 10mm

Version B
Clamping height 0.5 - 20mm

If the instrument is mounted flush (i.e.: from the back so that the instrument glass and the panel form one plane), the front ring must be removed. Press the instrument glass with both thumbs, while at the same time pressing the front ring forward from the instrument with both index fingers. Note the use of a tool in the adjacent figure.

Flush assembly

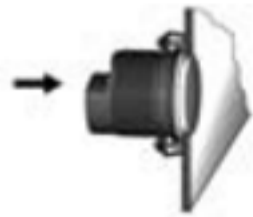
The recommended panel thickness is 1.5 to 3mm.

The drill hole must have a diameter of 48.1mm.

Ensure that the installation location is level and has no sharp edges.

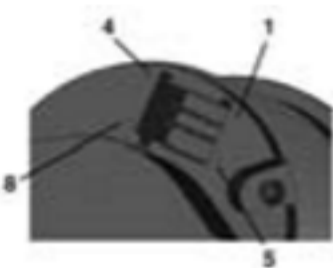
- ⚠ Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- ⚠ Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65mm.
- ⚠ Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber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

Installation Info - Viewline All-Weather



Place the flush mount seal A2C53215640 on the instrument glass.

Put the instrument into the drill hole from the back. Adjust the instruments 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.



Depending on the configuration, insert the cable into the 8-pin contact enclosure according to the following pin assignment. The contacts must audibly lock into place.

- Pin 1 – T. 15 - ignition plus 12V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – unassigned
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – warning LED ground
- Pin 8 – warning LED plus

Now insert the plus into the gauge. Note the inverse polarity protection nose in the process.



Main Connection Harness – 8-pin:A2C-8-way

Aux. Connection Harness – 14-pin:A2C-14-way

Electrical connection:

- Note cable cross-sectional area!
- Reducing 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 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 connection!
- Make crimp connections with cable crimping pliers only. Follow the safety instructions of the tool manufacturer.
- Insulated exposed stranded wires to prevent short circuit.
- 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 together electronic systems. Consequently, all power supply cable connections must be provided with weldable connectors and 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 stabilised and it must comply with the following standard: DIN EN 61000, Parts 6-12 to 6-4.

Installation Info - Viewline All-Weather

Viewline Installation 52mm - Continued



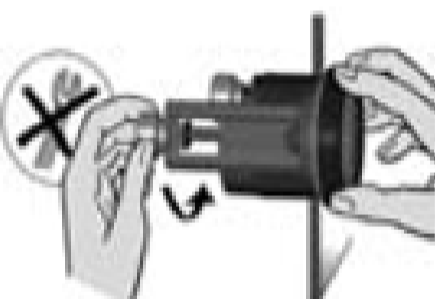
Align the instrument and hand-tighten the fastening nut. Ensure that the nut is not tightened with a torque greater than 400Ncm.

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



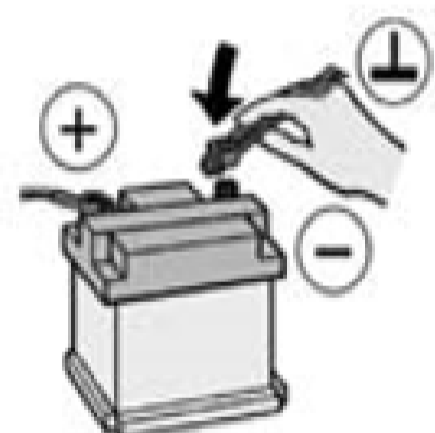
If you would like to omit the fastening nut, you may use the part set A2C59510854 as an alternative. This is recommended if the installation location is subject to vibratory loads.

Screw the stud bolts into the provided drill holes in the enclosure. max stuff bolt torque is 1.5Nm.



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

- Make sure the seal lays flat between the panel and the front ring (see Fig. 14).



Close the battery after inspecting the connection.

⚠ Please note that when you disconnect the battery, all volatile electronic memory lose their input values and must be reprogrammed.



If necessary, replace the main circuit switch. Turn on the ignition and conduct a functional test. Reprogram any other instruments that may have lost their saved settings.

Important: Clean the instrument glass and front frame with water only. Do not use chemical agents.

Installation Info - Viewline All-Weather

Accessories/Spare parts	
Bush contacts 0.25 - 0.5mm	A2C59510846
Bush housing 8-pin	A2C59510847
Hand pliers	Tyco No. 539635-1
Tool for hand pliers	Tyco No. 539682-2
Single contacts 0.14 - 0.22mm	Tyco No. 1355718-1
Single contacts 0.5 - 0.75mm	Tyco No. 963729-1
Strip 0.14 - 0.22mm	Tyco No. 1355717-1
Strip 0.25 - 0.5mm	Tyco No. 928999-1
Strip 0.5 - 0.75mm	Tyco No. 963715-1
Bracket assembly mounting set	A2C59510854
Flush mount fixing bracket	A2C59510864
Flush mount seal	A2C53215640
Fastening nut	A2C53007398
Front ring, flat; black	A2C53186040
Front ring, flat; white	A2C53186022
Front ring, flat; chrome	A2C53186023
Front ring, triangular; black	A2C53186024
Front ring, triangular; white	A2C53186025
Front ring, triangular; chrome	A2C53186026
Front ring, round; black	A2C53186027
Front ring, round; white	A2C53186028
Front ring, round; chrome	A2C53186029
Series resistor 24V (connector not included)	A2C59510221
Series resistor 24V (Connector not included)	A2C59510853
Warning point control	A2C59510886
Protective connector cap, 8-pin	A2C53324664

Temperature, Pressure, Trim, Fuel, Fresh water gauges for level-type sensor

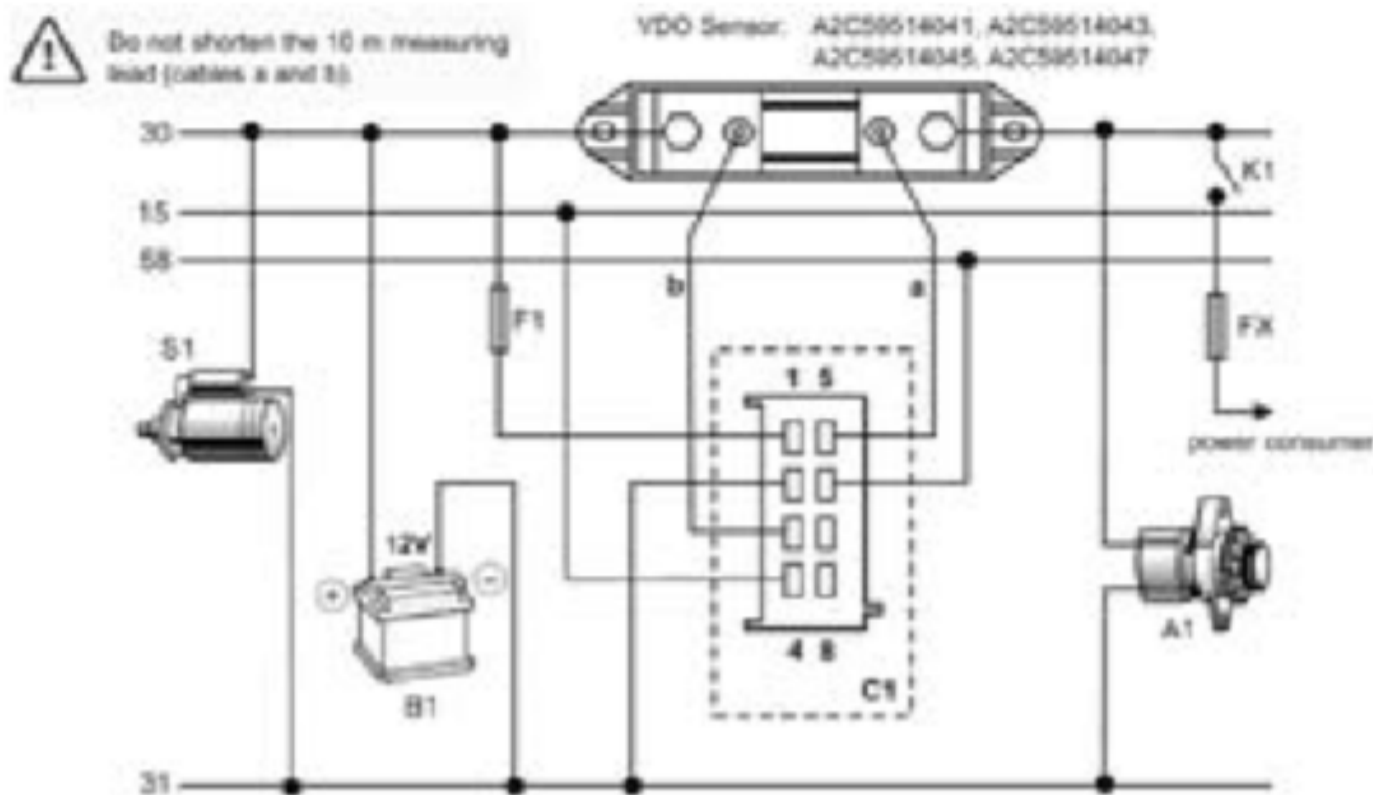
Designations in the wiring diagram:

- 15 – terminal 15 - connected (ignition) plus 12V
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQS connector
- C2 - Series resistor 24

You must comply with the wiring diagram.

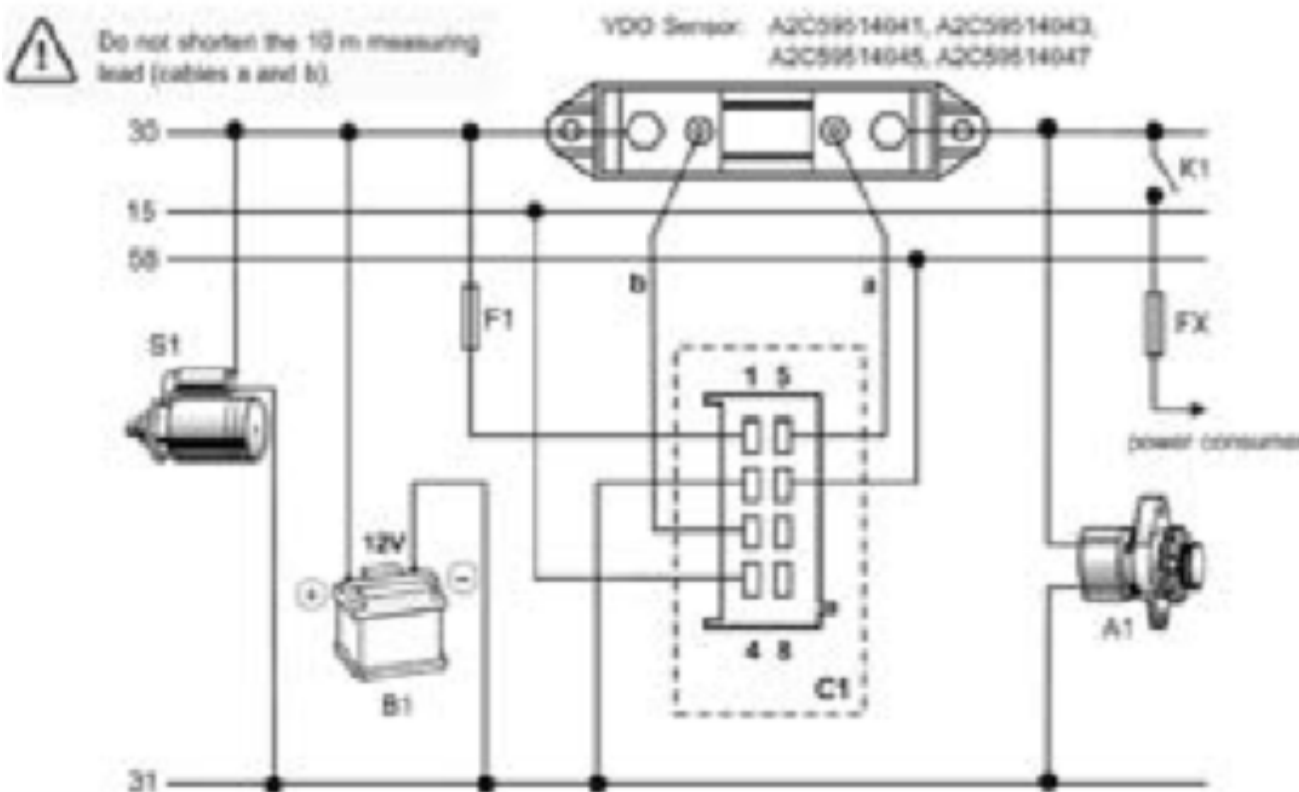
Viewline Installation 52mm - Continued

Ammeter - Connection 12V/24V



Designations in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
- 15 terminal 15 - connected (ignition) plus
- 58 terminal 58 - lighting
- 31 terminal 31 - ground
- A1 – alternator
- B1 – battery
- F1 – fuse 5A quick-response
- K1 switch ignition
- S1 starter



Designations in the wiring diagram:

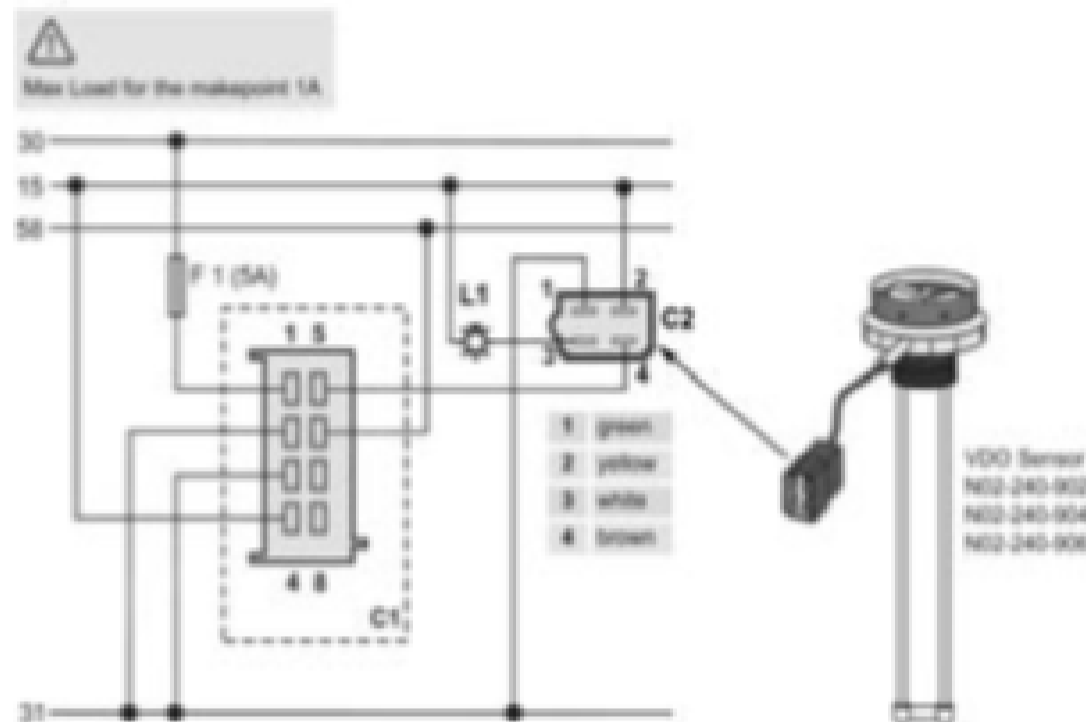
- 30 – term. 30 - steady-state plus 12V/24V
- 15 term. 15 - connected (ignition) plus
- 58 term. 58 - lighting
- 31 term. 31 - ground
- A1 – alternator
- B1 – battery
- C1 8-pole Hirschmann MQS Connector
- F1 – fuse 5A quick-response
- K1 switch ignition
- S1 starter

You must comply with the wiring diagram.

In special cases, show the ship's electrical diagram to your boat yard or to a branch or agent and ask for advice on how to connect the sensors.

Installation Info - Viewline All-Weather

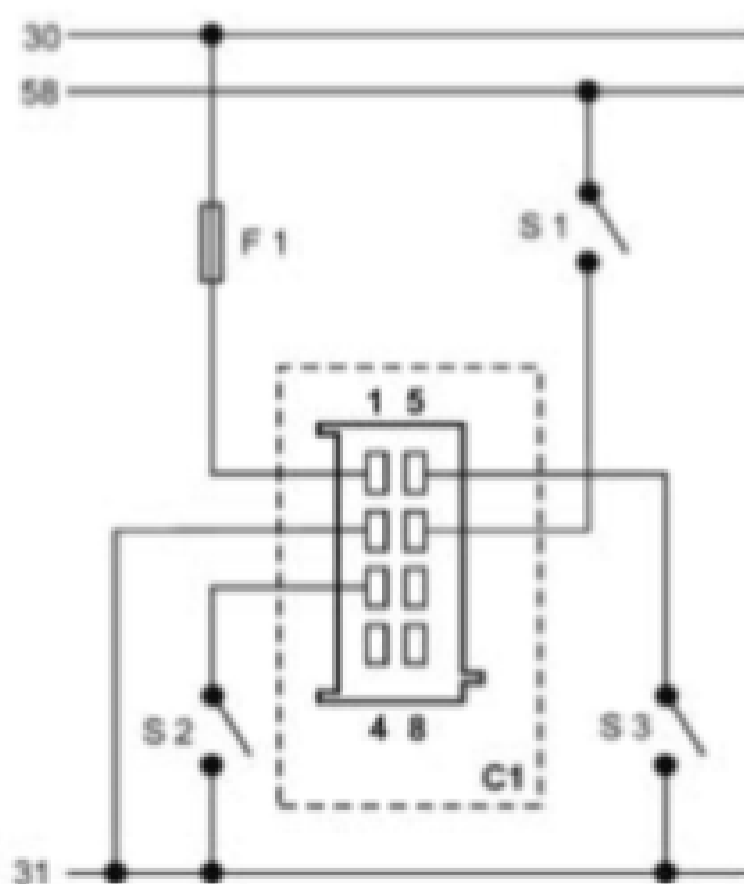
Black Water Gauge - Connection 12V/24V



Designations in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
 - 15 – terminal 15 - connected (ignition) plus
 - 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - F1 – fuse 5A quick-response
 - C1 – 8-pole "Hirschmann MQS" connector
 - C2 – 4-pole connector (Sensor)
 - L1 – Optional external warning light
- You must comply with the wiring diagram.

Clock - Connection 12V/24V



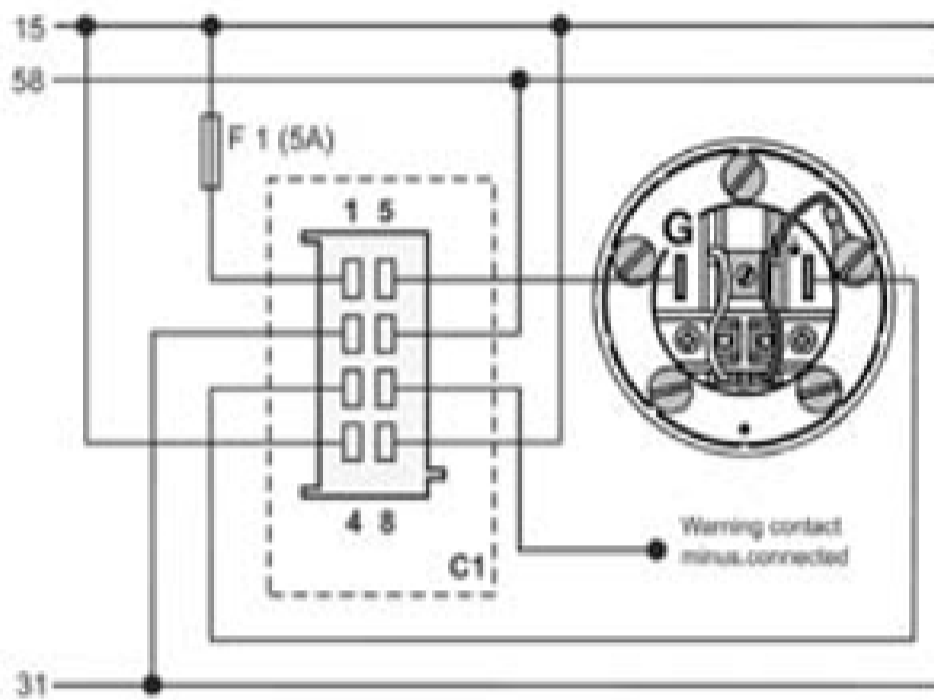
Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
 - 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - F1 – fuse 5A quick - response
 - S1 – light switch
 - S2 – clock setting, forwards
 - S3 – clock setting, backwards
 - C1 – 8-pin MQS connector
- You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 52mm - Continued

Freshwater Level - Connection 12V/24V

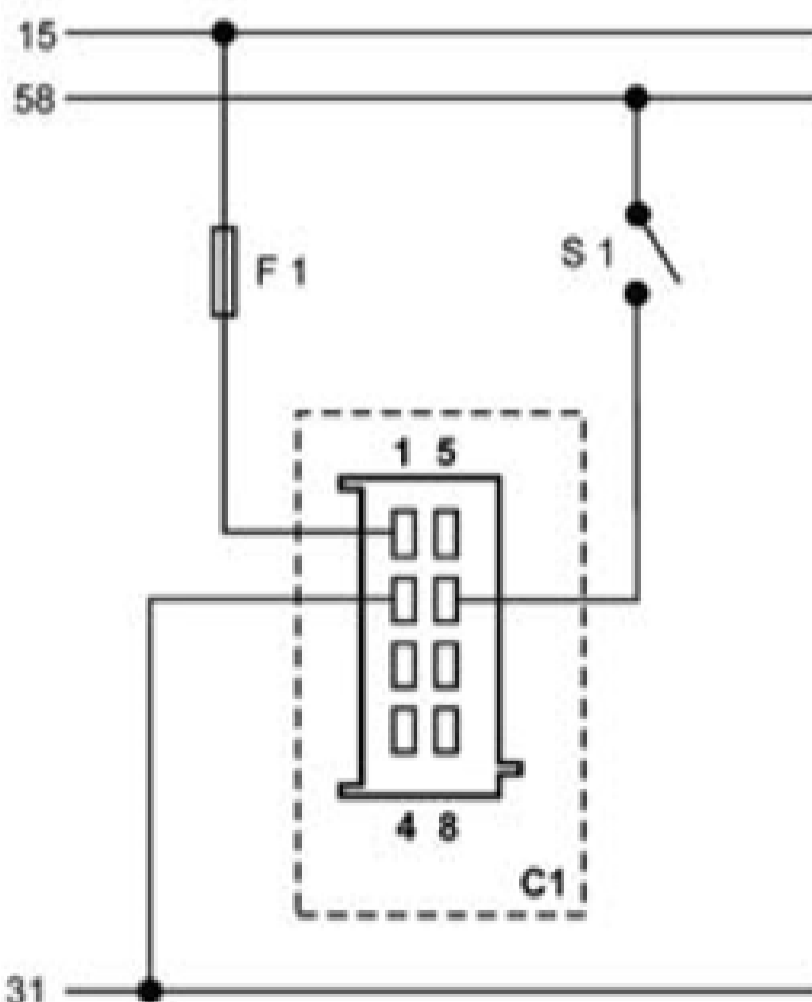


Designations in the wiring diagram:

- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick-response
- C1 – 8-pin "Hirschmann MQS" connector

You must comply with the wiring diagram.

Hourmeter - Connection 12V/24V



Designation in the wiring diagram:

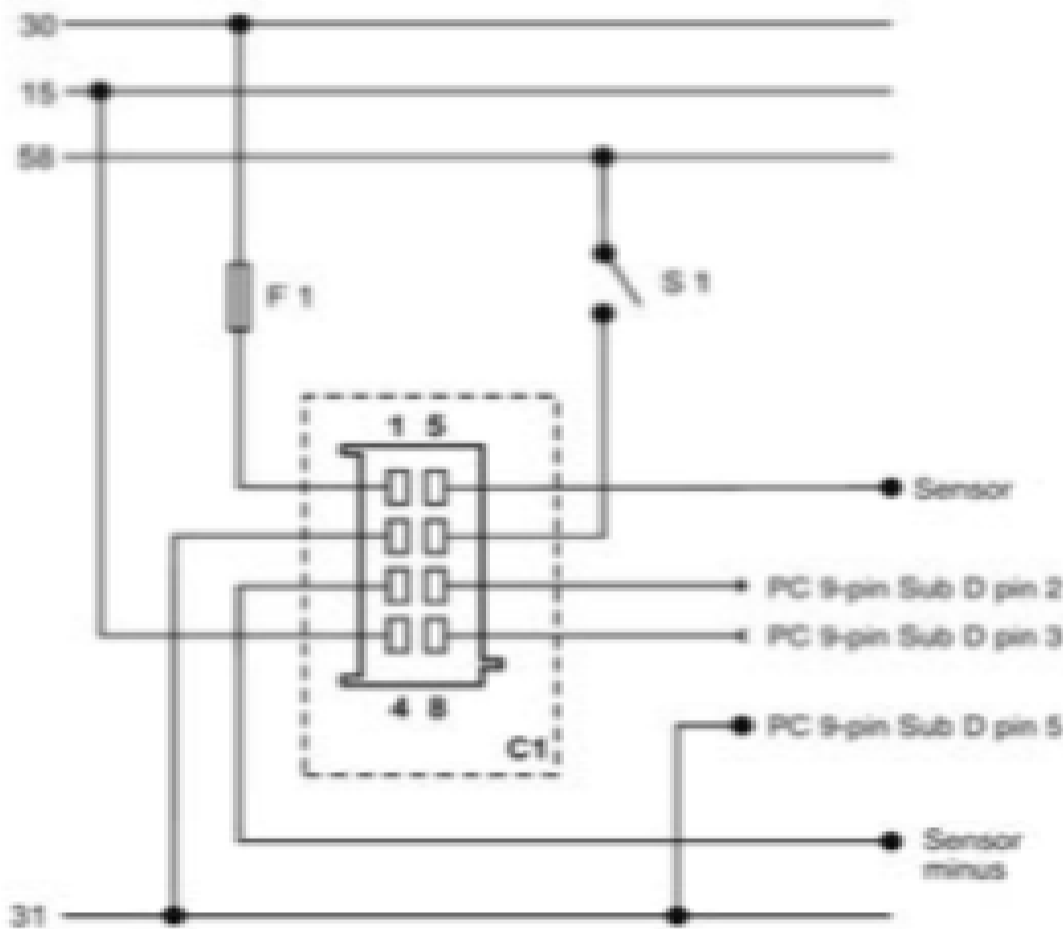
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – light switch
- C1 – 8-pin MQS connector

You must comply with the wiring diagram.



Installation Info - Viewline All-Weather

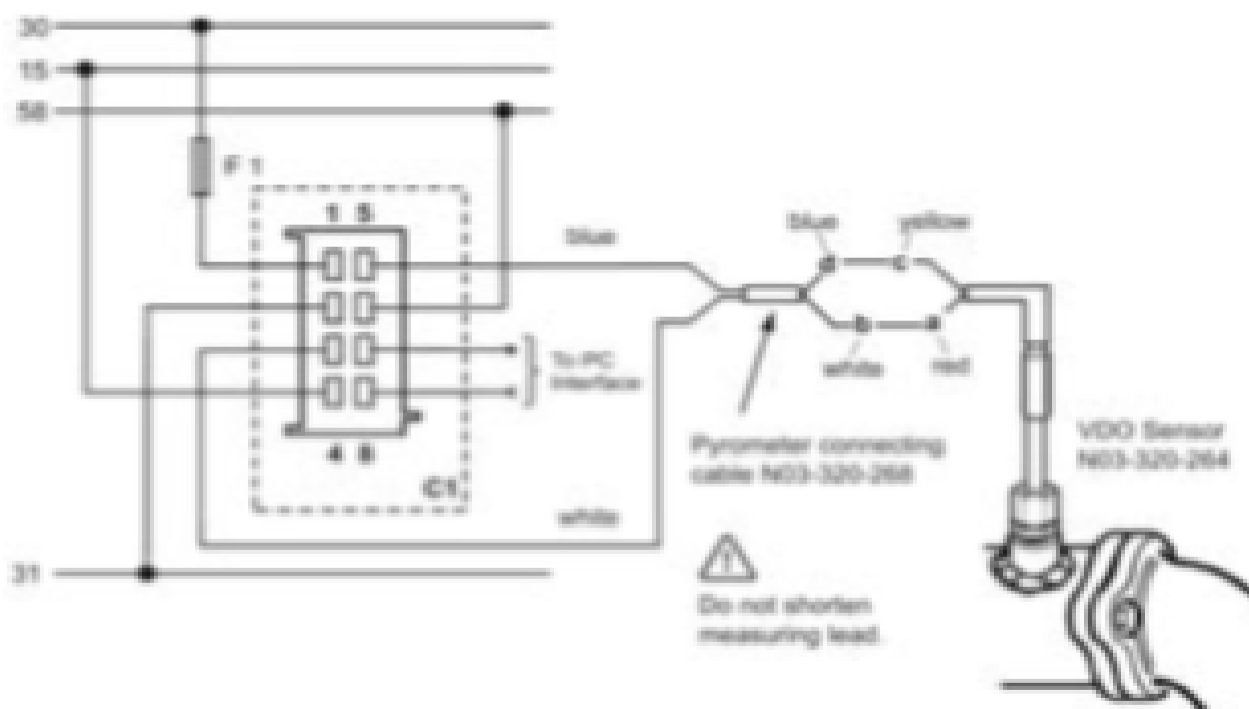
Outside Temperature Gauge - Connection 12V/24V



Designations in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
 - 15 – terminal 15 - connected (ignition) plus
 - 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - F1 – fuse 5A quick - response
 - S1 – light switch
 - C1 – 8-pin MQS connector
- You must comply with the wiring diagram.

Pyrometer - Connection 12V/24V



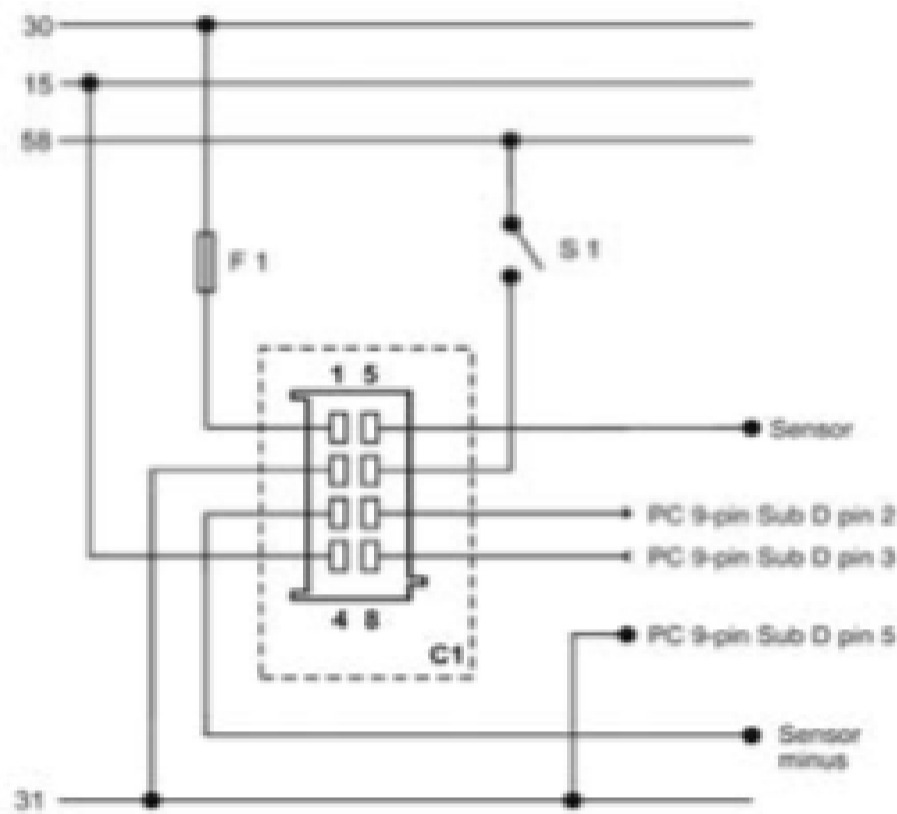
Designations in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
 - 15 – terminal 15 - connected (ignition) plus
 - 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - F1 – fuse 5A quick-response
 - C1 – 8-pole "Hirschmann MQS" Connector
- You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 52mm - Continued

Tachometer - Connection 12V/24V



Designations in the diagram:

- 30 – terminal - steady-state plus 12V/24V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – light switch
- C1 – 8-pin MQS connector

You must comply with the wiring diagram.

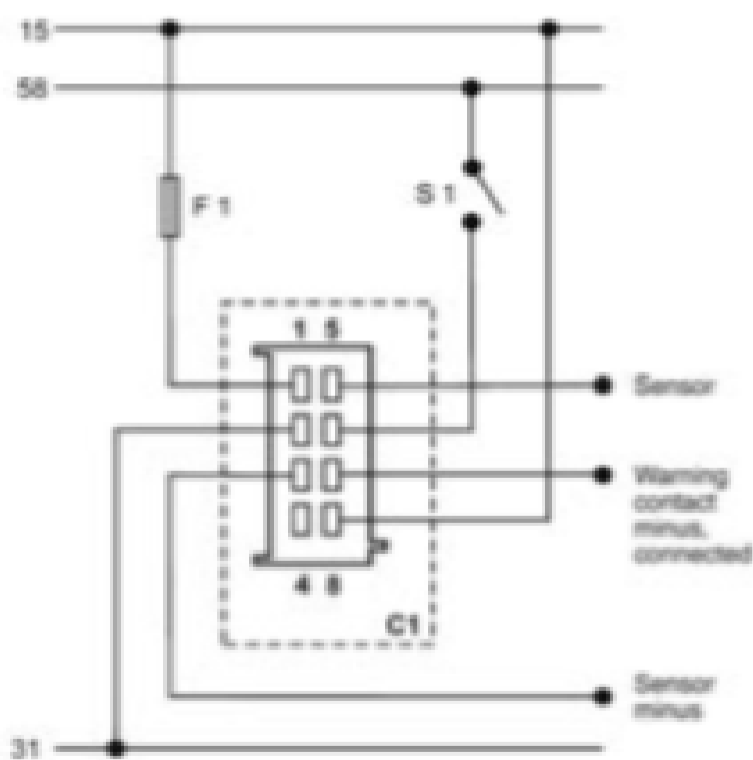
Startup

Setting the impulse number:

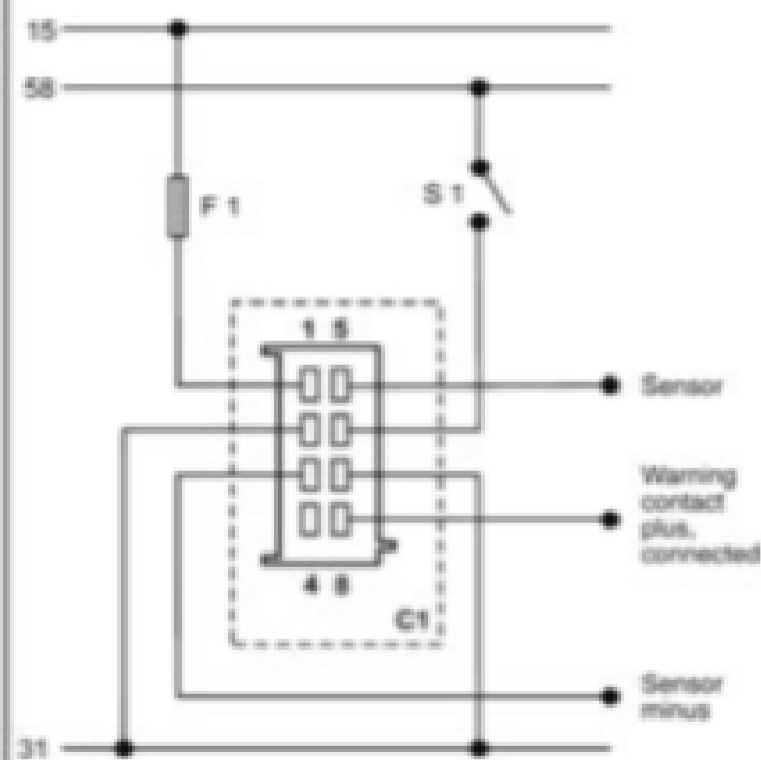
The revolution counter is factory – set to 6 impulses per revolution. Optionally available PC software can be used to change the number of impulses. Please contact your VDO partner for more information.

Tank Gauge for Immersion Tube Sensor - Connection 12V/24V

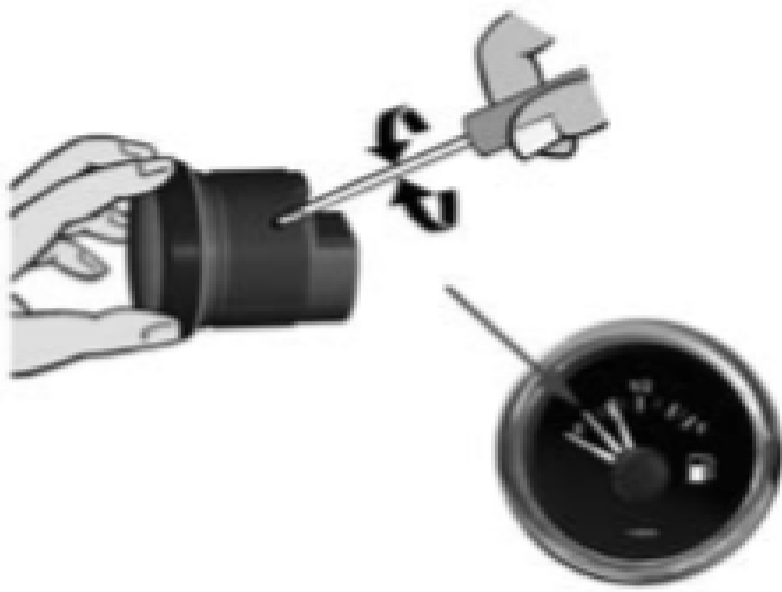
Variant 1: Warning contact minus, connected



Variant 2: Warning contact plus, connected



Installation Info - Viewline All-Weather



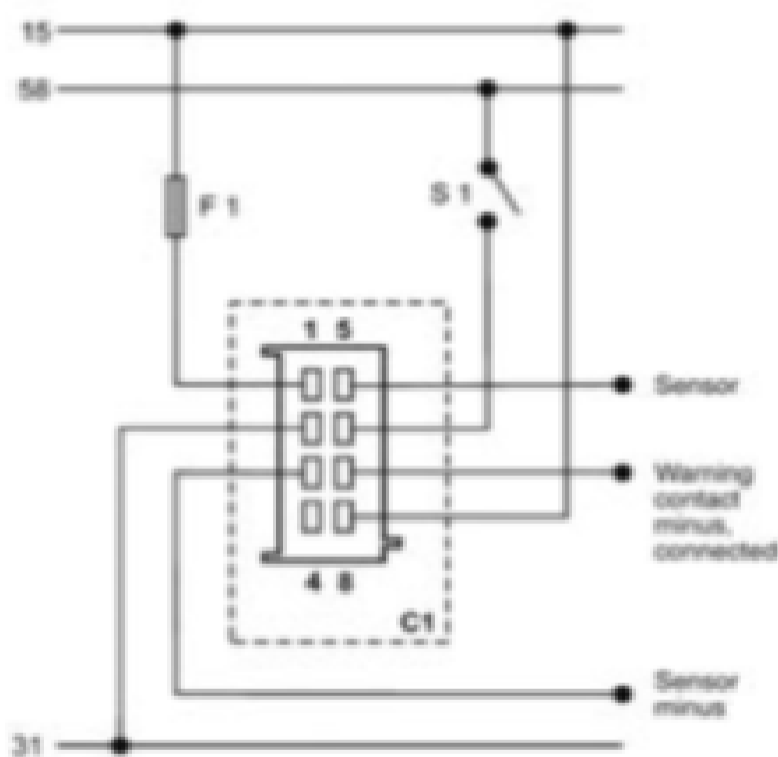
Designation in the wiring diagram:

- 30 – terminal - steady-state plus 12V/24V
 - 15 – terminal 15 - connected (ignition) plus
 - 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - F1 – fuse 5A quick - response
 - S1 – light switch
 - C1 – 8-pin MQS connector
- You must comply with the wiring diagram.

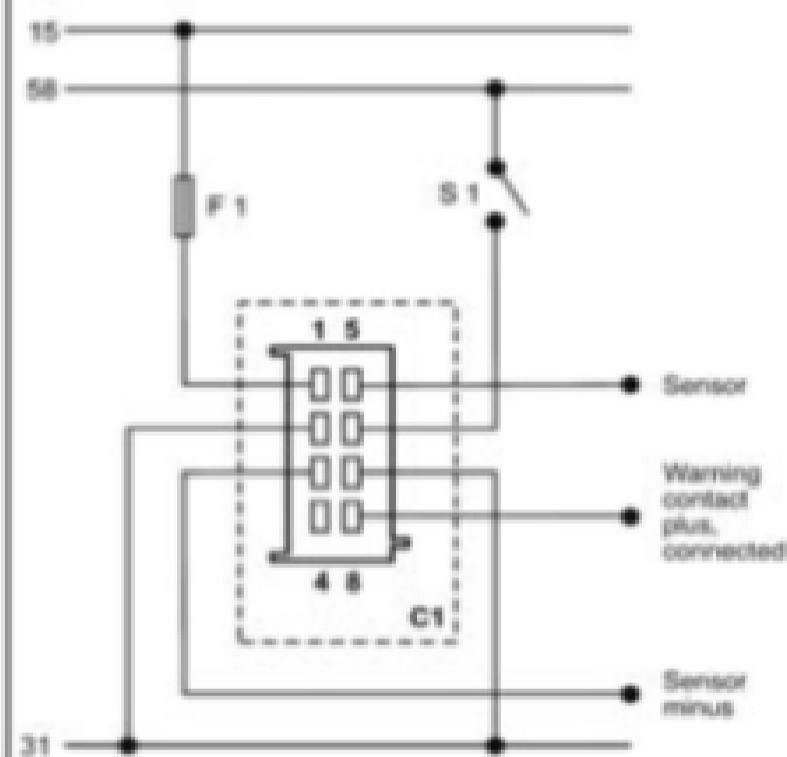
The gauge must be calibrated to the connected immersion tube sensor. Adjust the setting with an insulated screwdriver when the tank is empty. Rotate the potentiometer until the gauge reads empty (O or E). The potentiometer's setting range is between 60 and 90.

Temp, Pressure, Rudder Angle, Trim, Fuel Level Gauges - Connection 12V/24V

Variant 1: Warning contact minus, connected



Variant 2: Warning contact plus, connected



Designations in the wiring diagram:

- 15 – terminal 15 - connected (ignition) plus 12V/24V
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground

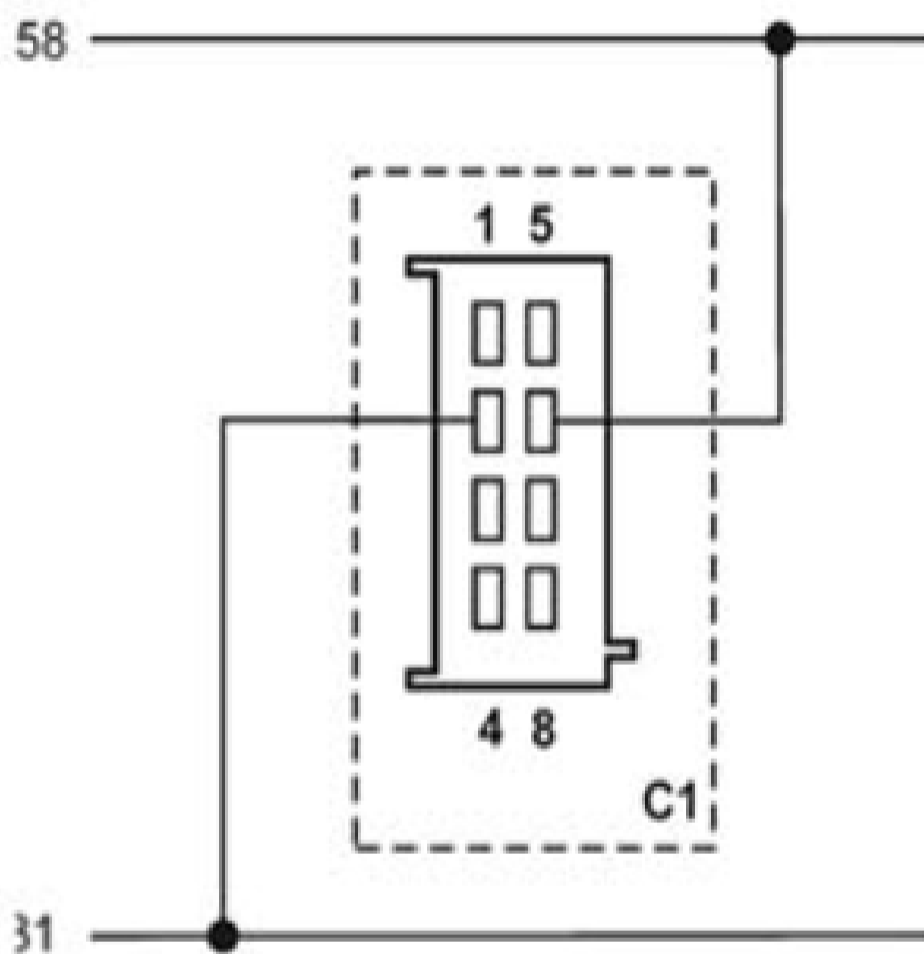
- F1 – use 5A quick-response
 - C1 – 8-pin MQS connector
- You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 52mm - Continued

Water Pressure

Connection 8-pole



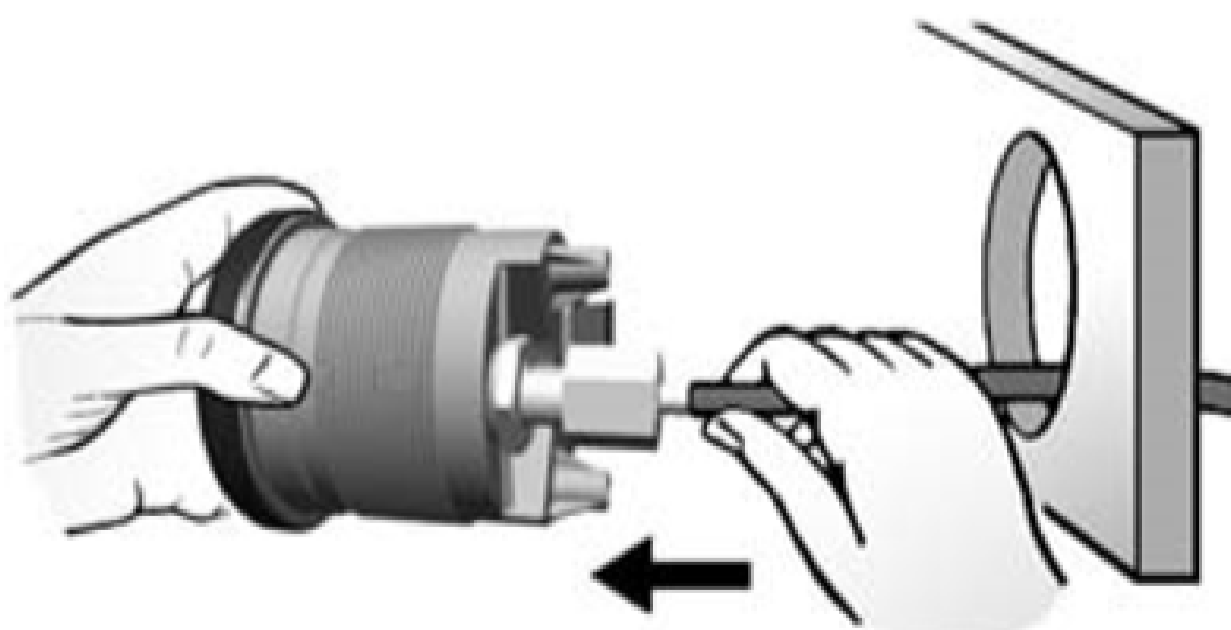
Designations in the wiring diagram:

58 – terminal 58 - lighting

31 – terminal 31 - ground

C1 – 8-pin MQS connector

You must comply with the wiring diagram.



Recommended tube inside diameter 3.8 mm. Burst pressure min 10 bar.

VDO

Installation Info - Viewline All-Weather


Viewline Installation 85mm

Safety Instructions:

- 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 VDO 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 installations:

- 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 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 jewellery 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: 65mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tool, saber saws, keyhole saws or files. Debur 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 the conventional test lamps can cause damage to control units or other electronic systems.
- The electrical indicator outputs an cables connected to them must be protected from direct contact and damage. The cables in use must have sufficient insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measure to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, un-insulated cables and contacts is prohibited.

 **No Smoking!**
No open fire or lights!

VDO


Viewline Installation 85mm

Safety Instructions:

- 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 VDO 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 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 jewellery 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: 65mm,
- Drill small ports; enlarge and complete them, if necessary, using taper milling tool, saber saws, keyhole saws or files. Debur 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 the conventional test lamps can cause damage to control units or other electronic systems.
- The electrical indicator outputs an cables connected to them must be protected from direct contact and damage. The cables in use must have sufficient insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measure to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, un-insulated cables and contacts is prohibited.

 **No Smoking!**
No open fire or lights!

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



The following rings may be installed as alternatives to the supplied front ring:

Front ring, flat; black	A2C53192911
Front ring, flat; white	A2C53192912
Front ring, flat; chrome	A2C53192910
Front ring, flat; black	A2C53192917
Front ring, triangular; white	A2C53192920
Front ring, triangular; chrome	A2C53192918
Front ring, round; black	A2C53192913
Front ring, round; white	A2C53192916
Front ring, round; chrome	A2C53192914



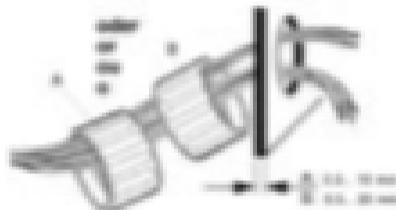
Place the new front ring on the instrument and press it on until it is flush with the instrument glass.



Conventional assembly: (instrument is put into the drill hole from the front).
The panel width may be within a range of 0.5 to 20mm.

The drill hole must have a diameter of 53mm.

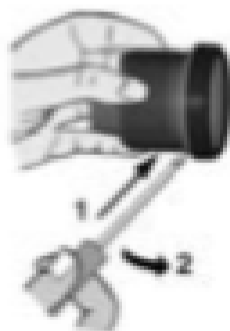
- ⚠ Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- ⚠ Note the necessary clearance behind the drill hole or port at the installation location. Required mounting depth: 65mm.
- ⚠ Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber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



For 85mm instruments, the fastening nut can be mounted at position A or B.
This allows you to realise various clamping heights.

Version A
Panel bore 85.5 - 86mm
Circumferential lip away from instrument

Version B
Panel bore 80.5 - 81mm
Circumferential lip next to instrument



If the instrument is mounted flush (i.e.: from the back so that the instrument glass and the panel form one plane), the front ring must be removed. Press the instrument glass with both thumbs, while at the same time pressing the front ring forward from the instrument with both index fingers. Note the use of a tool in the adjacent figure.



Flush assembly

The recommended panel thickness is 1.5 to 3mm.

The drill hole must have a diameter of 75.4mm.

Ensure that the installation location is level and has no sharp edges.

- ⚠ 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: 65mm.
- ⚠ 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.

Ac
Go

Viewline Installation 85mm - Continued



Place the flush mount seal A2C53215641 on the instrument glass.

Put the instrument into the drill hole from the back. Adjust the instruments 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.

Main Connection Harness – 8-pin: A2C-8-way

Aux. Connection Harness – 14-pin: A2C-14-way

Electrical connections:

- Note cable cross-sectional area!
- Reducing 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 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 connection!
- Make crimp connections with cable crimping pliers only. Follow the safety instructions of the tool manufacturer.
- Insulate exposed stranded wires to prevent short circuit.
- 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 together electronic systems. Consequently, all power supply cable connections must be provided with weldable connectors and 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 stabilised and it must comply with the following standard:
DIN EN 61000, Parts 6-12 to 6-4.



Align the instrument and hand-tighten the fastening nut. Ensure that the nut is not tightened with a torque greater than 400Nm.

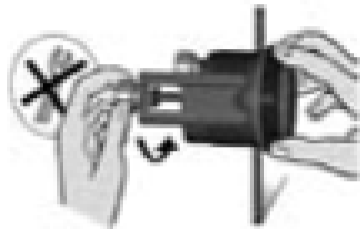
- Make sure the seal lays flat between the panel and the front ring.

If you would like to omit the fastening nut, you may use the part set A2C59510854 as an alternative. This is recommended if the installation location is subject to vibratory loads.

Screw the stud bolts into the provided drill holes in the enclosure. max stuff bolt torque is 1.5Nm.

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



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

- Make sure the seal lays flat between the panel and the front ring (see Fig. 14).



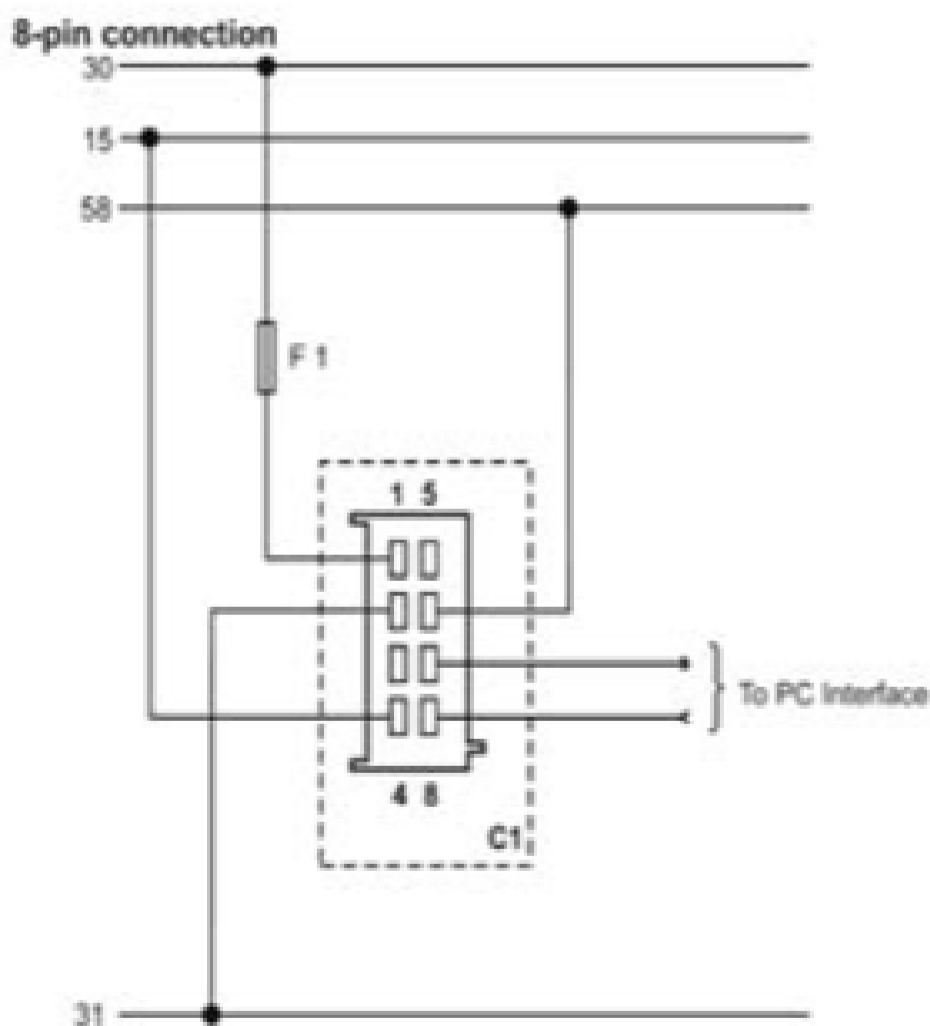
Close the battery after inspecting the connection.

⚠ Please note that when you disconnect the battery, all volatile electronic memory lose their input values and must be reprogrammed.



If necessary, replace the main circuit switch. Turn on the ignition and conduct a functional test. Reprogram any other instruments that may have lost their saved settings.

Depth gauge - Connection 12V/24V



Designations in the wiring diagram:

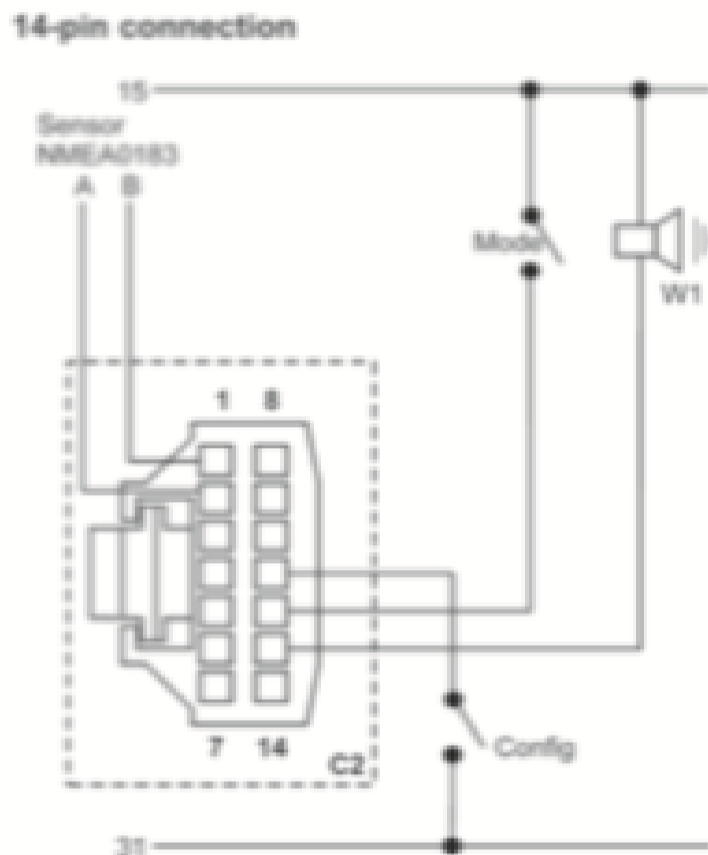
- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A, quick-response
- C1 – 8-pin MQS connector
- C2 – 14-pin MQS connector
- Config – Configuration key
- Mode – Mode key
- WI – Optional alarm output (max. 100mA)

You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Depth gauge - Connection 12V/24V



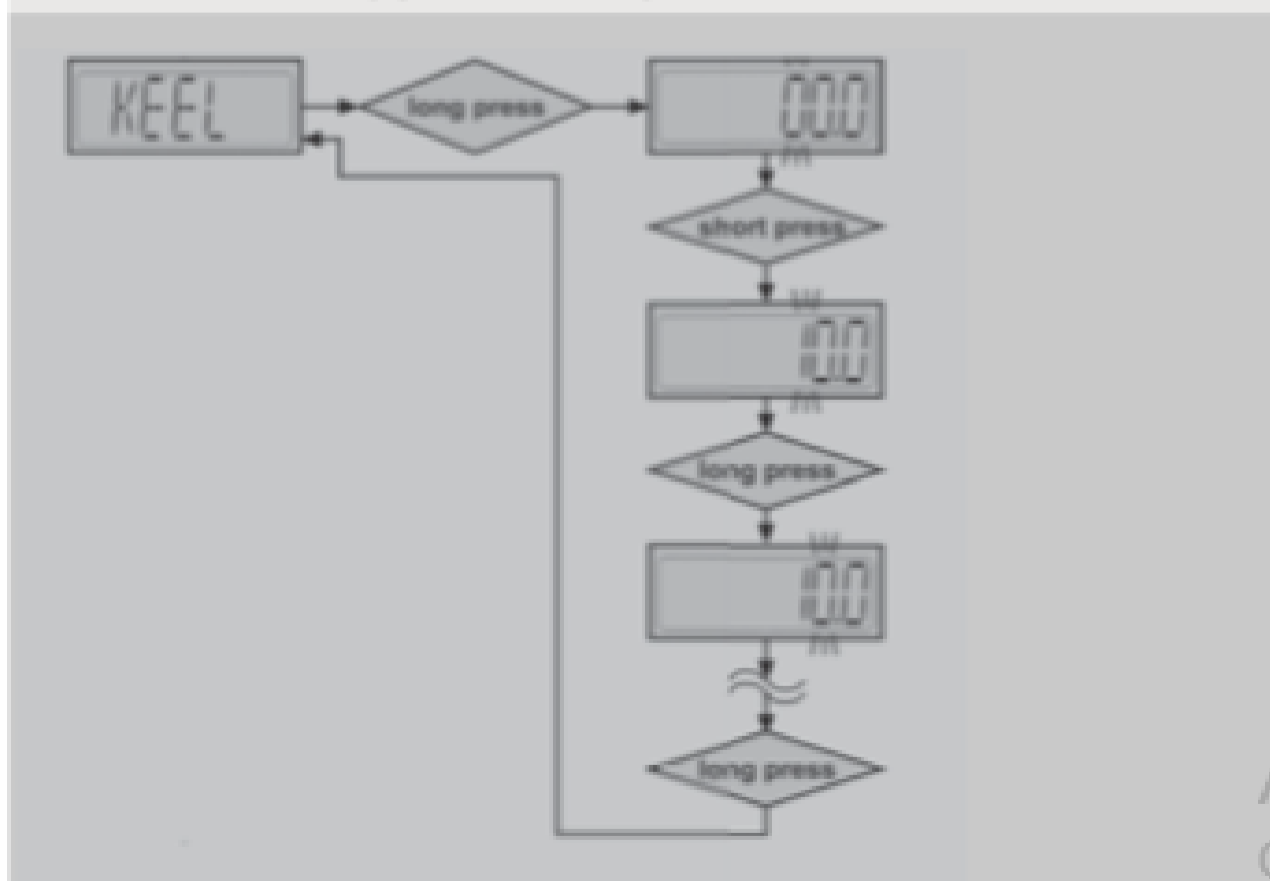
Designations in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick-response
- C1 – 8-pin MQ5 connector
- C2 – 14-pin MQ5 connector
- Config – Configuration key
- Mode – Mode key
- W1 – Optional alarm output (max 100mA)

You must comply with the wiring diagram.

Operation

1. Activate Term. 30 (8-pin connector - Pin1)
2. Deactivate Term. 15 (8-pin connector - Pin4)
3. Press and hold down the config. button (14-pole - Pin1)
4. Activate Term. 15 (8-pin connector - Pin4)



Basics:

Function KEEL

Set the difference between lower edge of the keel and lower edge of the depth sounder sensor.

This ensures that the display shows the depth under the keel.

The flashing digit increases by 1.

If the flashing digit is "9", the display returns to "0"

The next lower digit flashes

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Start-up:

1. Setting the unit, alarm threshold and time zone (TIMEZ)

1. Activate Term. 30 (8-pin connector - Pin1)
2. Deactivate Term. 15 (8-pin connector - Pin4)
3. Press and hold down the config.button (14-pole - Pin1)
4. Activate Term. 15 (8-pin connector - Pin4)

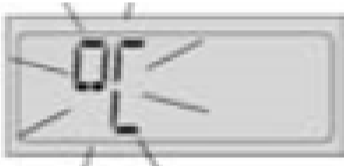


Press and hold Mode key



By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format

Press and hold Mode key

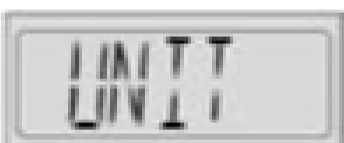


Press the Mode key to change the water temperature unit from C - F (symbol)

Press and hold Mode key



Press mode key briefly to change the water depth unit from von m to ft



Press Mode key briefly

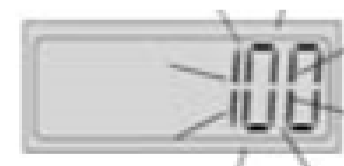


Press and hold Mode key



Set alarm threshold is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'.

Press and hold Mode key



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'.

Continue until the complete alarm threshold is set

Press and hold Mode key

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Deactivate T. 15. This saves the unit and the alarm threshold in the display



Time zone set is displayed, the first position flashes

Press and hold Mode key



Time zone set is displayed, the first position flashes

Press Mode key briefly



The flashing digit is increased by 1. If the flashing position is a "12" the display jumps to "-1"

Press and hold Mode key

In operation:

1. Display Indicator

1. Activate T. 30 (8-pin connector - Pin 1)

2. Activate T. 15 (8-pin connector - Pin 4)



Depth

Press Mode key briefly



Time

Press Mode key briefly



Water temperature

Press Mode key briefly



On-board voltage

2. Setting the clock

1. Activate T. 30 (8-pin connector - Pin 1)

2. Activate T. 15 (8-pin connector - Pin 4)

Press the Mode key repeatedly until the time is displayed

Press and hold Mode key

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Set time is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Press and hold the Mode key



The next lower digit flashes

Press and Hold mode key



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Continue until the correct time is set

Press and hold the Mode key



Clock is set

Important: if T. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the on-board voltage is displayed



Press and hold the Mode key



Press the Mode key repeatedly until the desired brightness is reached. The brightness can be set between 0 (OFF) to 10 (max)



Press and hold Mode key

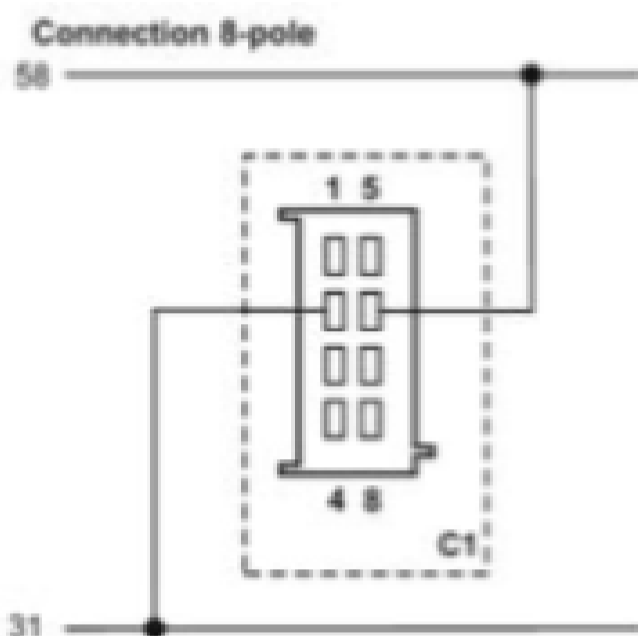


The desired brightness is now permanently set

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

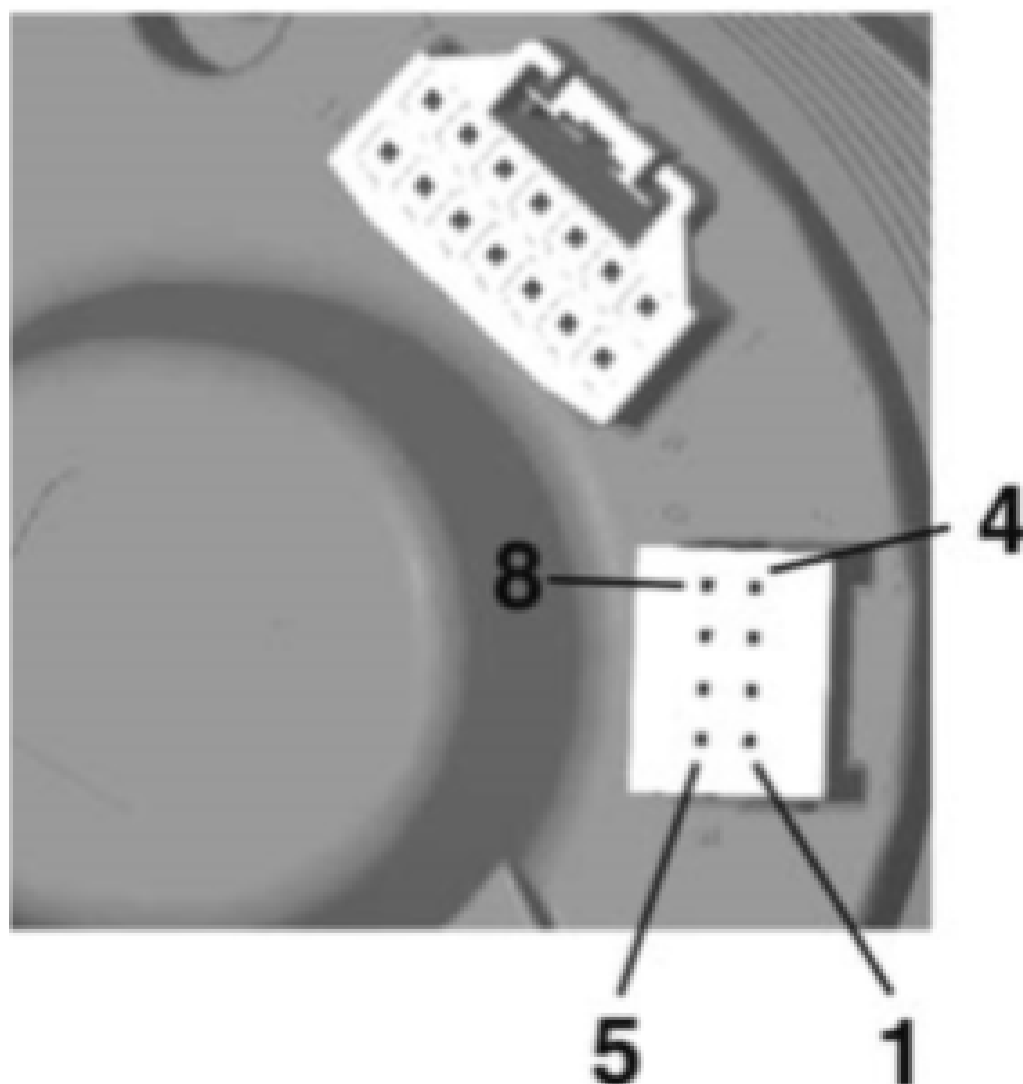
Pitot Speedometer gauge - Connection 12V/24V



Designations in the wiring diagram:

- 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - C1 – 8-pin MQS connector
- You must comply with the wiring diagram.

Rudder Position - Connection 12V/24V



Depending on the configuration, insert the cable into the 8-pin contact housing according to the following pin assignment. The contacts must audibly lock into place

8-pin contact housing

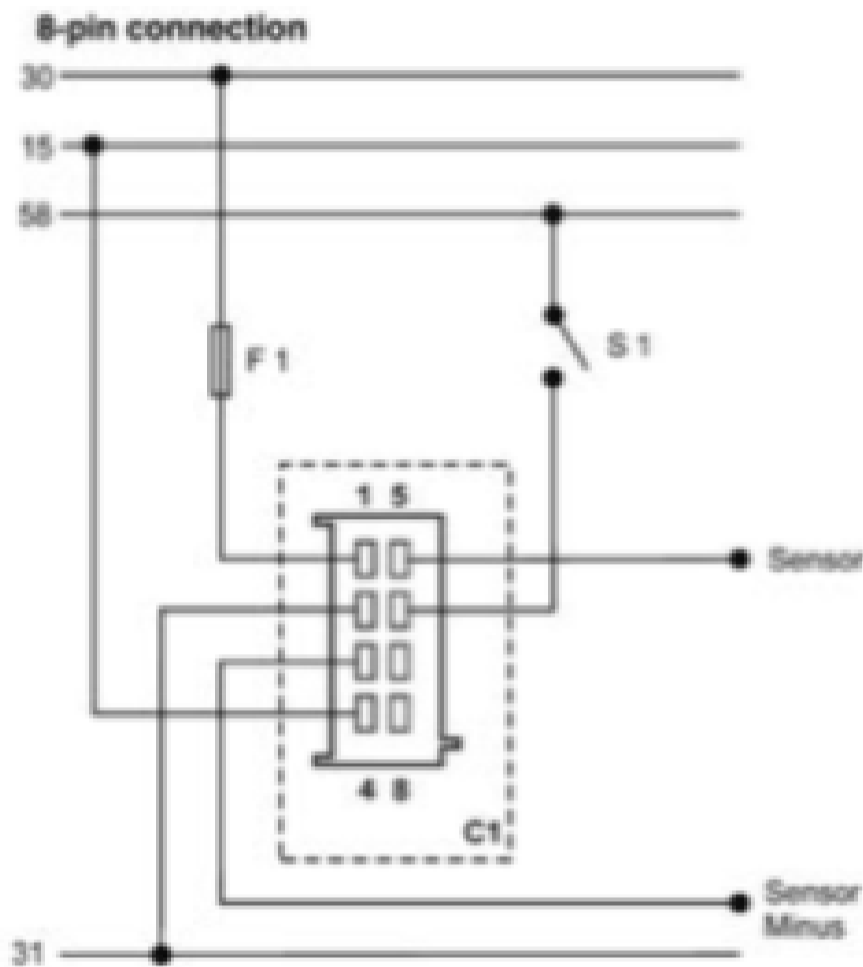
- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – unassigned
- Pin 8 – unassigned

Now insert the plug into the gauge. Note the inverse polarity protection nose in the process.

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Rudder Position - Connection 12V/24V

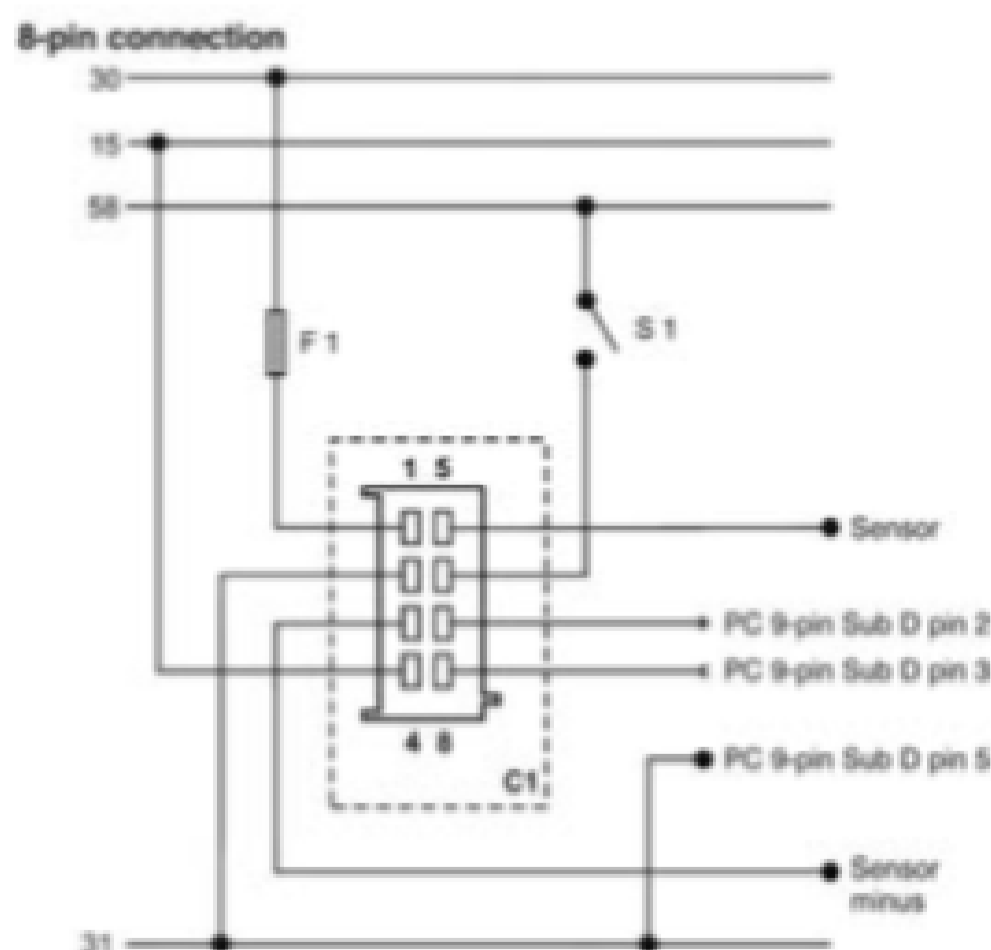


Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – light switch
- C1 – 8-pin MQ5 connector

You must comply with the wiring diagram.

Speedometer - Connection 12V/24V



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQ5 connector

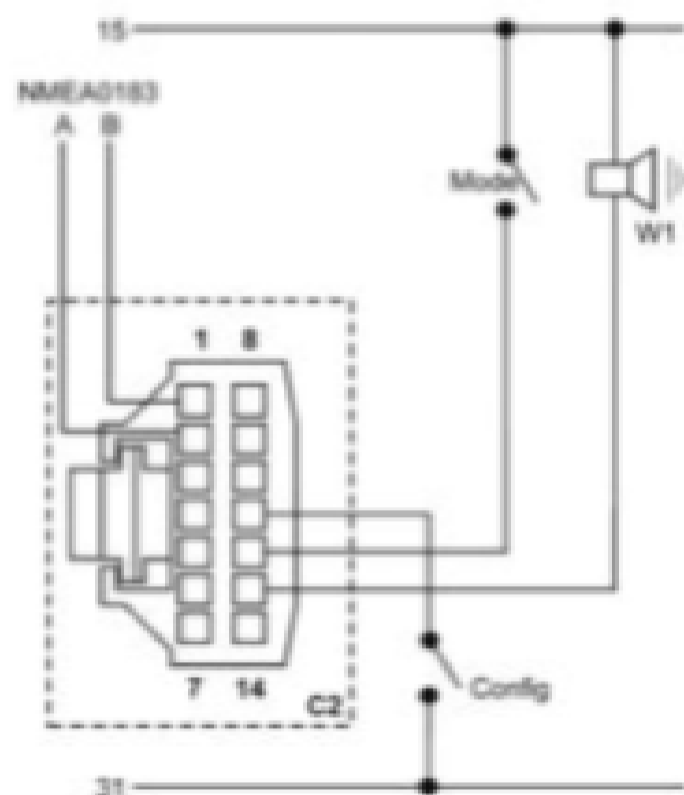
You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Speedometer - Connection 12V/24V

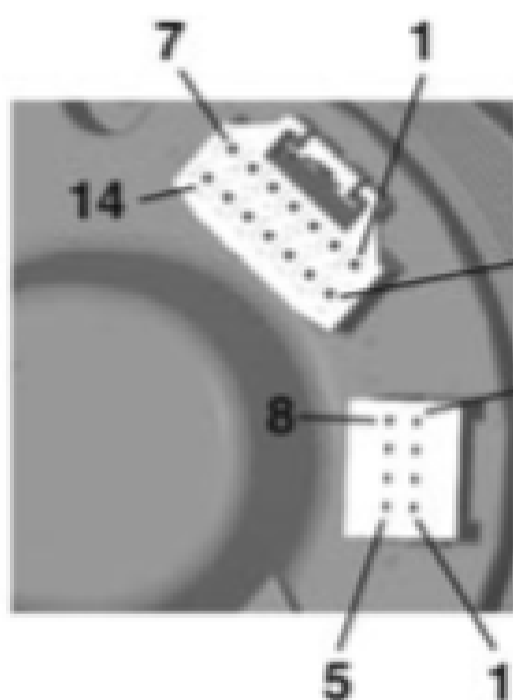
14-pin connection



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQS connector

You must comply with the wiring diagram.



Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – unassigned
- Pin 8 – unassigned

14-pin contact housing

- Pin 1 – unassigned
- Pin 2 – unassigned
- Pin 3 – unassigned
- Pin 4 – unassigned
- Pin 5 – unassigned
- Pin 6 – unassigned
- Pin 7 – unassigned
- Pin 8 – unassigned
- Pin 9 – unassigned
- Pin 10 – unassigned
- Pin 11 – configuration key
- Pin 12 – mode key
- Pin 13 – alarm output (max 100mA)
- Pin 14 – unassigned

Now insert the plugs into the gauge. Note the inverse polarity protection nose in the process.

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Basics:

Operation

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.

Start-up:

1. Setting the signal source and pulse count

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 145 (8-pin connector - Pin4)
3. Press and hold Config key (14-pin connector - Pin1)

Activate T. 15
 Release Config key



Press and hold Config key



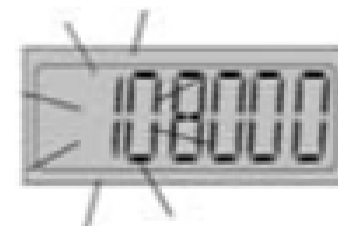
Press and Config key to changeover between the frequency input (8-pole plug - pin5) and the NMEA0183 input (14-pole plug, Pins 1 and 2)
 Press Config key briefly



Press and hold Config key



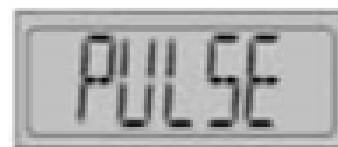
Set impulse number is displayed, the first digit flashes
 Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9' the display returns to '0'
 Press Config key briefly



The next lower digit flashes
 Press Config key briefly
 Continue until the complete impulse number is set
 Press and hold Config key



Deactivate T. 15. This saves the impulse number in the display



Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

2. Setting the unit and alarm threshold

1. Activate T. 302 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin - Pin4)
3. Press and hold Mode key (14-pin connector - Pin12)

Activate T. 15
Release Mode key



Press and hold mode key



By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format
Press and hold Mode key



Press Mode key briefly



Press and hold Mode key



Set alarm threshold is displayed, the first digit flashes
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Press and hold Mode key
Continue until the complete alarm threshold is set
Press and hold the Mode key



Deactivate T. 15. This saves the unit and the alarm threshold in the display

3. Setting the clock

1. Activate T. 30 (8-pin connector - Pin1)
 2. Activate T. 15 (8-pin connector - Pin4)
- Press the Mode key repeatedly until the time is displayed
Press and hold Mode key



Set time is displayed, the first digit flashes
Press Mode key briefly

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Press and hold the Mode key



The next lower digit flashes

Press and Hold mode key



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Continue until the correct time is set

Press and hold the Mode key



Clock is set

Important: if Y. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the on-board voltage is displayed



Press and hold the Mode key



Press the Mode key repeatedly until the desired brightness is reached. The brightness can be set between 0 (OFF) to 10 (max)



Press and hold Mode key



The desired brightness is now permanently set

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

In operation:



1. Display Indicator selection

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Odometer

Press Mode key briefly

Tripometer

Press Mode key briefly

Time

Press Mode key briefly

On-board voltage

2. Resetting the day counter

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the trip distance are displayed



Press an hold Mode key

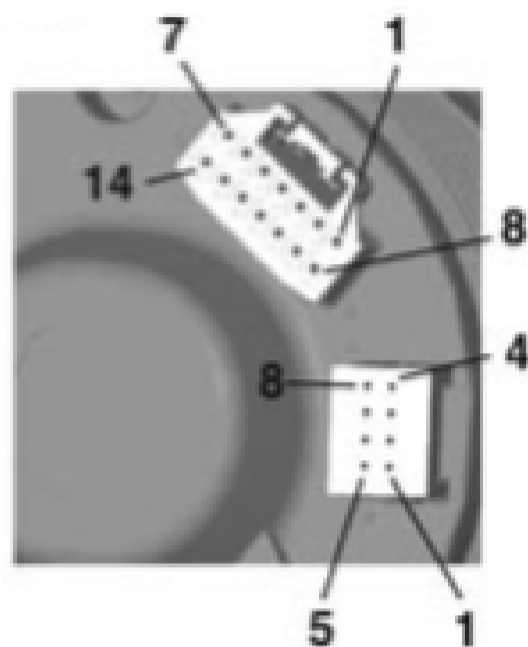


Trip is now deleted

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Sumlog - Connection 12V/24V



Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

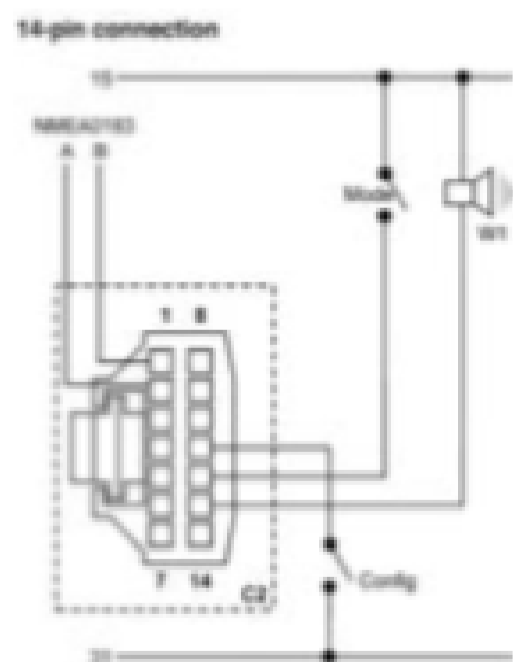
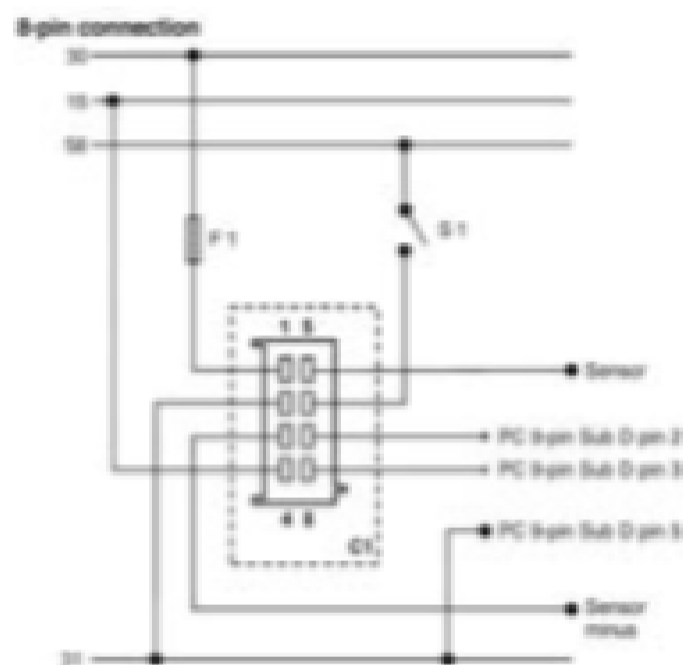
8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – unassigned
- Pin 8 – unassigned

14-pin contact housing

- Pin 1 - NMEA0183-B
- Pin 2 - NMEA0183-A
- Pin 3 – unassigned
- Pin 4 – unassigned
- Pin 5 – unassigned
- Pin 6 – unassigned
- Pin 7 – unassigned
- Pin 8 – unassigned
- Pin 9 – unassigned
- Pin 10 – unassigned
- Pin 11 – Configuration key
- Pin 12 – Mode key
- Pin 13 – Alarm output (max: 100mA)
- Pin 14 – unassigned

Now insert the plugs into the gauge. Note the inverse polarity protection nose in the process.



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V/24V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQS connector

You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Basics:

Operation

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

Start-up:

I. Setting the signal source and pulse count



Activate T. 15
 Release Config key



Press and hold Config key



Press the Config key to changeover between the frequency input (8-pole plug - pin 5) and the NMEA0183 input (14-pole plug, Pins 1 and 2).
 Press and hold Config key briefly



Press the Config key



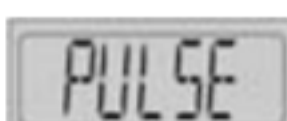
Set impulse number is displayed, the first digit flashes
 Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
 Press Config key briefly



The next lower digit flashes
 Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
 Continue until the complete impulse number is set
 Press the hold Config key

Deactivate T. 15. This saves the impulses number in the display

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

2. Setting the unit and alarm threshold

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin connector - Pin4)

Activate T. 15

Release Mode key



Press and hold Mode key



By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format

Press and hold Mode key



Press the Mode key to change the water temperature unit from C - F (symbol)

Press and hold Mode key



Press mode key briefly to change the water depth unit from von m to ft



Press Mode key briefly

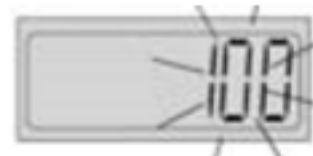


Press and hold Mode key



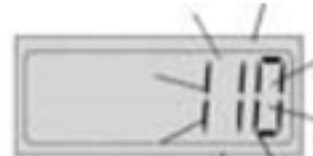
Set alarm threshold is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'

Press and hold Mode key



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'

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

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

In operation

1. Display Indicator

- 1. Activate T. 30 (8-pin connector - Pin1)
- 2. Activate T. 15 (8-pin connector - Pin4)



Odometer

Press Mode key briefly



Tripometer

Press Mode key briefly



Depth

Press Mode key briefly



Time

Press Mode key briefly



Water temperature

Press Mode key briefly



On-board voltage

2. Resetting the day counter

- 1. Activate T. 30 (8-pin connector - Pin1)
- 2. Activate T. 15 (8-pin connector - Pin4)

Press the mode key repeatedly until the trip distance are displayed



Press and hold Mode key



Trip is now deleted

3. Setting the clock

- 1. Activate T. 30 (8-pin connector - Pin1)
- 2. Deactivate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the time is displayed

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Press and hold Mode key

Set time is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Press and hold Mode key



The next lower digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Continue until the correct time is set

Press and hold Mode key



Clock is set

Important: If T. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the on-board voltage is displayed



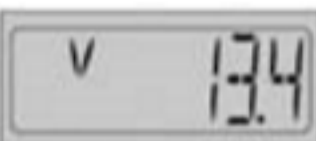
Press and hold Mode key



Press the Mode key repeatedly until the desired brightness is reached. The brightness can be set between 0 (OFF) to 10 (max)



Press and hold Mode key

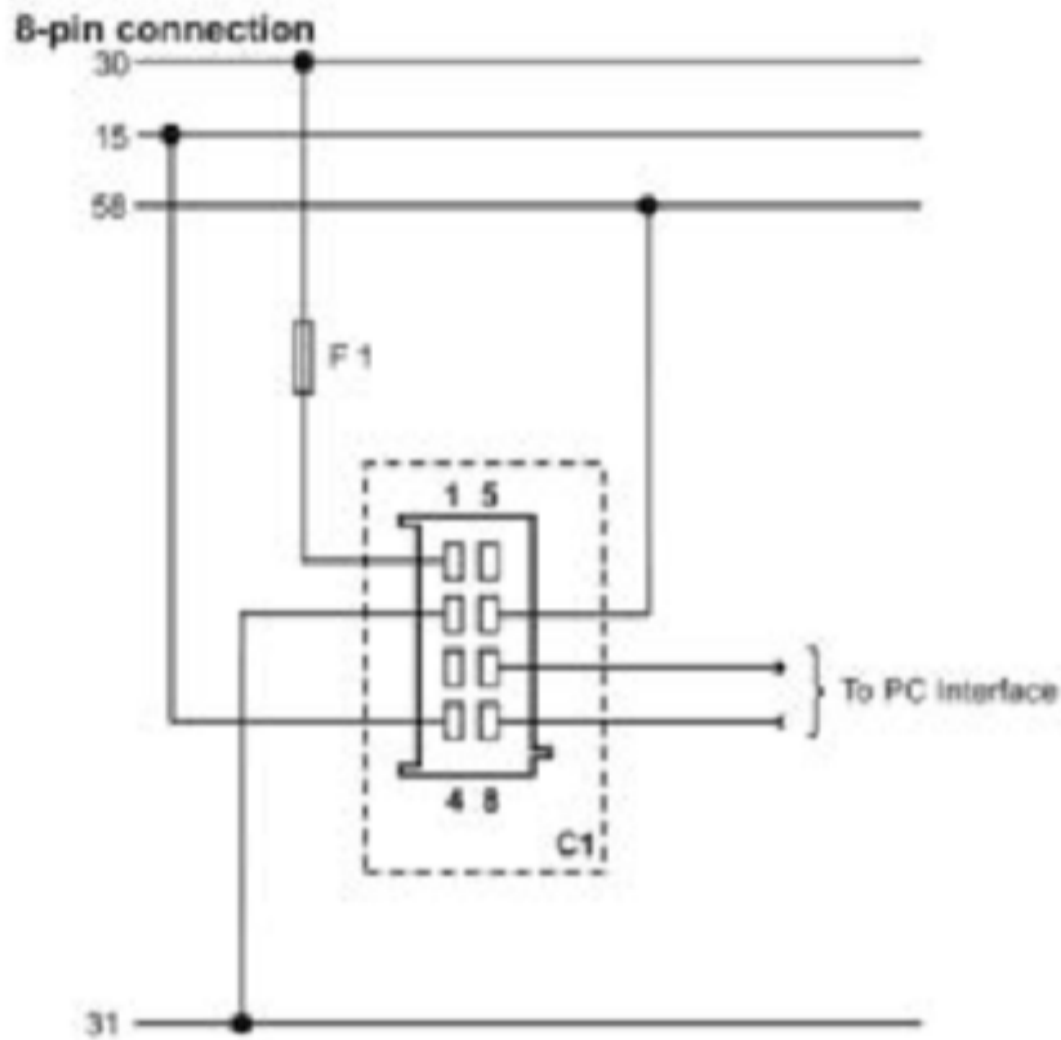


The desired brightness is now permanently set

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Sumlog with Compass Function - Connection 12V/24V



30 – terminal 30 - steady-state plus 12V

15 terminal 15 - connected (ignition) plus

58 terminal 58 - lighting

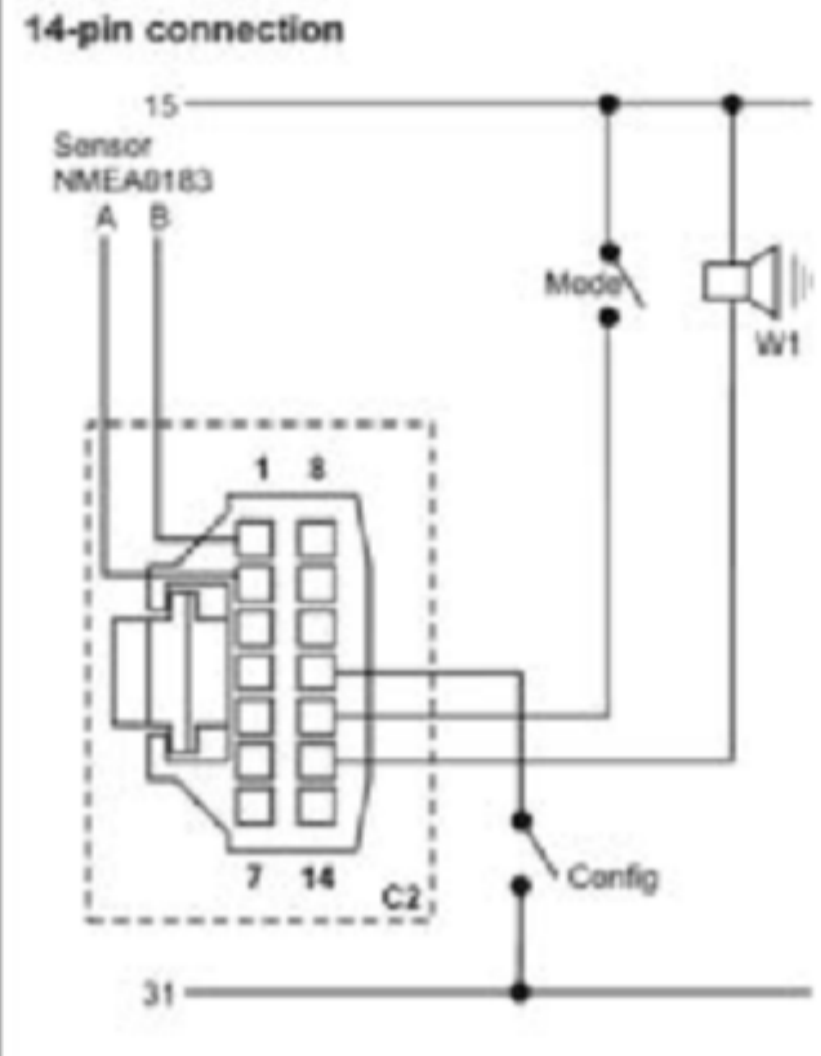
31 terminal 31 - ground

F1 – fuse 5A quick-response

C1 8-pin MQS connector

C2 14-pin MQS connector

Config – Configuration key



Mode – Mode key

W1 – Optional alarm output (max. 100mA)

You must comply with the wiring diagram.

Operation

Basics:

1. Activate Term. 30 (8-pin connector - Pin1)
2. Deactivate Term. 15 (8-pin connector - Pin4)
3. Press and hold down the config. button (14-pole - Pin1)
4. Activate Term. 15 (8-pin connector - Pin4)

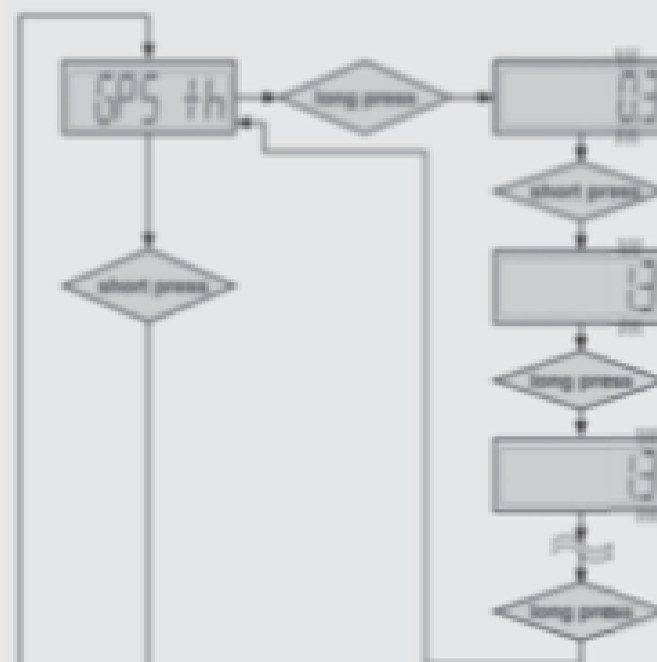
Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Ia. GPS function

Set the speed threshold from which course above ground and speed above ground are indicated. (Only valid for data from a GPS sensor).

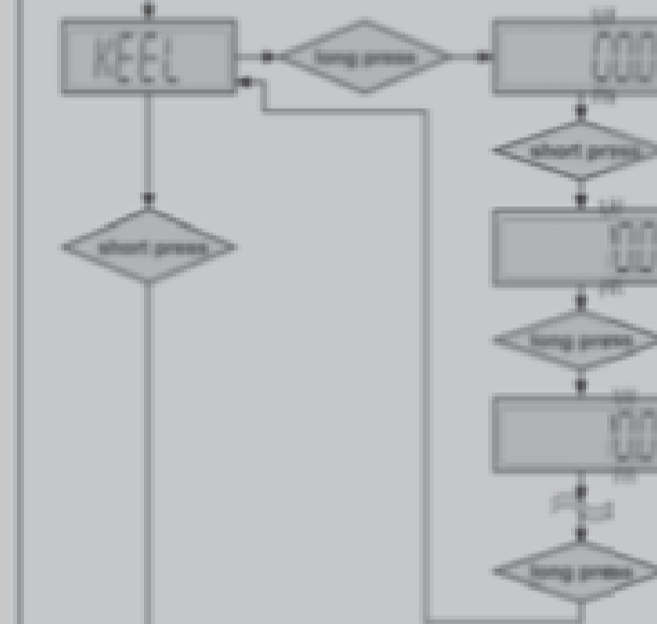
The flashing digit increases by 1.
If the flashing digit is "9", the display returns to "0"
The next lower digit flashes



Ib. KEEL function

Set the difference between lower edge of the keel and lower edge of the depth sounder sensor.

This ensures that the display shows the depth under the keel.
The flashing digit increases by 1.
If the flashing digit is "9", the display returns to "0"
The next lower digit flashes

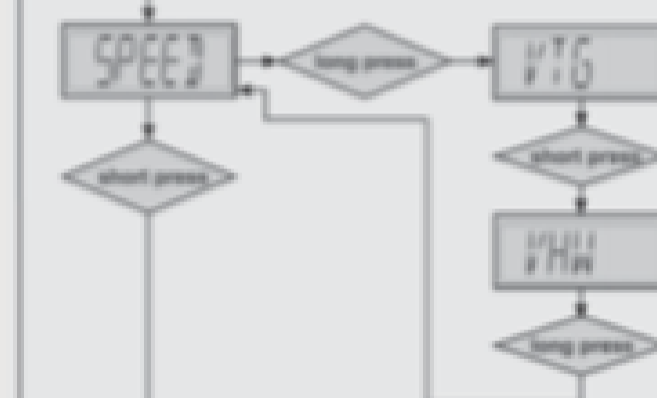


Ic. NMEA speed

Choose which NMEA 0183 data record is to be used for displaying speed.

The following are possible:
VHW
RMC
RMA
VTG

For this, check the manual of the sensor you have connected.

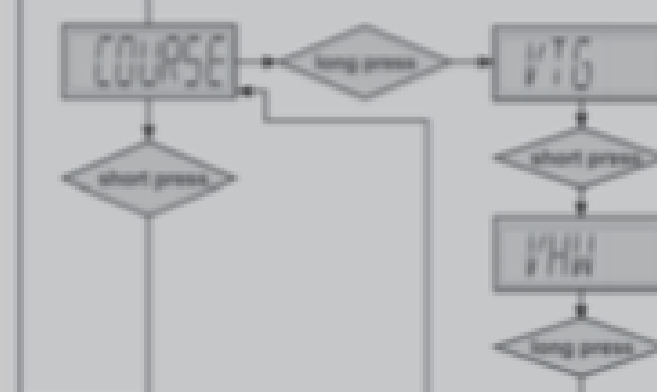


Id. Course NMEA

Choose which NMEA 0183 data record is to be used for displaying the course:

VTG
VHW
RMC
HDG

For this, check the manual of the sensor you have connected.



Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Start-up:

1. Setting the unit (UNIT), alarm threshold (Warn) and time zone (TIMEZ)

1. Activate Term. 30 (8-pin connector - Pin1)
2. Deactivate Term. 15 (8-pin connector - Pin4)
3. Press and hold down the config. button (14-pole - Pin1)



Press and hold Mode key



By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format

Press and hold Mode key



Press the Mode key to change the water temperature unit from C - F (symbol)

Press and hold Mode key



Press mode key briefly to change the water depth unit from von m to ft



Press Mode key briefly



Press and hold Mode key



Set alarm threshold is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'

Press and hold Mode key



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'

Continue until the complete alarm threshold is set

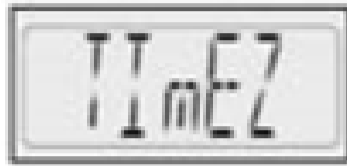
Press and hold Mode key



Deactivate T. 15. This saves the unit and the alarm threshold in the display

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Time zone set is displayed, the first position flashes.
Press and hold Mode key



Time zone set is displayed, the first position flashes.
Press Mode key briefly

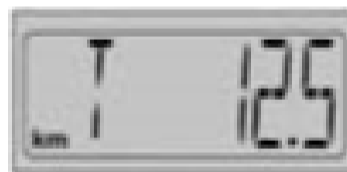


The flashing digit is increased by 1. If the flashing position is a "12" the display jumps to "-1".
Press and hold Mode key

In operation:

1. Display indicator

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)



Odometer
Press Mode key briefly



Tripometer
Press Mode key briefly



Depth
Press Mode key briefly



Time
Press Mode key briefly



Water temperature
Press Mode key briefly



On-board voltage

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

2. Resetting the day counter

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)



Press the Mode key repeatedly until the time is displayed
Press the hold Mode key



Trip is now deleted

3. Setting the clock

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the time is displayed
Press the hold Mode key



Set time is displayed, the first digit flashes
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Continue until the correct time is set
Press and hold Mode key



Clock is set
Important: If T. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the on-board voltage is displayed



Press and hold Mode key

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Press the Mode key repeatedly until the desired brightness is reached. The brightness can be set between 0 (OFF) to 10 (max)



Press and hold Mode key



The desired brightness is now permanently set

Synchroniser

Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

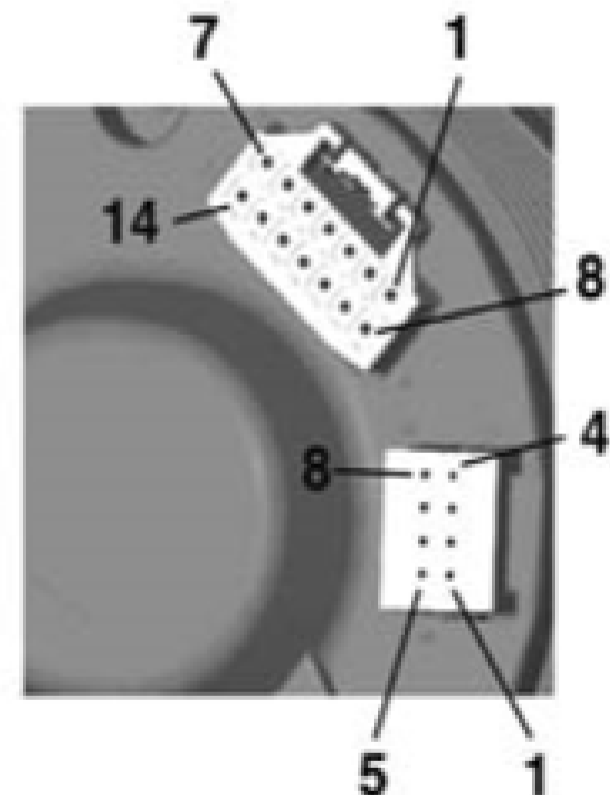
8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – warning LED ground
- Pin 8 – warning LED plus

14-pin contact housing

- Pin 1 – unassigned
- Pin 2 – unassigned
- Pin 3 – unassigned
- Pin 4 – sensor starboard minus
- Pin 5 – sensor starboard
- Pin 6 – unassigned
- Pin 7 – unassigned
- Pin 8 – unassigned
- Pin 9 – unassigned
- Pin 10 – unassigned
- Pin 11 – unassigned
- Pin 12 – unassigned
- Pin 13 – unassigned
- Pin 14 – unassigned

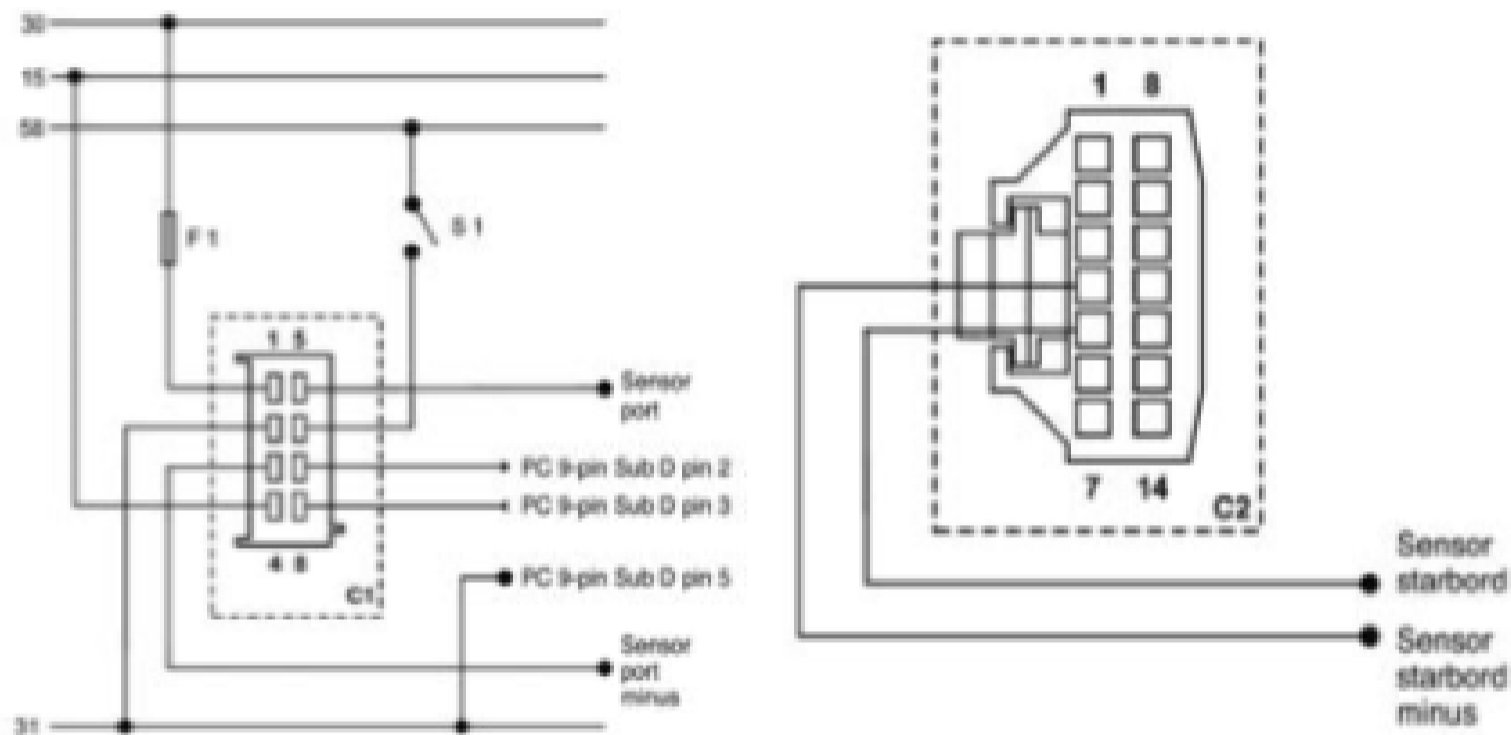
Now insert the plugs into the gauge.
Note the inverse polarity protection nose in the process.



Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

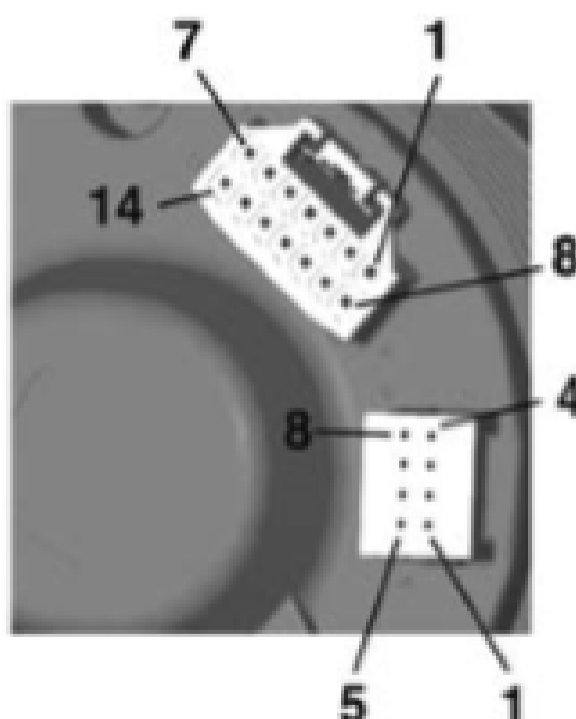
Tachometer - with Display



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response

- S1 – light switch
- C1 – 8-pin MQS connector
- C2 – 14-pin MQS connector
- Main Connection Harness – 8-pin A2C - 8-way
- Aux. Connection Harness – 14-pin A2C - 14-way



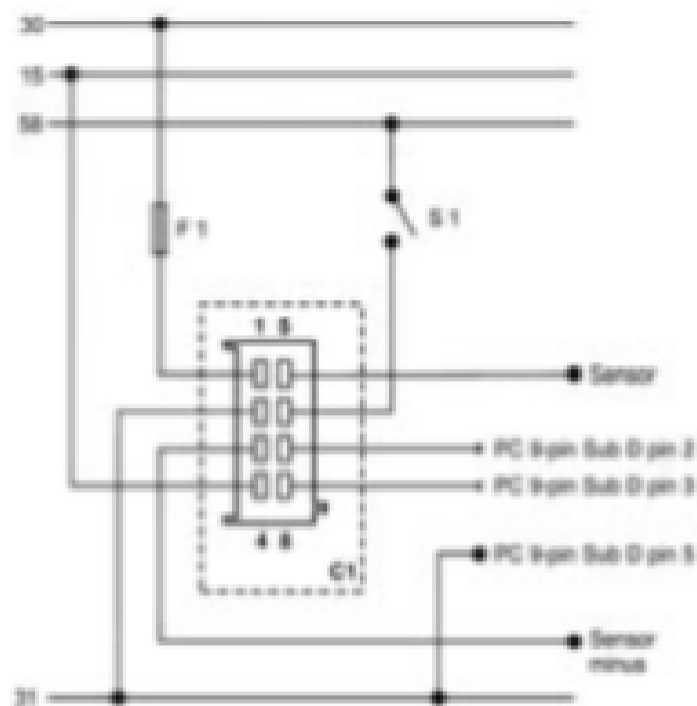
Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – unassigned
- Pin 8 – unassigned

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

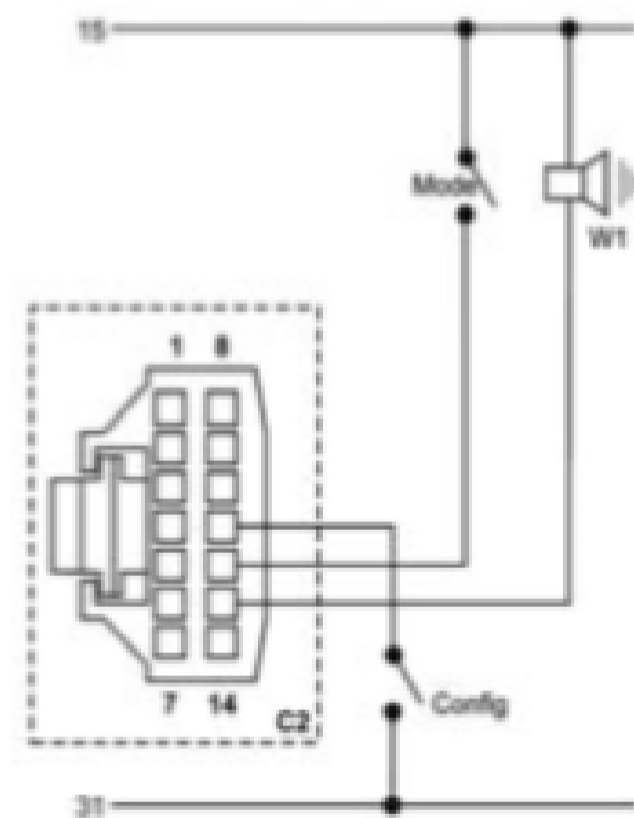


14-pin contact housing

- Pin 1 – unassigned
- Pin 2 – unassigned
- Pin 3 – unassigned
- Pin 4 – unassigned
- Pin 5 – unassigned
- Pin 6 – unassigned
- Pin 7 – unassigned
- Pin 8 – unassigned
- Pin 9 – unassigned
- Pin 10 – unassigned
- Pin 11 – Configuration key
- Pin 12 – Mode key
- Pin 13 – Alarm output (max 100mA)
- Pin 14 – unassigned

Now insert the plugs into the gauge. Note the inverse polarity protection nose in the process.

Technical details subject to change



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQ5 connector
- C2 – 14-pin MQ5 connector
- Config – Configuration key
- Mode – Mode key
- W1 – Alarm output (max. 100mA)

You must comply with the wiring diagram.

Operation

Press the key briefly (<2sec.) to change the currently displayed value

Press the key longer (>2sec.) to change to the next value

The display return to normal operating mode if a key is not pressed for 30 seconds

Any setting you have made are not saved

Basics:

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Startup:

1. Setting the Impulse number

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin connector - Pin4)
3. Press and hold Config key (14-pin connector - Pin1)

Activate T. 15

Release Config key



Press and hold Config key



Set impulse number is displayed, the first digit flashes

Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Continue until the complete impulse number is set

Press hold Config key



Deactivate T. 15. This saves the impulse number in the display

2. Setting the unit and alarm threshold

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin connector - Pin4)
3. Press and hold Mode key (14-pin connector - Pin12)

Activate T. 15

Release Mode key



Press and hold Mode key

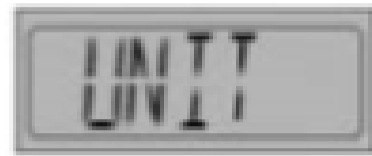


By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format

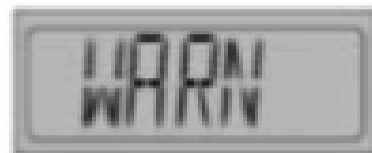
Press and hold Mode key

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Press Mode key briefly



Press and hold Mode key



Set alarm threshold is displayed, the first digit flashes
Press Mode key briefly



The next lower digit flashes
Press mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Continue until the complete alarm threshold is set
Press and hold the mode key



Deactivate T. 15. This saves the unit and the alarm threshold in the display

In operation:



1. Display Indicator selection

1. Activate T. 30 (8-pin connector - Pin 1)
2. Activate T. 15 (8-pin connector - Pin 4)



Total operating hours

Press Mode key briefly



Trip hours

Press Mode briefly



Time

Press Mode briefly

On-board voltage

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

2. Resetting the day counter

1. Activate T. 30 (8-pin connector - Pin 1)
2. Activate T. 15 (8-pin connector - Pin 4)



Press the Mode key repeatedly until the time is displayed
Press the hold Mode key



Trip is now deleted

3. Setting the clock

1. Activate T. 30 (8-pin connector - Pin 1)
2. Activate T. 15 (8-pin connector - Pin 4)

Press the Mode key repeatedly until the time is displayed
Press the hold Mode key



Set time is displayed, the first digit flashes
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Continue until the correct time is set
Press and hold Mode key



Clock is set
Important: If T. 30 (8-pin connector - Pin 1) is deactivated, the clock no longer runs

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin 1)
2. Activate T. 15 (8-pin connector - Pin 4)

Press the Mode key repeatedly until the on-board voltage is displayed



Press and hold Mode key

Installation Info - Viewline All-Weather

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the on-board voltage is displayed



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 (max)

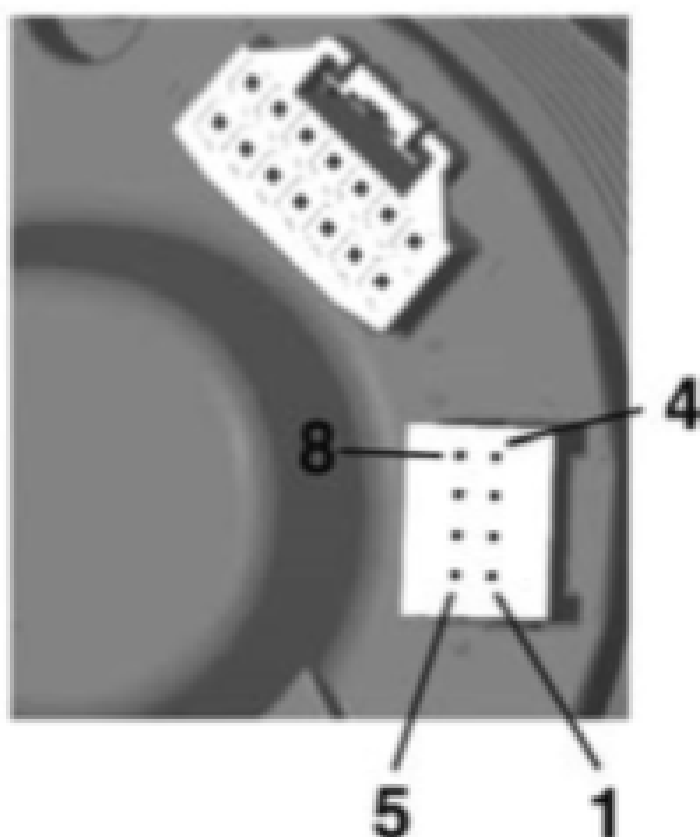


Press and hold Mode key



The desired brightness is now permanently set

Tachometer - without display



Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

8-pin contact housing

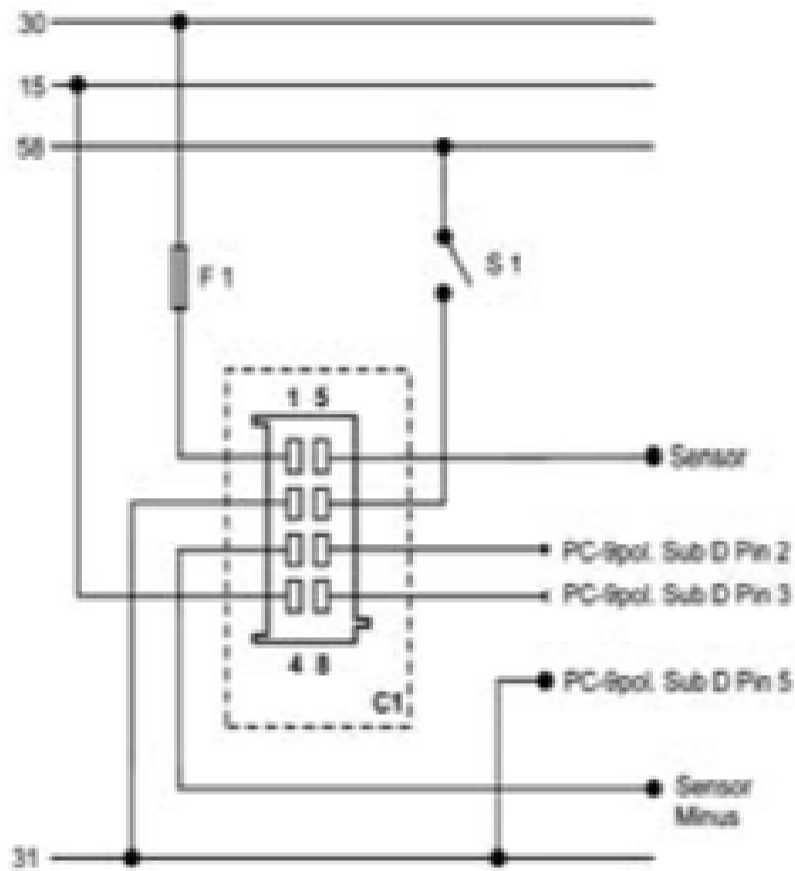
- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – programming port Tx
- Pin 8 – programming port Rx

Now insert the plugs into the gauge. Note the inverse polarity protection nose in the process.

Ac

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQS connector

You must comply with the wiring diagram.

Start up: Setting the impulse number

1. Activate T. 30 (8-pin connector - Pin 1)
2. Deactivate T. 15 (8-pin connector - Pin 1)

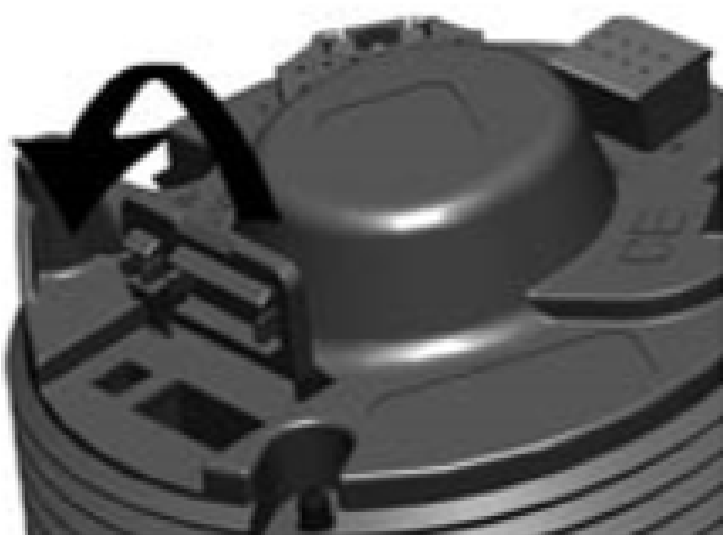
Set the impulse number according to the following table.

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.

Code table: Viewline Tachometer without LCD

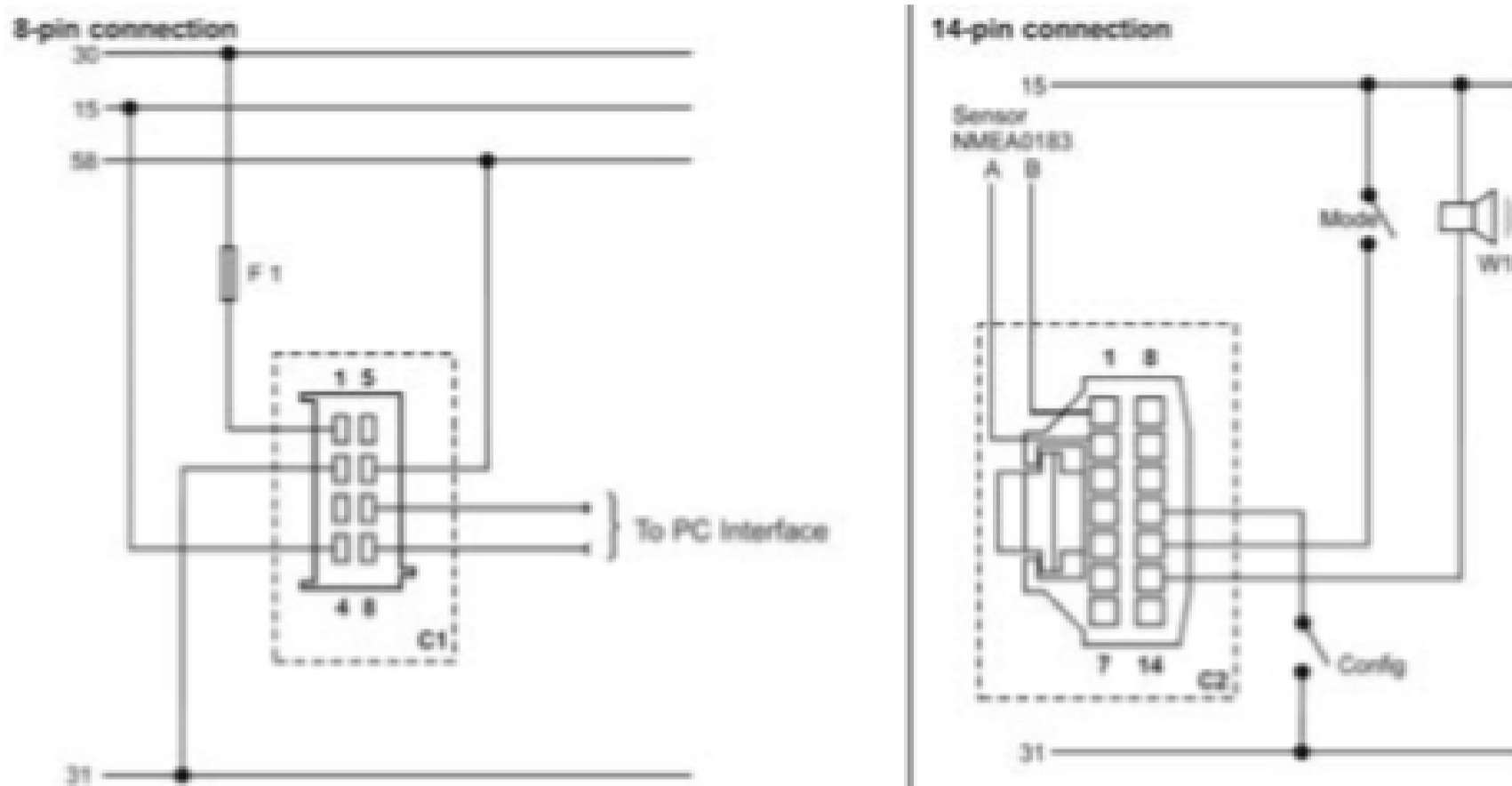
Imp / R	Switch 1	Switch 2	Switch 3
XXX	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
8	1	1	1



Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

Wind Gauge (Close Hauled)



Designations in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A, quick-response
- C1 – 8-pin MQ5 connector

- C2 – 14-pin MQ5 connector
 - Config – Configuration key
 - Mode – Mode key
 - W1 – Optional alarm output (max 100 mA)
- You must comply with the wiring diagram.

Basics:

Operation

Setting the unit and alarm threshold

Setting of warning threshold is always in the unit kn (knots), no matter which unit has been selected under UNIT.

Start-ups:

1. Setting the unit (UNIT), alarm threshold (Warn) and time zone (TIMEZ)

1. Activate Term. 30 (8-pin connector - Pin1)
2. Deactivate Term. 15 (8-pin connector - Pin4)
3. Press and hold down the config. button (14 pole - Pin 12)



- Activate T. 15
- Release Mode key
- Press and hold Mode key

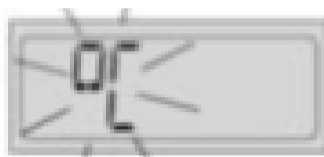
Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format

Press and hold Mode key



Press the Mode key to change the water temperature unit from C - F (symbol)

Press and hold Mode key



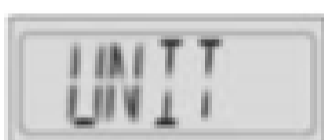
Briefly press the mode key to change the unit of apparent wind speed from Beaufort (bft) to km/h, m/s or kn (knots)

Press and hold Mode key



Briefly press the mode key to change the unit air pressure from millibar (mb) to hectopascal (hPa)

Press and hold Mode key



Press Mode key briefly



Press and hold Mode key



Set alarm threshold is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'

Press and hold Mode key



The flashing digit increases by 1. If the flashing digit is '9', the display return to '0'

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

In operation

1. Display Indicator

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued



Wind speed
Press Mode key briefly



Maximum wind speed
Press Mode key briefly



Air pressure
Press Mode key briefly



Time
Press Mode key briefly



Air temperature
Press Mode key briefly



On-board voltage

2. Setting the clock

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the time is displayed

Press the hold Mode key



Set time is displayed, the first digit flashes
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Continue until the correct time is set
Press and hold Mode key



Clock is set
Important: If T. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

Installation Info - Viewline All-Weather

Viewline Installation 85mm - Continued

3. Delete the stored maximum wind speed

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)



Press the mode key as often as required until the maximum wind speed is displayed (in Beaufort here).

Press and hold Mode key



The maximum wind speed has now been deleted

4. Setting the brightness

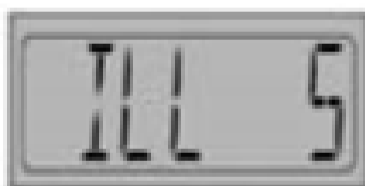
1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

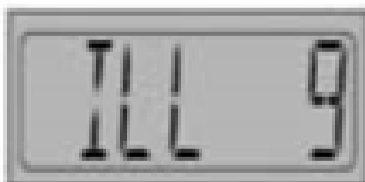
Press the Mode key repeatedly until the on-board voltage is displayed



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 (max)



Press and hold Mode key



The desired brightness is now permanently set

Installation Info - Viewline All-Weather

Viewline Installation 110mm

Safety Instructions:

- 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 VDO 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 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 jewellery 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 mounding depth: 65mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tool, 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 the conventional test lamps can cause damage to control units or other electronic systems.
- The electrical indicator outputs and cables connected to them must be protected from direct contact and damage. The cables in use must have sufficient insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measure to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, un-insulated cables and contacts is prohibited.

No Smoking!
No open fire or lights!

Installation Info - Viewline All-Weather


Viewline Installation 110mm

Safety Instructions:

- 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 VDO 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 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 jewellery 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 mounding depth: 65mm.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tool, 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 the conventional test lamps can cause damage to control units or other electronic systems.
- The electrical indicator outputs and cables connected to them must be protected from direct contact and damage. The cables in use must have sufficient insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measure to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, un-insulated cables and contacts is prohibited.

 **No Smoking!**
No open fire or lights!

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Safety after installation:

- Connect the ground cable tightly to the negative terminal of the battery.
- Reenter/reprogram the volatile electronic memory terminal of the battery.
- Check all functions.
- Use only clean water to clean the components. Note the Ingress Protection (IP) ratings (IEC 60529).

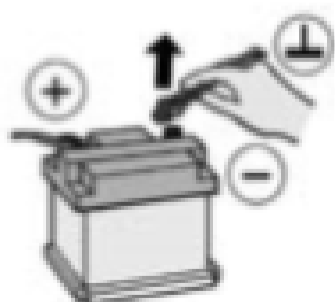
Electrical connections:

- 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!
- 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 electronics 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 stabilised and it must comply with the following standard: DIN EN 61000, Parts 6-1 to 6-4.

Procedures for installing VDO Viewline Instruments.



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



Disconnect the negative terminal on the battery.

Make sure the battery cannot unintentionally restart.

- 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.

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

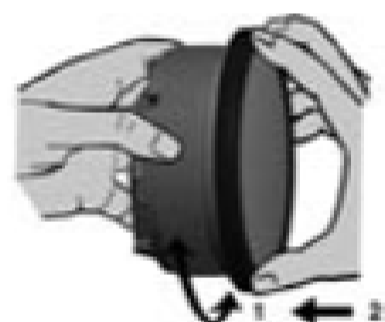


If installing the instrument near a magnetic compass, note the magnetic safe distance to the compass.

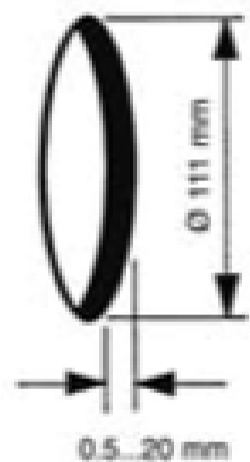


The following rings may be installed as alternatives to the supplied front ring:

Front ring, flat; black	A2C53210745
Front ring, flat; white	A2C53210746
Front ring, flat; chrome	A2C53210747
Front ring, flat; black	A2C53210763
Front ring, triangular; white	A2C53210764
Front ring, triangular; chrome	A2C53210765
Front ring, round; black	A2C53210749
Front ring, round; white	A2C53210760
Front ring, round; chrome	A2C53210761



Place the new front ring on the instrument and press it on until it is flush with the instrument glass.



Conventional assembly. (Instrument is put into the drill hole from the front).

The panel width may be within a range of 0.5 to 20mm.

The drill hole must have a diameter of 111mm.

- ⚠ 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: 65mm.
- ⚠ 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.

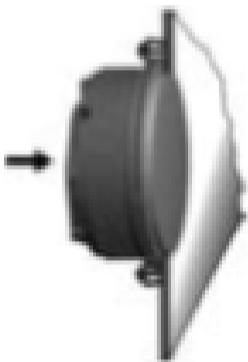


If the instrument is mounted flush (i.e.: from the back so that the instrument glass and the panel form one plane), the front ring must be removed. Press the instrument glass with both thumbs, while at the same time pressing the front ring forward from the instrument with both index fingers. Note the use of a tool in the adjacent figure.

Active
Go to F

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



Flush assembly

The recommended panel thickness is 1.5 to 3mm.

The drill hole must have a diameter of 105.4mm.

Ensure that the installation location is level and has no sharp edges.

- ⚠ 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: 65mm.
- ⚠ 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.

Place the flush mount seal A2C53215641 on the instrument glass. Put the instrument into the drill hole from the back. 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.

Main connection Harness – 8-pin
A2C-8-way

Aux. Connection Harness – 14-pin
A2C-14-way

⚠ Electrical connection:

- Note cable cross-sectional area!
- Reducing 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 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 connection!
- Make crimp connections with cable crimping pliers only. Follow the safety instructions of the tool manufacturer.
- Insulate exposed stranded wires to prevent short circuit.
- 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 together electronic systems. Consequently, all power supply cable connections must be provided with weldable connectors and 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 stabilised and it must comply with the following standard: DIN EN 61000, Parts 6-12 to 6-4.

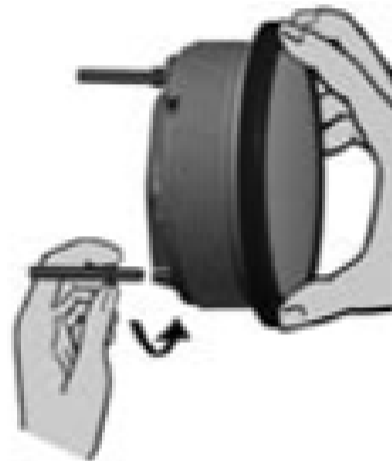
Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



Align the instrument and hand-tighten the fastening nut. Ensure that the nut is not tightened with a torque greater than 400 Nm.

- Make sure the seal lays flat between the panel and the front ring

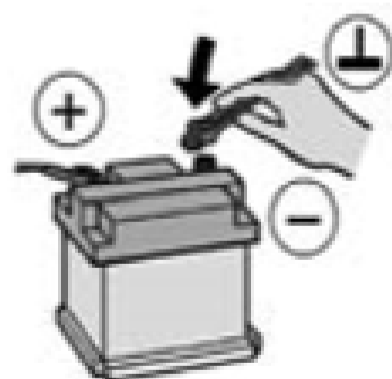


If you would like to omit the fastening nut, you may use the part set A2C59510854 as an alternative. This is recommended if the installation location is subject to vibratory loads. Screw the stud bolts into the provided drill holes in the enclosure. max stud bolt torque is 1.5 Nm



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

- Make sure the seal lays flat between the panel and the front ring



Close the battery after inspecting the connection.

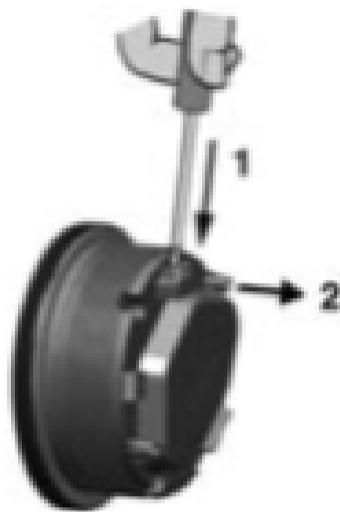
⚠ Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.



If necessary, replace the main circuit switch. Turn on the ignition and conduct a functional test. Reprogram other instruments that may have lost their saved settings.

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



To remove the connector, press the latch (1) and pull the connector out (2).

Important: Clean the instrument glass and front frame with water only. Do not use chemical agents.

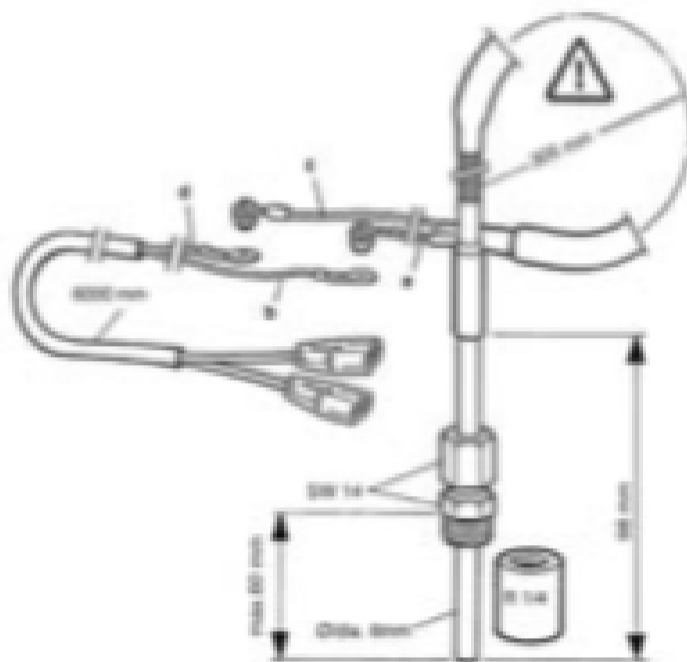
Accessories/Spares parts

Bush contacts 0.25 - 0.5mm	A2C59510846
Bush housing 8-pin	A2C59510847
Hand pliers	Tyco No. 539635-1
Tool for hand pliers	Tyco No. 539682-2
Single contacts 0.14 - 0.22mm	Tyco No. 1355718-1
Single contacts 0.5 - 0.75mm	Tyco No. 963729-1
Strip 0.14 - 0.22mm	Tyco No. 1355717-1
Strip 0.25 - 0.5mm	Tyco No. 928999-1
Strip 0.5 - 0.75mm	Tyco No. 963715-1
Bracket assembly moulding set	A2C59510854
Flush mount fixing bracket	A2C59510864
Flush mount seal	A2C53215640
Fastening nut	A2C53007398
Front ring, flat; black	A2C53186040
Front ring, flat; white	A2C53186022
Front ring, flat; chrome	A2C53186023
Front ring, triangular; black	A2C53186024
Front ring, triangular; white	A2C53186025
Front ring, triangular; chrome	A2C53186026
Front ring, round; black	A2C53186027
Front ring, round; white	A2C53186028
Front ring, round; chrome	A2C53186029
Series resistor 24V (connector not included)	A2C59510221
Series resistor 24V (Connector not included)	A2C59510853
Warning point control	A2C59510886
Protective connector cap, 8-pin	A2C53324664

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

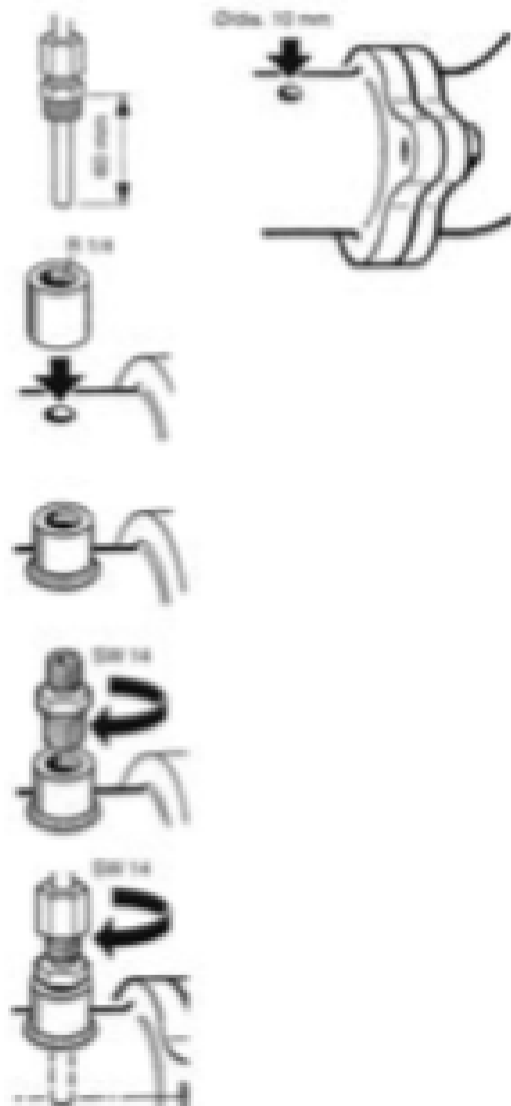
Pyrometer Sensor



Do not shorten measuring leads.

Coil if necessary:

- a red
- b white
- c yellow
- d blue



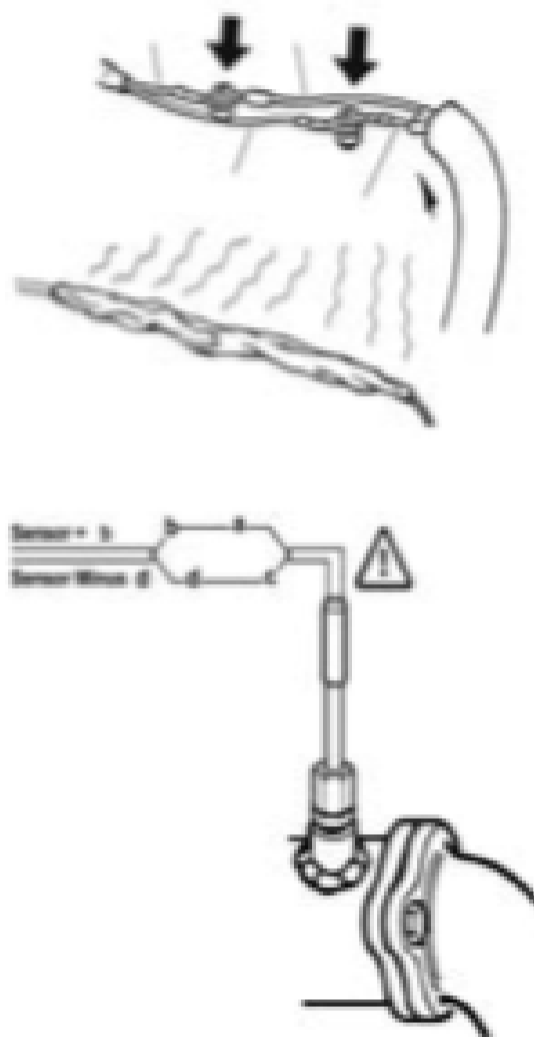
Install the sensor in the exhaust pipe near the elbow flange. Maximum adjustment depth up to the middle of exhaust pipe: 60mm.

Mount the bushing concentrically and weld on. The weld must form a tight seal. Always follow the safety instructions and advice of the welding equipment manufacturer.

Part No.	Description
N03-320-264	Sensor
N03-320-266	Weld Boss
N03-320-268	Cable 4m

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



Slide the heat - shrinkable sleeve over the cable connections and then heat with a hot-air fan over the entire length until it shrinks. Always follow the safety advice of the hot-air fan manufacturer.

Do not shorten measuring lead.

- a red
- b white
- c yellow
- d blue

Rudder Angle Sensor



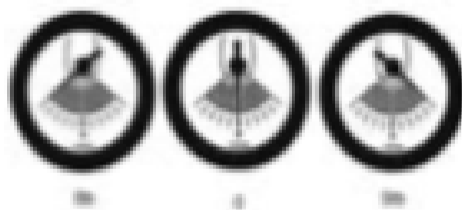
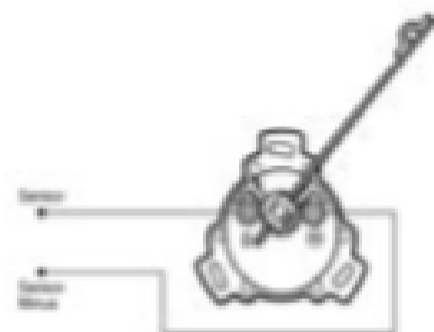
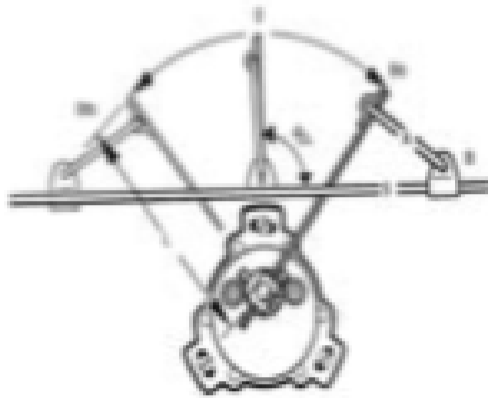
⚠ Sensor is filled with oil. Do not open!

The rudder position should be installed in a favourable position on the rudder segment of the hydraulic rudder system, choose a position in which the balance lever (A) (not supplied) is in its zero position (rudder in its centre position), at $90^\circ \pm 15^\circ$ from the sensor lever. Make sure that the sensor lever and balance lever have room to swivel freely. The length (L) of the sensor lever is adjustable. If the indicator unit is to give an analogue reading of the rudder's angle position, the sensor lever length (L) has to be equal to the turning radius (R) of the rudder segment. The balance lever A is not supplied.

Part No.	Description
440-102-001-001D	Single Station
440-102-002-001D	Dual Station

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

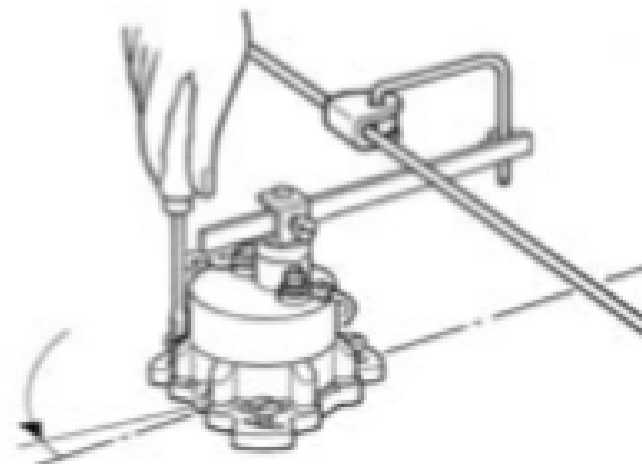


When installing the rudder position sensor on the control rope, choose a position where the control rope passes close to the sensor axis within the lever's turning circle.

Make sure that the sensor lever and balance lever (A) have room to swivel freely. The length L of the sensor lever is adjustable. It depends on the control rope's length of motion and has to be determined. Set the zero position (rudder in its centre position) at right angles to the control rope S. The balance lever A and the connecting piece - B - are not supplied.

Do not shorten measuring lead.

- Bb Rudder to Port
- O Rudder in Centre
- Sb Rudder to Starboard

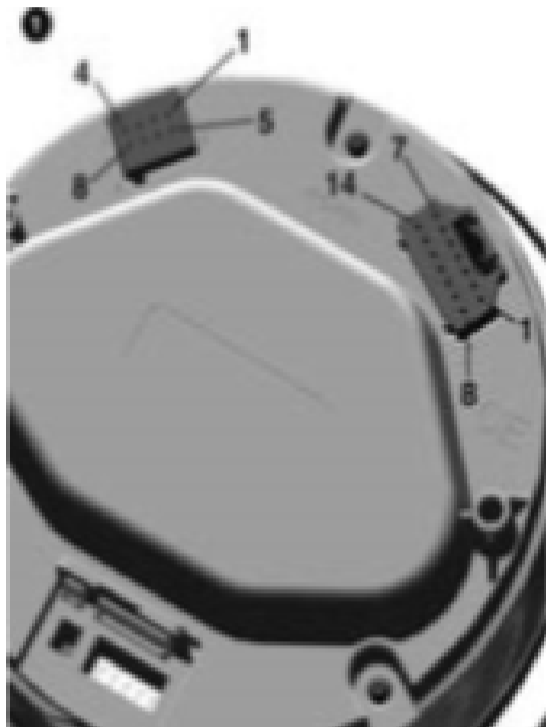


Act
Go t

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Speedometer



Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

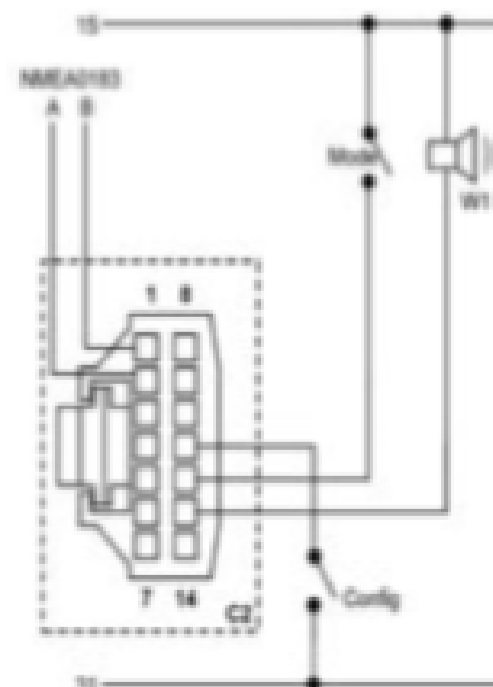
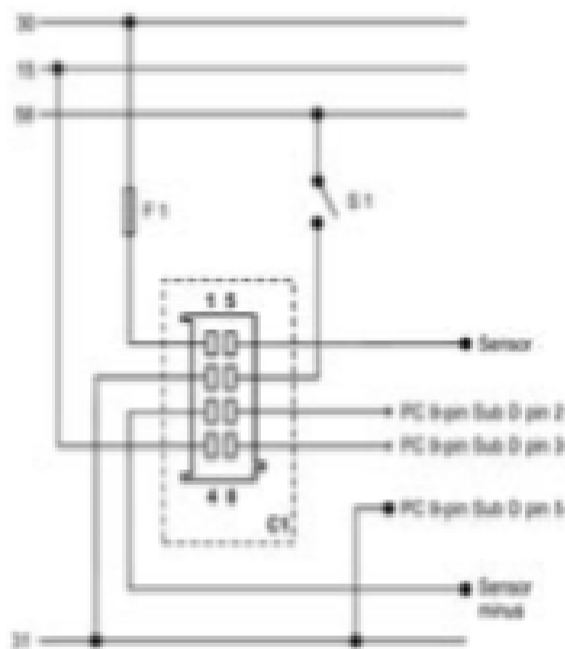
8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – programming port Tx
- Pin 8 – programming port Rx

14-pin contact housing

- Pin 1 – unassigned
- Pin 2 – unassigned
- Pin 3 – unassigned
- Pin 4 – unassigned
- Pin 5 – unassigned
- Pin 6 – unassigned
- Pin 7 – unassigned
- Pin 8 – unassigned
- Pin 9 – unassigned
- Pin 10 – unassigned
- Pin 11 – Configuration key
- Pin 12 – Mode key
- Pin 13 – Alarm output (max. 100mA)
- Pin 14 – unassigned

Now insert the plugs into the gauge. Note the inverse polarity protection nose in the process.



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
 - 15 – terminal 15 - connected (ignition) plus
 - 58 – terminal 58 - lighting
 - 31 – terminal 31 - ground
 - F1 – fuse 5A quick - response
 - S1 – lightswitch
 - C1 – 8-pin MQS connector
 - C2 – 14-pin MQS connector
 - Config – Configuration key
 - Mode – Mode key
 - W1 – Alarm output (max. 100mA)
- You must comply with the wiring diagram.

A

HEAD OFFICE

Johannesburg

Telephone : 011 326 4146

Cellphone: 082 375 3280

Fax: 011 781 4392

Email: adriang@lantic.net

www.timeandautomotive.co.za

TAS

TIME ACCESS & AUTOMOTIVE SYSTEM
Import, Export & Retail

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Basics:

Operation

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.

Start-up:

1. Setting the signal source and pulse count

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 145 (8-pin connector - Pin4)
3. Press and hold Config key (14-pin connector - Pin1)

Activate T. 15
 Release Config key



Press and hold Config key



Press and Config key to changeover between the frequency input (8-pole plug, Pin 5) and the NMEA0183 input (14-pole plug, Pins 1 and 2)
 Press Config key briefly



Press and hold Config key



Set impulse number is displayed, the first digit flashes
 Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9' the display returns to '0'
 Press Config key briefly



The next lower digit flashes
 Press Config key briefly
 Continue until the complete impulse number is set
 Press and hold Config key



Deactivate T. 15. This saves the impulse number in the display

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

2. Setting the unit and alarm threshold

1. Activate T. 302 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin connector - Pin4)
3. Press and hold Mode key (14-pin connector - Pin 12)

Activate T. 15
Release Mode key



Press and hold mode key



By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format

Press and hold Mode key



Press Mode key briefly



Press and hold Mode key



Set alarm threshold is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Press and hold Mode key

Continue until the complete alarm threshold is set

Press and hold the Mode key



Deactivate T. 15. This saves the unit and the alarm threshold in the display

In operation

1. Display Indicator selection

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)



Odometer

Press Mode key briefly

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



Tripometer

Press Mode key briefly



Time

Press Mode key briefly



On-board voltage

2. Resetting the day counter

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)



Press the Mode key repeatedly until the time is displayed
Press the hold Mode key



Trip is now deleted

3. Setting the clock

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the time is displayed
Press the hold Mode key



Set time is displayed, the first digit flashes
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'
Continue until the correct time is set
Press and hold Mode key



Clock is set
Important: If T. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

4. Setting the brightness

1. Activate T. 30 (8-pin connector - Pin1)
2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the on-board voltage is displayed



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 (max)



Press and hold Mode key



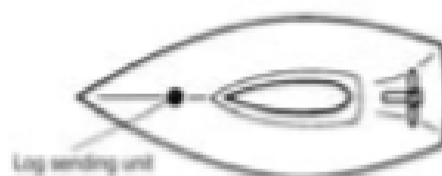
The desired brightness is now permanently set

Sumlog Sensor

Installation of the sending unit:

The sending unit must be installed in a turbulence - free zone in the hull. If an echo sounder is installed, the Sumlog sending unit should be installed at the same height and to the side of, or laterally offset to the echo sounder. Check for sufficient distance to stanchions, stringers, bulkheads, etc. when drilling the hull.

Do not install the sending unit close to external valves, anodes, etc. to avoid influences by turbulence.



Installation on sailing boats:

On sailing boats the sending unit should always be installed in front of the keel, as close to the longitudinal ship axis as possible. On boats with a long keel the installation should be at the end of the first third of the hull, but not at the widest location of the hull.

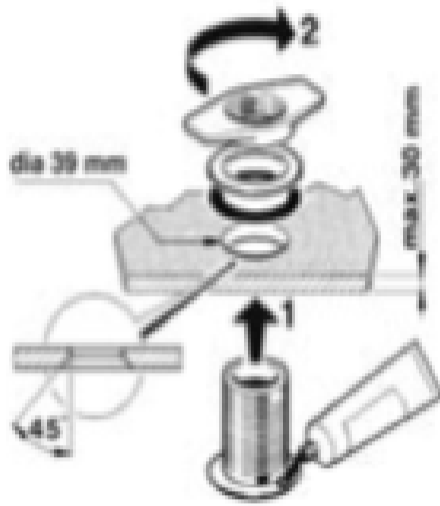


Installation on powerboats:

On powerboats the sending unit should be installed at about the first third of the hull and never towards the stern in a zone of strong turbulence or up front, where strong disturbances by air induction must be expected. An ideal installation is near the longitudinal axis of the ship and in the zone of the first stringer, directly in front of the engine compartment if possible. At higher speeds this is the only location where a disturbance free operation can be expected.

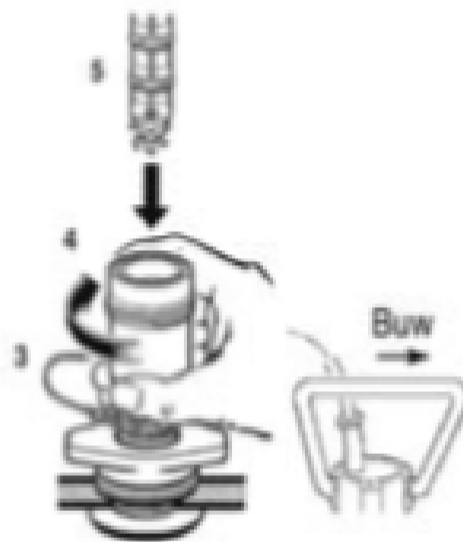
Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



Make a hole 39mm diameter, at a suitable location. The wall thickness can be up to 30mm. Chamfer the hole out of 45 degrees for good sealant distribution during the assembly. To install the hull sleeve and the sending unit proceed as follows:

1. Put salt-water resistant sealant on the hull sleeve flange and introduce the sleeve from the outside into the hole
2. From the inside, install the black sealing ring on the hull sleeve, then the white one, and screw the union nut down. Lightly hand tighten the union nut at first. After letting the sealant harden, tighten the nut another $\frac{1}{4}$ turn by hand and check the hull feed through for leaks
3. Put the loop of the control rope around the hull sleeve and knot the loose end of the rope to the blind plug
4. Screw the flood valve to the hull sleeve until an audible click indicates secure seating, is heard
5. Insert the sending unit from the top and secure it with the nut



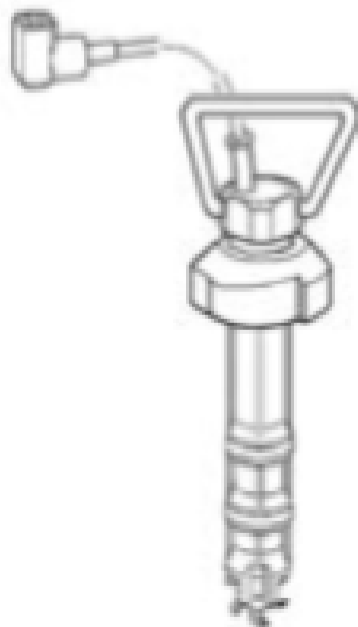
Installation flooding valve and sending unit:

Note the correct direction when inserting the sending unit. The pointed side of the sending unit loop must be directed towards the bow as soon as the sending unit has been inserted.

Removal of the sending unit:

Loosen the union nut and pull the sending unit from the sleeve by rotating it slightly. Immediately insert the blind plug.

- ⚠ Never pull on the cable to remove the sending unit. Always use the loop. Always insert the blind plug when the sending unit has been removed.



Replacement of the paddle wheel:

The paddle wheel of the sending unit is rotated by the flow of water. The rotational speed of the paddle wheel is measured without contacts, and transmitted to the indicating instrument.

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Sumlog Sensor - Continued



Use a screw driver to replace the paddle wheel and its shaft.
Carefully lift the paddle wheel shaft upwards to remove it from the sending unit.
Insert the new shaft into the new paddle wheel shaft upwards to remove it from the sending unit.



Check the correct installation direction when replacing the paddle wheel. The spoon-shaped leading surface of the wheel (A) must be directed towards the pointed side of the loop (B).
The pointed side of the loop must be directed to the bow when the sending unit is inserted in the hull sleeve.



Paddle wheel for indication range 12 (kn, km/h, mph)



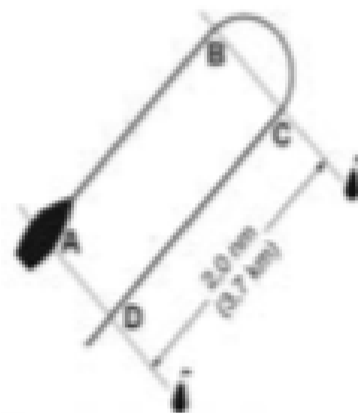
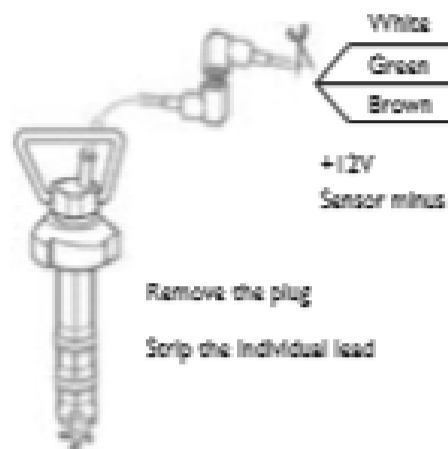
Paddle wheel for indicating range 30 and 50 (kn, km/h, mph)



Part No.	Description
X11-719-000-053	Transom Mount
X11-719-000-058	Hull Mount

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



Connection to Viewline Sumlog

- Remove the plug
- Strip the individual lead

Calibration

After installation of the system your Viewline Sumlog must be calibrated to obtain speed and distance measurements with the maximum accuracy.

On the Viewline Sumlog display, select the 'FREQUE' setting for the dia 'INPUT' function.

On the Viewline display, depending on the Impeller being used, set the 'PULSE' value to one of the following pulse numbers:

- 120c: 54737 Imp/nm
- 500c: 41748 Imp/nm
- 60mph: 41748 Imp/nm

Mark two distinct points on the map. The distance between these two points defines the measuring length. During the trip from one point to the other, the Viewline Sumlog measures the covered distance. In flowing waters it is necessary to make the measuring run in both directions to compensate for the influence of the current.

Measuring Length:

Make a measuring run at a cruising speed, which remains as constant as possible.

Check that the trip distance counter is set to zero.

The following example refers to a measuring run in water without a current with a measuring length of 2 nautical miles (nm)

Approach starting point A of the measuring length.

Set the trip distance counter to zero when passing starting point A.

Follow the measuring length on a straight line and note the indicated value (1.7 nm in this example) when passing end point B.

Calculate the calibration factor C with the following formula:

$$C = \frac{\text{Effectively covered distance (A-B)}}{\text{Indication of the display (A-B)}} = \frac{2.0 \text{ nm}}{1.7 \text{ nm}} = 1.18$$

Multiply the calculated value C by the pulse number set on the Viewline display and set the calculated result as the new pulse number.

In the case of a measuring run in the flowing water repeat the same distance measuring steps in the opposite direction (measuring length C-D).

The calibration factor is calculated with the following formula:

$$C = \frac{\text{Effectively covered distance (A-B) + (C-D)}}{\text{Indication of the display (A-B) + (C-D)}}$$

⚠ Do not use the GPS navigator as a reference for Viewline Sumlog calibration. The GPS navigator indicates speed over ground (SOG), but the Viewline Sumlog measures speed through water.

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Tachometer - without display

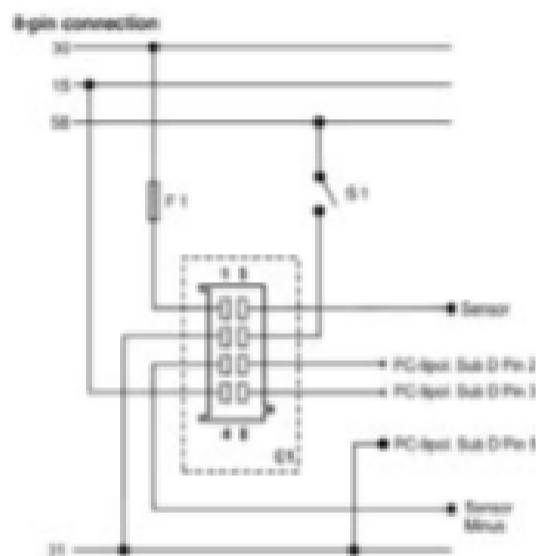


Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – programming port Tx
- Pin 8 – programming port Rx

Now insert the plug into the gauge. Note the inverse polarity protection nose in the process.



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A, quick - response
- S1 – lightswitch
- C1 – 8-pin MQS connector

You must comply with the wiring diagram.

Setting the impulse number

1. Activate T. 30 (8-pin connector - Pin 1)
2. Deactivate T. 15 (8-pin connector - Pin 4)

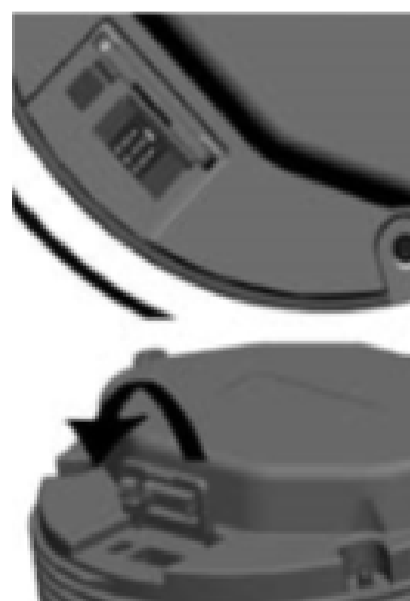
Set the impulse number according to the following table.

Ensure that the 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.

Code table: Viewline Tachometer without LCD

Imp / R	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

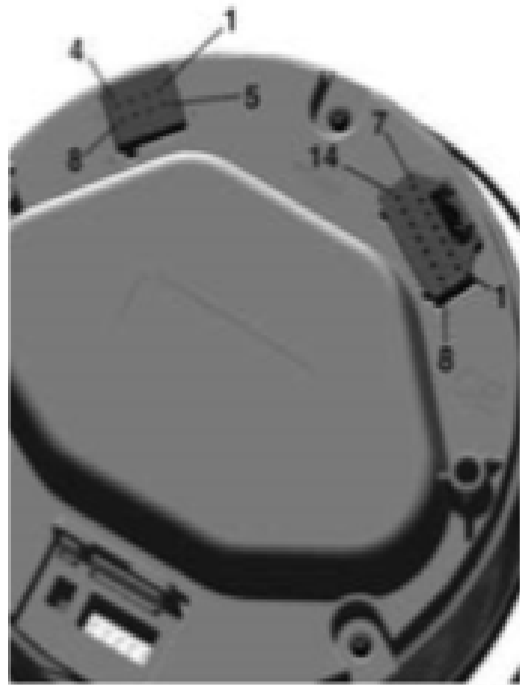


Warning: The warranty is for 12 months from date of installation. Standard Control Instruments warranty conditions apply. Technical details subject to change. 25/02

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Tachometer - with display



Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

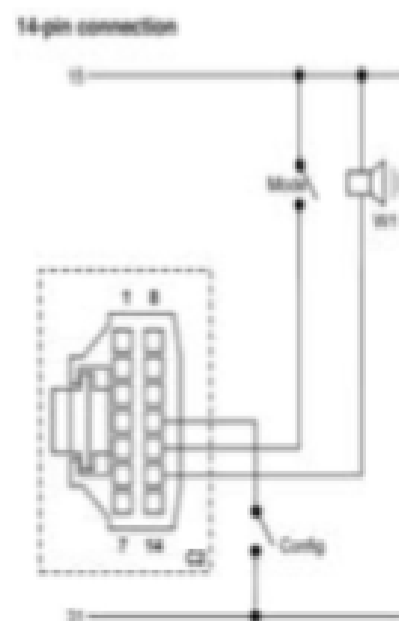
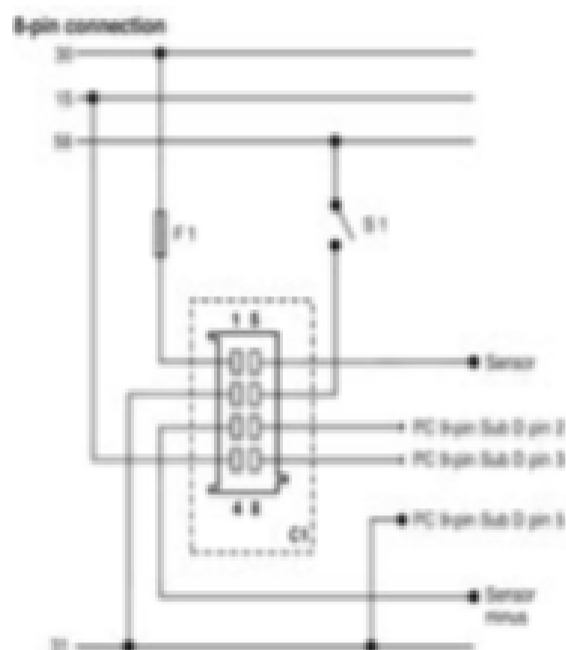
8-pin contact housing

- Pin 1 – T. 30 - battery 12V/24V
- Pin 2 – T. 31 - ground
- Pin 3 – signal ground
- Pin 4 – T. 15 - ignition plus
- Pin 5 – sensor signal
- Pin 6 – T. 58 - lighting
- Pin 7 – programming port Tx
- Pin 8 – programming port Rx

14-pin contact housing

- Pin 1 – unassigned
- Pin 2 – unassigned
- Pin 3 – unassigned
- Pin 4 – unassigned
- Pin 5 – unassigned
- Pin 6 – unassigned
- Pin 7 – unassigned
- Pin 8 – unassigned
- Pin 9 – unassigned
- Pin 10 – unassigned
- Pin 11 – Configuration key
- Pin 12 – Mode key
- Pin 13 – Alarm output (max 100mA)
- Pin 14 – unassigned

Now insert the plug into the gauge. Note the inverse polarity protection nose in the process.



Designation in the wiring diagram:

- 30 – terminal 30 - steady-state plus 12V
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick - response
- S1 – lightswitch
- C1 – 8-pin MQS connector
- C2 – 14-pin MQS connector
- Config – Configuration key
- Mode – Mode key
- WI – Alarm output (max. 100mA)

You must comply with the wiring diagram.



Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Basics:

Operation

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.

Start-up:

1. Setting the signal source and pulse count

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 145 (8-pin connector - Pin4)
3. Press and hold Config key (14-pin connector - Pin1)

Activate T. 15
 Release Config key



Press and hold Config key



Press and Config key to changover between the frequency input (8-pole plug - pin5) and the NMEA0183 input (14-pole plug, Pins 1 and 2)

Press Config key briefly



Press and hold Config key



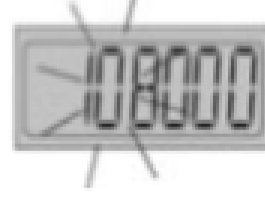
Set impulse number is displayed, the first digit flashes

Press Config key briefly



The flashing digit increases by 1. if the flashing digit is '9' the display returns to '0'

Press Config key briefly



The next lower digit flashes

Press Config key briefly

Continue until the complete impulse number is set

Press and hold Config key



Deactivate T. 15. This saves the impulse number in the display

2. Setting the unit and alarm threshold

1. Activate T. 302 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin connector - Pin4)
3. Press and hold Mode key (14-pin connector - Pin12)

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

Basics:

Operation

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.

Start-up:

1. Setting the signal source and pulse count

1. Activate T. 30 (8-pin connector - Pin1)
2. Deactivate T. 145 (8-pin connector - Pin4)
3. Press and hold Config key (14-pin connector - Pin1)

Activate T. 15
 Release Config key



Press and hold Config key



Press and Config key to changeover between the frequency input (8-pole plug - pin5) and the NMEA0183 Input (14-pole plug, Pins 1 and 2)

Press Config key briefly



Press and hold Config key



Set Impulse number is displayed, the first digit flashes

Press Config key briefly



The flashing digit increases by 1. If the flashing digit is '9' the display returns to '0'

Press Config key briefly

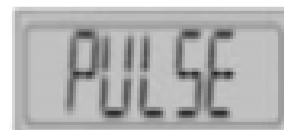


The next lower digit flashes

Press Config key briefly

Continue until the complete impulse number is set

Press and hold Config key



Deactivate T. 15. This saves the impulse number in the display

2. Setting the unit and alarm threshold

1. Activate T. 302 (8-pin connector - Pin1)
2. Deactivate T. 15 (8-pin connector - Pin4)
3. Press and hold Mode key (14-pin connector - Pin12)

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

	<p>Activate T. 15 Release Mode key</p>
	<p>Press and hold mode key</p>
	<p>By briefly pressing the Mode key, you can switch between 24h and 12h (AM/PM) clock format. Press and hold Mode key</p>
	<p>Press Mode key briefly</p>
	<p>Press and hold Mode key</p>
	<p>Set alarm threshold is displayed, the first digit flashes Press Mode key briefly</p>
	<p>The flashing digit increases by 1. If the flashing digit is 9, the display returns to 0 Press and hold Mode key</p>
	<p>Continue until the complete alarm threshold is set Press and hold the Mode key</p>
	<p>Deactivate T. 15. This saves the unit and the alarm threshold in the display</p>

In operation

1. Display Indicator selection

1. Activate T. 30 (8-pin connector - Pin 1)
2. Activate T. 15 (8-pin connector - Pin 4)

	<p>Odometer Press Mode key briefly</p>
	<p>Tripometer Press Mode key briefly</p>
	<p>Time Press Mode key briefly</p>

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued



On-board voltage

2. Resetting the day counter

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)



Press the Mode key repeatedly until the time is displayed

Press the hold Mode key



Tip is now deleted

3. Setting the clock

1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

Press the Mode key repeatedly until the time is displayed

Press the hold Mode key



Set time is displayed, the first digit flashes

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Press Mode key briefly



The flashing digit increases by 1. If the flashing digit is '9', the display returns to '0'

Continue until the correct time is set

Press and hold Mode key



Clock is set

Important: If T. 30 (8-pin connector - Pin1) is deactivated, the clock no longer runs

4. Setting the brightness





1. Activate T. 30 (8-pin connector - Pin1)

2. Activate T. 15 (8-pin connector - Pin4)

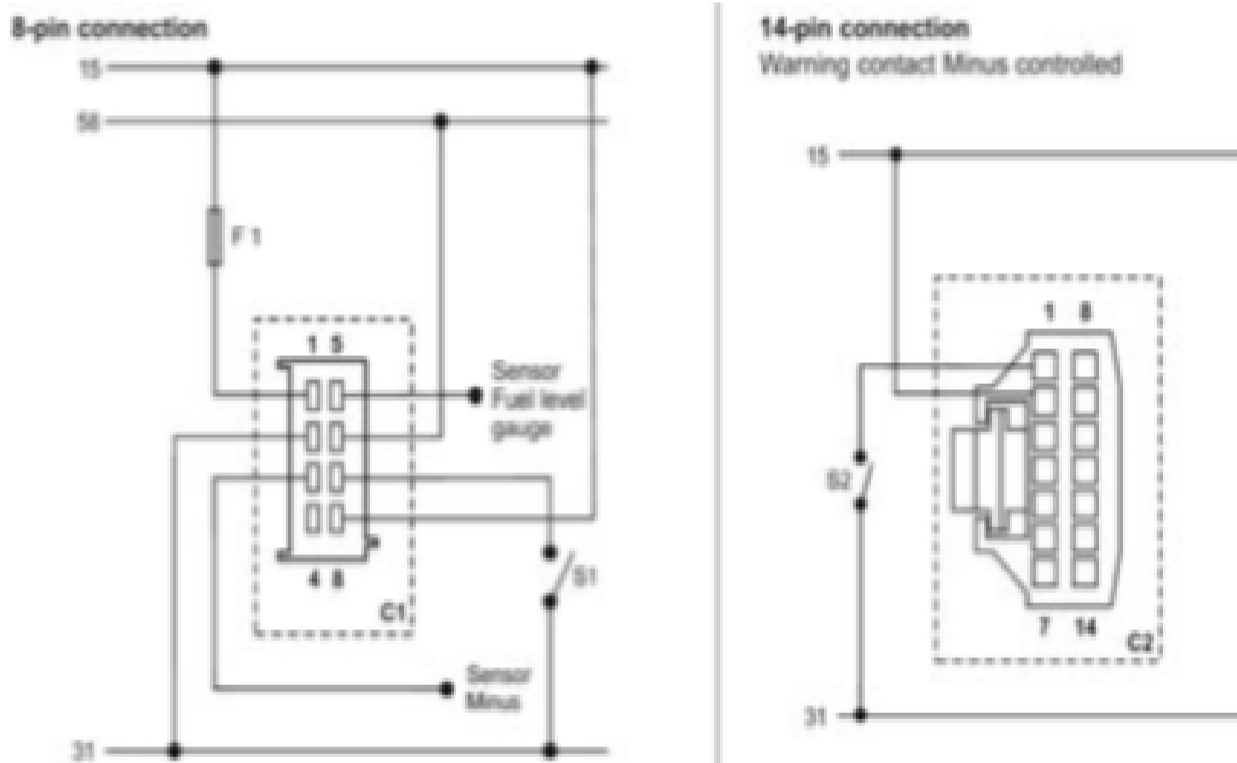
Press the Mode key repeatedly until the on-board voltage is displayed

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

	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 (max)
	Press and hold Mode key
	The desired brightness is now permanently set

2 in 1 - Pitot Speedometer/Fuel Gauge



Designations in the wiring diagram:

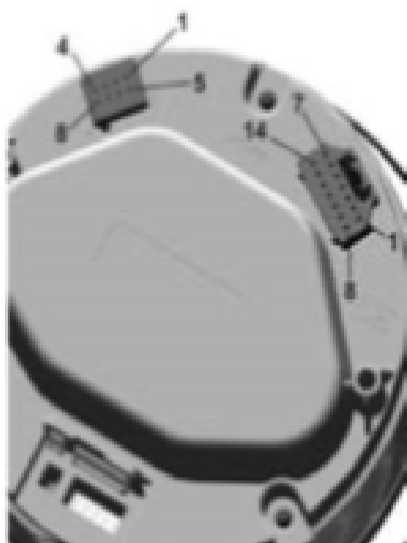
- 15 – terminal 15 - connected (ignition) plus
- 58 – terminal 58 - lighting
- 31 – terminal 31 - ground
- F1 – fuse 5A quick-response

- S1 – warning contact 1
 - S2 – warning contact 2
 - C1 – 8-pin MQS connector
 - C2 – 14-pin MQS connector
- You must comply with the wiring diagram.

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

2 in 1 - Tachometer/Trim gauge



Now insert the plug into the gauge. Note the Inverse polarity protection nose in the process.



Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.

8-pin contact housing

- Pin 1 – Term. 30 - battery 12V/24V
- Pin 2 – Term. 31 - ground
- Pin 3 – Sensor 1 ground
- Pin 4 – Term. 15 - ignition plus
- Pin 5 – Sensor 1 signal (RPM)
- Pin 6 – Term. 58 - lighting
- Pin 7 – Sensor 2 ground
- Pin 8 – Sensor 2 signal (trim)

14-pin contact housing

- Pin 1 – warning LED 1 minus
- Pin 2 – warning LED 1 plus
- Pin 3 – unassigned
- Pin 4 – programming port Tx
- Pin 5 – programming port Rx
- Pin 6 – warning LED 2 minus
- Pin 7 – warning LED 2 plus
- Pin 8 – warning LED 3 minus
- Pin 9 – warning LED 3 plus
- Pin 10 – warning LED 4 minus
- Pin 11 – warning LED 4 plus
- Pin 12 – warning LED 5 minus
- Pin 13 – warning LED 5 plus
- Pin 14 – unassigned

Setting the impulse number

1. Activate Term. 30 (8-pin connector - Pin1)
2. Deactivate Term. 15 (8-pin connector - Pin1)

Set the impulse number according to the following table.

Ensure that the switch position "0" 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 VDO partner for more information.

Code table: Viewline Tachometer without LCD

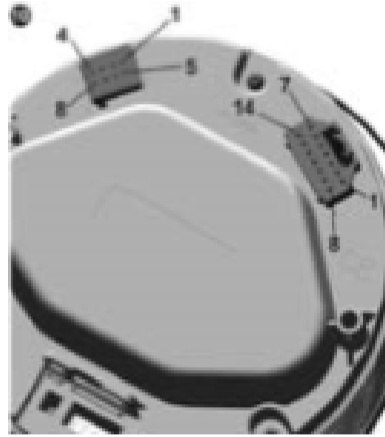
Imp / R	Switch 1	Switch 2	Switch 3
XXX	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
8	1	1	1

Installation Info - Viewline All-Weather

Viewline Installation 110mm - Continued

4 in 1 - Fuel Level/Cooling Water Temperature/Engine Oil Pressure/Voltmeter

Depending on the configuration, insert the cable into the 8-pin and 14-pin contact housing according to the following pin assignment. The contacts must audibly lock into place.



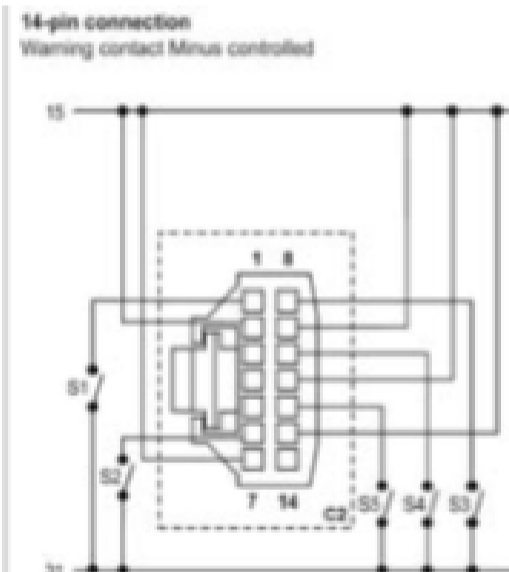
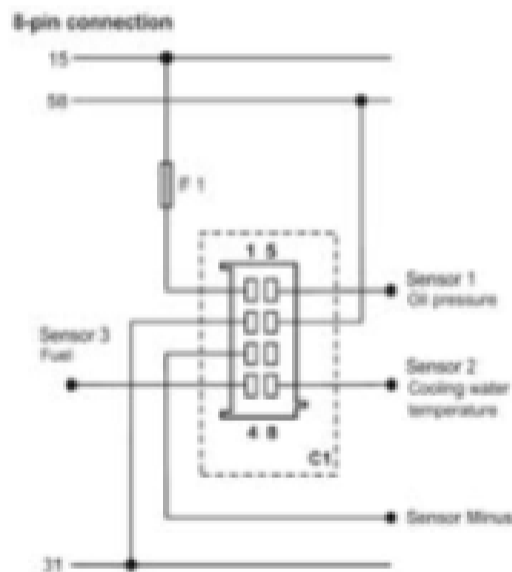
Now insert the plug into the gauge.
Note the inverse polarity protection nose in the process.

8-pin contact housing

- Pin 1 – Term. 15 - ignition plus
- Pin 2 – Term. 31 - ground
- Pin 3 – Sensor ground
- Pin 4 – Sensor 3 – signal (fuel)
- Pin 5 – Sensor 1 signal (oil pressure)
- Pin 6 – Term. 58 - lighting
- Pin 7 – unassigned
- Pin 8 – Sensor 2 signal (cooling water temperature)

14-pin contact housing

- Pin 1 – warning LED 1 minus
- Pin 2 – warning LED 1 plus
- Pin 3 – 5 unassigned
- Pin 6 – warning LED 2 minus
- Pin 7 – warning LED 2 plus
- Pin 8 – warning LED 3 minus
- Pin 9 – warning LED 3 plus
- Pin 10 – warning LED 4 minus
- Pin 11 – warning LED 4 plus
- Pin 12 – warning LED 5 minus
- Pin 13 – warning LED 5 plus
- Pin 14 – unassigned



Designations in the wiring diagram:

- | | | |
|--|-----------------------------|--|
| 30 – terminal 30 - steady-state plus 12V | 31 – terminal 31 - ground | S4 – Warning contact 4 |
| 15 – terminal 15 - connected (ignition) plus | F1 – fuse 5A quick-response | S5 – Warning contact 5 |
| 58 – terminal 58 - lighting | S1 – Warning contact 1 | C1 – 8-pin MQS connector |
| | S2 – Warning contact 2 | You must comply with the wiring diagram. |
| | S3 – Warning contact 3 | |



PARTS LISTING - INSTRUMENT CLUSTERS

In an effort to distinguish VDO from their competitors and to present their clusters as a whole family, the decision has been made to give the clusters a family name.

The VDO Centrobases 500 is an instrument cluster that allows all relevant engine data (analogue and digital) to be presented clearly on a central display, thus ensuring greater convenience and enhanced ergonomics in drivers' cabs. The VDO Centrobases 500 can be programmed to meet customer-specific needs thanks to the special CentroVWin software.

This easy-to-use software allows configuration for each sensor and offers maximum convenience. VDO Centrobases 500 instrument clusters stand out for their efficiency, flexibility, quality, reliability and user-friendliness. The dials can be adapted to individual customer requirements in terms of scaling, symbols and design.

With its host of customisable options, the VDO FlexCluster indicating instrument provides precisely this flexibility. From special municipal vehicles, such as waste management trucks, to agricultural machines, construction vehicles, and even marine applications, the VDO FlexCluster indicating instrument allows a perfectly customised solution, no matter what the demands of the job.

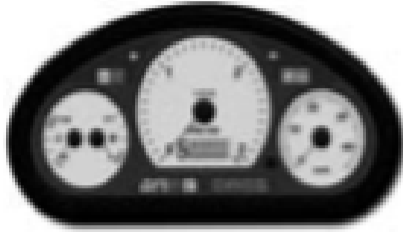
Combining excellent ergonomics with the latest technology, the VDO FlexCluster indicating instrument sets new standards, both in terms of ease of use and value for money.

Section Content

- Centrobases 500
- FlexCluster

Parts Listing - Instrument Clusters

Centrobase 500*



Analogue Cluster

230° Central Analogue Indicator - Speedometer or Tachometer
270° Analogue Indicator - Speedometer, Tachometer or Other** (just 90° defl. angle)
2 x 90° Analogue Indicator - Level, Temperature, Pressure or Battery Voltage
15 Warning Lights (tell-tales)
LC Display - Electronic Hour Counter (EHC)/Trip Hour Counter - Gear Shift Indicator - Clock
Internal Buzzer
** Level, Temperature, Pressure or Battery

General

Moulding Dimension:	271mmx124mm (oval moulding form)
Dial Type:	Backlit
Operating Voltage:	9 - 16 VDC
Current Consumption:	400mA ± 20%
Connector:	GHV, No. 14137, 28-pins
Operating Temperature:	-30 - +75°C (-22 - 167°F)
Storage Temperature:	-40 - +85°C (-40 - 185°F)
LCD Temperature:	-20 - +65°C (-4 - 149°F)
IP Protection Class: (acc. to IEC 60 529)	IP 65 front IP 30 back

Analogue Inputs

Speedometer:	300 - 400,000 Pulses/km
Tachometer:	0.5 - 400 Pulses/Revolution
Pressure:	10 - 220Ω
Temperature:	10 - 580Ω
Fuel:	0.5 - 200Ω
Voltage:	9 - 16VDC

Warning Lights (tell-tales)

Telltale	Input Pin	Function	Input Switch
1	6	cbd	Positive or ground
2	8	cbd - warning threshold	Positive, ground or controller
3	17	cbd	Positive or ground
4	19	cbd	Positive or ground
5	25	cbd	Positive
6	8	cbd	Ground
7	2	cbd - warning threshold	Ground or controller
8	26	cbd	Positive or ground
9	9	cbd	Positive or ground
10	28	cbd	Positive or ground
11	16	cbd	Ground

A

Parts Listing - Instrument Clusters

Centrobase 500* - Continued



Warning Lights (Tell-tales) - continued

12	22	tbd	Positive
13	24	tbd	Positive
14	20	tbd	Positive or ground
15	14	tbd	Positive or ground

Part No.

Sales Sample:	Analogue cluster:	A2C53105413
Connector Parts:	Housing cover with lever:	A2C53117228
	Socket housing:	A2C53117260
	Socket contact:	A2C53117261

* Min take-off order quantity of 500 pieces

FlexCluster



CAN capable indication cluster to displays all relevant information fast and in an easy-to-ready way.

Benefits and Features

Monitoring of many parameters in a compact space

4 Gauges, 26 Telltales and large Dot-matrix-Display

Multiple CAN channels (incl. Gateway function)

DTC handling

Several options for customization (e.g. dial, bezel etc.)

Technical Data

Dimensions	Inputs	Outputs	Interfaces
290.6 x 143.5 x 72.5 mm	24 digital, 6 analog, 4 frequency	3 x 500mA, 1 buzzer	2 x CAN, 1 x LIN, 1 x additional gauge satellites

IP 67 protected (front & rear)



PARTS LISTING - ACCESSORIES

The Accessories section comprises of all accessories required as additional add-ons to complement and complete the extensive range of VDO Cockpit International and Viewline All-Weather instruments.

The large assortment of components including Bezels, Clamp Rings, Globes and -Holders, Windscreen Washer Systems Accessories and more, gives you a full rounded selection to complement most needs.

Section Content

- Adaptors
- Bezels - Viewline
- Brackets - Instruments
- Clamp Rings & Side brackets
- Connectors
- Connectors - Viewline
- Globes
- Globe Holders
- Housings - Plastic
- Instrument Blank - Plastic Black
- Reduction Rings - Metal Black
- Resistor (Dropping) - For Viewline
- Warning Buzzers
- Warning Buzzer Installation
- Windscreen Washer Systems Accessories

Adaptors



Adaptors - Brass

Suitable for pressure & temperature senders & switches with 1/8"-27NPTF thread

Mechanical temperature gauges with 1/8"-27NPTF, oil pressure pipe kits for mechanical pressure gauges

Part No.	Internal Thread	External Thread
105-043	1/8"-27NPTF	1/2"-14NPTF
105-040	1/8"-27NPTF	1/4"-18NPTF
105-042	1/8"-27NPTF	3/8"-18NPTF
105-041	1/8"-27NPTF	5/8"-18UNF
105-029	1/8"-27NPTF	M14x1.5
105-035	1/8"-27NPTF	M16x1.5
105-039	1/8"-27NPTF	M18x1.5

Part No.	Internal Thread	External Thread
105-036	M14x1.5	1/2"-14NPTF
105-034	M14x1.5	3/8"-18NPTF
105-033	M14x1.5	5/8"-18UNF
105-031	M14x1.5	M16x1.5
105-032	M14x1.5	M18x1.5

T-Piece Adapter (Steel)

Part No.	Description
1403060	2 x 1/8"-27NPTF Female 2 x 1/8"-27NPTF 1 x Male

Pressure Sender Adaptor

Part No.	Description
415-030	2 x M14x1.5, 1 x M10x1

Extension Adaptor

Part No.	Description
415-032	Male/Female 1/8"-27NPTF

Pressure Sender Extension Pipe

Part No.	Description
410-541	300mm

Bezels - Viewline



Part No. 52mm	
A2C53186024	Triangle black
A2C53186026	Triangle chrome
A2C53186027	Round black
A2C53186028	Round white
A2C53186029	Round chrome
A2C53186040	Flat black

Part No. 85mm	
A2C53192911	Flat black
A2C53192913	Round black
A2C53192914	Round chrome
A2C53192916	Round white
A2C53192917	Triangle black
A2C53192918	Triangle chrome

Part No. 110mm	
A2C53210745	Flat black
A2C53210749	Round black
A2C53210761	Round chrome
A2C53210760	Round white
A2C53210763	Triangle black
A2C53210765	Triangle chrome

Brackets - Instruments



Suitable for all 52mm Instruments

Part No.	Description
230-005	1 x 52mm
230-006	2 x 52mm
230-007	3 x 52mm

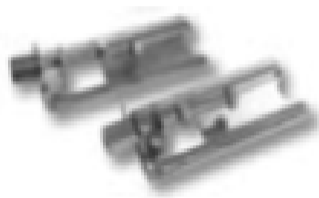
Parts Listing - Accessories

Clamp Rings & Side brackets



Suitable for Vision range of Instruments

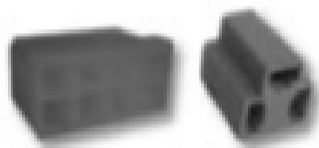
Part No.	Description
800-005-013G	Spin lock clamp for 52mm Instruments
800-005-005G	Spin lock clamp for 80mm Instruments
800-005-001G	Side bracket kit for 80-100mm Instruments
800-005-007G	Spin lock clamp for 100mm Instruments



Suitable for Viewline range of Instruments

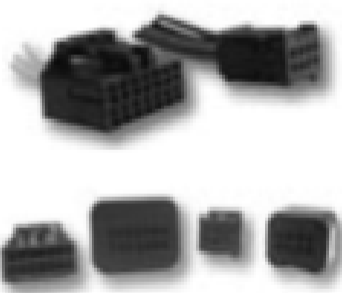
Part No.	Description
A2C53007398	Spin lock clamp for 52mm Instruments
A2C53212238	Spin lock clamp for 85mm Instruments
A2C53238881	Spin lock clamp for 110mm Instruments

Connectors



Part No.	Description
999-115-015	3 way
Z863101	4 way
Z863102	6 way
Z863103	8 way
Z863016	Terminal

Connectors - Viewline



Part No.	Description
A2C-14 way	Connector harness 14 way
A2C-8 way	Connector harness 8 way
A2C53324664	Connector protective cap 14 way
A2C53324671	Connector protective cap 8 way
A2C59510850	Connector kit 8-pin
A2C59510851	Connector kit 14-pin
A2C-8 way 24V	Connector harness 8 way for 24V

Globes



Part No.	Description
999-065-001	Globe wedge large 12V 3W
999-065-002	Globe wedge large 24V 3W
GE902	Globe wedge large 24V 5W (Box 10) GEC AC

Parts Listing - Accessories

Globe Holders



Part No.	Description
29-133-005	Insulated for 7mm base globe
29-133-009	Metal single spade 7mm base globe
800-005-002G	Insulated large wedge globe 12V (pair)
800-005-003G	Insulated large wedge globe 24V (pair)
999-067-001	Wedge large

Housings - Plastic



Plastic moulding cups with adjustable clip-on pedestal	
Part No.	Description
240-059-006-001K	52mm short
240-059-007-001K	52mm long
240-059-008-001K	80mm long

Instrument Blank - Plastic Black



Suitable for 52mm cut-out	
Part No.	Description
230-038	

Reduction Rings - Metal Black



Used for moulding 52 mm Instruments in 60mm cut-outs	
Part No.	Description
14-067-014-5162	

Resistor (Dropping) - For Viewline



Dropping resistor 24V w/o connector	
Part No.	Description
A2CS9510221	

Parts Listing - Accessories

Warning Buzzers



The VDO warning buzzer signals critical temperature or pressure variations

It is activated by a switch or sender unit with warning contact

38mm Diameter

34mm Depth

Connection 2x4 amp terminals

Dash Mount

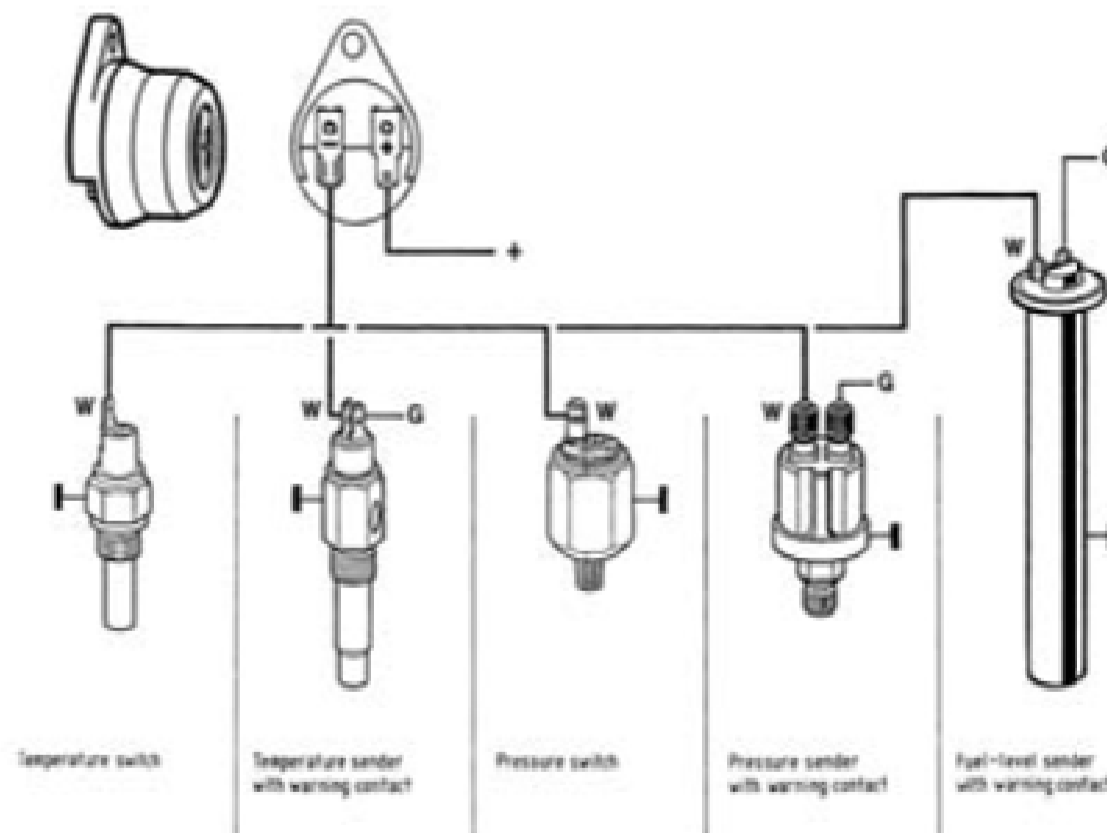
Part No.	Range	Colour	Voltage
X10-236-000-002C	85DB	Black	12
X10-236-000-003	85DB	Red	24

41.8mm Diameter

22mm Depth

Part No.	Range	Colour	Voltage
415-006	89DB	Black	3-30

Warning Buzzer Installation

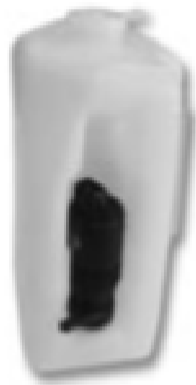


Parts Listing - Accessories

Windscreen Washer Systems - Accessories

VDO windscreen washer systems were developed to meet the demanding requirements of construction and agricultural equipment and speciality vehicles

The system comprises of an electric high pressure pump, bottle, bracket, bottle cap and filter



Washer System - 1.5 litre

Part No.	Description	Voltage
X10-246-001-007	Kit	12V

12V pump: +2.2Bar

24V pump: +1.8Bar

Bottles are made of all-weather and age resistant material to withstand temperatures from -30 - +100°C

Please note: Nozzle, Non Return Valve, Hose, Push Button and T-Piece must be ordered separately



Washer System - 4.0 litre

Part No.	Description	Voltage
X10-246-001-012	Kit	12V
X10-246-001-013	Kit	24V

12V pump: +2.2Bar

24V pump: +1.8Bar

Bottles are made of all-weather and age resistant material to withstand temperatures from -30 - +100°C

Please note: Nozzle, Non Return Valve, Hose, Push Button and T-Piece must be ordered separately



Washer System - 6.0 litre

Part No.	Description	Voltage
X10-246-001-015	Kit	12V
X10-246-001-016	Kit	24V

12V pump: +2.2Bar

24V pump: +1.8Bar

Bottles are made of all-weather and age resistant material to withstand temperatures from -30 - +100°C

Please note: Nozzle, Non Return Valve, Hose, Push Button and T-Piece must be ordered separately



Washer Kits - 2.0 litre

Part No.	Description	Voltage
246-001	Full installation kit	12V
246-002	Full installation kit	24V

Parts Listing - Accessories

Hose



Part No.

41-037

Non-Return Valve



Part No.

246-063-012-001G

Nozzle



Part No.

246-069-006-006G

Description

Twin chrome nozzle

246-069-029-004G

Twin plastic nozzle

246-069-050-005D

Twin small clip-on nozzle

246-069-056-001Z

Twin large clip on nozzle

Pump - Mono



Part No.

246-082-008-014C

Pressure

2.28bar 12V

Consumption

max = 4.5Amp

Flow

2.0L/min

246-082-008-012C

1.88bar 24V

max = 1.2Amp

1.0L/min

Pump - Universal



Part No.

246-075-010-001C

Volt

24V

246-075-015-001C

12V

Parts Listing - Accessories

Push Button



Part No.

90-006-001

T-Piece



Part No.

88-326-001

Water Bottle



Water Bottle - 2.0 Litre

Part No.

88-326-001

Water Bottle Bracket



Water Bottle Bracket - 2.0 Litre

Part No.

2-451-488-1142

Wiring Harness



Part No.

X39-246-000-001

Acti
Go to



PARTS LISTING - CONTROL & MONITORING SYSTEMS

The Autosave product line from Control Instruments Automotive is designed to control and monitor a fleet of vehicles, be it petrol, diesel, or medium to heavy duty vehicles.

The Autosave system is a monitoring system which will provide the driver an early warning signal thus saving the vehicle from any potential vehicle damage.

The system is designed to save fuel, reduce down time, increase productivity, manage driver performance and improve vehicle safety just mention a few.

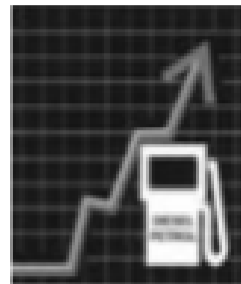
Section Content

Benefits of Control & Monitoring Systems

Parts Listing

- Automonitors
- Hubodometers
- Pedal Interface II
- Pick-up Sensors - Magnetic
- Rev Limiter
- Reversing Camera
- RSI System (Add-On Kit)
- Road Speed Limiter
- Speed/ RPM Alert
- Spike & Over-Voltage Protectors
- Starter Motor Protectors
- Tilt Switches
- Turbo Timers
- Ultrasonic Tank Senders
- Water Level Probes

Benefits of Control & Monitoring Systems



Save fuel

With the price of fuel escalating exponentially over the past 5 years, this has got to be high on the list of priorities when it comes to fleet management. By installing the Revs, Speed and Idle Limiting System, fuel costs can be slashed because the driver of the vehicle will not be able to speed or over-rev, which will lead to great fuel saving.



Reduce down time

Any vehicle out of action is a waste of time and money which no business or individual needs or can afford.

The Autosave range is pro-active in that it warns you to take action BEFORE the damage is done! You can save yourself a blown engine or even the loss of an entire vehicle due to an engine failure.

Increase productivity

Keep your vehicle working for you and running effectively. Vehicle downtime reduces productivity and adds expense.

Manage your vehicle pro-actively

If you are monitoring all the vital signs of your vehicles and taking appropriate action, the chances of engine damage occurring are eliminated, and so are the potential costs of engine repair. It's like having your own fleet manager for each vehicle - anticipating problems and avoiding them before they happen.

Manage driver performance

Prevent speeding, resultant fines and bad driving habits such as over-revving and excessive engine idling time. Don't pay the price for a driver who ignores the warning lights on the dashboard.

Save time and money

Reduce vehicle maintenance costs and keep your vehicles on the road. Extend the life of your vehicles and engines and reduce the number of accidents by limiting driving speed. Prevent 'ghost' trips from occurring with a device which measures tyre revolutions, independently of the Odometer.

Reduce CO₂ emissions and save energy

By limiting the idling time on your vehicle engine, and preventing excessive revving, you will reduce exhaust emissions significantly, thus reducing CO₂ emissions and saving energy.

Improve vehicle safety

With an Autosave reversing camera installed on your vehicle you can do away with vehicle and pedestrian accidents caused during reversing when the driver cannot see clearly behind him.

AC
Go

Parts Listing - Control & Monitoring Systems

Automonitors



The Automonitor is a PRO-ACTIVE engine monitoring system which provides an early warning of potential malfunctions resulting from low oil pressure, high water temperature and low cooling water level

The malfunctions are indicated to the driver on a display unit and by means of a buzzer located in the truck cabin

Optionally, a shutdown of the vehicle can be triggered on fault detection

The Automonitor can be combined with an RSI (Rev, Speed & Idling) to provide a complete pro-active system

Features

- Self diagnostic test mode
- Optional shut down mode on fault mode output
- Audible warning
- Visual operating display
- Fail safe sender units
- Shock and vibration-resistant module
- Water & dust proof control module
- Upgradable to include RSI

Application

Commercial vehicles, diesel and petrol engines.

Part No.	Description
415-SPEC-501	Installation kit 12V
415-SPEC-502	Installation kit 24V

Complete installation kit comprising of:
Electronic module-display-wiring harness-buzzer, switches and all parts for diesel shutdown

Part No.	Description
415-SPEC-601	Kit all level probes

This kit does not include the water level probe or the diesel shutdown components
Suitable probe Part No.'s: 415-207, 415-148, 230-058

Part No.	Description
415-SPEC-503	Basic Kit 24V

Complete installation kit comprising all installation parts except diesel shutdown components
For a detailed connection diagram please refer to the technical section (page 165)

Automonitor - Air Cooled Engine

Function: Detects the following:

- Engine Oil Pressure
- Engine Air Cooled Temperature (170°C)

Part No.	Description
415-SPEC-303	Installation kit 12V
415-SPEC-304	Installation kit 24V

For a detailed connection diagram please refer to the technical section (page 165)

The following Automonitor Kits will accept the RSI add on kit:

Part No.
415-SPEC-501
415-SPEC-502
415-SPEC-503
415-SPEC-601

For a detailed connection diagram please refer to the technical section (page 165)

Hubodometers



The Hubodometer is a totally sealed, stand alone mechanical distance-counter mounted onto the wheel hub of a trailer or truck. It counts the revolutions of the tyre and converts them into actual distance travelled.

Features:

- Records every tyre revolution in either direction
- Hermetically sealed with inert gas and anti-fog double O-ring protection
- Precision shaft is supported both from the front and rear for greater strength
- Unique counterbalance system
- Prevents orbiting even on rough roads
- Magnifying crystal enlarges kilometre digits, angles up for easy reading

Benefits:

- Maintenance dates can be planned and observed
- Tyres, brakes and other important components can be checked for wear and tear in time
- Transport and cost/performance ratios can be calculated quickly
- Prevents 'ghost' trips (if the speedometer is disconnected, there is still an accurate reading of distance travelled)

Part No.	For tyre sizes
VR800R20 Tyre turns 326/km	10 x 22.5
	10 R22.5
	900 R20
VR715X16 Tyre turns 392/km	715 x 16
	750 x 16
VR700X16 Tyre turns 424/km	700 x 16
	750 x 16
VR115X80R13 Tyre turns 572/km	155 x 80 R13
	1100 R22
VR1100X22 Tyre turns 294/km	1100 x 22
	12 x 24.5
	1200 R20
VR1100X20 Tyre turns 310/km	1100 x 22.5
	1100 x 20
	12 R22.5
	315/80 R22.5 1100R 22.5
VR1100X20 Tyre turns 310/km	1100 x 22.5
	1100 x 20
	12 R22.5
	315/80 R22.5 1100R 22.5
VR1000X20 Tyre turns 316/km	1000 x 20
	1000 R20
	850 x 16
Other ratios available on request	

Parts Listing - Control & Monitoring Systems

Pedal Interface II



Can combine Cruise Control, Speed Limitation and RPM control in one.
Our Pedal Interface II is the simple, cost effective way to control electronically managed engines, and is available in three versions: STANDARD, ENHANCED and PREMIUM

Market Segments

Versions:	Standard	Enhanced	Premium
Main Function:	Cruise Control	Road Speed Limiter	RPM Control
Market Segment:	On Highway, P&A	On Highway, P&A	On/Off Highway OE
Application:	Car/Van	Van/LCV	Special LCV

For a detailed installation overview please refer to the technical section (page 165)

Part No.	Description
X10-737-100-001	Standard kit
X10-737-101-001	Enhanced kit
X10-737-102-001	Premium kit
All above kits consist of:	
<ul style="list-style-type: none"> • Electronic control module • Wiring harness • Accessories kit 	

Single Components And Installation Accessories

Part No.	Description
X39-737-300-009	Contact-less clutch switch
X39-737-300-008	Wiring harness
X39-737-300-007	Flexible control stalk switch (L/hand)
X39-737-300-006	Flexible control stalk switch (R/hand)
X39-737-300-005	LED stalk control switch (L/hand)
X39-737-300-004	LED stalk control switch (R/hand)
X39-737-300-003	Installation accessories kit
X39-737-101-001	Control module (Enhanced)
X39-737-003-003	PTO hand controller
X39-397-106-152	Clutch switch

Pick-up Sensors - Magnetic



Pick-up Sensor - Magnetic

The electro-magnetic sensor measures speed via an electro-magnetic charge and passes this signal onto the tachograph, Speedometer and any on-board computer

Features:

- High output voltage signal
- Wide operating temperature range
- Durable aluminium threaded sleeve with lock mount for adjustable depth applications
- Heavy duty wiring harness

Application:

All types of American trucks, e.g. Eagle, Mack, Freightliner and International

Part No.	Description
104-107	Speed sender single output
104-112	Speed sender dual output

Parts Listing - Control & Monitoring Systems

Rev Limiter



Engine revolutions, if not kept under manufacturers' specification, can irreparably damage an engine. Stop the driver from over-revving.

When the revs exceed the pre-set speed limit, it gives an audible and visible warning signal. Thereafter there is an optional engine shut-down.

Specifications:

- 12V application
- Temperature range: -40 - +85°C
- Adjustable range: 4 cyl. 3000 RPM to 12000 RPM
6 cyl. 2000 RPM to 9000 RPM
8 cyl. 1500 RPM to 6000 RPM
- Pre-set at 5200 RPM for 4 cyl. engine

Application:

Petrol engines only fitted with 'Hall-effect' electronic distributors.

Part No.	Description
104145	12V Elect. Ignition (hall effect only)

For a detailed connection diagram please refer to the technical section (page 165)

Reversing Camera



- Large Screen
- Colour or black & white
- Multiple cameras
- Split screen viewing of up to 4 camera inputs
- ISO9001 & ISO13766 approved
- Waterproof
- Provides surveillance of goods in transit (theft protection)
- Increase safety on construction and mining sites
- Offers night vision
- Driver is in more control of hazards such as pedestrians, vehicles buildings and equipment
- Prevents traffic fines from broken lights due to reversing accidents

RBG8100 Reversing Camera Kit



Part No.	Description
RBGM8	5.6 TFT monitor
RBGM64	Cable adaptor
RBGM2	Monitor extension cable fitting kit
RBGC8	Colour audio camera
RBG020	20m 4 core cable



Applications

- Buses
- Earth moving equipment
- Mining vehicles
- Commercial vehicles
- Cash-in-transit vehicles
- Caravan & trailers
- Marine ships and leisure crafts
- Off-road vehicles
- In-van vision in vehicles/vessels

Part No.	Description
RBG020	20m camera extension cable for RBG8000 system
RBG8100	Colour TFT rear view camera system Voltage operation 12-24V Full installation kit consists of: 1 x LCD monitor screen, size 140mm 1 x CCD colour camera, dimensions: 72W x 45H x 550D 1 x control box consists of: 2 camera inputs Mirror/normal view selection for both cameras 1 x fitting kit including: 20m cable (camera to monitor), power supply and monitor control cable
RBG8400	Quad 4 colour camera system Full installation kit consists of: 4 x colour cameras 2 x 10m extension cables 2 x 20m extension cables 1 x colour monitor 180mm 1 x quad control box 1 x power cable
RBGC8	Colour camera for RBG8000 system
RBGCB8	Control box for RBG8000 system
RBGM2	Monitor extension cable for RBG8000 system
RBGM46	DIN adaptor cable 4-way plug male
RBGM64	DIN adaptor cable 6-way plug female
RBGM7	Colour monitor screen size 180mm Suitable to operate with colour camera RBGC8 20m extension cable RBG020 and control box RBGCB8
RBGC8	Colour camera for RBG8000 system
RBGPW3	Power cable for RBG8000
RBGSC8	Flexible suzi cable for RBG8000 system

Parts To Operate The Monitor With Two Cameras

Part No.	Description
RBG010	10m camera/monitor extension cable
RBG020	20m camera extension cable
RBG05	5M camera/monitor extension cable
RBGC8	Colour camera

Parts Listing - Control & Monitoring Systems

RSI System (Add-On Kit)



Add-On Kit

The RSI system limits engine revolutions, vehicle speed and idling time on vehicles and prevents these operating limits from being exceeded. Revolutions and speed are controlled by means of an early warning visual display, a buzzer alarm and an optional engine shut down.

Part No.	Description
415-SPEC-402	Installation kit 12V/24V
This kit is designed to be added to the Automonitor system	
Monitoring speed, RPM and idling	
The Automonitor harness is designed to accept the RSI module and display	
The system requires a Road Speed Pulse and engine RPM input signal	
For a detailed connection diagram please refer to the technical section (page 165)	

Stand Alone

Not recommended for petrol engine application
This kit comprises RSI module-display-buzzer-plug kit-harness
The system requires a Road Speed Pulse and Engine RPM input signal
Diesel shutdown components are not included in this kit

Application:

Diesel engine applications only	
Part No.	Description
415-SPEC-403	Installation Kit 12V/24V



Buzzer

• 41.8mm diameter			
• 22mm depth			
Part No.	Description	Colour	Volt
415-006	89DB	Black	3V-30V
For a detailed connection diagram please refer to the technical section (page 165)			

Road Speed Limiter



Road Speed Limiter - Petrol

The Road Speed Limiter controls vehicle speed by limiting it to a pre-set speed. It does not restrict the vehicle's performance until the pre-set limit is reached when an audible warning sounds. If the warning is ignored, the vehicle is permitted to travel marginally faster before its speed is limited. Once the vehicle speed drops below the limit, control is returned to the driver.

Features:

• Limits speed without limiting revs
• Allows maximum pulling power
• Audible warning speed threshold
• Robust and tamper proof
• Programmable speed range
• Self Diagnostic fault memory
• High accuracy tolerance (0.5%)
• Ability to check the total installation while the vehicle is stationary

Parts Listing - Control & Monitoring Systems

Road Speed Limiter - Continued



Benefits:

- Pro-active control of speed
- Safer drivers
- Lower collision costs
- Less fuel
- Less engine repairs
- Less downtime
- Less maintenance
- Less traffic fines

Our product has been approved by the governments of:
Zambia, Tanzania, Kenya, Zimbabwe, Namibia, Uganda and Zambia

Application:

All petrol engines

Part No.	Description
104-SPEC-101	Complete kit 12V - includes electronic module-wiring harness, buzzer and speed sensor kit
104-SPEC-104	Installation kit 12V - without speed sensor kit

For a detailed connection diagram please refer to the technical section (page 165)

Road Speed Limiter - Diesel

Part No.	Description
104-SPEC-102	Full kit 24V without the speed input sender - the speed signal can be taken from an electronic speedometer or tachograph
104-SPEC-103	Complete kit 24V includes the speed sensor and diesel shutdown components
104-SPEC-105	Full kit 12V without the speed input sender - the speed signal can be taken from an electronic speedometer or tachograph
104-SPEC-106	Complete kit 24V includes the speed sensor and diesel shutdown components
104-SPEC-107	Kit 12V/24V includes the module/harness and buzzer
104-SPEC-107K	Kit 12V/24V includes the module/harness and buzzer (no RPM input required)
104-SPEC-201	Basic kit 24V includes the speed sensor but without diesel shutdown components
104-SPEC-201K	Basic kit 12V/24V includes the speed sensor but without diesel shutdown components (no RPM input required)

Application:

All types of diesel engines

For a detailed connection diagram please refer to the technical section (page 165)

Speed/RPM Alert

This is a warning device which alerts the driver to over-revving or excessive speed. It does not limit revs or speed as such but alerts the driver to the infringement by means of a warning light or warning buzzer.

Features:

- It has a passive warning device
- Easily adjustable setting
- Over-ride at any time for safety reasons
- Can be used on any vehicle

Parts Listing - Control & Monitoring Systems

Speed/RPM Alert - Continued



Application:

All types of vehicles, petrol or diesel

Part No.	Description
104154	Module only

Depending on the application a buzzer or warning light must also be supplied
The speed input signal can be taken from an existing electronic speedometer or from an in-line speed sender (not supplied with module)

The RPM signal is to be taken from the "W" terminal of the alternator

For a detailed connection diagram please refer to the technical section (page 165)

Spike & Over-Voltage Protectors



Spike & Over-Voltage Protector - 24V

Protect your electronic equipment from damage and destruction caused by power spikes and voltage surges

Just one voltage surge or spike can cause serious damage to your electronic on-board equipment, for example, tachographs, navigation equipment and on-board computer
Imagine the cost involved in replacing those items

Operational Description:

This module provides spike voltage suppression on supply voltage and "W" terminal outputs
The module detects continuous over-voltage of input supply and disconnects the output from the input when the input voltage exceeds a set limit

The maximum "W" terminal output is limited to 33V continuous

The module requires correct polarity supply input to provide a supply output

How It Works:

It works by suppressing spike voltage and detecting power surges, for example, during jump-starting (from corroded or loose battery terminals) and electric welding on chassis

Application:

All types of vehicles, off-road equipment and marine engines, 24V

Part No.	Description
415-301	Spike & Over-voltage protector 24V

For a detailed connection diagram please refer to the technical section (page 165)

Starter Motor Protectors

Save yourself the cost of replacing your starter motor and reduce vehicle downtime by fitting this device

Operational Description:

The starter motor protector module controls the engine cranking time (starter motor running time) to a maximum of 12 sec and prevents further starter motor operation for 20 sec

Battery voltage is monitored and starter motor operation is prevented when the battery voltage is below 18V for a 24V system

Starter motor operation is inhibited when the engine is running

Parts Listing - Control & Monitoring Systems

Starter Motor Protectors - Continued



Features:

- Controls maximum continuous cranking time
- Controls maximum inhibited cranking time
- Maintenance-free electronic module
- Waterproof, shock-proof module
- High voltage spike protection

Application:

All types of vehicles, off-road equipment and marine engines, 24V

Part No.	Description
415-300	Starter motor protector 24V

For a detailed connection diagram please refer to the technical section (page 165)

Tilt Switches



The Tilt Switch is specifically designed to detect a vehicle rollover. The unit is built to withstand heavy vibration without giving false readings. After rotating past 45° 'along its longer axis' for greater than 4 seconds, the unit trips a relay and holds until it returns to less than 45° tilt.

Tilting along its narrow axis requires around 70° to activate, allowing a diversity of applications. The delay is ideal where the terrain may cause the rotation to momentarily pass 45° as it needs to stay past 45° for more than 3-4 seconds to trip the sensor. Supply voltage is flexible, operating anywhere from 10-32V DC.

Even in the roughest terrain there will be no false readings until the vehicle stays past 45°. This unit is built to drive a relay (500mA max on blue wire) so as to allow for greatest variety of applications, such examples are fuel cut-off, engine-kill, sending a signal to an onboard computer, etc. The switch is in solid epoxy which provides all weather protection for use in the harshest environments.

Features:

- Operating voltage: 10 - 32V
- Temperature range: -40 - 85°C
- Pre-set at 60°
- Mercury contacts

Benefits:

- Used for insurance purposes
- Reduces downtime
- Saves the engine
- Prevents possible engine fire

Application:

All types of vehicles, petrol or diesel engines 12V/24V

Part No.	Description
415-218A	Roll-over (Tilt Switch)

For a detailed connection diagram please refer to the technical section (page 165)

Parts Listing - Control & Monitoring Systems

Turbo Timers



The turbo timer is suitable for petrol or diesel engines. It does not limit the engine revolutions and allows normal operation of the vehicle.
 When the engine reaches the threshold engine revolution, the turbo timer is activated. The built-in timer starts counting when the ignition is switched off, allowing 2 minutes of idling time to allow the turbo to 'cool-off'.
 After the 2 minutes has elapsed the vehicle will automatically switch off.

Operation

1. Rev up the engine to the turbo operating speed (factory specified RPM) or 1000 RPM for diesel engines and 2500 RPM for petrol engines. These are approximate values. It is recommended to contact the vehicle manufacturer for correct turbo operating speeds.
2. Turn potentiometer until the LED comes on.
3. Reduce engine rev to idle and check that the LED goes off again.
4. Switch off ignition and wait for 2 minutes to ensure that the Turbo Timer keeps the engine running for 2 minutes.
5. Connect to either W-Terminal or Negative coil.

Features:

- Built in spike protection
- Thermal shutdown protection
- Reverse polarity protection
- Maximum output current 7A for limited time
- 12V/24V version operates between 150Hz & 1000Hz from W-terminal of the alternator
- 2 minute shutdown only starts after engine RPM has dropped below present parameters

Application:

All types of vehicles, petrol or diesel engines

Part No.	Description
104-SPEC-301	Turbo timer kit with harness
104157	Turbo timer module 12V/24V
104158	Turbo timer harness 1.5m

For a detailed connection diagram please refer to the technical section (page 165)

Ultrasonic Tank Senders



Ultrasonic Tank Sender - Application:

Can be used on fuel (petrol & diesel) and fresh water tanks.
 Standard off-the-shelf TSI is set for 200mm - 2m depth.

Features:

- 10V (min) - 32V (max) DC
- Operating distance of 200mm - 2000mm
- Linear and non-linear tank calibration at 5 levels
- Supports metal and plastic tanks
- Industry standard SAE-5 stud mounting pattern with gasket seal and washers
- Supports 10 - 180V, 10 - 300V, 240 - 33V and 1 - 5V gauge outputs
- Resistant to petrol, diesel, water and chemical toilet

Parts Listing - Control & Monitoring Systems

Ultrasonic Tank Senders - Continued

- Operating temperature range of 4 - 65°C

Plug Information and Specifications:

- Red - Battery Positive
- Black - Battery Negative
- Green - Output to Gauge

Part No.	Description
TSI	Tank sender
TSI-PK	USTS programming kit
	USTS (ultrasonic tank sender)
TSI-Promo Kit	Consists of 12 x TSI's and the TSI-PK programming kit

For a detailed connection diagram please refer to the technical section (page 165)

Water Level Probes



Mounting the Rubber Grommet In the Expansion Tank

- Find a suitable location (slightly below the low level mark on a flat surface)
- The probe should never be installed in an area of cooling water turbulence
- Drill a hole of 24mm diameter using a hole saw (a cone drill is not suitable)
- Remove/clean holes of burrs and sharp edges
- Use an adhesive to stop the grommet from turning inside the hole
- Use grease or a mild lubricating oil between the flat surface of the grommet and the hexagon of the probe for easier turning
- Tighten the probe by hand in the grommet until it is properly secured (if necessary turn it another 1/2 turn using a spanner)

Part No.	Description
395-209	Water level probe (compact)
395-210	Oil level probe (compact)
415-207	Water level probe (capacitive)
415-209	Interface for above
415-SPEC-215	Kit includes probe and interface

For a detailed connection diagram please refer to the technical section (page 165)



TECHNICAL INFORMATION - CONTROL & MONITORING SYSTEMS

Detailed technical information on Autosave vehicle monitors.

Due to the intricacies involved in the installation of the Automonitor range, Control Instruments Automotive in this section gives you, the technician, all the necessary information required for successful installation. Please see page 166 to 167 for further details.

Section Content

Technical Information

- Frequently asked questions
- Connection Diagrams
 - Automonitors
 - Pedal Interface II
 - Rev Limiter
 - RSI System
 - Road Speed Limiter
 - Speed/ RPM Alert
 - Spike & Over-Voltage Protector
 - Starter Motor Protector
 - Tilt Switch
 - Turbo Timers
 - Ultrasonic Tank Senders
 - Water Level Probes

Technical Info - Frequently asked questions

RSL

1. Does the RSL reduce engine power?

The RSL limits the road speed. It does not reduce or limit the engine's power.

2. Why is there a separate control module for petrol and diesel engines?

The two engines have different ways of igniting fuel. As a result there is also a difference in the way that the engines are shut down. For that reason there are separate modules for the 2 engine types.

3. What do the Calibrator and the Policing units do?

The Calibrator unit is used to pre-set the speed limit on the control module. The Policing unit is used to check if the speed limit set on the control module has been changed or tampered with.

RPM Alert

1. Is the RPM Alert only used to monitor excessive engine revolutions?

No, it can also be used to monitor road speed and will warn the driver if either revs or speed go over the preset limit.

Turbo Timer

1. Does the Turbo Timer lubricate the turbo?

The Turbo Timer does not lubricate the turbo. It prevents damage to the turbo by allowing the vehicle to run at idle speed for the recommended 2 minutes before shutting down.

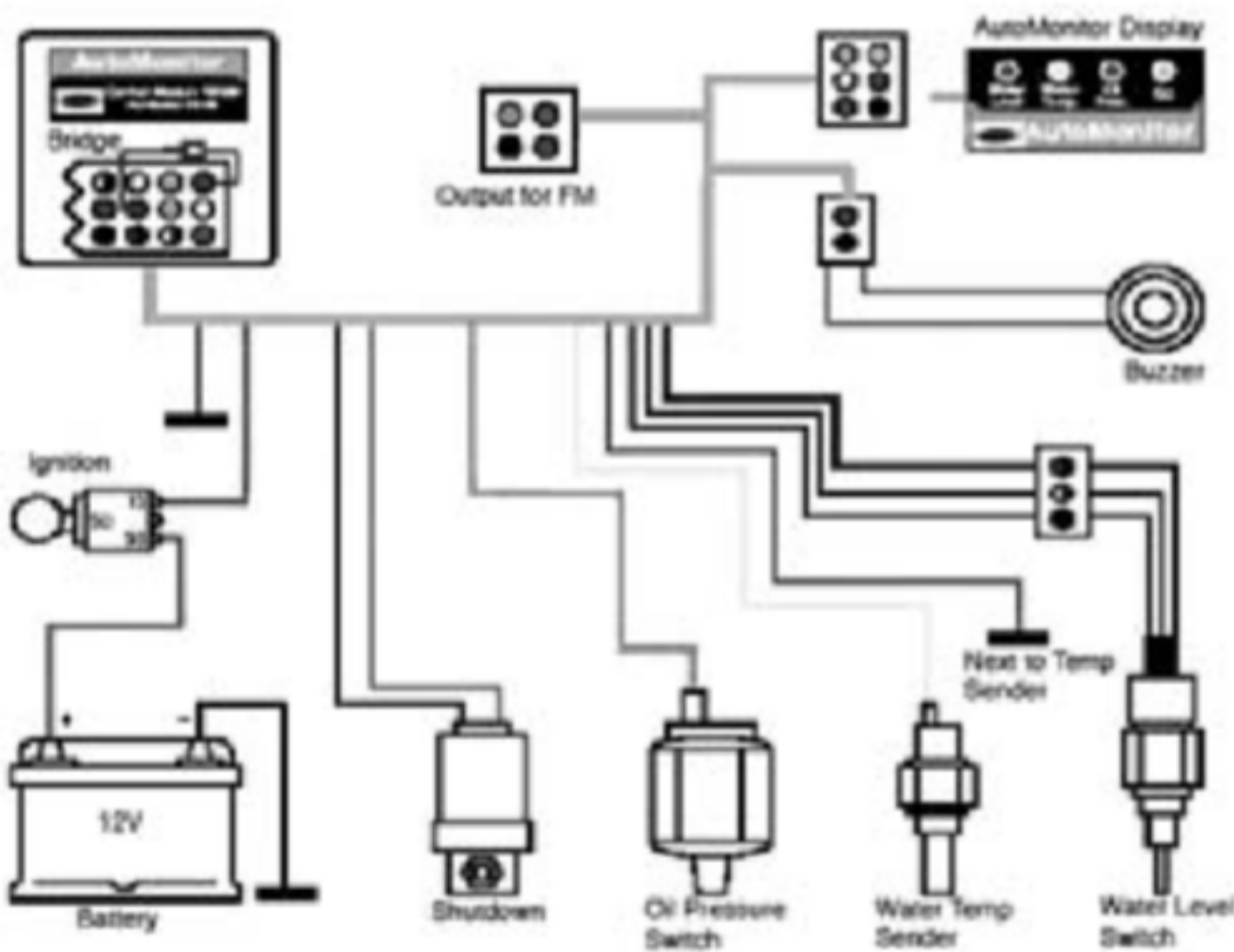
Tilt Switch

1. What is the purpose of the Tilt Switch?

The Tilt Switch is used to prevent damage to the engine by shutting it down in the unfortunate event of the vehicle overturning. In this situation the engine is no longer lubricated, so as a protection against further damage, the Tilt Switch shuts the vehicle down.

Technical Info - Connection Diagrams

Automonitors



Automonitors connections

Red - Ignition+
Black - Ground

Shutdown

Blue - Positive Supply
Black - Ground

Oil Switch

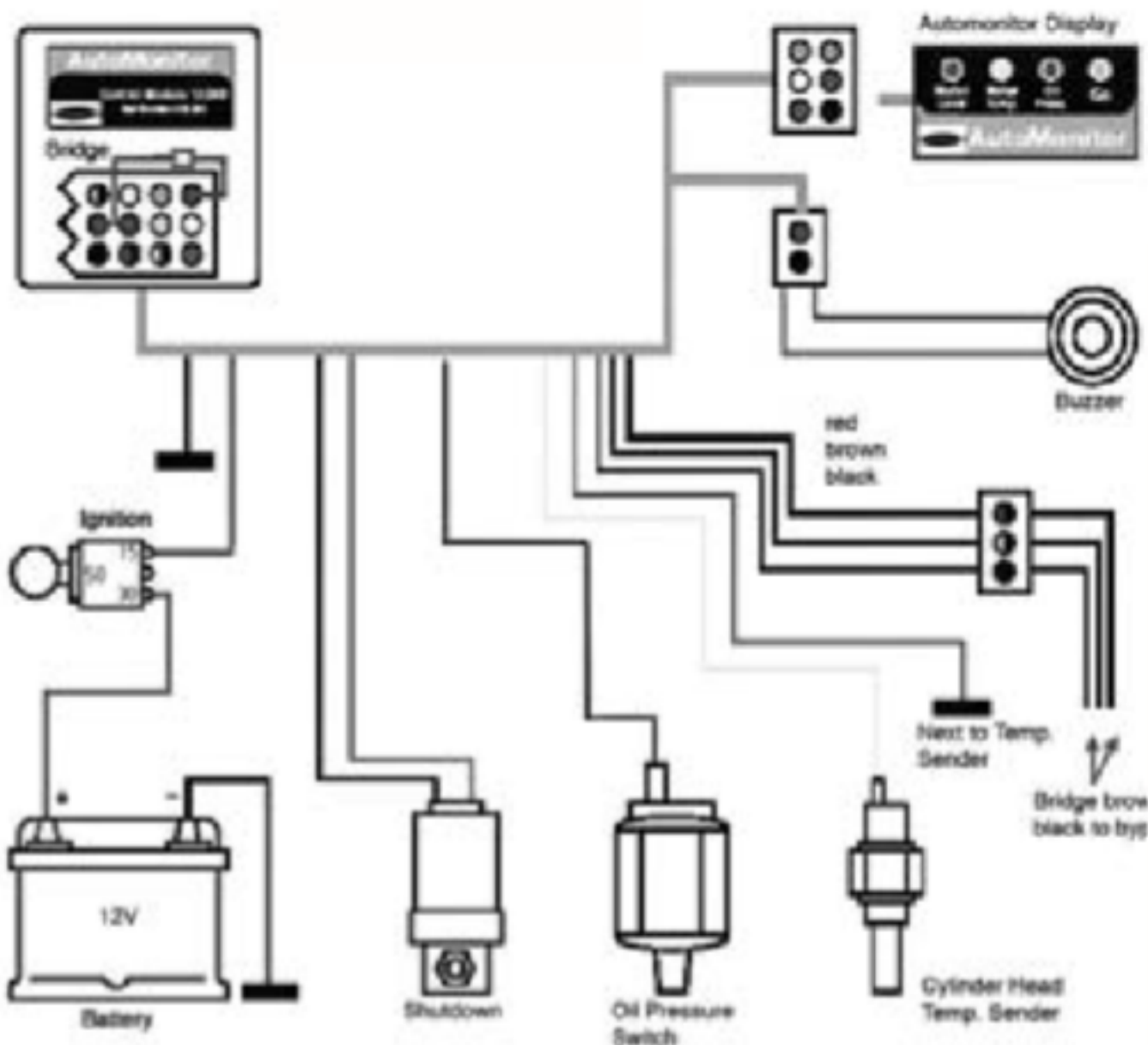
Green - Sensor

Water Temperature Sender

Yellow - Sender
Purple - Sender Ground

Water Level Switch

Red - Supply
Red/Brown - Signal
Black - Switch Ground



Automonitors connections - air cooled applications

Red - Ignition+
Black - Ground

Shutdown

Blue - Positive Supply
Black - Ground

Oil Switch

Green - Sensor

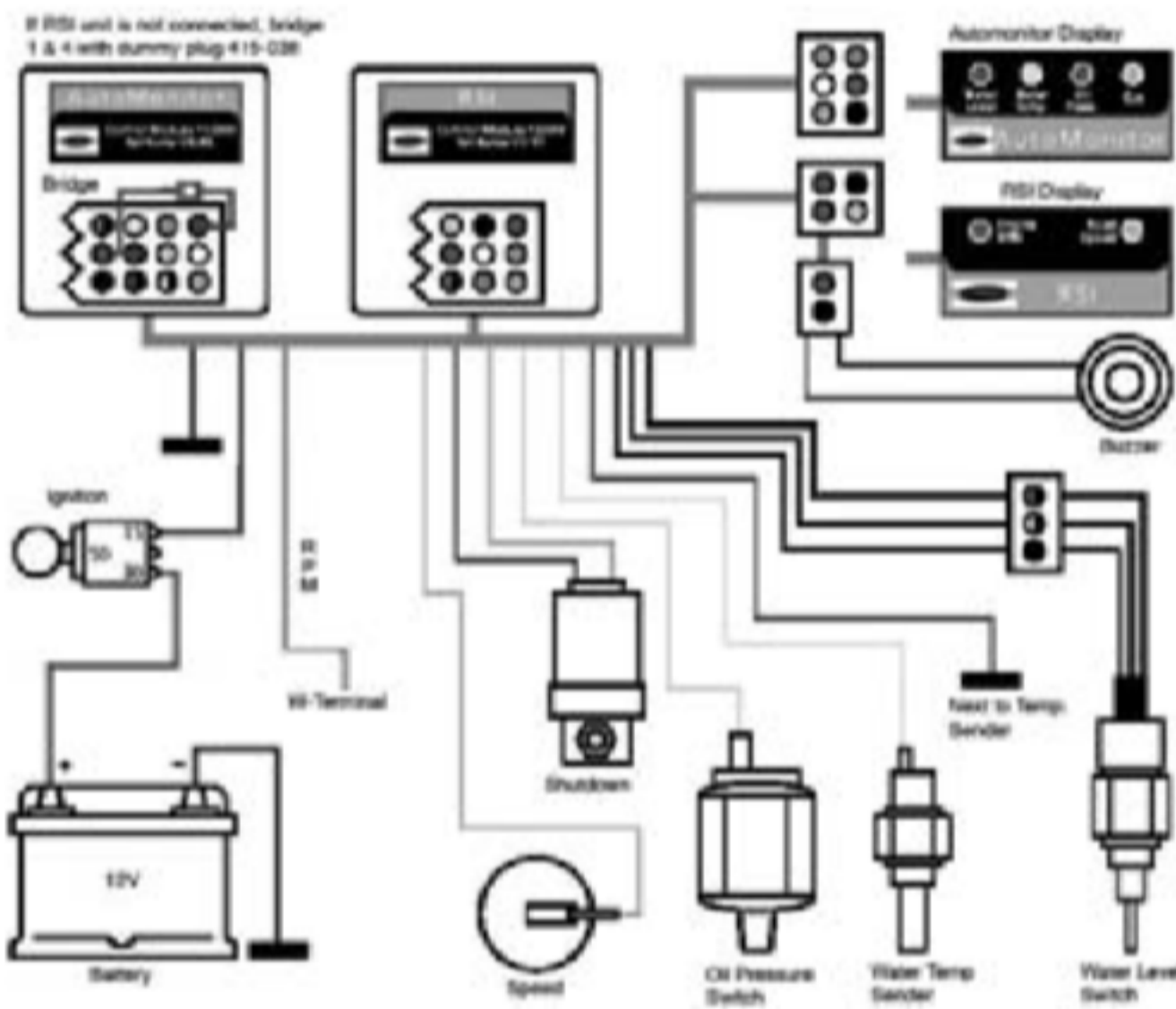
Water Temperature Sender

Yellow - Sender
Purple - Sender Ground

Water Level Switch

Red - Supply
Red/Brown - Signal
Black - Switch Ground

Technical Info - Connection Diagrams



Automonitors and RSI connections

Red - Ignition+

Black - Ground

RPM

Orange - Alternator "W" Term

Speed

Pink - Speed Pulse

Shutdown

Blue - Positive Supply

Black - Ground

Oil Switch

Green - Sensor

Water Temperature Sender

Yellow - Sender

Purple - Sender Ground

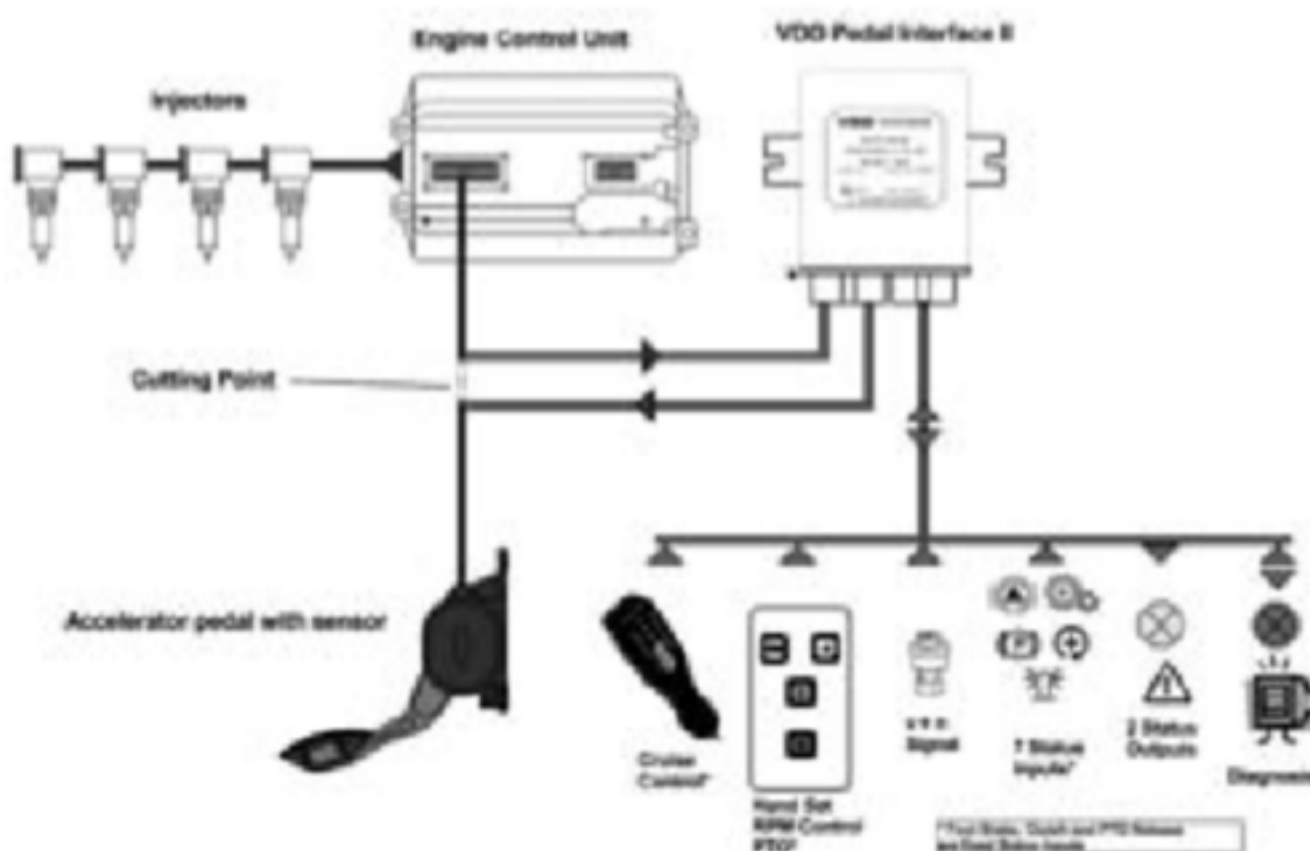
Water Level Switch

Red - Supply

Red/Brown - Signal

Black - Switch Ground

Pedal Interface II

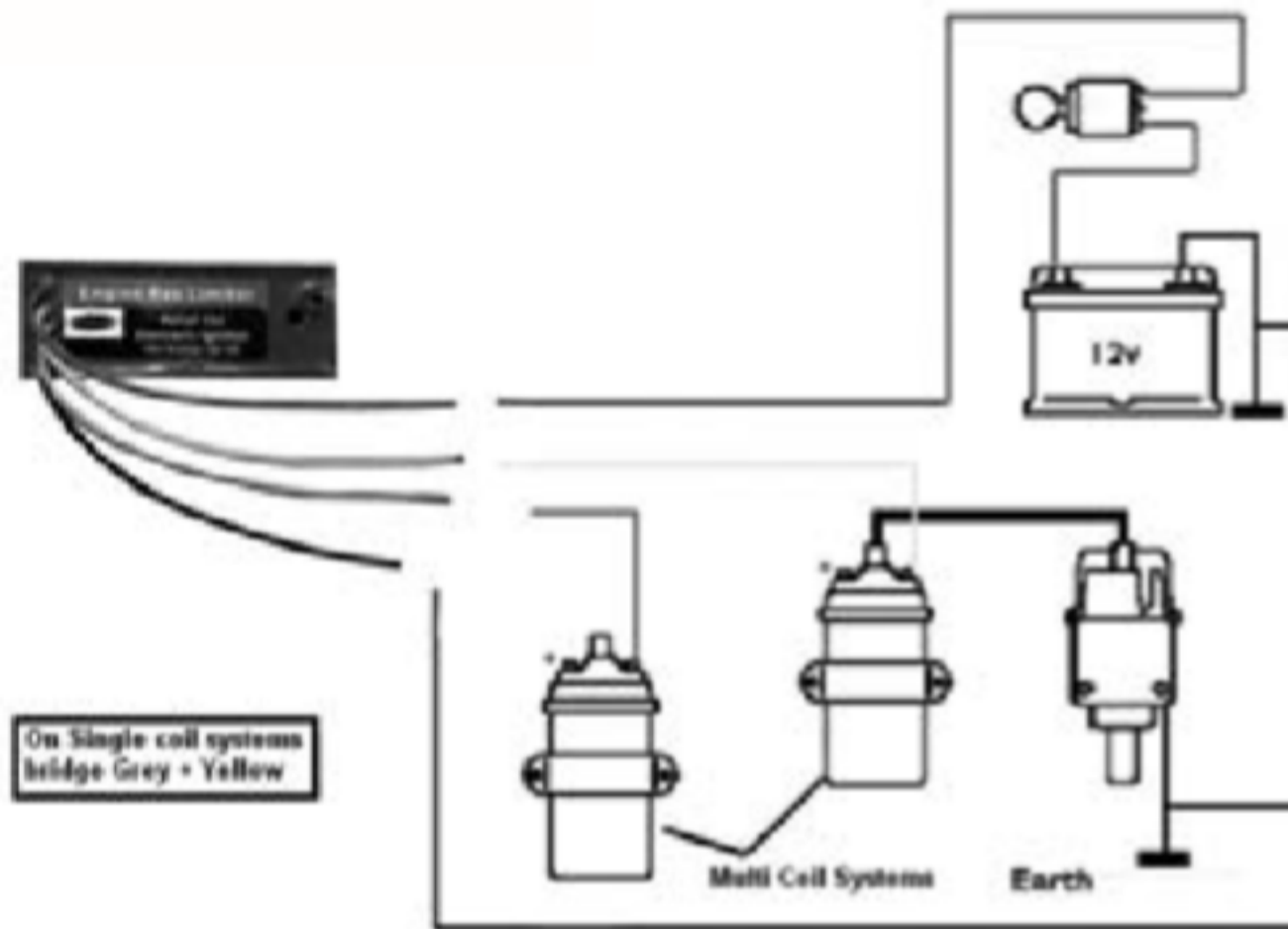


Installation overview

The Pedal Interface II is installed between the electronic accelerator pedal and the engine control unit. The electrical signals from the pedal pass the VDO Pedal Interface II ECU. Because of the different electrical signals on the various vehicles, each vehicle needs a special master file for installation. This master file is downloaded during installation.

Technical Info - Connection Diagrams

Rev Limiter

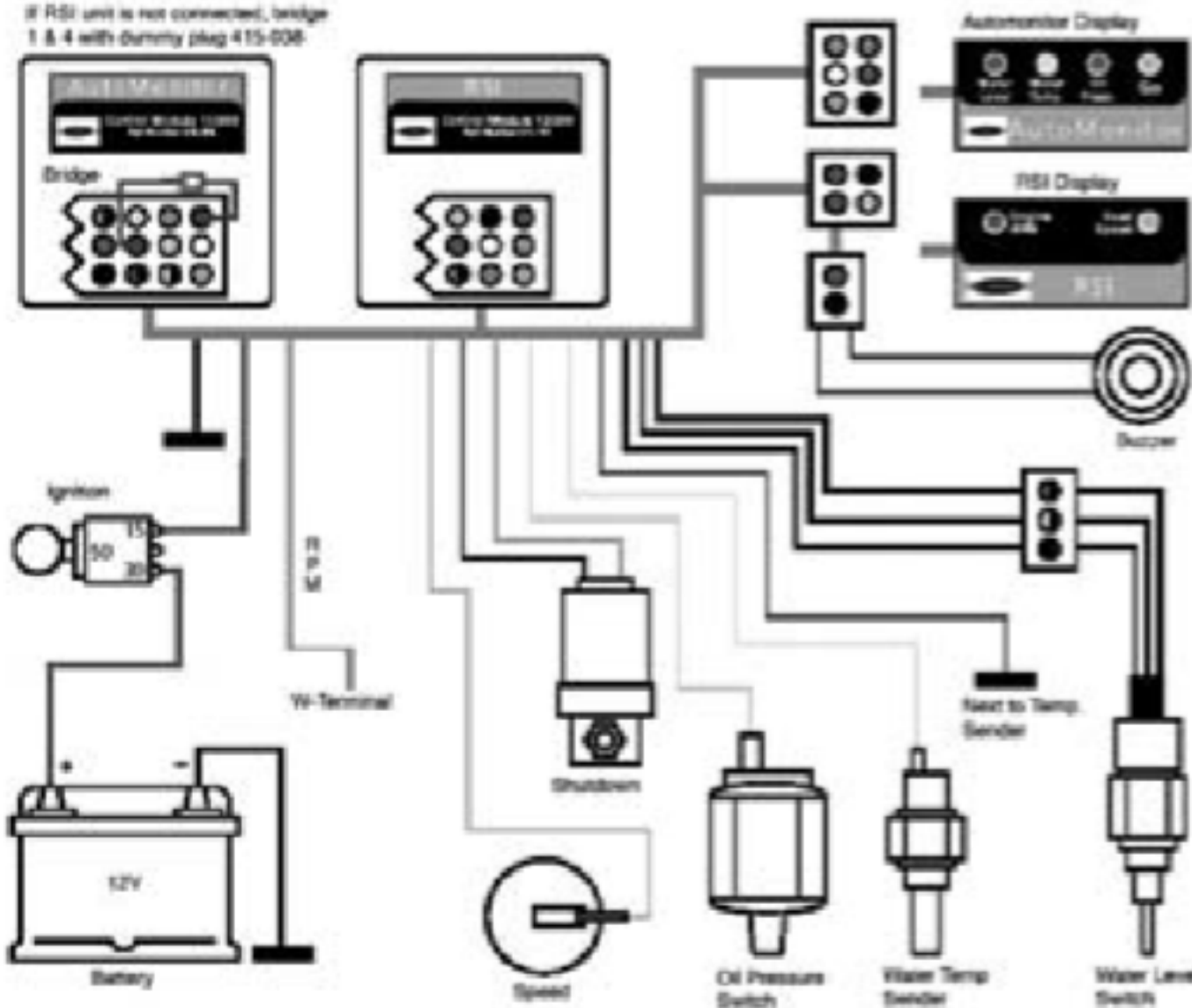


Rev Limiter connections

- Red - Ignition+
- Black - Ground
- Grey - Coil Neg Trigger (Coil 1)
- Yellow - Coil Neg Trigger (Coil 2)

RSI System

If RSI unit is not connected, bridge 1 & 4 with dummy plug 415-038

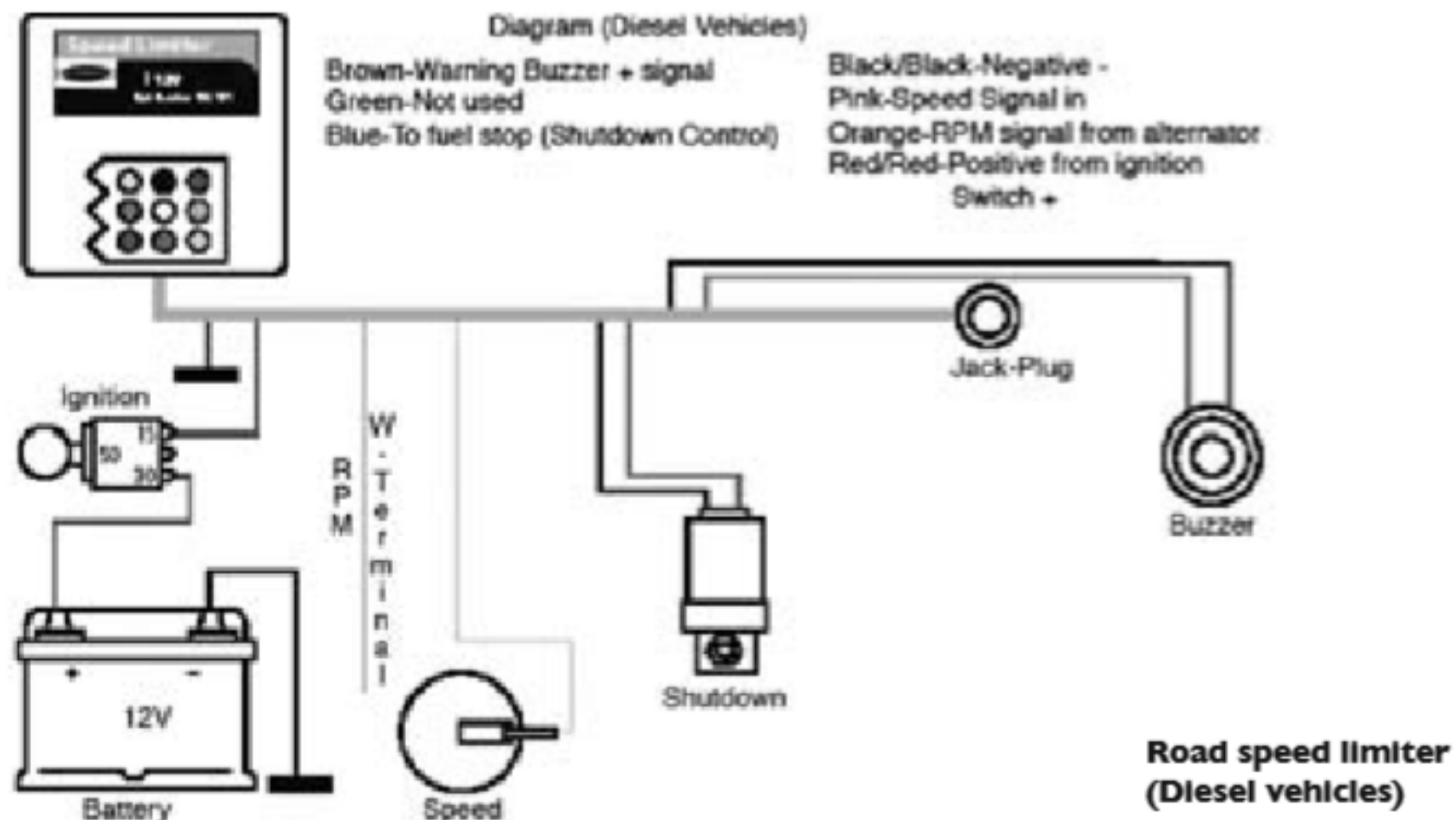
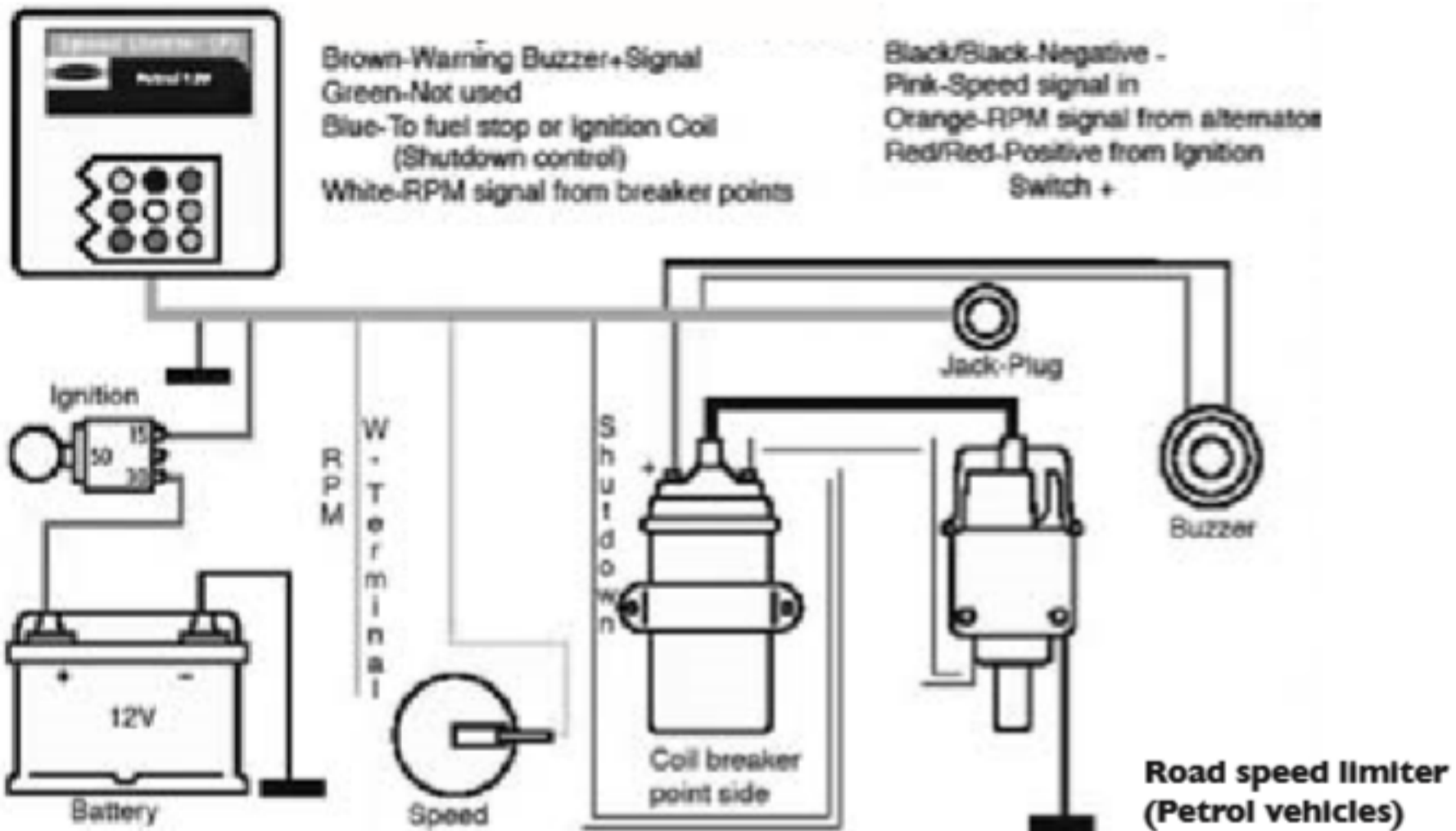


Automonitors and RSI connections

- Red - Ignition+
 - Black - Ground
- #### RPM
- Orange - Alternator "W" Term
- #### Speed
- Pink - Speed Pulse
- #### Shutdown
- Blue - Positive Supply
 - Black - Ground
- #### Oil Switch
- Green - Sensor
- #### Water Temperature Sender
- Yellow - Sender
 - Purple - Sender Ground
- #### Water Level Switch
- Red - Supply
 - Red/Brown - Signal
 - Black - Switch Ground

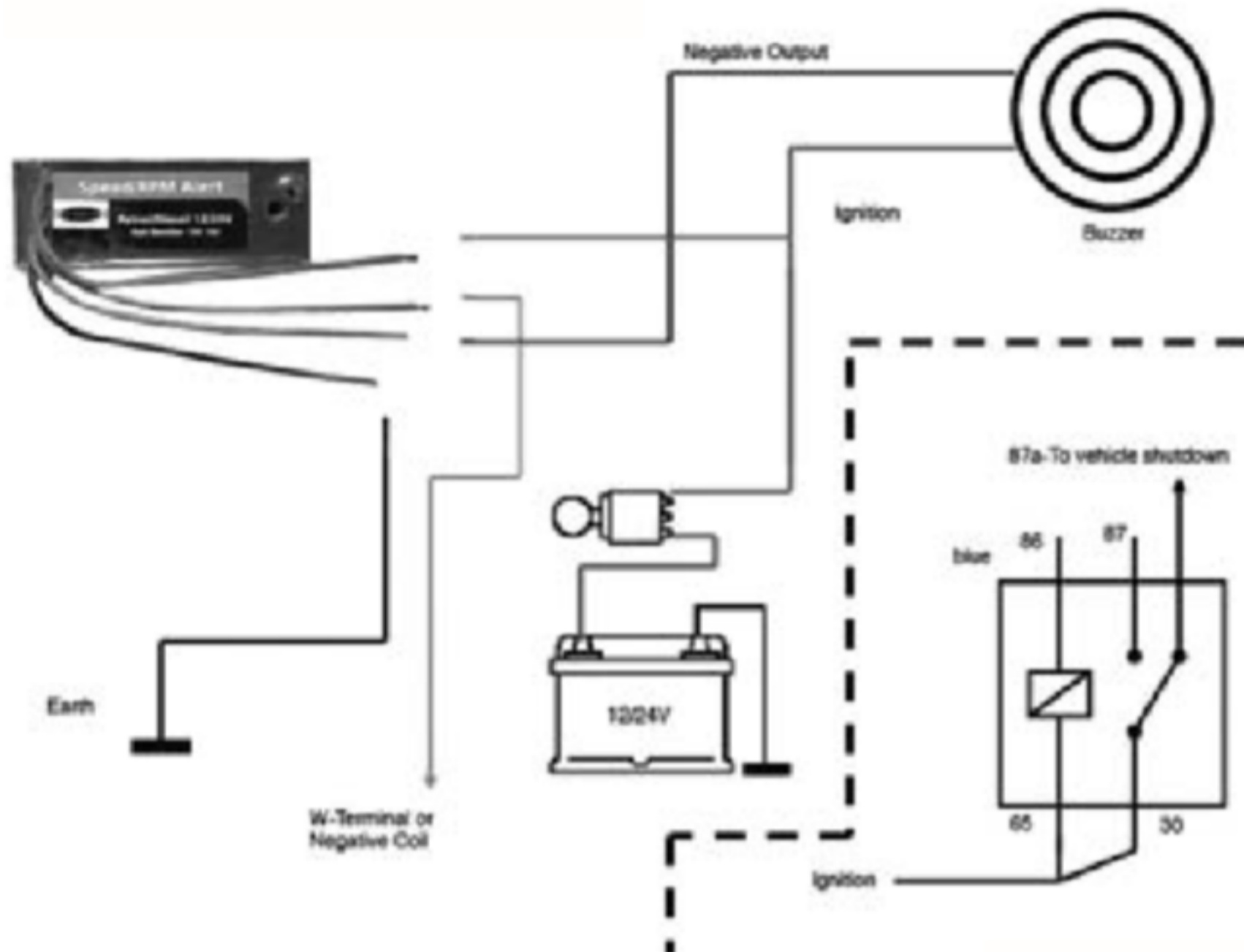
Technical Info - Connection Diagrams

Road Speed Limiter



Technical Info - Connection Diagrams

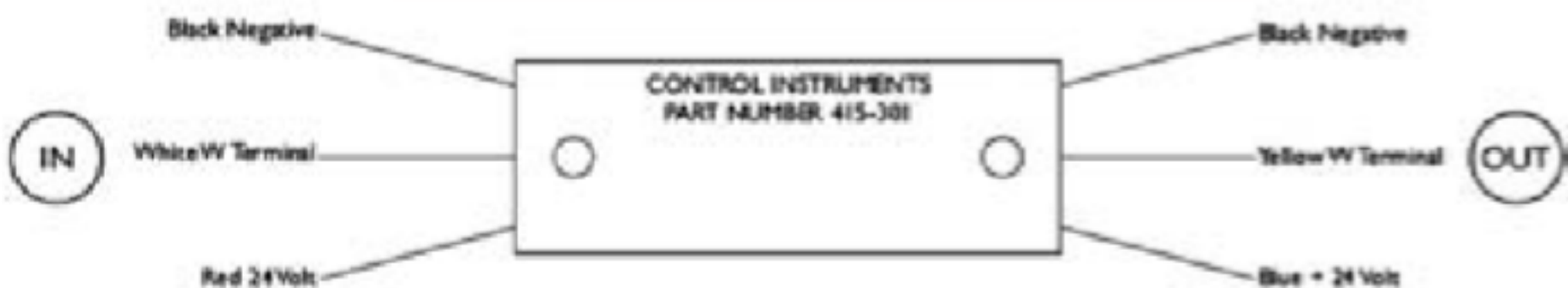
Speed/RPM Alert



Speed/RPM Alert

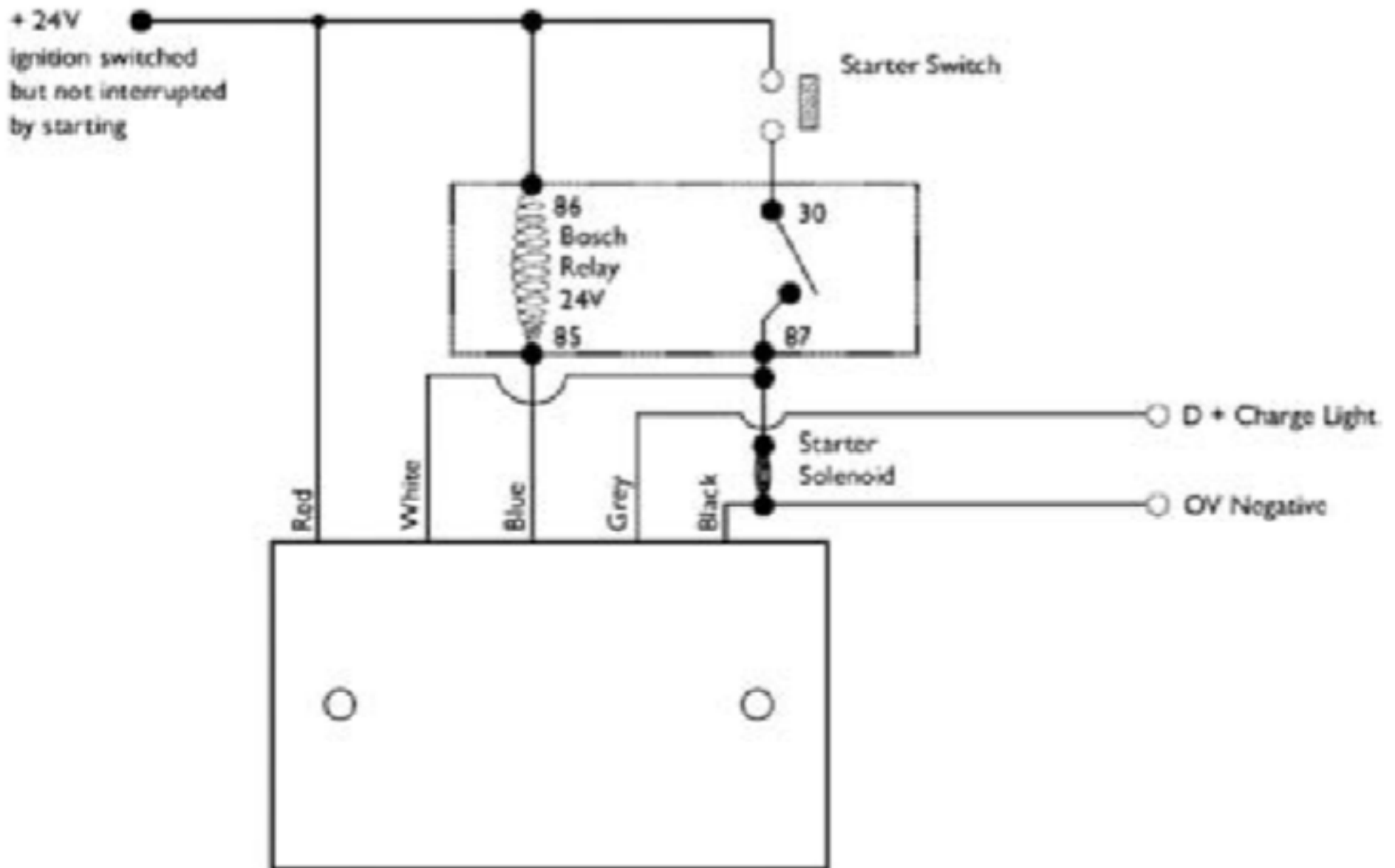
- Red - Ignition+
- Black - Ground
- Grey - Signal (w-term/coil/hall)
- Yellow - Negative Output

Spike & Over-Voltage Protector



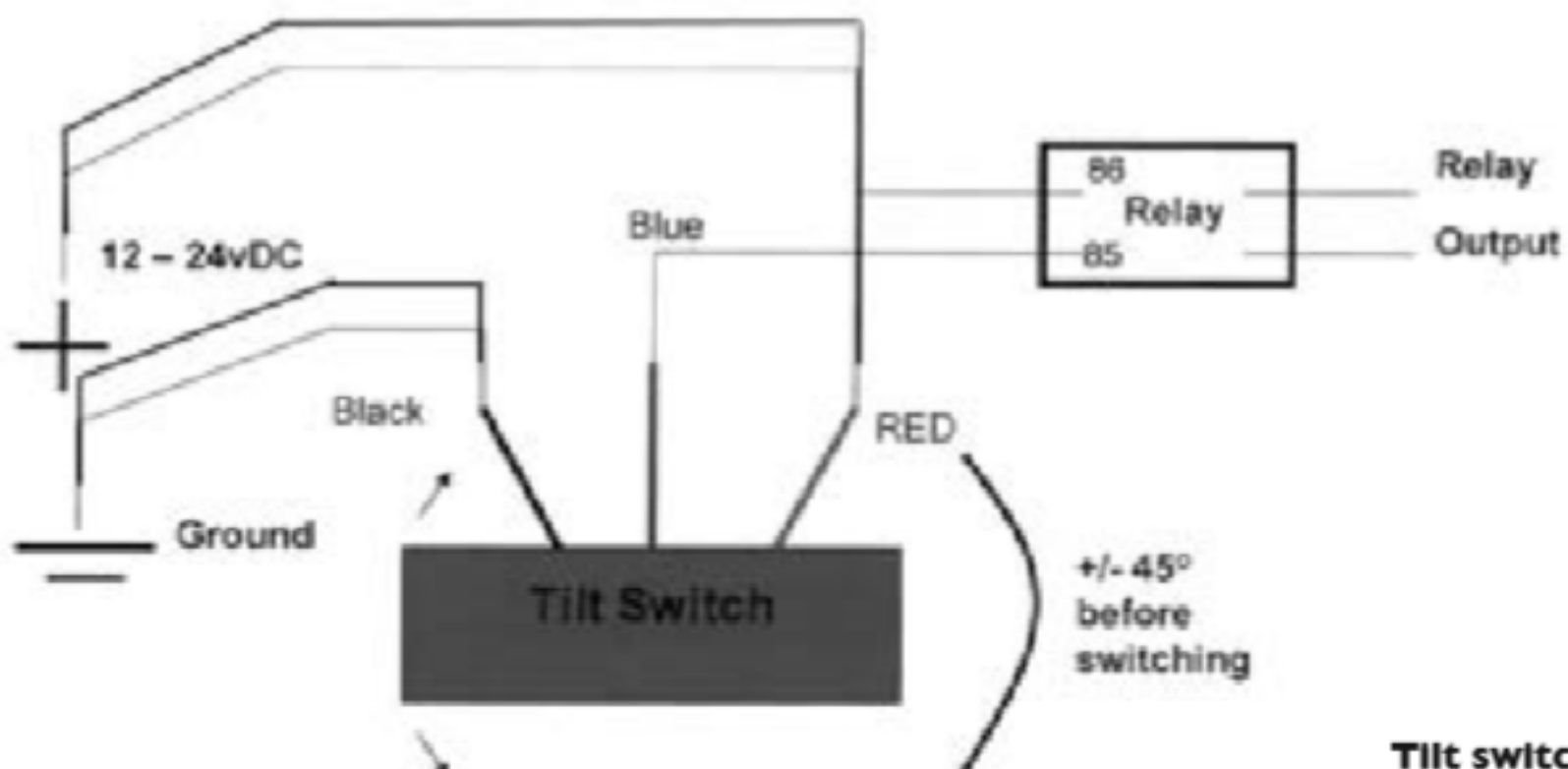
Technical Info - Connection Diagrams

Starter Motor Protector



Starter motor protector connections

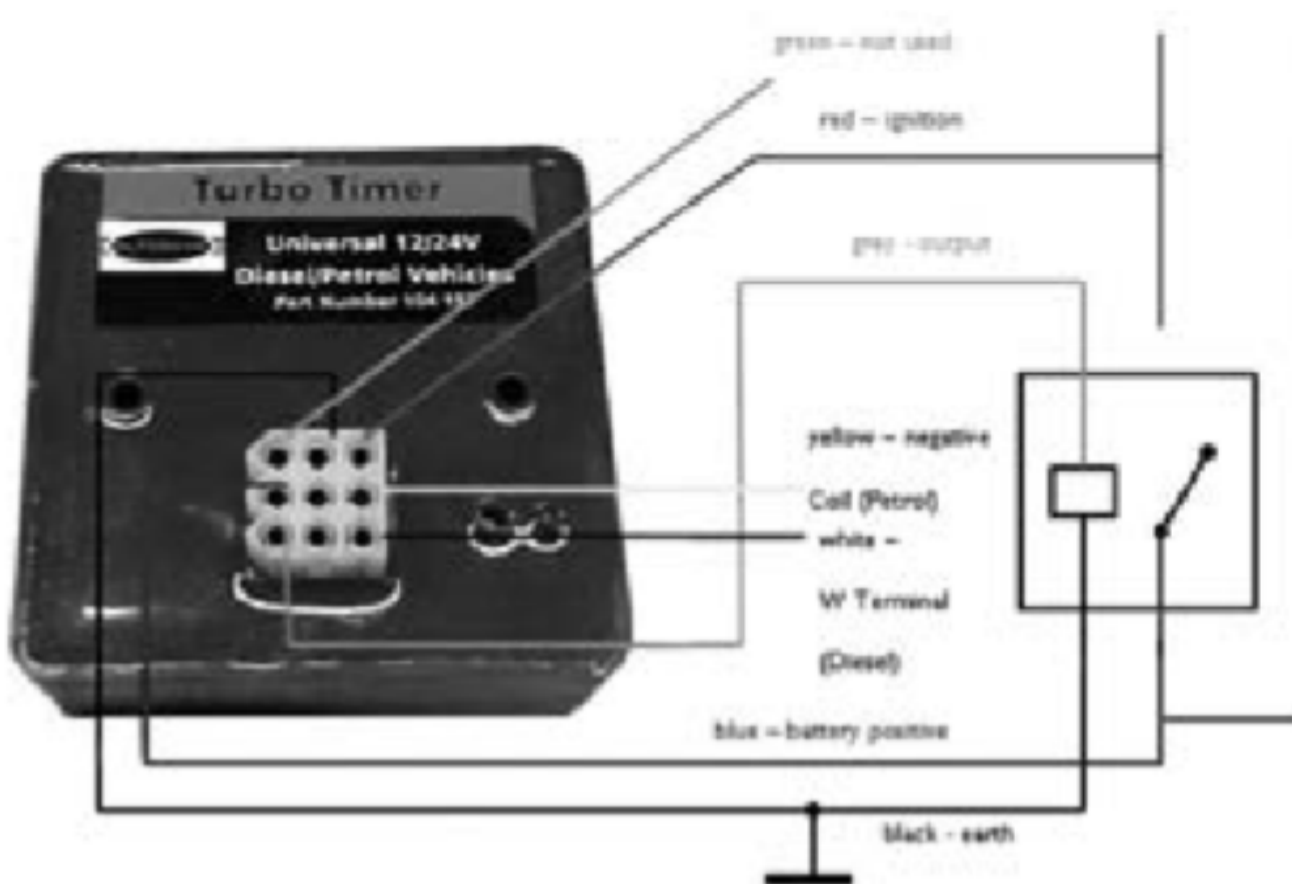
Tilt Switch



Tilt switch connections

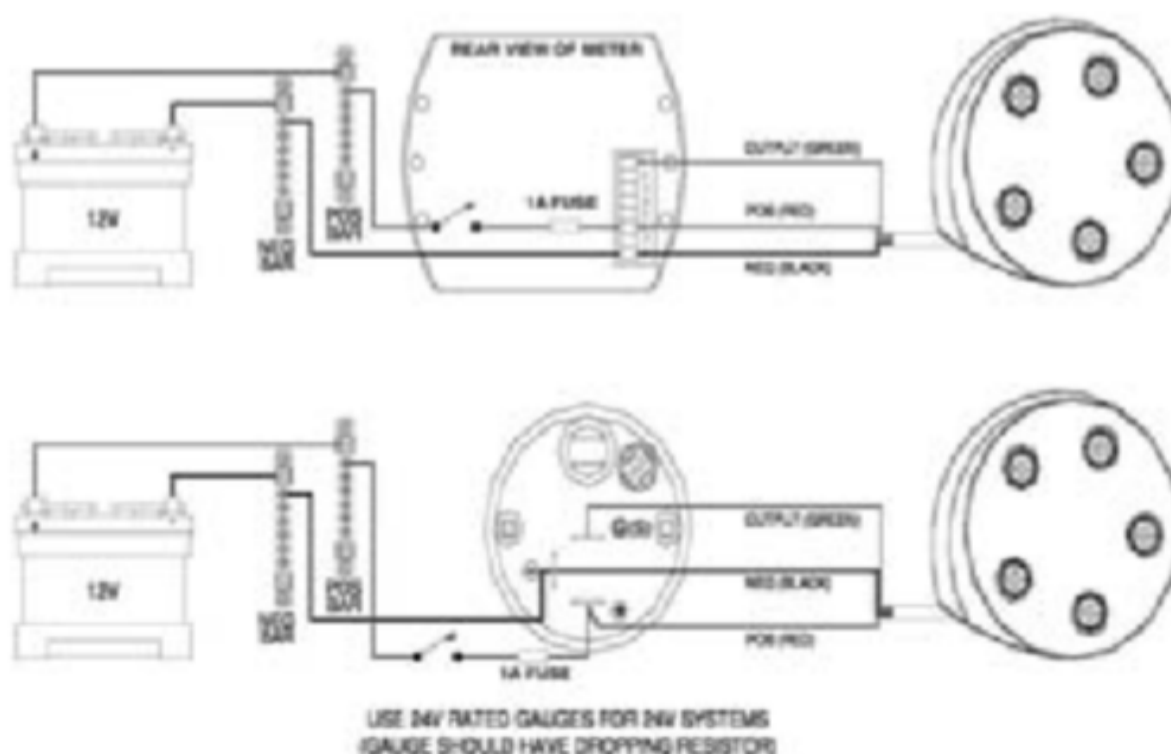
Technical Info - Connection Diagrams

Turbo Timers



Turbo timers connections

Ultrasonic Tank Senders



Ultrasonic tank sender wiring diagram

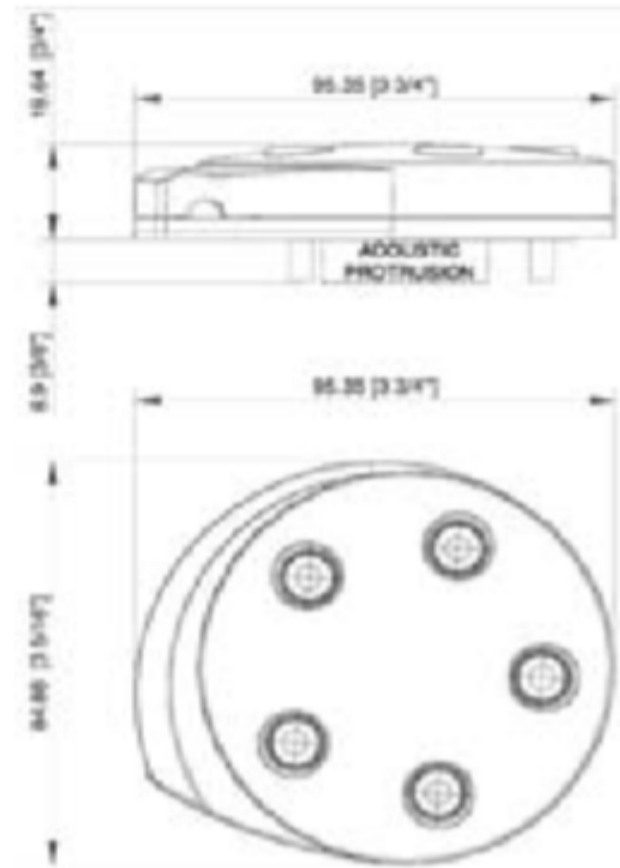
Important:

- The TSI is not recommended for use on tanks under 200mm.
- Mounting with baffles: The TSI can be mounted 60mm from a vertical tank baffle.
- The TSI (acoustic protrusion) see page 151, must not touch the wall of the tank. Otherwise, the TSI will not function.
- Please use the gasket provided, otherwise the TSI will not function. (Cork/Viton).
- Use 5 washers provided, washers must be placed under screw heads to prevent rubber lid damage.
- Maximum torque for the mounting screws is 0.5 Newton meter.
- 10 - 180Ω, 240 - 33Ω, and 10 - 300Ω, settings are suitable for analogue gauges only.
- The VDO Lever-Type fuel gauge 10 - 180Ω, is suitable to operate with the ultrasonic sender.

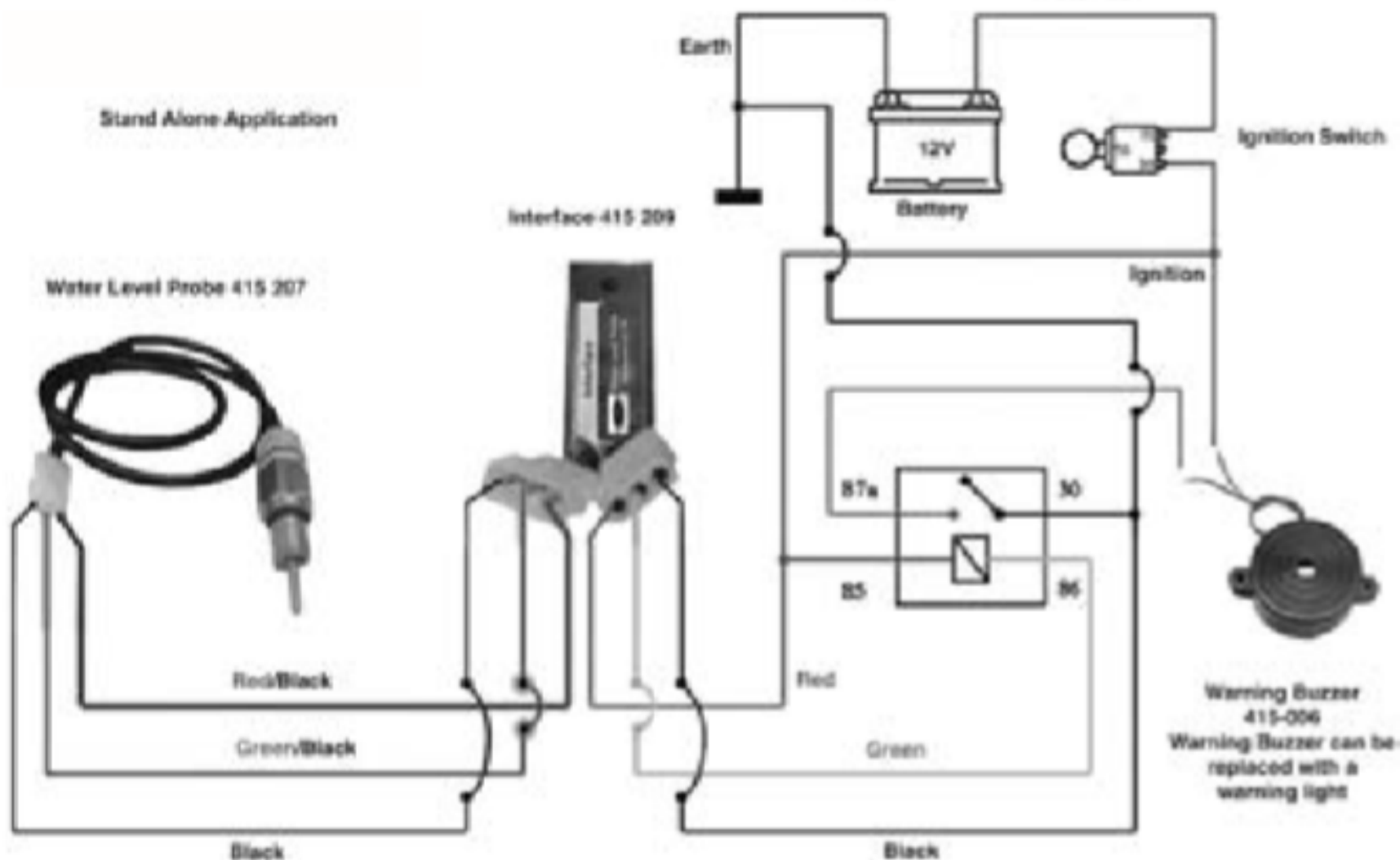
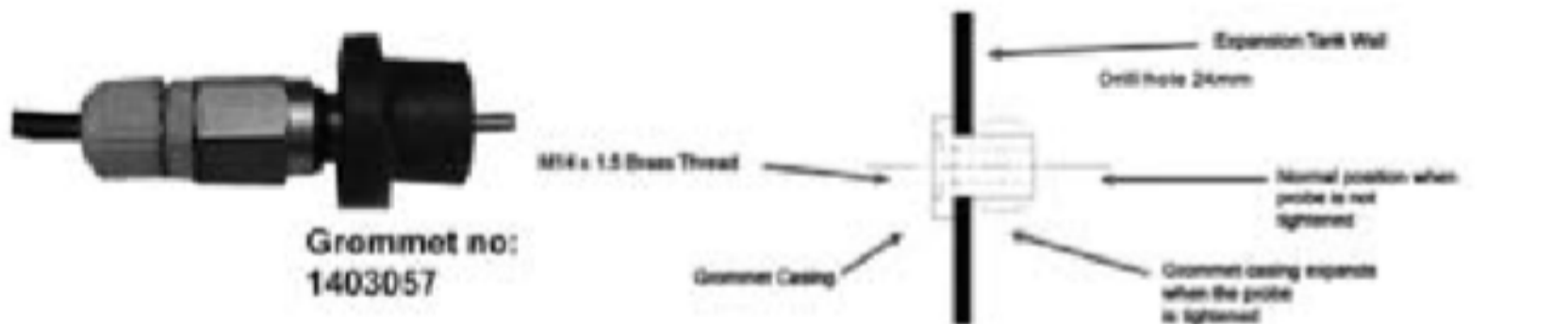
Technical Info - Connection Diagrams

Problem Solving:

- Error Message:**
 The output will decrease towards empty and increase towards full, repetitively when no tank depth can be found after approximately 10 minutes.
- Water Tanks:**
 After long periods of no use, condensation will build up on the roof of the water tank and the sender face. If the water droplets are large, the sender will not be able to read the contents of the tank accurately. This will clear with normal boat or RV use.
- Waste Tanks:**
 Large amounts of foam bubble on the surface of the liquid caused by detergents or washing powders will result in the sender not receiving reflected sound pulses back from the liquid surface. Instead these will be absorbed by the bubbles until they disperse. Then normal operation will resume.



Water Level Probes





I FUEL PUMPS

High quality VDO fuel supply systems offer the assurance of constant and reliable fuel supply from tank to engine.

Idle running of pumps, contaminated fuel or faults in the vehicle electrics can lead to failure of individual components or, in a worst-case scenario, failure of the entire system. VDO genuine brand replacement parts enable trouble-free replacement with low installation outlay and top quality.

The product range that is highlighted in this section covers VDO fuel pumps for various South African passenger car and light commercial vehicle applications. Vehicle manufacturers are listed in alphabetical order by Make, Model and Derivative, Engine and Year, providing easy reference to the correct fuel pump part number and type.

Section Content

Vehicle Listing - Fuel

Parts Listing - Fuel

Vehicle	Model	Engine	Year	Part No.	Type
AUDI					
Audi	A3 1.8	AGN	98 on	E22-041-095Z	S/Pot
Audi	A3 1.8	AGN	98 on	405-058-005-011Z	Unit
Audi	A3 1.8 T	AGU	98 on	E22-041-095Z	S/Pot
Audi	A3 1.8 T	AGU	98 on	405-058-005-011Z	Unit
Audi	A6 2.4	AGA	97-01	E22-041-094Z	S/Pot
Audi	A6 2.6	ABC	94-97	405-052-003-002G	Pump
Audi	A6 2.8	ACK	97-01	405-052-003-002G	Pump
Audi	A6 2.8	ACK	97-01	E22-041-094Z	S/Pot
Audi	A6 2.8 E	AAH	94-97	405-052-003-002G	Pump
Audi	A8 3.7	AEW	96-99	405-052-002-001Z	Pump
Audi	A8 4.2	ABZ/AQF		405-052-002-001Z	Pump
BMW					
BMW	316i E30	M10	83-90	228-220-004-002C	Unit
BMW	316i E30	M40	89-92	228-220-004-002C	Unit
BMW	316i E36	M40	92-94	228-222-005-001Z	Unit
BMW	316i E36	M43	96-97	228-222-005-001Z	Unit
BMW	316i E36	M43	97-98	228-222-005-003Z	Unit
BMW	318i E30	M40	89-92	228-220-004-002C	Unit
BMW	318i E36	M42	92-96	228-222-005-001Z	Unit
BMW	318i E36	M42	92-96	228-222-005-003Z	Unit
BMW	318i E46	M43	99-01	228-222-009-002Z	Unit
BMW	318i E46	N42	01-05	228-222-009-002Z	Unit
BMW	318iS E36	M44	96-99	228-222-005-003Z	Unit
BMW	320i E36	M50	92-96	228-222-005-001Z	Unit
BMW	320i E36	M50	93-96	228-222-005-003Z	Unit
BMW	320i E46	M52	99-05	05 228-222-009-002Z	Unit
BMW	323i E36	M52	96-99	228-222-005-003Z	Unit
BMW	323i E46	M52	99-01	01 228-222-009-002Z	Unit
BMW	325i E36	M50	92-95	228-222-005-001Z	Unit
BMW	325i E36	M50	92-95	228-222-005-003Z	Unit
BMW	325i E46	M54	00-05	05 228-222-009-002Z	Unit
BMW	730i E38	M60	92-94	E22-041-080Z	Pump & Filter
BMW	735i E38	M62	92-95	E22-041-080Z	Pump & Filter
BMW	740i E38	M60	92-95	E22-041-080Z	Pump & Filter

Vehicle Listing - VDO Fuel Pumps

Vehicle	Model	Engine	Year	Part No.	Type
LAND ROVER					
Land Rover	2.5 Diesel	TD5	98 on	A2C59511614	Pump
VOLKSWAGEN					
Volkswagen	Golf II 1.8	HV	84-92	E22-057-013	L/Pump
Volkswagen	Golf III Carburettor motor	DELS	96-99	228-225-021-004C	Unit
Volkswagen	Golf III 1.6 FI	AFX	96-99	228-225-020-004C	Unit
Volkswagen	Golf III 1.6 FI	AFX	96-99	E22-041-056Z	S/Pot
Volkswagen	Golf III 1.8 FI	AFV	92-96	228-225-020-004C	Unit
Volkswagen	Golf III 1.8 FI	AFV	92-96	E22-041-056Z	S/Pot
Volkswagen	Golf III 1.8 GTi	AFW	93-99	228-225-020-004C	Unit
Volkswagen	Golf III 1.8 GTi	AFW	93-99	E22-041-056Z	S/Pot
Volkswagen	Golf III 2.0	2E	92-99	228-225-020-004C	Unit
Volkswagen	Golf III 2.0	2E	92-99	E22-041-056Z	S/Pot
Volkswagen	Golf III 2.8 VR6	AAA	00 on	228-225-020-004C	Unit
Volkswagen	Golf III 2.8 VR6	AAA	00 on	E22-041-056Z	S/Pot
Volkswagen	Golf IV 1.6 AKL	AKL	99-04	E22-041-095Z	S/Pot
Volkswagen	Golf IV 1.6 AKL	AKL	99-04	405-058-005-011Z	Unit
Volkswagen	Golf IV 1.8 AGN	AGN	99-04	E22-041-095Z	S/Pot
Volkswagen	Golf IV 1.8 AGN	AGN	99-04	4055-058-005-011Z	Unit
Volkswagen	Golf IV 1.9 TDi A	AHF	99-04	E22-041-096Z	S/Pot
Volkswagen	Golf IV 2.0 APK	APK	99-04	E22-041-095Z	S/Pot
Volkswagen	Golf IV 2.0 APK	APK	99-04	405-058-005-011Z	Unit
Volkswagen	Jetta II 1.8	HV	84-92	E22-057-013	L/Pump
Volkswagen	Jetta 2.3 V5	AGZ	99-05	E22-041-095Z	S/Pot
Volkswagen	Jetta 2.3 V5	AGZ	99-05	405-058-005-011Z	Unit
Volkswagen	Passat 1.8 T	AEB	99-05	E22-041-094Z	S/Pot
Volkswagen	Passat 2.8 V6	ACK	99-05	E22-041-094Z	S/Pot
Volkswagen	Polo 1.8 (4 pin)		99-05	228-233-003-001D	Unit
Volkswagen	Sharan 1.8 T	AJH	00 on	E22-041-095Z	S/Pot
Volkswagen	Sharan 1.8 T	AJH	00 on	405-058-005-011Z	Unit
Volkswagen	Sharan 1.9 TDi	AUY	03-06	E22-041-096Z	S/Pot

Unit = Complete Assembly
 Pump = Fuel Pump Only
 L/Pump = Lift Pump
 S/Pot = Swirl Pot With Pump

Parts Listing - VDO Fuel Pumps



Part No.	Vehicle	Model & Derivative	Engine	Year
228-220-004-002C	BMW	316i E30	M10	83-90
	BMW	316i E30	M40	89-92
	BMW	318i E30	M40	89-92
Pressure: 3Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
228-222-005-001Z	BMW	316i E36	M40	92-94
	BMW	316i E36	M43	96-97
	BMW	318i E36	M42	92-96
	BMW	320i E36	M50	92-96
	BMW	325i E36	M50	92-95
Pressure: 3.5Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
228-222-005-003Z	BMW	316i E36	M43	97-98
	BMW	318i E36	M42	92-96
	BMW	318iS E36	M44	96-99
	BMW	320i E36	M50	93-96
	BMW	323i E36	M52	96-99
	BMW	325i E36	M50	92-95
Pressure: 3.5Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
228-222-009-002Z	BMW	318i E46	M43	99-01
	BMW	318i E46	N42	01-05
	BMW	320i E46	M52	99-05
	BMW	323i E46	M52	99-01
	BMW	325i E46	M54	00-05
Pressure: 3.5Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
228-225-020-004C	Volkswagen	Golf III 1.6 FI	AFX	96-99
	Volkswagen	Golf III 2.0	2E	92-99
	Volkswagen	Golf III 2.8 VR6	AAA	00 on
	Volkswagen	Golf III 1.8 FI	AFV	92-96
	Volkswagen	Golf III 1.8 GTi	AFW	93-99
Pressure: 3Bar				

Parts Listing - VDO Fuel Pumps



Part No.	Vehicle	Model & Derivative	Engine	Year
228-225-021-004C	Volkswagen	Golf III	Carburettor motor, DELS	96-99
Pressure: 1.2Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
228-233-003-001D	Volkswagen	Polo 1.8 (4 pin)		99-05
Pressure: 4Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
405-052-002-001Z	Audi	A8 3.7	AEW	96-99
	Audi	A8 4.2	AQF/ABZ	
Pressure: 4Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
405-052-003-002G	Audi	A6 2.6	ABC	94-97
	Audi	A6 2.8	ACK	97-01
	Audi	A6 2.8 E	AAH	94-97
Pressure: 4Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
405-058-005-011Z	Audi	A3 1.8	AGN	98 on
	Audi	A3 1.8 T	AGU	98 on
	Volkswagen	Golf IV 1.6 AKL	AKL	99-04
	Volkswagen	Golf IV 1.8 AGN	AGN	99-04
	Volkswagen	Golf IV 2.0 APK	APK	99-04
	Volkswagen	Jetta 2.3 V5	AGZ	99-05
	Volkswagen	Sharan 1.8 T	AJH	00 on
Pressure: 3Bar				

Parts Listing - VDO Fuel Pumps



Part No.	Vehicle	Model & Derivative	Engine
993-784-025A	Daihatsu	Charade 1.3V	16V
	Honda	Accord, Civic, VTEC, CR-V, Legend	All models
	Hyundai	Accent, S-Coupe, Elantra, Sonata	All models
	Jeep	Cherokee, XJ, Grand, Wrangler	All models
	Mazda	323, MX-3, MX-5, MX-6	All models
	Mitsubishi	Colt 1.3, GLi 1.6, GTi	16V
	Nissan	200SX, Maxima QX, Pick-up	All models
	Opel	Astra 1.4, 1.6, 2.0	16V
	Toyota	All models with in-tank pumps	
	In-tank - complete with pump, filter & wiring harness		
Outlet position: Straight			
Pressure: 3.5Bar			



Part No.	Vehicle	Model & Derivative	Engine	Year
A2C59511614	Land Rover	2.5D	TDS	98 on
Pressure: 4Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-041-056Z	Volkswagen	Golf III 2.8VR6	AAA	00 on
	Volkswagen	Golf III 1.6 FI	AFX	96-99
	Volkswagen	Golf III 2.0	2E	92-99
	Volkswagen	Golf III 1.8 FI	AFV	92-96
	Volkswagen	Golf III 1.8 GTi	AFW	93-99
Pressure: 3Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-041-080Z	BMW	735i E38	M62	92-95
	BMW	740i E38	M60	92-95
	BMW	730i E38	M60	92-94
Pressure: 3.5Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-041-094Z	Audi	A6 2.4	AGA	97-01
	Audi	A6 2.8	ACK	97-01
	Volkswagen	Passat 1.8 T	AEB	99-05
	Volkswagen	Passat 2.8 V6	ACK	99-05
Pressure: 4Bar				

Parts Listing - VDO Fuel Pumps



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-041-095Z	Audi	A3 1.8	AGN	98 on
	Audi	A3 1.8T	AGU	98 on
	Volkswagen	Golf IV 1.6 AKL	AKL	99-04
	Volkswagen	Golf IV 1.8 AGN	AGN	99-04
	Volkswagen	Golf IV 2.0 APK	APK	99-04
	Volkswagen	Jetta 2.3V5	AGZ	99-05
	Volkswagen	Sharan 1.8T	AJH	00 on
Pressure: 3Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-041-095Z	Audi	A3 1.8	AGN	98 on
	Audi	A3 1.8T	AGU	98 on
	Volkswagen	Golf IV 1.6 AKL	AKL	99-04
	Volkswagen	Golf IV 1.8 AGN	AGN	99-04
	Volkswagen	Golf IV 2.0 APK	APK	99-04
	Volkswagen	Jetta 2.3V5	AGZ	99-05
	Volkswagen	Sharan 1.8T	AJH	00 on
Pressure: 0.5Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-041-096Z	Volkswagen	Golf IV 1.9 TDi A	AHF	99-04
	Volkswagen	Sharan 1.9 TDi	AUY	05-06
Pressure: 0.5Bar				



Part No.	Vehicle	Model & Derivative	Engine	Year
E22-057-013	Volkswagen	Jetta II 1.8	HV	84-92
Pressure: 0.24Bar				

BRANDS OF TAS

GABRIEL manufactures a comprehensive range of dampers that are designed and engineered to suit the conditions of South African roads. These are available in shock absorbers, spring seat shocks, struts, strut cartridges and steering dampers. Gabriel also manufactures gas springs that ease the opening and closing of car boots, bonnets, hatches, hatchback windows and canopies. Gabriel supplies kits and accessories for shocks and struts.

VDO is a global brand providing state of the art automotive electronic and mechatronic solutions capturing the automotive future. The extensive range of VDO quality products covers the automotive, marine, commercial, industrial and specialised OEM market. The brand is associated with only the highest quality, and embodies the principles of individual mobility, driving pleasure, safety, environmental responsibility and cost efficiency.

ECHLIN is acknowledged as a premium brand in the ignition, fuel, cooling and switch category. For nearly 60 years Echlin has remained at the forefront of product range development, boasting the widest range of radiator caps, oil filler caps, locking caps, ignition products, water pumps, fuel pumps, carburettor kits, thermostats and switches in the South African automotive aftermarket. Echlin is the industry reference in range and quality.

AUTOCOM has been recognised as a leading brand in the suspension and steering market since 1978, and continues to remain at the forefront of the suspension market through technical agreements with global OEM manufacturers. Autocom suspension and steering components are manufactured from only the highest quality material to ensure that these safety critical parts conform to internationally recognised OEM quality standards.

ACSA-MAG is one of South Africa's leading brand of auto electrical products which includes starters, alternators and rotational parts such as solenoids, bendix drives, armatures, regulators and rectifiers. The brand is also associated with a wide range of quality auto electrical accessories, including brackets, cables, sleeves, fuses, cable ties, plugs, sockets, tape and terminals. ACSA-MAG prides itself on quality and range availability.

MAG BRAKES, a true South African brand in the heavy-duty airbrake market, is widely acclaimed for its supply of quality airbrake parts and hydraulic cylinders to the brake industry. Mag Brakes is not only recognised for their extensive range of airbrake, brass and steel fittings, adaptors and comprehensive range of grease nipples, but also for their design and installation of ABS, EBS and hydraulic brake kits for trucks and trailers to SABS specification.

WARN, with more than 60 years of research, development and manufacturing experience, is undoubtedly the premium global winch brand. Manufactured for extreme performance, WARN provides a range of winches for automotive, industrial, commercial and recreational needs as well as a full range of off-road accessories. The company's commitment to engineering excellence can be seen in the products' quality, durability and innovation.

HI-LIFT jacks are just about the most versatile piece of off-road equipment you can buy. It doesn't matter if you are in the Namib desert, the African jungle, or the Bushveld, Hi-Lift jacks are designed to help you survive the most demanding situation. Manufactured to the most exacting standards, with only the highest quality material to withstand the demands of these conditions, it will never let you down.

EUROCABLE has more than 35 years experience in the design, development and manufacturing of ignition leads, and is a global brand in the automotive spare parts market. It continues to offer the widest range for the aftermarket whilst developing and manufacturing tailor made ignition leads for industrial engines. Eurocable ensure that OEM standards are always met through the provision of ISO 9001 and TS16949 manufacturing standards.

CONTITECH, a brand of Continental Corporation, is a leader in the power transmission market, manufacturing everything from power transmission belts and matched components right through to complete belt drive systems. Quality and innovation have ensured that the Contitech range of products deliver proven performance in the automotive industry, and ensure that the brand continues to live up to its motto "Our Drive Your Success".

TRUCK-LITE has been providing visibility systems since 1955 and continues to remain a leading global brand in the truck and trailer market. It has always been at the forefront of innovation: from the era of bulb replaceable metal lights to sealed and shock resistant poly carbonate lights, from bulbs to light emitting diodes. Truck-Lite continues to innovate and provide quality products from the front of the truck to the rear of the trailer.

HEAD OFFICE

Johannesburg

Telephone : 011 326 4146

Cellphone: 082 375 3280

Fax: 011 781 4392

Email: adriang@lantic.net

www.timeandautomotive.co.za

TAS

TIME ACCESS & AUTOMOTIVE SYSTEM
Import, Export & Retail