

# Marine Catalogue

2011 - 2012



[www.vdo.net.au](http://www.vdo.net.au)

**Viewline—the new generation in instrumentation**

- ◆ **Navigation Instruments**
- ◆ **Tachometer & Tachourmeter**
- ◆ **Gauges for engine monitoring**

**VDO**



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# Clocks & Weather Station



With over 100 Years of experience in products dedicated to the marine world, VDO stands for quality . The new series of Black Ocean and White Ocean is a union of refined elegance.

Dial Colour	Part number	Description
 <b>Black</b>	<b>CW700011</b>	Clock VDO Black Ocean Ø 100mm desk or wall mount , polished Stainless-Steel case
	<b>CW700012</b>	Barometer VDO Black Ocean Ø 100mm desk or wall mount , polished Stainless-Steel case with grey pointers
	<b>CW700013</b>	Hygrometer/Thermometer VDO Black Ocean Ø 100mm desk or wall mount , polished Stainless-Steel case with grey pointers
 <b>White</b>	<b>CW700014</b>	Clock VDO White Dial Ocean Ø 100mm desk or wall mount, Satin Stainless-Steel case with
	<b>CW700015</b>	Barometer VDO White Dial Ocean Ø 100mm desk or wall mount, Satin Stainless-Steel
	<b>CW700016</b>	Hygrometer/Thermometer VDO White Ocean Ø 100mm desk or wall mount , Satin Stainless-Steel case with black pointers



Ø 85mm

## SUMLOG



Ø 110mm

## PITOT SPEEDO



## PITOT SPEEDO + TRIM



## WIND DIRECTION / SPEED



## PITOT SPEEDO + FUEL



## CLOSE HAULED



## FUEL - PRESS - VOLT - TEMP



## DEPTH INDICATOR





### LCD display.

As well as having an analogue indication (speed or engine revs), the new Viewline tachometer and speedometer instruments have an additional digital display:

- ▶ Display size 37 mm x 11 mm
- ▶ Quick and reliable retrieval of other data
- ▶ Optimum reading angle and representation on the display
- ▶ Display with speed or engine revs (option)
- ▶ Further monitoring functions available on the LC display (e. g., battery, temperature, mileage indicator, etc.)
- ▶ Individual function selection via external button



### Full backlight technology.

The dials and pointers of all Viewline instruments feature full backlight technology:

- ▶ Optimum contrast and superb readability of the display when lit
- ▶ Attractive display appearance at night thanks to clearly structured dial design



### Combi and multifunction gauges\*.

Now, in addition to the tried and tested standard solutions, Viewline also offers OEMs the option of installing multifunction devices:

- ▶ 85 mm combi devices, analogue and / or digital representation of speedometer and tachometer signals (OEM solution)
- ▶ 110 mm multifunction devices, such as 4-in-1, 2-in-1\*
- ▶ Integration of up to five display / warning lights (OEM solution)

### Signal inputs.

Viewline offers the following options for the signal inputs:

- ▶ NMEA 0183 data input for all navigation instruments
- ▶ Standard tachometer and speedometer signals
- ▶ Second frequency input (option)
- ▶ Standard signals for engine monitoring and on-board power supply
- ▶ Signal inputs for special sensors (option)
- ▶ Up to five usable switching inputs for control / warning lights within the OEM version (option)

### Programmable displays.

Viewline enables the user to use different setting and programming options:

- ▶ Basic setup via dip switches, external button or a PC software package
- ▶ Setup of various display functions via external button

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# Conversion Table



## Oceanline to Viewline Gauges

Previous Oceanline Part number	New Viewline Part number	Gauge dial and Bezel Colour	Main Function	Voltage	Ø	Range
N01113014	<b>A2C59512405</b>	BLACK	Sumlog LCD (Speedo)	12/24V	85	50kn
N01211022	<b>A2C59512564</b>	BLACK	Trim	12/24V	52	Down
N02011116	<b>A2C59512344</b>	BLACK	Tacho	12/24V	52	4000rpm
N02011118	<b>A2C59512345</b>	BLACK	Tacho	12/24V	52	6000rpm
N02012106	<b>A2C59512396</b>	WHITE	Tachourmeter	12/24V	85	3000rpm
N02012110	<b>A2C59512397</b>	WHITE	Tachourmeter	12/24V	85	4000rpm
N02012114	<b>A2C59512398</b>	WHITE	Tachourmeter	12/24V	85	5000rpm
N02012122	<b>A2C59512399</b>	WHITE	Tachourmeter	12/24V	85	6000rpm
N02012146	<b>A2C59512390</b>	BLACK	Tachourmeter	12/24V	85	3000rpm
N02012150	<b>A2C59512391</b>	BLACK	Tachourmeter	12/24V	85	4000rpm
N02012154	<b>A2C59512392</b>	BLACK	Tachourmeter	12/24V	85	5000rpm
N02012162	<b>A2C59512393</b>	BLACK	Tachourmeter	12/24V	85	6000rpm
N02012406 & N02012706	<b>A2C59512433</b>	WHITE	Tacho	12/24V	85	3000rpm
N02012410 & N02012710	<b>A2C59512434</b>	WHITE	Tacho	12/24V	85	4000rpm
N02012414 & N02012714	<b>A2C59512435</b>	WHITE	Tacho	12/24V	85	6000rpm
N02012426 & N02012726	<b>A2C59512430</b>	BLACK	Tacho	12/24V	85	3000rpm
N02012430 & N02012730	<b>A2C59512431</b>	BLACK	Tacho	12/24V	85	4000rpm
N02012434 & N02012734	<b>A2C59512432</b>	BLACK	Tacho	12/24V	85	6000rpm
N02124102 & N02124502	<b>A2C59514225</b>	WHITE	Press Turbo	12/24V	52	2bar
N02124106 & N02124506	<b>A2C59514211</b>	WHITE	Press Oil	12/24V	52	5bar
N02124110 & N02124510	<b>A2C59514199</b>	WHITE	Press Oil	12/24V	52	10bar
N02124114 & N02124514	<b>A2C59514206</b>	WHITE	Press Oil	12/24V	52	25bar
N02124118 & N02124518	<b>A2C59514208</b>	WHITE	Press Oil	12/24V	52	30bar
N02124122 & N02124522	<b>A2C59514149</b>	BLACK	Press	12/24V	52	2bar
N02124126 & N02124526	<b>A2C59514123</b>	BLACK	Press Oil	12/24V	52	5bar
N02124130 & N02124530	<b>A2C59514111</b>	BLACK	Press Oil	12/24V	52	10bar
N02124134 & N02124534	<b>A2C59514136</b>	BLACK	Press Trans	12/24V	52	25bar
N02124138 & N02124538	<b>A2C59514141</b>	BLACK	Press Trans	12/24V	52	30bar
N02222102 & N02222302	<b>A2C59514184</b>	WHITE	Level Fuel	12/24V	52	1/1
N02222112 & N02222312	<b>A2C59514091</b>	BLACK	Level Fuel	12/24V	52	1/1
N02222502 & N02222702	<b>A2C59514182</b>	WHITE	Level Fuel	12/24V	52	1/1
N02222512 & N02222712	<b>A2C59514088</b>	BLACK	Level Fuel	12/24V	52	1/1



# Conversion Table



## Oceanline to Viewline Gauges

Previous Oceanline Part number	New Viewline Part number	Gauge colour dial/bezel	Main Function	Voltage	Ø	Range	Scale	FSD
N02230602	<b>A2C59512341</b>	WHITE	Level Freshwater	12/24V	52	1/1		20mA
N02230612	<b>A2C59512340</b>	BLACK	Level Freshwater	12/24V	52	1/1		20mA
N02230622	<b>A2C59512343</b>	WHITE	Level Waste water	12/24V	52	1/1		20mA
N02230626	<b>A2C59512342</b>	BLACK	Level	12/24V	52	1/1		20mA
N02230702	<b>A2C59512559</b>	WHITE	Level Freshwater	12/24V	52	F	S	LT-EU
N02230712 & N02230812	<b>A2C59512514</b>	BLACK	Level Freshwater	12/24V	52	1/1	S	LT-EU
N02340702	<b>A2C59512333</b>	WHITE	Pyrometer	12/24V	52	900°C		37mV
N02340712	<b>A2C59512332</b>	BLACK	Pyrometer	12/24V	52	900°C		37mV
N02340714	<b>A2C59512334</b>	BLACK	Pyrometer	12/24V	52	1650°F		37mV
N02321402	<b>A2C59512336</b>	BLACK	Temp Outside	12/24V	52	+50°C		2kOhm
N02321502	<b>A2C59512338</b>	WHITE	Temp Outside	12/24V	52	+50°C		2kOhm
N02321602 & N02321702	<b>A2C59514237</b>	WHITE	Temp Water	12/24V	52	120°C	D	EU
N02321606	<b>A2C59514231</b>	WHITE	Temp Oil	12/24V	52	150°C	D	EU
N02321612 & N02321712	<b>A2C59514170</b>	BLACK	Temp water	12/24V	52	120°C	D	EU
N02321616 & N02321716	<b>A2C59514160</b>	BLACK	Temp Oil	12/24V	52	150°C	D	EU
N02400306	<b>A2C59512330</b>	WHITE	Amp ext. Shunt	12/24V	52	+60A		60mV
N02420712	<b>A2C59512328</b>	BLACK	Amp ext. Shunt	12/24V	52	+60A		60mV
N02420714	<b>A2C59512329</b>	BLACK	Amp ext. Shunt	12/24V	52	+150A		60mV
N02410802	<b>A2C59512546</b>	WHITE	Volt	12V	52	16	S	
N02410812	<b>A2C59512545</b>	BLACK	Volt	12V	52	1/1	S	
N02410902	<b>A2C59512459</b>	WHITE	Volt	24V	52	32V	S	
N02410912	<b>A2C59512458</b>	BLACK	Volt	24V	52	32V	S	
N03110404	<b>A2C59512454</b>	WHITE	Hourmeter	12/24V	52			
N03110412	<b>A2C59512453</b>	BLACK	Hourmeter	12/24V	52			
N03211402 & N03211502	<b>A2C59512562</b>	WHITE	Rudder angle	12/24V	52	40°Stb	S	
N03211202	<b>A2C59512411</b>	WHITE	Rudder angle	12/24V	85	+45°	S	
N03211206	<b>A2C59512410</b>	BLACK	Rudder angle	12/24V	85	+45°	S	
N03211412 & N03211512	<b>A2C59512561</b>	BLACK	Rudder angle	12/24V	52	40°Stb	S	
N03270602	<b>A2C59513443</b>	WHITE	Clock	12V	52		S	
N03270603	<b>A2C59513444</b>	WHITE	Clock	24V	52		S	
N03270612	<b>A2C59513445</b>	BLACK	Clock	12V	52		S	
N03270613	<b>A2C59513446</b>	BLACK	Clock	24V	52		S	



# Introducing VDO Viewline

Our engineers started with a clean sheet of paper and a worldwide view to create an instrument line like no other in today's market. Their goal to create an instrument with flexibility, class and integrity something you've come to expect from VDO.

It begins with a fresh style and three choices of instrument sizes 100mm, 85mm and 52mm.

For styling, you have a choice of dial face colors of Black or White.

Next we added three choices of bezel styles along with two choices of bezel colors, white, black and chrome.

To complete your choices we give you three choices of instrument sizes 100mm, 85mm and 52mm giving you more flexibility than ever to create the instrument you are looking for.

They did not stop with just a pretty face, next they added integrity.

With the use of fully sealed dual lens, lifetime LED lighting and warning indicators assure you that Viewline can withstand even open cab environments easily.

Whether you are looking for standard or customized products, you are truly getting "more bang for your buck" with Viewline.

The VDO Heritage: **Reliability, durability and accuracy.**

## Reliability

- IP67 water resistance means, that no matter how wet it gets, our gauges keep on working.
- Anti-corrosion materials mean no oxidation or rust will develop – Viewline will continue to work and look like new.

## Accuracy

- VDO patented stepper motors and resistive movements.
- OEM derived technology in every instrument.

## Durability

- CE certification.
- GL registered.
- UL94 flame resistance.
- Tested to 25 G continuous vibration and 100 G shock.
- 100% LED warning lights and telltales for long service life.

# Viewline Gauges

Viewline is the new standardised instrument platform for pleasure boats and yachts. With modular solutions in three housing variations, we supply more functions, more flexible installation and design options as well as space-saving combi instruments – something unique in this sector.

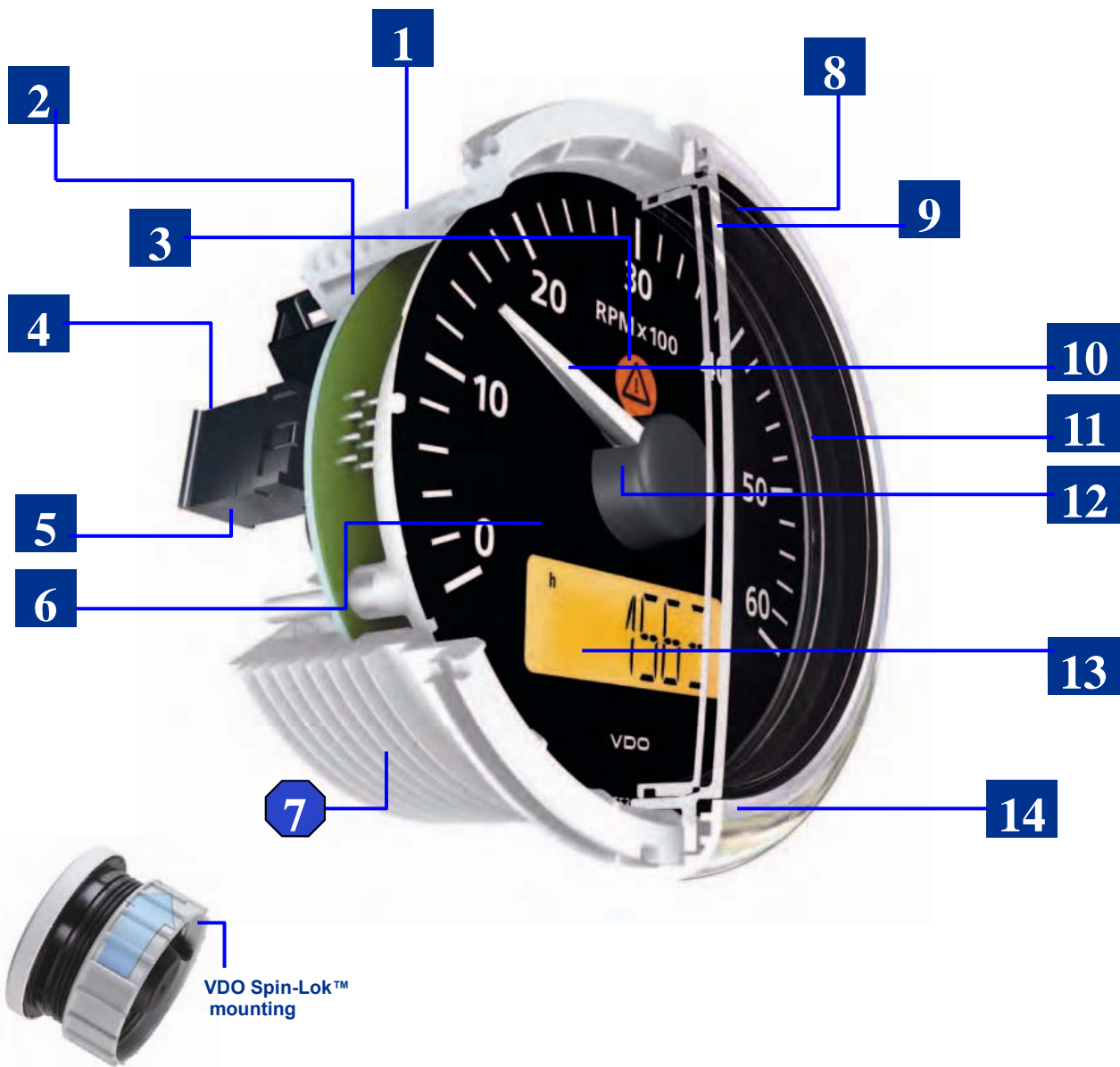
All Viewline instruments can be conveniently mounted in the instrument panel.

Here, it is possible to use the modular bezels for installation as well as integrating the instruments flat without the bezels (flush installation).

This allows maximum flexibility in cockpit customisation and numerous design variants.



# Viewline Gauges



1. Spin-Lok mounting – a VDO innovation developed to safeguard against mounting panel warping and makes fast installation.
2. Single PCB increases reliability and minimizes instrument depth.
3. Built-in LED warning indicator (up to 5) is programmable to OEM-specified function.
4. Single cavity connectors reduce wiring installation time.
5. Reverse polarity and over voltage protection virtually eliminate the possibility of installation failures.
6. VDO is one of the few companies in the world to design, patent and manufacture stepper motors and resistive movements.
7. Corrosion-free and flame retardant materials comply with manufacturer's latest specifications.
8. Laser welded lenses ensure the highest level of protection against water intrusion.
9. Dual domed lenses eliminate fogging – another VDO innovation.
10. LED lit pointers and through dial lighting" minimize current consumption while optimizing nighttime viewing. "
11. Detail finish ring enhances the overall appearance of finished instrument – a VDO exclusive.
12. Designed to withstand continuous 25 G vibrations and 100 G single shock, to ensure maximum reliability of each instrument.
13. Large, multifunction backlit LCD provides easy readout of programmed functions.
14. Customer installed bezels with nine style choices allow for greater styling differentiation between product lines.

# Viewline Gauges



Benefiting in the long-term from new technologies In developing the Viewline instrumentation, we have paid attention to the requirements of manufacturers. With Viewline, we have created a platform-wide standard with which we offer maximum freedom in respect of cockpit design.



## Highly visible LED warning and indicator lights

Viewline instruments are fitted with highly visible, high intensity LED warning and indicator lights.

They ensure that critical operating conditions can be quickly and safely detected.



## Clip-on bezel

The modular bezel concept offers design flexibility in the layout of instrument panels.

Three attractive design variants in black, white or chrome perfectly complement any boat's interior.

Furthermore, bezels are available in flat, round and triangular versions. All available bezels can be combined with all devices.

# Viewline Gauges



## Viewline Black



## Viewline White



Apparent Wind - Maximum Wind Speed  
Atmospheric Air Pressure - Ambient Temperature - Clock



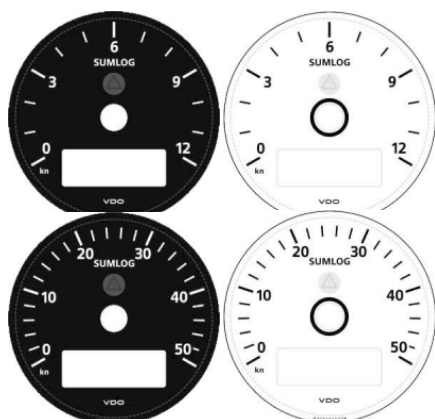
Apparent Wind - Maximum Wind Speed  
Atmospheric Air Pressure - Ambient Temperature - Clock  
Voltmeter (when connected to an NMEA0183 PB100 or PB200 Sensor)



Water Temperature - Depth - Shallow Water Alarm  
Voltmeter - Clock (when connected to an NMEA0183 Depth Sensor)



Water Temperature - Depth - Compass Course - Course Over Ground  
- GPS Time - Steering Aid - Voltmeter - Trip & Distance  
(when connected to an active NMEA0183 from a Paddle Wheel  
Sensor - GPS or Compass Sensor)



## Wind Direction / Speed Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59514245	Black	0 - 180° BB/SB	12/24V
A2C59514248	White	0 - 180° BB/SB	12/24V

## Close Haul Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59514246	Black	0 - 60° BB/SB	12/24V
A2C59514249	White	0 - 60° BB/SB	12/24V

Note: BB = Port SB=Star Board

## Depth Ø 80/85 mm

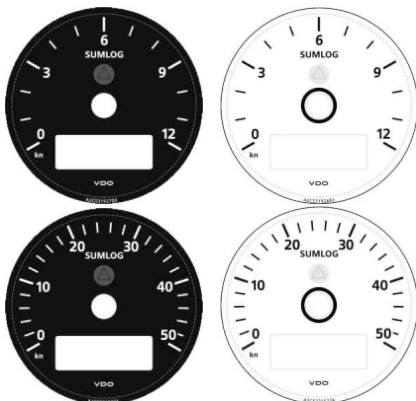
Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59514247	Black	0 - 30	12/24V
A2C59514250	White	0 - 30	12/24V

## Sumlog - Compass Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Range	Voltage	Applicable Signal
A2C59514251	Black	12 Kn	12/24V	NMEA 0183
A2C59514252	Black	30 Kn	12/24V	NMEA 0183
A2C59514253	Black	50 Kn	12/24V	NMEA 0183
A2C59514254	Black	60 MPH	12/24V	NMEA 0183
A2C59514255	White	12 Kn	12/24V	NMEA 0183
A2C59514256	White	30 Kn	12/24V	NMEA 0183
A2C59514257	White	50 Kn	12/24V	NMEA 0183
A2C59514258	White	60 MPH	12/24V	NMEA 0183



# Sumlog & Tachourmeter



Speed  
Total & Trip Distance  
Depth  
Sea Water Temperature  
Clock  
Voltmeter  
External Trip-reset Button  
External Mode Button



Through-Hull Kit



Transom Kit

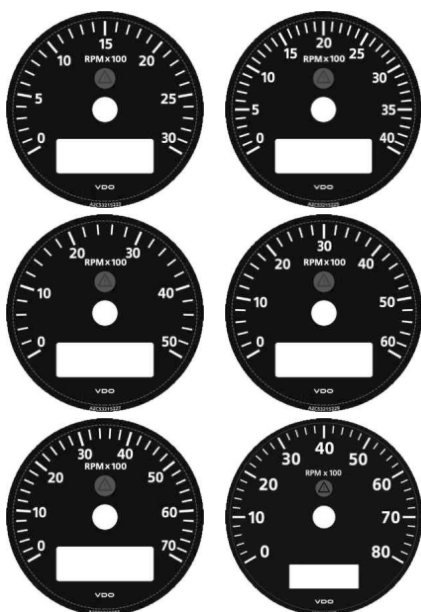
## Sumlog (standard)

Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Range	Voltage	Smart Transducer
A2C59512404	Black	0 - 12 Kn	12/24V	See below
A2C59512407	White	0 - 12 Kn	12/24V	See below
A2C59512405	Black	0 - 50 Kn	12/24V	See below
A2C59512408	White	0 - 50 Kn	12/24V	See below

## Transducer : Speed - Depth - Sea Water Temp

Part Number	Range	Description	Cable Length	Connector
1501120004	0 - 12 Kn	Transom Kit <b>A</b>	10 m	Blue White Red Black/Shield NMEA0183 + NMEA0183 - + 12/24V Negative
X11719000053	0 - 50 Kn	Transom Kit	10 m	Blue White Red Black/Shield NMEA0183 + NMEA0183 - + 12/24V Negative
X11719000058	0 - 50 Kn	Through-Hull Kit <b>B</b>	10 m	Blue White Red Black/Shield NMEA0183 + NMEA0183 - + 12/24V Negative
A2C59513503		Loom	0.3 m	Connection between Transducer p/n X11719000053 or p/n X11719000058 and Sumlog head.



Engine Speed (RPM)  
Total & Trip Hours  
Clock  
Voltmeter  
External Trip-reset Button  
External Mode Button  
Programmable External Alarm

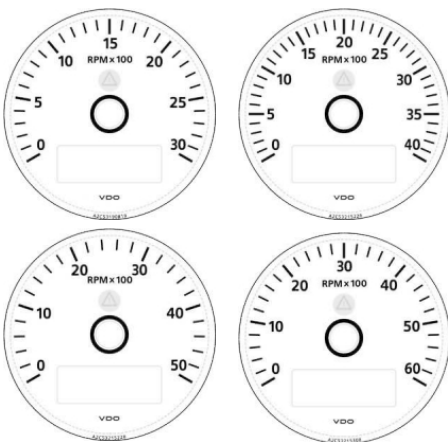
## Tachourmeter

Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Range	Voltage	Applicable Signal
A2C59512390	Black	0-3000 RPM	12/24V	Alternator Ignition Coil Generator Inductive
A2C59512391	Black	0-4000 RPM	12/24V	Alternator Ignition Coil Generator Inductive
A2C59512392	Black	0-5000 RPM	12/24V	Alternator Ignition Coil Generator Inductive
A2C59512393	Black	0-6000 RPM	12/24V	Alternator Ignition Coil Generator Inductive
A2C59512394	Black	0-7000 RPM	12/24V	Alternator Ignition Coil Generator Inductive
A2C59512395	Black	0-8000 RPM	12/24V	Alternator Ignition Coil Generator Inductive

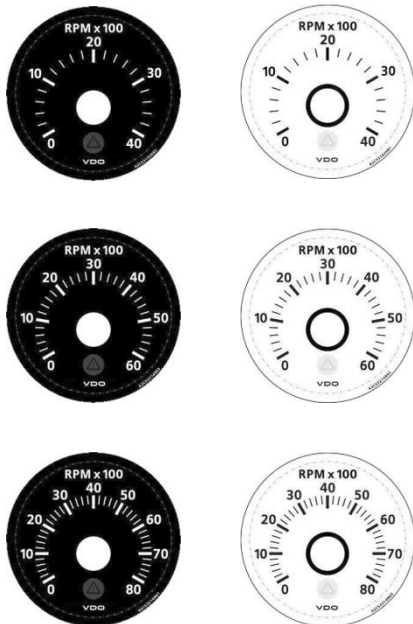
Note: For all 270° meter movement deflection Viewline gauges' calibration, use Viewline Software adaptor cable & Software p/n A2C59514543.

# Tachourmeter & Tachometer



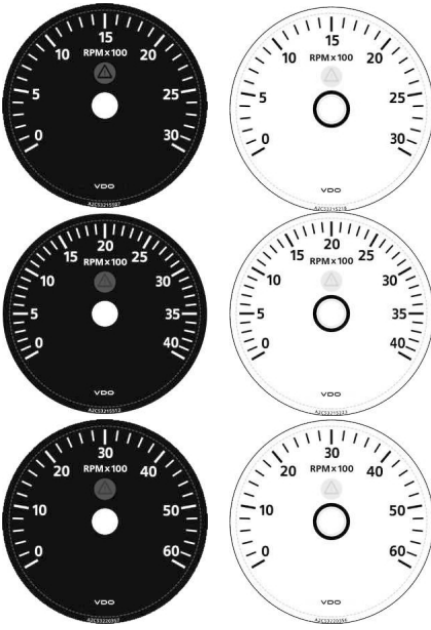
**Engine Speed (RPM)**  
**Total & Trip Hours**  
**Clock**  
**Voltmeter**  
**External Trip-reset Button**  
**External Mode Button**  
**Programmable External Alarm**

<b>Tachourmeter</b>				<b>∅ 80/85 mm</b>
<b>Part Number</b>	<b>Colour Dial/ Bezel</b>	<b>Range</b>	<b>Voltage</b>	<b>Applicable Signal</b>
<b>A2C59512396</b>	White	0-3000 RPM	12/24V	Alternator, Ignition Coil Generator, Inductive
<b>A2C59512397</b>	White	0-4000 RPM	12/24V	Alternator Ignition Coil Generator Inductive
<b>A2C59512398</b>	White	0-5000 RPM	12/24V	Alternator, Ignition Coil Generator, Inductive
<b>A2C59512399</b>	White	0-6000 RPM	12/24V	Alternator Ignition Coil Generator Inductive



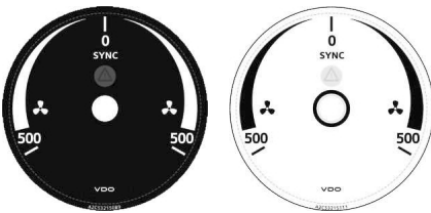
**Engine Speed (RPM)**

<b>Tachometer</b>				<b>∅ 52 mm</b>
<b>Part Number</b>	<b>Colour Dial/ Bezel</b>	<b>Range</b>	<b>Voltage</b>	<b>Applicable Signal</b>
<b>A2C59512344</b>	Black	0-4000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only).
<b>A2C59512345</b>	Black	0-6000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only).
<b>A2C59512346</b>	Black	0-8000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only).
<b>A2C59512347</b>	White	0-4000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only).
<b>A2C59512348</b>	White	0-6000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only).
<b>A2C59512349</b>	White	0-8000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only).



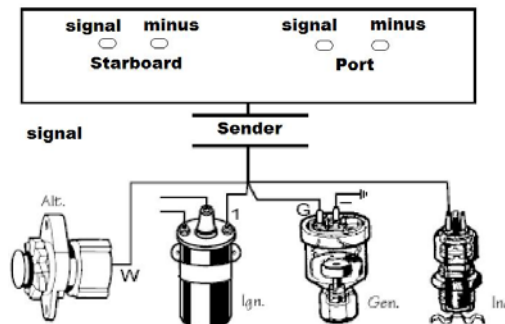
**Engine Speed (RPM)  
Programmable Alarm (Software)**

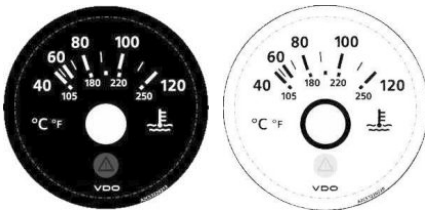
<b>Tachometer</b>		<b>Ø 80/85 mm</b>		
Part Number	Colour Dial/ Bezel	Range	Voltage	Applicable Signal
<b>A2C59512430</b>	Black	0-3000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only. Contact a VDO Service Agent for assistance)
<b>A2C59512431</b>	Black	0-4000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only. Contact a VDO Service Agent for assistance)
<b>A2C59512432</b>	Black	0-6000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only. Contact a VDO Service Agent for assistance)
<b>A2C59512433</b>	White	0-3000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only. Contact a VDO Service Agent for assistance)
<b>A2C59512434</b>	White	0-4000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only. Contact a VDO Service Agent for assistance)
<b>A2C59512435</b>	White	0-6000 RPM	12/24V	Alternator Ignition Coil (Note: Alternator signal calibration via software, only. Contact a VDO Service Agent for assistance)



**Differential Engine Speed (RPM)**

<b>Synchroniser Tachometer</b>		<b>Ø 80/85 mm</b>		
Part Number	Colour Dial/ Bezel	Range	Voltage	Applicable Signal
<b>A2C59512402</b>	Black	+/- 0-500 RPM	12/24V	Alternator Ignition Coil Generator Inductive
<b>A2C59512403</b>	White	+/- 0-500 RPM	12/24V	Alternator Ignition Coil Generator Inductive





## Temperature Gauge Water Ø 52 mm

Part Number	Colour Dial/ Bezel	Range	Voltage	Ohms Range
A2C59514170	Black	40 - 120C (250F)	12/24V	282 - 22 Ohms 38.6 Ohms = 100C
A2C59514237	White	40 - 120C (250F)	12V/24V	282 - 22 Ohms 38.6 Ohms = 100C

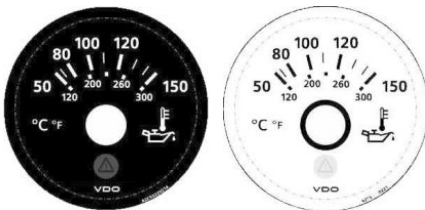
## Temperature Sender Water



Part Number	Range	Thread size	Connector
323805001001K	40 - 120C (250F)	M14x1.5	2 spade terminals
323805001015N	40 - 120C (250F)	M18x1.5	2 spade terminals
323805001004K	40 - 120C (250F)	1/2"-14NPTF	2 spade terminals
323805001007N	40 - 120C (250F)	1/4"-18NPTF	2 spade terminals
323805001005N	40 - 120C (250F)	3/8"-18NPTF	2 spade terminals
323805001002C	40 - 120C (250F)	5/8"-18UNF 2A	2 spade terminals



Note: For single terminals (earth return) or dual station senders, refer appendix on page 38 - 39



## Temperature Gauge Engine Ø 52 mm

Part Number	Colour Dial/ Bezel	Range	Voltage	Ohms Range
A2C59514160	Black	50 - 150C (300F)	12V/24V	323 - 18 Ohms 62.2 Ohms = 100C
A2C59514231	White	50 - 150C (300F)	12V/24V	323 - 18 Ohms 62.2 Ohms = 100C

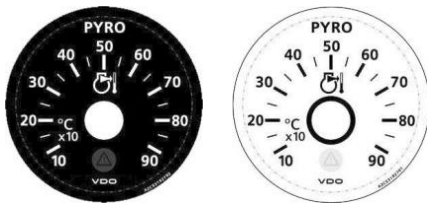
## Temperature Sender Engine



Part Number	Range	Thread size	Connector
323805001001K	50 - 150C (300F)	M14x1.5	2 spade terminals
323805003002N	50 - 150C (300F)	1/4"-18NPTF	2 spade terminals



Note: For single terminals (earth return) or dual station senders, refer appendix on page 38 - 39

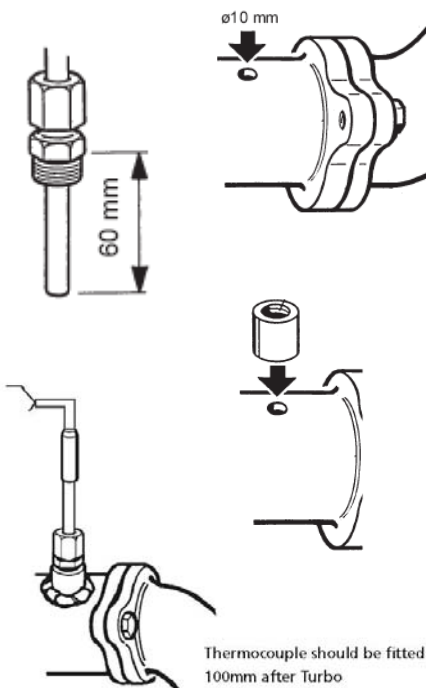


## Pyrometer Gauge - Ø 52 mm

Part Number	Colour Dial/ Bezel	Range	Voltage	mV Range
<b>A2C59512332</b>	Black	100 - 900C (1650F)	12/24V	4.04 - 37.5 mV
<b>A2C59512333</b>	White	100 - 900C (1650F)	12/24V	4.04 - 37.5 mV
<b>A2C59512334</b>	Black	212 - 1650F (900C)	12/24V	4.04 - 37.5 mV
<b>A2C59512335</b>	White	212 - 1650F (900C)	12/24V	4.04 - 37.5 mV

## Thermocouple K Type Kit (no gauge)

Part Number	Description	Range	Terminals
<b>320.714</b>	Thermocouple Probe	100 - 900C (1650F)	Red = Negative Yellow = Positive
<b>240.035</b>	Compensating Cable	5 metres	White = Negative Blue = Positive <b>or</b> Red = Negative Brown = Positive



Install the sensor in the exhaust pipe near the elbow flange.

Maximum adjustment depth up to the middle of exhaust pipe: 60 mm.

Mount the bushing centrally and weld on.

The weld must form a tight seal.

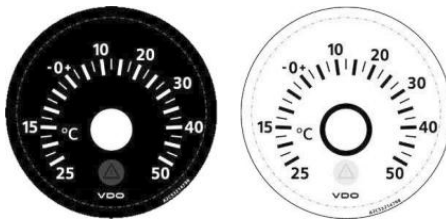
## K Type thermocouple Calibration Chart

Degrees Celsius	Probe Voltage (mV)
100	4.04
200	8.137
300	12.20
400	16.4
500	20.64
600	24.902
700	29.128
800	33.277
900	37.325

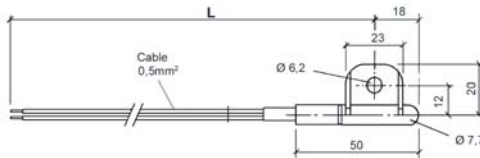
## Celsius to Fahrenheit Conversion Chart

Degrees Celsius	Degrees Fahrenheit
100	212
200	392
300	572
400	752
500	932
600	1112
700	1292
800	1472
900	1650

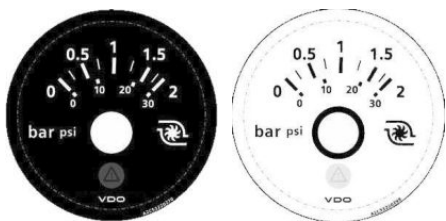
# Outside Temp & Turbo Pressure



<b>Outside Air Temperature</b>				<b>Ø 52 mm</b>
Part Number	Colour Dial Bezel	Range	Voltage	Ohms
<b>A2C59512336</b>	Black	-25to+50C	12/24V	0°C = 4082 Ohms
<b>A2C59512338</b>	White	-25to+50C	12/24V	0°C = 4082 Ohms



<b>Temperature Sender Air</b>			
Part Number	Range	Cable Length	Wires
<b>323809010006C</b>	-25to+50C	L = 4500mm	Green Signal Brown Negative

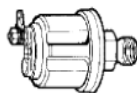


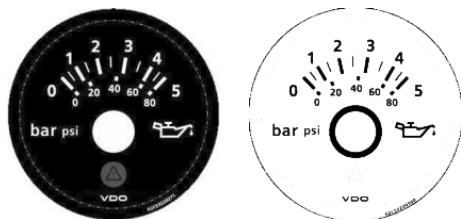
<b>Pressure Gauge Turbo 2 Bar</b>				
Part Number	Colour Dial/ Bezel	Range	Voltage	Ohms Range
<b>A2C59514149</b>	Black	0 - 2 Bar (28 Psi)	12/24V	10 - 183 Ohms 0-2 Bar
<b>A2C59514225</b>	White	0 - 2 Bar (28 Psi)	12/24V	10 - 183 Ohms 0-2 Bar



<b>Pressure Sender 2 Bar</b>			
Part Number	Range	Thread size	Connector
<b>360081032025C</b>	0 - 2 Bar (28 Psi)	1/8"-27NPTF	2 x M4 Screws
<b>360081032011C</b>	0 - 2 Bar (28 Psi)	M12x1.5	2 x M4 Screws

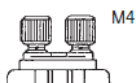
Note: For single terminals (earth return) or dual station senders, refer to pages 37 - 38





## Pressure Gauge Engine Oil Ø 52 mm

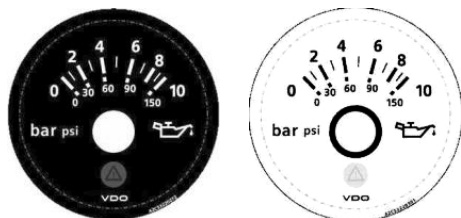
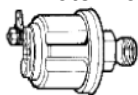
Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
<b>A2C59514123</b>	Black	0 - 5 Bar (72 Psi)	12/24V	0 Bar = 10 5 Bar = 183
<b>A2C59514211</b>	White	0 - 5 Bar (72 Psi)	12/24V	0 Bar = 10 5 Bar = 183



## Pressure Sender Engine Oil

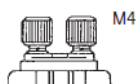
Part Number	Range	Thread size	Connector
<b>360081032002C</b>	0 - 5 Bar (72 Psi)	M10x1	2 Screw terminals
<b>360081032001C</b>	0 - 5 Bar (72 Psi)	1/8"-27NPTF	2 Screw terminals

Note: For single terminals (earth return) or dual station senders, refer to pages 36 - 37



## Pressure Gauge Engine Oil Ø 52 mm

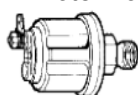
Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
<b>A2C59514111</b>	Black	0 - 10 Bar (150 Psi)	12/24V	0 Bar = 10 10 Bar = 183
<b>A2C59514199</b>	White	0 - 10 Bar (150 Psi)	12/24V	0 Bar = 10 10 Bar = 183



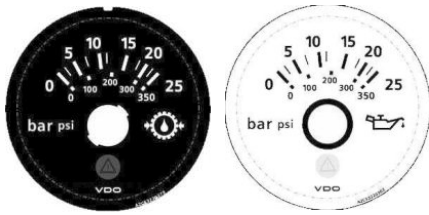
## Pressure Sender Engine Oil

Part Number	Range	Thread size	Connector
<b>360081032003C</b>	0 - 10 Bar (150 Psi)	M10x1	2 Screw terminals
<b>360081032006C</b>	0 - 10 Bar (150 Psi)	M14x1.5	2 Screw terminals
<b>360081032014C</b>	0 - 10 Bar (150 Psi)	1/8"-27NPTF	2 Screw terminals

Note: For single terminals (earth return) or dual station senders, refer to pages 37 - 38

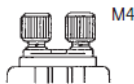


# Transmission Pressure



## Pressure Gauge Transmission Ø 52 mm

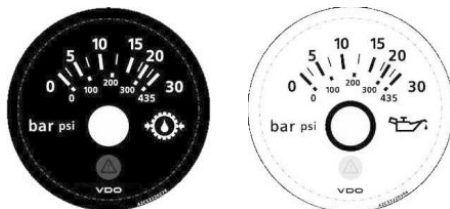
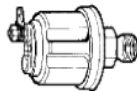
Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
<b>A2C59514136</b>	Black	0 - 25 Bar (400 Psi)	12/24V	0 Bar = 10 25 Bar = 183
<b>A2C59514206</b>	White	0 - 25 Bar (400 Psi)	12/24V	0 Bar = 10 25 Bar = 183



## Pressure Sender Transmission

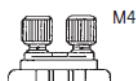
Part Number	Range	Thread size	Connector
<b>360081038001C</b>	0 - 25 Bar (400 Psi)	M14x1.5	2 Screw terminals
<b>360081038003C</b>	0 - 25 Bar (400 Psi)	1/8"-27NPTF	2 Screw terminals
<b>360081038002C</b>	0 - 25 Bar (400 Psi)	3/8"-18NPTF	2 Screw terminals

Note: For single terminals (earth return) or dual station senders, refer to pages 36 - 37



## Pressure Gauge Transmission Ø 52 mm

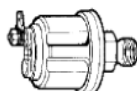
Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
<b>A2C59514141</b>	Black	0 - 30 Bar (435 Psi)	12/24V	0 Bar = 10 30 Bar = 183
<b>A2C59514208</b>	White	0 - 30 Bar (435 Psi)	12/24V	0 Bar = 10 30 Bar = 183



## Pressure Sender Transmission

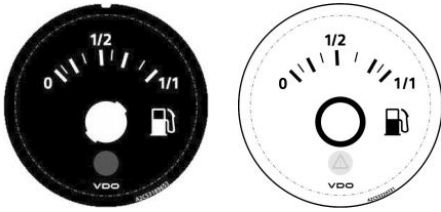
Part Number	Range	Thread size	Connector
<b>360081038001C</b>	0 - 30Bar (435 Psi)	M14x1.5	2 Screw terminals
<b>360081038003C</b>	0 - 30Bar (435 Psi)	1/8"-27NPTF	2 Screw terminals
<b>360081038002C</b>	0 - 30 Bar (435 Psi)	3/8"-18NPTF	2 Screw terminals

Note: For single terminals (earth return) or dual station senders, refer to pages 37 - 38



**\*For 30 Bar pressure sender's range, use 25 Bar senders**

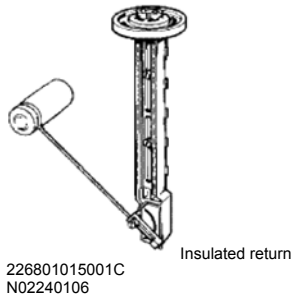




## Fuel Gauge

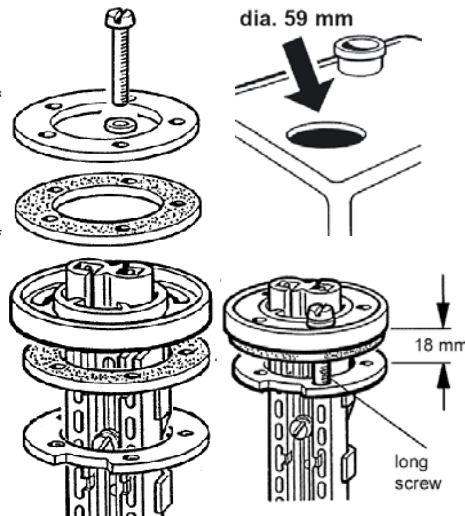
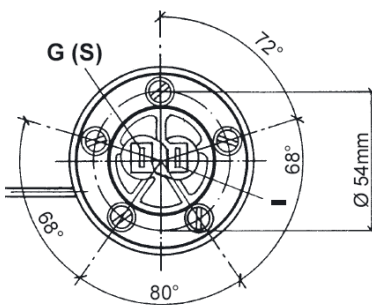
Ø 52 mm

Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
A2C59514091	Black	0 - 1	12/24V	Empty = 3 Full = 180
A2C59514184	White	0 - 1	12/24V	Empty = 3 Full = 180

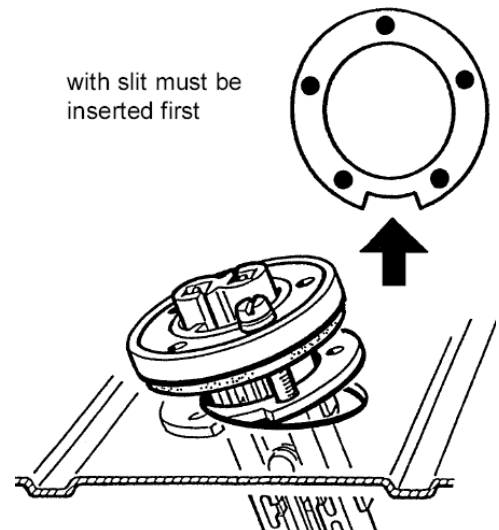


## Sender Float Arm - Fuel Pitch 54 mm

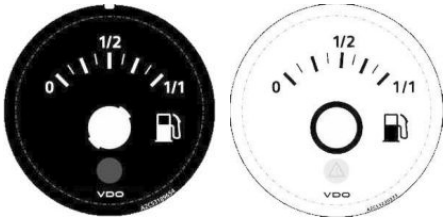
Part Number	Range	Notes	Terminal
226801015001C	3-180 Ohms	Adjustable 200-600mm	Spade x2
N02240106	5-90 Ohms	Adjustable 200-600mm	Spade x2
A2C59510165	3-180 Ohms	Sender with low fuel warning switch. Adjustable 150-535mm	Spade x3
A2C59510171	3-180 Ohms	Arm Type Fuel Sender Adjustable 150-535mm	Spade x2
A2C59510166	5-90 Ohms	Sender with low fuel warning switch. Adjustable 150-535mm	Spade x3
A2C59510172	5-90 Ohms	Arm Type Fuel Sender Adjustable 150-535mm	Spade x2
A2C59510167	240-33 Ohms	Sender with low fuel warning switch. Adjustable 150-535mm	Spade x3
A2C59510173	240-33 Ohms	Arm Type Fuel Sender Adjustable 150-535mm	Spade x2



with slit must be inserted first



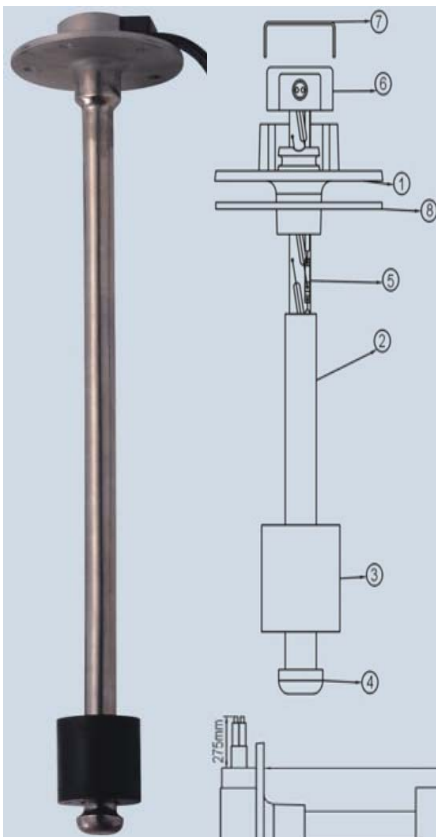
Note: Use adaptor plate p/n CTA0200 when installing the five holes sender's plate on to 6 holes applications.



## Fuel Gauge Ø 52 mm

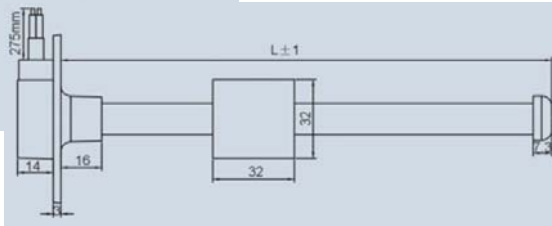
Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
<b>A2C59514091</b>	Black	0 - 1	12/24V	Empty = 3 Full = 180
<b>A2C59514184</b>	White	0 - 1	12/24V	Empty = 3 Full = 180

Note: All Reed Switch senders on the list below have a Low Fuel Warning switch, except the 150 & 180 mm length (marked \*)

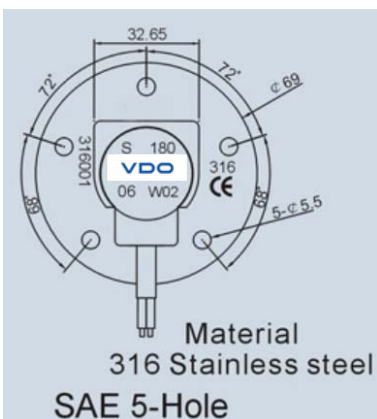


## Sender Reed Switch - Fuel Pitch 54 mm

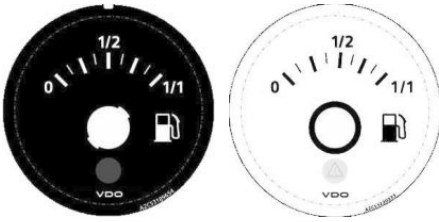
Part Number	Range E - F	L = length
<b>220.150-180</b>	3-180 Ohms	150 mm *
<b>220.180-180</b>	3-180 Ohms	180 mm *
<b>220.230-180</b>	3-180 Ohms	230 mm
<b>220.250-180</b>	3-180 Ohms	250 mm
<b>220.260-180</b>	3-180 Ohms	260 mm
<b>220.270-180</b>	3-180 Ohms	270 mm
<b>220.300-180</b>	3-180 Ohms	300 mm
<b>220.320-180</b>	3-180 Ohms	320 mm
<b>220.330-180</b>	3-180 Ohms	330 mm
<b>220.350-180</b>	3-180 Ohms	350 mm
<b>220.600-180</b>	3-180 Ohms	600 mm
<b>220.660-180</b>	3-180 Ohms	660 mm



Item #	Qty	Description	Material
1	1	Sensor Head	S/Steel 316
2	1	Reed Sw Tube	S/Steel 316
3	1	Float 32x32mm	Acrylon NBR
4	1	Bottom plug	S/Steel 316
5	1	Reed Sw assy	NBR 60
6	1	Rubber	
7	1	Cover	Alum
8	1	Gasket 68x2mm	NBR 60



Note: Use adaptor plate p/n CTA0200 when installing the five holes sender's plate on to 6 holes applications.



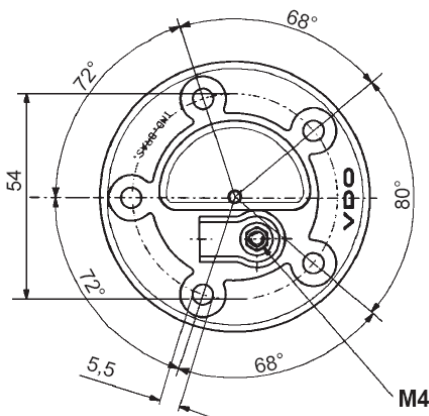
## Fuel Gauge Tubular Type

Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
<b>A2C59514088</b>	Black	0 - 1/1	12/24V	Empty = 110 / 50 Full = 2
<b>A2C59514182</b>	White	0 - 1/1	12/24V	Empty = 110 / 50 Full = 2

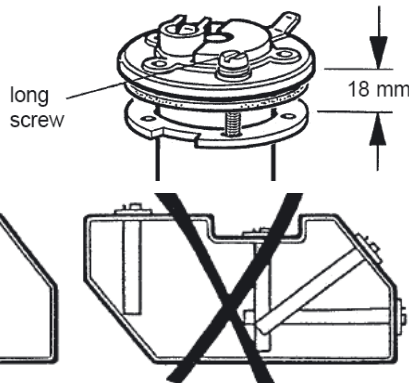
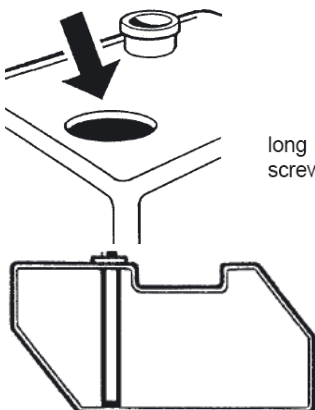


## Sender Tubular Type - Fuel Pitch 54 mm

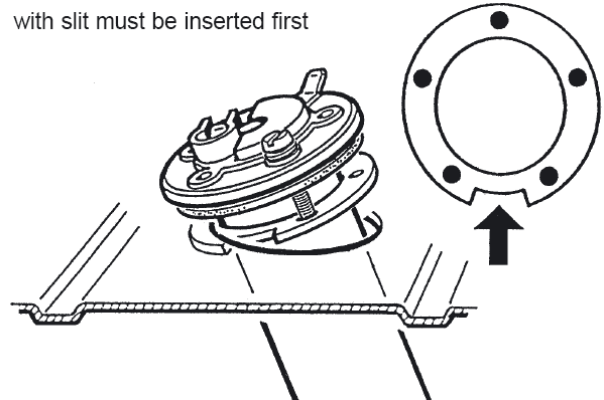
Sender Part No.	Length	Sender Part No.	Length
<b>224011000015G</b>	150mm	<b>224011000032G</b>	320mm
<b>224011000016G</b>	160mm	<b>224011000033G</b>	330mm
<b>224011000017G</b>	170mm	<b>224011000034G</b>	340mm
<b>224011000018G</b>	180mm	<b>224011000035G</b>	350mm
<b>224011000019G</b>	190mm	<b>224011000036G</b>	360mm
<b>224011000020G</b>	200mm	<b>224011000037G</b>	370mm
<b>224011000021G</b>	210mm	<b>224011000038G</b>	380mm
<b>224011000022G</b>	220mm	<b>224011000039G</b>	390mm
<b>224011000023G</b>	230mm	<b>224011000040G</b>	400mm
<b>224011000024G</b>	240mm	<b>224011000045G</b>	450mm
<b>224011000025G</b>	250mm	<b>224011000050G</b>	500mm
<b>224011000026G</b>	260mm	<b>224011000055G</b>	550mm
<b>224011000027G</b>	270mm	<b>224011000060G</b>	600mm
<b>224011000028G</b>	280mm	<b>224011000065G</b>	650mm
<b>224011000029G</b>	290mm	<b>224011000070G</b>	700mm
<b>224011000030G</b>	300mm	<b>224011000075G</b>	750mm
<b>224011000031G</b>	310mm	<b>224011000080G</b>	800mm

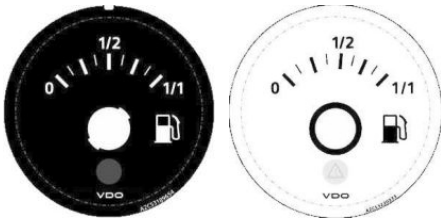


dia. 59 mm



with slit must be inserted first





## Fuel Gauge Tubular Type

Part Number	Colour Dial Bezel	Range	Voltage	Ohms Range
A2C59514088	Black	0 - 1/1	12/24V	Empty = 110 / 50 Full = 2
A2C59514182	White	0 - 1/1	12/24V	Empty = 110 / 50 Full = 2

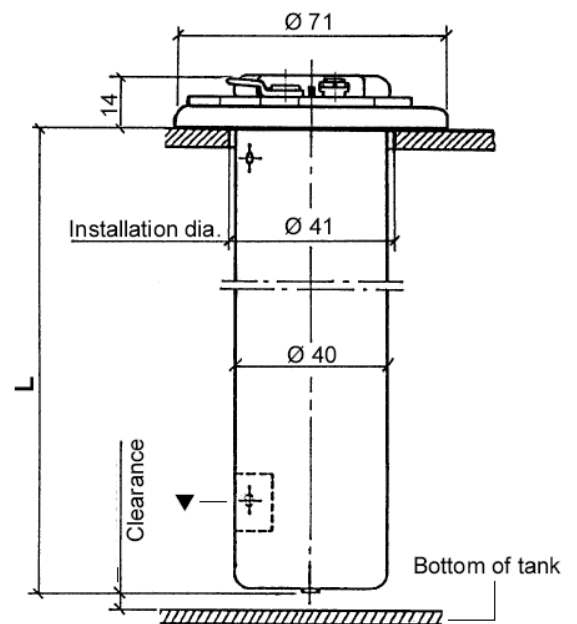
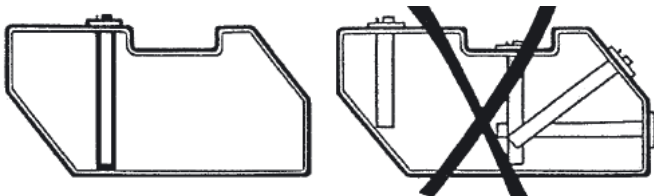
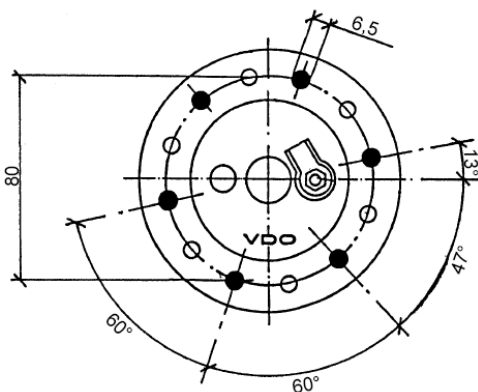
## Sender Tubular Type - Fuel Pitch 80 mm



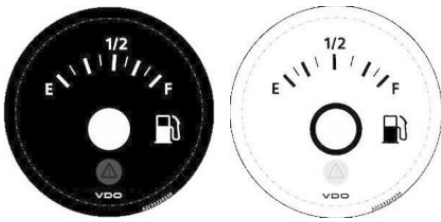
Sender Part No.	Length	Sender Part No.	Length
X10224014031	326 mm	X10224009026	831 mm
X10224014021	426 mm	X10224021006	846 mm
X10224009037	536 mm	X10224014003	881 mm
X10224009053	551 mm	X10224014011	916 mm
X10224009039	596 mm	X10224009057	946 mm
X10224021002	596 mm	X10224014015	996 mm
X10224014022	616 mm	X10224009022	1001 mm
X10224009048	641 mm	X10224021005	1045 mm
X10224014002	686 mm	X10224009040	1086 mm
X10224009029	741 mm	X10224014044	1250 mm
X10224009019	781 mm	X10224009072	1387 mm
X10224021004	803 mm	-----	-----

### Accessories:

p/n 115910011401 Welding Flange Ø80mm  
p/n 2251016 Gasket Cork Ø80mm



# Fuel Gauge - US Senders



<b>Fuel Gauge (US Application)</b>				<b>Ø 52 mm</b>
Part Number	Colour Dial / Bezel	Range	Voltage	Ohms Range
A2C59514085	Black	E -1/2 - F	12/24V	Empty = 5 Full = 90
A2C59514186	White	E -1/2 - F	12/24V	Empty = 5 Full = 90
A2C59514094	Black	E -1/2 - F	12/24V	Empty= 240 Full = 33
A2C59514190	White	E -1/2 - F	12/24V	Empty= 240 Full = 33



<b>Lever Fuel Sensor - without low fuel alarm</b>			
Part Number	Ohms Range	Adjustable	Pitch Ø
220.004	5 - 90	145 - 400 mm	54 mm
220.005	240 -33	145 - 400 mm	54 mm

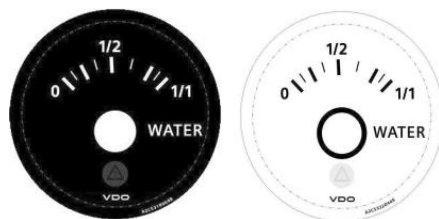
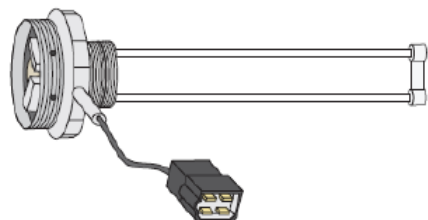
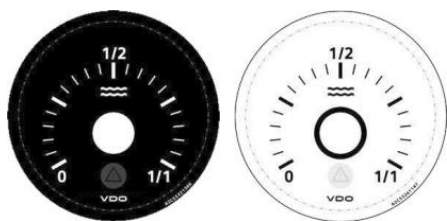


<b>Lever Fuel Sensor - with low fuel alarm</b>			
Part Number	Ohms Range	Adjustable	Pitch Ø
A2C59510166	240 - 33	145 - 400 mm	54 mm
A2C59510167	0 - 90	145 - 400 mm	54 mm

<b>Lever Fuel Sensor - without low fuel alarm</b>			
Part Number	Ohms Range	Ohms Range	Pitch Ø
A2C59510172	240 - 33	145 - 400 mm	54 mm
A2C59510173	0 - 90	145 - 400 mm	54 mm



<b>Tank Sender Accessories</b>	
Part No.	Description.
N05801432	Flange Kit Bolt Circle Ø54mm
22502641141	Bolt Circle Ø54mm
224011000017G	Bolt Circle Ø80mm
CTA0200	Six to five holes conversion plate



## Fresh Water Level Gauge Ø 52 mm

Part Number	Colour Dial Bezel	Range	Voltage	Range
A2C59510366	Black	0 - 1/1	12/24V	Empty = 4 mA Full = 20 mA
A2C59510368	White	0 - 1/1	12/24V	Empty = 4 mA Full = 20 mA

## Fresh Water Sender 4 - 20 mA

Part Number	Range E - F	Adjustable length	Terminal
N02240902	0 - 100%	80 - 600 mm	Water-Proof Plug
N02240904	0 - 100%	600 - 1200 mm	Water-Proof Plug
N02240906	0 - 100%	1200 - 1500 mm	Water-Proof Plug
X1022400007	Tank unit flange with Gasket		

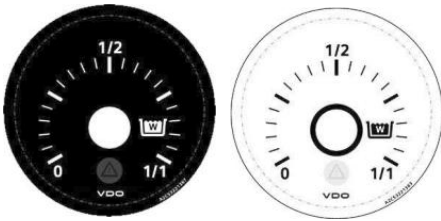
## Fresh Water Level Gauge Ø 52 mm

Part Number	Colour Dial Bezel	Range	Voltage	Range
A2C59510366	Black	0 - 1/1	12/24V	Empty = 3 Ohms Full = 180 Ohms
A2C59510368	White	0 - 1/1	12/24V	Empty = 3 Ohms Full = 180 Ohms

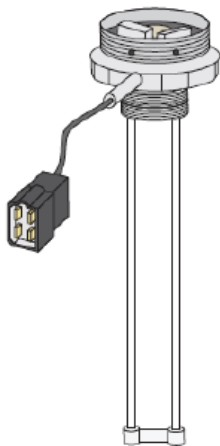
## Sender Reed Switch - Water Pitch 54 mm

Part Number	Range E - F	L = length	Terminal
220.150-180	3-180 Ohms	150 mm	Water-Proof Plug
220.180-180	3-180 Ohms	180 mm	Water-Proof Plug
220.230-180	3-180 Ohms	230 mm	Water-Proof Plug
220.260-180	3-180 Ohms	260 mm	Water-Proof Plug
220.270-180	3-180 Ohms	270 mm	Water-Proof Plug
220.300-180	3-180 Ohms	300 mm	Water-Proof Plug
220.320-180	3-180 Ohms	320 mm	Water-Proof Plug
220.330-180	3-180 Ohms	330 mm	Water-Proof Plug
220.600-180	3-180 Ohms	600 mm	Water-Proof Plug
220.660-180	3-180 Ohms	660 mm	Water-Proof Plug



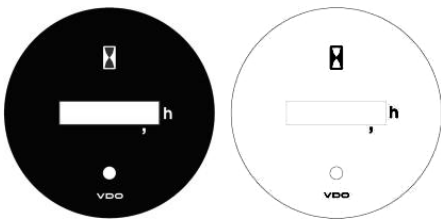


<b>Waste Water Level Gauge</b>				<b>Ø 52 mm</b>
Part Number	Colour Dial Bezel	Range	Voltage	Range
A2C59512342	Black	0 - 1/1	12/24V	Empty = 4 mA Full = 20 mA
A2C59512343	White	0 - 1/1	12/24V	Empty = 4 mA Full = 20 mA



<b>Waste Water Sender</b>			
Part Number	Range E - F	Adjustable length	Terminal
N02240902	Empty = 4 mA Full = 20 mA	80 - 600 mm	Water-Proof Plug
N02240904	Empty = 4 mA Full = 20 mA	600 - 1200 mm	Water-Proof Plug
N02240906	Empty = 4 mA Full = 20 mA	1200 - 1500 mm	Water-Proof Plug

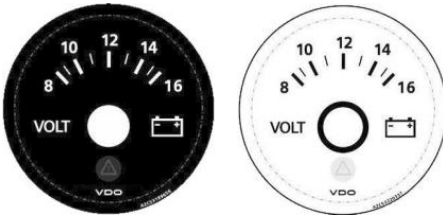
<b>Accessory</b>	
Part Number	Description
X1022400007	Tank unit flange with Gasket



<b>Hourmeter</b>			
Part Number	Colour Dial/ Bezel	Light	Voltage
A2C59512453	Black	Yes	12/24V
A2C59512454	White	Yes	12/24V



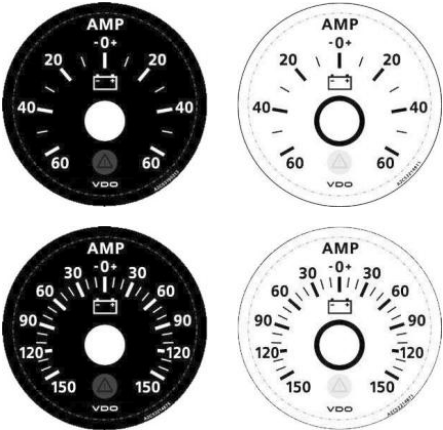
<b>Pressure Switch - Heavy Duty</b>					
Part Number	Switch Point Bar (Psi)	Thread Size	Terminals	Picture	Switch Contact
230.050	0.5 Bar (7) Fixed	1/8"-27NPTF	Screw x 2 Insulated Return	A	N/O Raising Pressure



## Voltmeter

Ø 52 mm

Part Number	Colour Dial / Bezel	Range	Voltage
<b>A2C59512545</b>	Black	8 -16V	12V
<b>A2C59512546</b>	White	8 -16V	12V
<b>A2C59512458</b>	Black	18 - 32V	24V
<b>A2C59512459</b>	White	18 - 32V	24V



## Ammeter Gauge with external shunt

Ø 52 mm

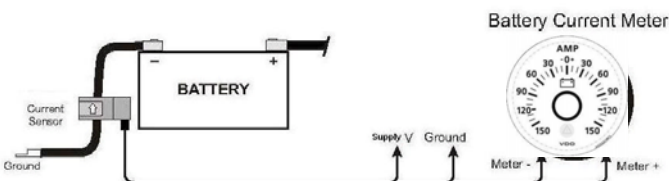
Part Number	Colour Dial / Bezel	Range	Voltage
<b>A2C59512328</b>	Black	60A	12/24V
<b>A2C59512330</b>	White	60A	12/24V
<b>A2C59512329</b>	Black	150A	12/24V
<b>A2C59512331</b>	White	150A	12/24V

Note: Gauge does not include Current Sensor or Loom



## Ammeter Shunt

Part Number	Range / Description	Voltage
<b>UK-UE-157</b>	60A	12/24V
<b>UK-UE-094</b>	150A	12/24V
<b>UK-UE-184</b>	Shunt Harness	
<b>UK-UE-188</b>	Universal Mounting Bracket Kit	



Battery Current Meter

### SENSOR Specs

Sensor Type: Open loop Hall-Effect  
 Linearity: 1.5%  
 Supply Voltage Range: 12/24V  
 Current Consumption: 8.1 mA max  
 Output to Gauge: + - 60 mV  
 Operating Temp: 40°C to + 125°C  
 Storage Temp: 40°C to + 125°C  
 Aperture size: 31.24 mm  
 Weight: 0.136 Kg  
 Connector: Packard sealed Metri-Pak 150  
 Note: Mating plug not supplied with sensor



# Trim & Rudder Angle



## Trim Gauge Ø 52 mm

Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59512564	Black	Bravo Drive	12/24V
A2C59514244	White	Bravo Drive	12/24V



## Rudder Angle Indicator Ø 52 mm

Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59512410	Black	40° Stb	12/24V (for 24V with dropping voltage resistor p/n A2C59510853)
A2C59512411	White	40° Stb	12/24V (for 24V with dropping voltage resistor p/n A2C59510853)



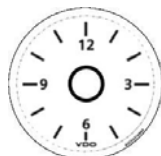
## Rudder Angle Indicator Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59512410	Black	+45°	12V
A2C59512411	White	+45°	12V



## Rudder Angle Sender

Part Number		Voltage	Note
440102001001D	Single Station	12/24V	Sender suitable for 52 and 85mm gauges
440102002001D	Dual Station	12/24V	Dual station sender has a "D" market on the body



## Clock Ø 52 mm

Part Number	Colour Dial/ Bezel	Range	Voltage
A2C59513445	Black	12h	12V
A2C59513443	White	12h	12V
A2C59513446	Black	12h	24V
A2C59513444	White	12h	24V





## Engine Monitoring Master SAE J1939 Ø 80/85 mm

Part Number	Colour Dial/ Bezel	Description	Range	Voltage
N02012920	Black	Master Gauge	3000	12/24V
N02012922	Black	Master Gauge	4000	12/24V
N02012928	White	Master Gauge	3000	12/24V
N02012930	White	Master Gauge	4000	12/24V

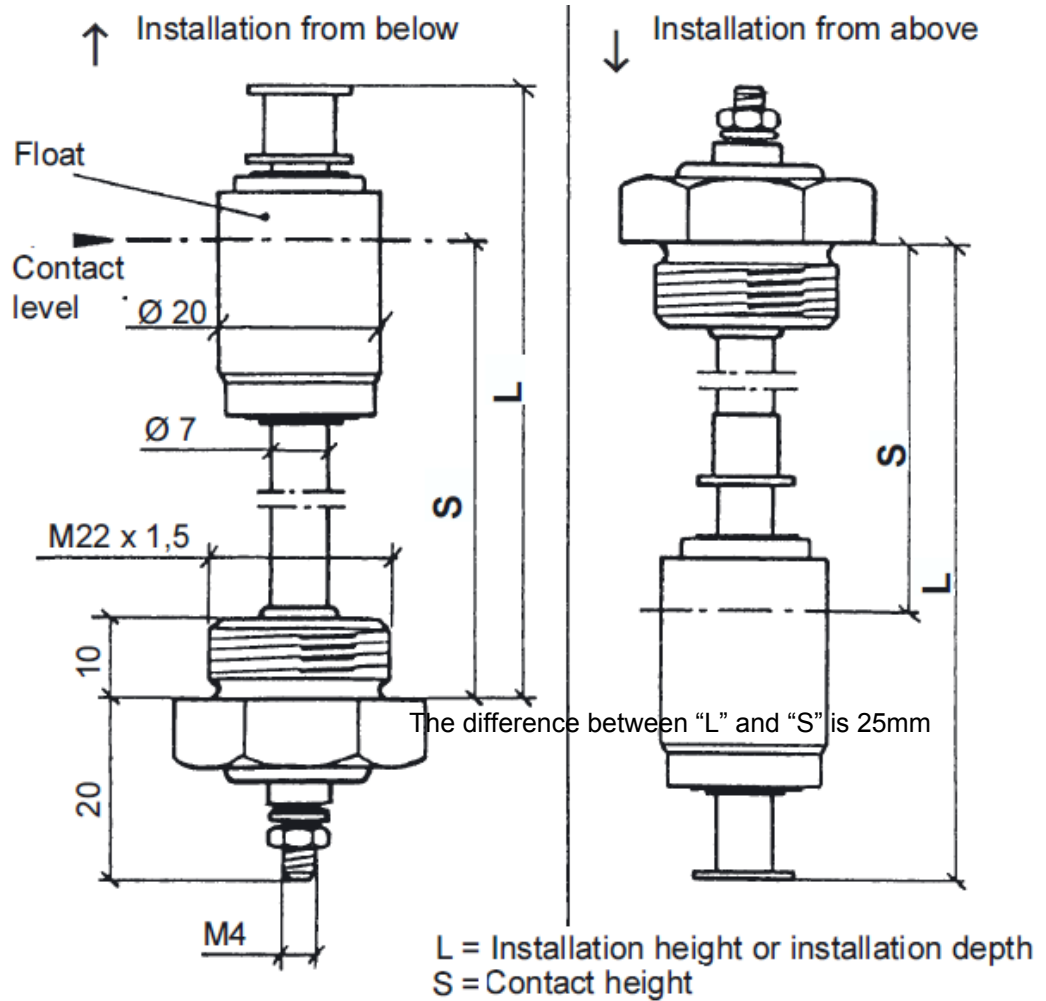
## Engine Monitoring Slave SAE J1939 Ø 52 mm

Part Number	Colour Dial/ Bezel	Description	Range	Voltage
N02140154	Black	Gearbox oil pressure gauge	25 bar	12/24V
N02140156	Black	Engine oil pressure gauge	10 bar	12/24V
N02140508	Black	Boost pressure gauge	3 bar	12/24V
N02140512	Black	Engine oil pressure gauge	150 psi	12/24V
N02140516	Black	Gearbox pressure gauge	360 psi	12/24V
N02224080	Black	Fuel tank gauge	0-4/4	12/24V
N02226002	Black	Engine load	0 - 100%	12/24V
N02270040	Black	Fuel flow gauge	80 l/h	12/24V
N02311054	Black	Engine oil temperature gauge	50 - 150°C	12/24V
N02311056	Black	Engine coolant temperature	40 - 120°C	12/24V
N02311536	Black	Gearbox oil temperature	50 - 150°C	12/24V
N02311540	Black	Exhaust gas temperature	100 - 900°C	12/24V
N02311544	Black	Gearbox oil temperature	120 - 300 °F	12/24V
N02311546	Black	Exhaust gas temperature	200 - 1700 °F	12/24V
N02311548	Black	Exhaust gas temperature, Turbine A	200 - 1700 °F	12/24V
N02311550	Black	Exhaust gas temperature, Turbine B	200 - 1700 °F	12/24V
N02311552	Black	Engine coolant temperature	100 - 250 °F	12/24V
N02311554	Black	Exhaust gas temperature, Turbine A	100 - 900 °C	12/24V
N02311556	Black	Exhaust gas temperature, Turbine B	100 - 900 °C	12/24V
N02413058	Black	Voltmeter	18 - 32 V	24V
N02413066	Black	Voltmeter	8 - 16 V	12V
N02311542	Black	Engine oil temperature	100 - 300 °F	12/24V
N02140158	White	Gearbox oil pressure gauge	25bar / 360psi	12/24V
N02140160	White	Engine oil pressure gauge	10bar / 145psi	12/24V
N02224082	White	Fuel tank gauge	0-4/4	12/24V
N02311058	White	Engine oil temperature gauge	150°C / 300°	12/24V
N02311060	White	Engine coolant temperature gauge	120°C / 250°F	12/24V
N02413060	White	Voltmeter	18-32 V	24V
N02413074	White	Voltmeter	8-16 V	12V



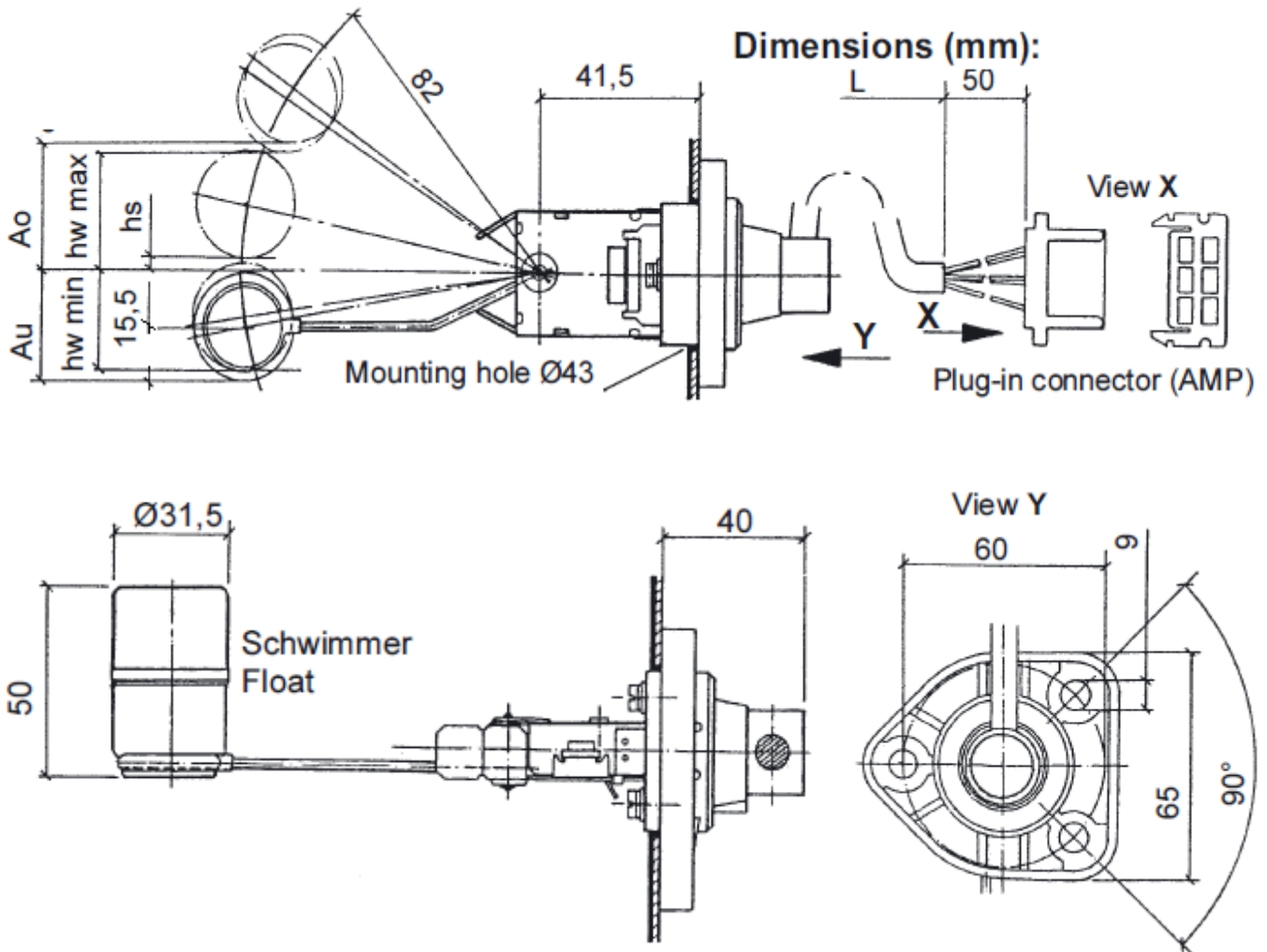
## Low Level Warning Switch - Oil & Diesel

Part Number	Installation from	Contact mm L	Switch Load	Thread Size	Voltage
395462001001	Above	158	2W	M22x1.5	24V
395262001007	Above	170	2W	M22x1.5	12V
395462001006	Above	285	3W	M22x1.5	24V
395462001002	Below	35.6	3W	M22x1.5	24V
395262001005	Below	50	2W	M22x1.5	12V
395262001015	Below	73	2W	M22x1.5	12V
395462001004	Below	120	3W	M22x1.5	24V
395462001005	Below	150	3W	M22x1.5	24V



## Oil Level Warning Switch

Part Number	Warning Contact		Stop Above	Stop Below	Cable Length
	hw	hw min	Ao	Au	
395024004005	<b>35</b> <sup>+1</sup> -2	<b>6</b> <sup>+2</sup> -1	<b>37</b> -1	<b>32</b> <sup>±1</sup>	<b>1500</b>
395024004008	<b>29</b> <sup>±4.5</sup>	<b>0</b> <sup>+1</sup> -2	<b>34</b> -2	<b>20</b> <sup>±2</sup>	<b>920</b>

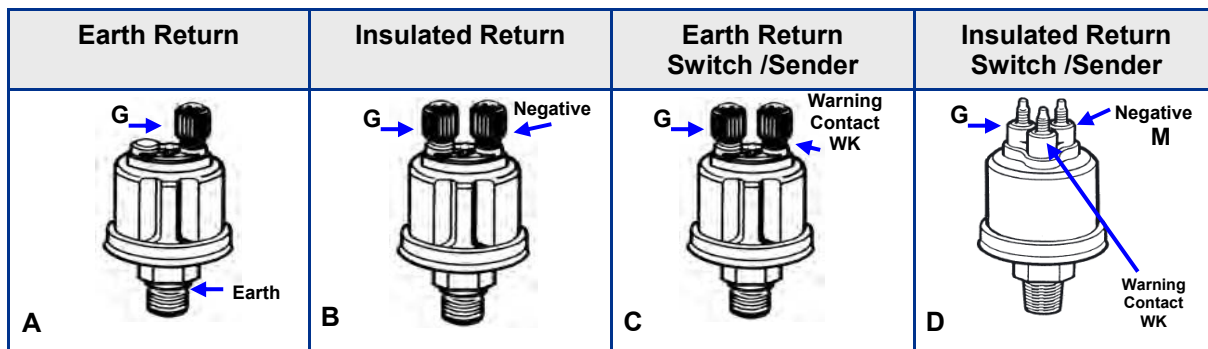


### Plug configuration

- 1 Warning contact max. (green)
- 2 Masse / Ground (brown-white)
- 3 not connected
- 4 Warning contact min ( yellow)
- 5 Contact-consumer (white)
- 6 Ground (brown-blue)

### Technical Data

insulated return  
 Rated voltage: 6V to 24V  
 Switching load: 3W max., noninductive  
 Contacting mode: slow-acting,  
 NOC = with contacts normally open  
 Operating temperature: - 25°C to + 110°C  
 Storage temperature: - 30°C to + 110°C  
 (up to + 120°C for 1h max.)  
 Installation form the side



### Pressure Sender - Oil / Air Single Station

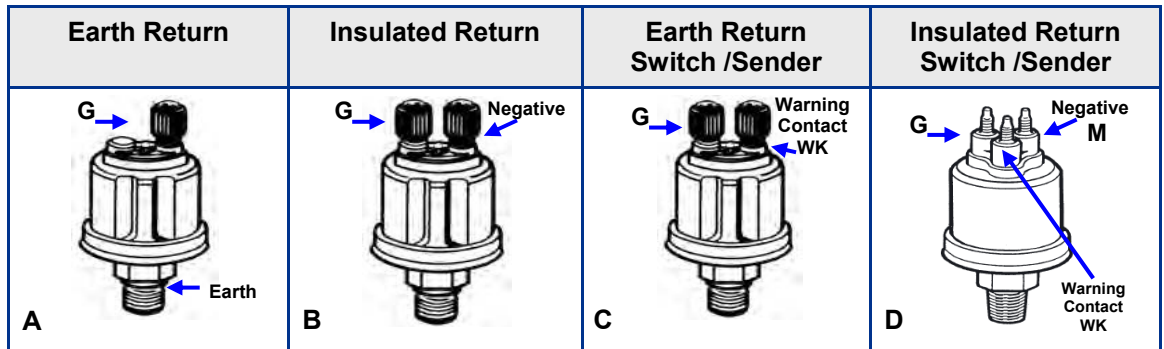
Part Number	Range Bar (Psi)	Thread Size	Switch Point Bar (Psi)	Picture	Ohms Range
360081032025C	0 - 2 Bar (75)	1/8"-27NPTF	---	B	10 - 180
360081032011C	0 - 2 Bar (75)	M12x1.5	---	B	10 - 180

### Pressure Sender - Oil / Air Single Station

Part Number	Range Bar (Psi)	Thread Size	Switch Point Bar (Psi)	Picture	Ohms Range
360.001	0 - 5 Bar (75)	1/8"-27NPTF	---	A	10 - 180
360.004	0 - 5 Bar (75)	1/4"-18NPTF	---	A	10 - 180
360.016	0 - 5 Bar (75)	1/8"-28BSP	---	A	10 - 180
360081032001C	0 - 5 Bar (75)	1/8"-27NPTF	---	B	10 - 180
360081032002C	0 - 5 Bar (75)	M10x1	---	B	10 - 180
360081030001K	0 - 5 Bar (75)	M10x1	0.25 Bar (3.5)	C	10 - 180
360081030002K	0 - 5 Bar (75)	M10x1	0.5 Bar (7)	C	10 - 180
360081030028K	0 - 5 Bar (75)	M14x1.5	0.5 Bar (7)	C	10 - 180
360081030049K	0 - 5 Bar (75)	1/8"-27NPTF	0.5 Bar (7)	C	10 - 180
360081030014C	0 - 5 Bar (75)	M10x1	0.6 bar (8.5)	C	10 - 180
360081030010C	0 - 5 Bar (75)	1/8"-27NPTF	1.4 Bar (11.5)	C	10 - 180
360081039002C	0 - 5 Bar (75)	1/8"-27NPTF	11.5 Psi	D	10 - 180
360081039004C	0 - 80 Psi	1/8"-27NPTF	10 Psi	D	10 - 180

### Pressure Sender - Oil / Air Dual Station

Part Number	Range Bar (Psi)	Thread Size	Switch Point Bar (Psi)	Picture	Ohms Range
362081001001K	0 - 5 Bar (75)	1/8"-27NPTF	---	B	5 - 90
362081001002K	0 - 10 Bar (150)	1/8"-27NPTF	---	B	5 - 90
362081003002K	0 - 10 Bar (150)	1/8"-27NPTF	---	A	5 - 90
362081002001K	0 - 25 Bar (350)	1/8"-27NPTF	---	B	5 - 90
362081004001C	0 - 25 Bar (350)	1/8"-27NPTF	---	A	5 - 90



## Pressure Sender/Switch - Oil / Air Single Station

Part Number	Range Bar (Psi)	Thread Size	Switch Point Bar (Psi)	Picture	Ohms Range
360081030009K	0 - 10 Bar (150)	M10x1	0.5 Bar (7)	C	10 - 184
360081030022C	0 - 10 Bar (150)	M12x1.5	0.5 Bar (7)	C	10 - 184
360081030052C	0 - 10 Bar (150)	1/8"-27NPTF	0.5 Bar (7)	C	10 - 184
360081030039C	0 - 10 Bar (150)	M10x1	0.75 Bar (10.7)	C	10 - 184
360081030015C	0 - 10 Bar (150)	1/8"-27NPTF	0.8 Bar (11.5)	C	10 - 184
360081030017C	0 - 10 Bar (150)	M10x1	0.9 Bar (12)	C	10 - 184
360081039003	0 - 10 Bar (150)	1/8"-27NPTF	0.8 Bar (11.5)	D	10 - 184

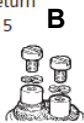
## Pressure Sender - Oil / Air Single Station

360081039003	0 - 25 Bar (400)	1/8"-27NPTF	-----	B	10 - 184
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1-pole Common Ground  
Screw M4 x 5



Insulated Return  
Screw M4 x 5  
(2x)

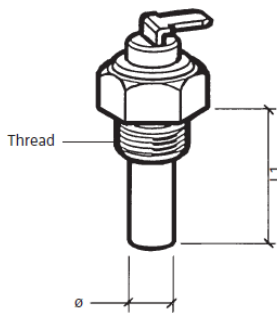


Insulated Return  
6.3 x 0.8 mm  
riveted

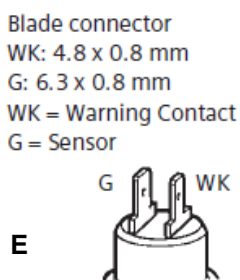
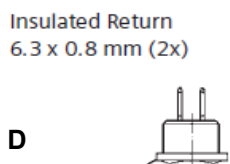
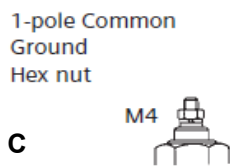
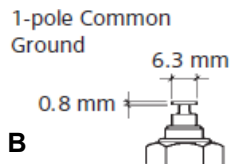


## Pressure Switches - Heavy Duty

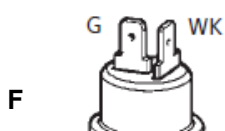
Part Number	Switch Point Bar (Psi)	Thread Size	Terminals	Picture	Switch Contact
230112005006	0.5 Bar (7) Fixed	1/8"-27NPTF	Screw x 2 Insulated Return	B	N/C Falling Pressure
230.044	0.5 Bar (7) Fixed	1/8"-27NPTF	Screw x 2 Insulated Return	B	N/C Falling Pressure
230213002004	4.5 Bar (64) Fixed	M10 x 1	Screw x 2 Insulated Return	B	N/C Falling Pressure
230213002001	7.5 Bar (64) Fixed	1/8"-27NPTF	Screw x 2 Insulated Return	B	N/C Falling Pressure
230.041	0.7 Bar (10) Fixed	1/8"-27NPTF	Screw x 1 Earth Return	A	N/C Falling Pressure
230.701	1.05 Bar (15) Fixed	1/8"-27NPTF	Screw x 2 Insulated Return	B	N/C Falling Pressure
230.050	0.5 Bar (7) Fixed	1/8"-27NPTF	Screw x 2 Insulated Return	B	N/O Falling Pressure
230.990	7 - 25 Psi Adjustable	1/8"-27NPTF	Screw x 2 Insulated Return	C	N/C Falling Pressure
230.993	15 - 150 Psi Adjustable	1/8"-27NPTF	Screw x 2 Insulated Return	C	N/C Falling Pressure



1-pole Common Ground  
6.3 x 0.8 mm



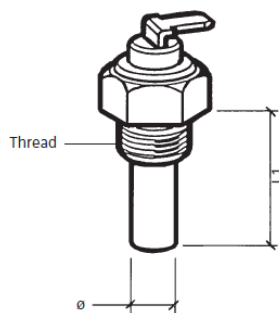
2 blade connectors arranged in the form of letter "T"  
6.3 x 0.8 mm  
WK = Warning Contact  
G = Sensor



Temp Senders				40 -120 Deg C	
Part Number	Switch Point	Thread Size	Term	Body Length	°C ► Ohms
323801001006K	-----	M14x1.5	A	29 mm	90 ► 51.2 ± 5.3
323801001040N	-----	M16x1.5	A	29 mm	90 ► 51.2 ± 5.3
323801001022K	-----	M18x1.5	A	29 mm	90 ► 51.2 ± 5.3
323801001010K	-----	1/2-14 NPTF	A	29 mm	90 ► 51.2 ± 5.3
323801001009N	-----	1/4-18 NPTF	A	29 mm	90 ► 51.2 ± 5.3
323801001007N	-----	3/8-18 NPTF	A	29 mm	90 ► 51.2 ± 5.3
323801001008N	-----	5/8-18 UNF-3A	A	29 mm	90 ► 51.2 ± 5.3
323805001001K	-----	M14x1.5	D	29 mm	90 ► 51.2 ± 5.3
323805001015N	-----	M18x1.5	D	29 mm	90 ► 51.2 ± 5.3
323805001004K	-----	1/2-14 NPTF	D	29 mm	90 ► 51.2 ± 5.3
323805001007N	-----	1/4-18 NPTF	D	29 mm	90 ► 51.2 ± 5.3
323805001005N	-----	3/8-18 NPTF	D	29 mm	90 ► 51.2 ± 5.3
323805001002C	-----	5/8-18 UNF-3A	D	29 mm	90 ► 51.2 ± 5.3
325805003001C	-----	1/4-18 NPTF	D	29 mm	90 ► 36.5 ± 2.7

Temp Senders & Switch				40 -120 Deg C	
Part Number	Switch Point	Thread Size	Term	Body Length	°C ► Ohms
323803001004D	90±3°C	M14x1.5	E	40 mm	90 ► 51.2 ± 5.3
323803001006D	96±3°C	M14x1.5	E	40 mm	90 ► 51.2 ± 5.3
323803001008D	110±3°C	M14x1.5	E	40 mm	90 ► 51.2 ± 5.3
323803001011D	95±3°C	5/8-18 NF-3	E	40 mm	90 ► 51.2 ± 5.3
323803001002D	98±3°C	5/8-18 NF-3	E	40 mm	90 ► 51.2 ± 5.3
323803001012D	100±3°C	5/8-18 NF-3	E	40 mm	90 ► 51.2 ± 5.3
323803001019D	95±3°C	1/2-14 NPTF	E	40 mm	90 ► 51.2 ± 5.3
323803001013D	106±3°C	M14x1.5	E	40 mm	90 ► 51.2 ± 5.3
323803004002D	105±3°C	M14x1.5	F	40 mm	90 ► 51.2 ± 5.3
323803001025	103±3°C	1/2-14 NPTF	E	40 mm	90 ► 51.2 ± 5.3

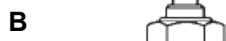
Temp Senders				50 -150 Deg C	
Part Number	Switch Point	Thread Size	Term	Body Length	°C ► Ohms
323801010001D	-----	M10x1.5	D	29 mm	120 ► 36.5 ± 2.7
323805003001N	-----	M14x1.5	D	29 mm	90 ► 36.5 ± 2.7
323805003002N	-----	1/4-18 NPTF	D	29 mm	90 ► 36.5 ± 2.7



1-pole Common Ground  
6.3 x 0.8 mm



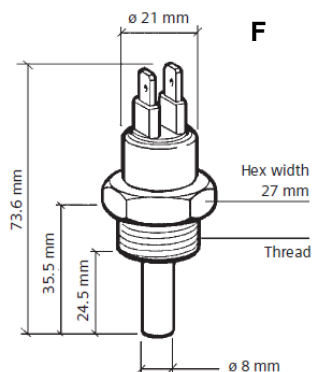
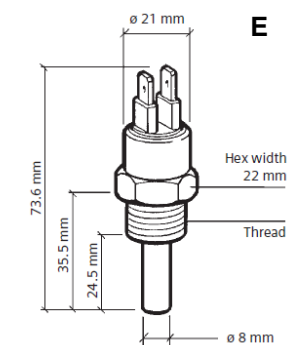
1-pole Common Ground



1-pole Common Ground  
Hex nut



Connector pin  
Ø 4 mm



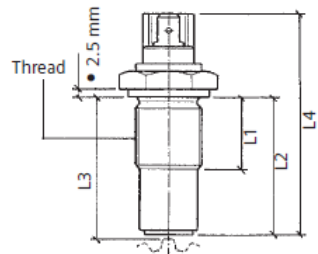
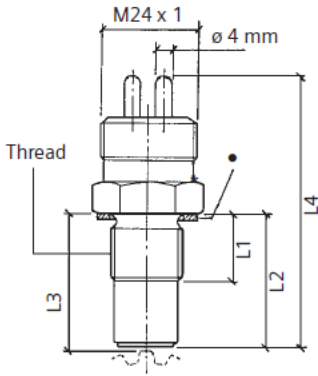
## Temp Switch 3 Watts Normally Open Contact - Break 5° below Sw point

Part Number	Switch Point	Thread Size	Term	Body Length L	Max Temp	Ø mm
232011017148D	35±3°C	M14x1.5	A	29 mm	120	9.7
232011017087D	40±3°C	M14x1.5	D	29 mm	120	10
232011017038D	55±3°C	M14x1.5	A	29 mm	120	10
232011017017D	85±3°C	M14x1.5	A	29 mm	120	10
232011017016D	95±3°C	M14x1.5	A	29 mm	150	10
232011017080D	97±3°C	M14x1.5	A	29 mm	120	10
232011017099D	98±3°C	5/8-18 UNF-2A	A	29 mm	120	10
232011017034D	100±3°C	M14x1.5	A	29 mm	160	10
232011017131D	103±3°C	1/2-14 NPTF	A	29 mm	160	10
232011017010D	110±3°C	M14x1.5	A	29 mm	160	10
232011017032D	120±3°C	M14x1.5	A	29 mm	130	10
232011017103D	130±3°C	M14x1.5	A	29 mm	150	10
232011017004D	140±10°C	M14x1.5	A	29 mm	150	10
232011005027D	150±5°C	M10x1.5	B	38.5 mm	200	6.9
232011005004D	170±5°C	M10x1.5	C	38.5 mm	220	6.9
232011005030D	185±5°C	M10x1.5	C	38.5 mm	230	6.9
232011019003D	195±10°C	M10x1.5	C	38.5 mm	250	6.9

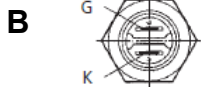
## Temp Switch 100 Watts Normally Open Contact - Break 5° below Sw point

Part Number	Switch Point	Thread Size	Term	Body Length L	Max Temp	Ø mm
X10232001001	64±3°C	M14x1.5	E	35.5 mm	110	8
X10232001002	82±3°C	M18x1.5	E	35.5 mm	110	8
X10232001003	86±3°C	M18x1.5	E	35.5 mm	110	8
X10232001004	92±3°C	M18x1.5	E	35.5 mm	110	8
X10232001005	96±3°C	M18x1.5	E	35.5 mm	110	8
X10232001006	96±3°C	1/2-14 NPTF	E	43.5 mm	110	8
X10232001007	96±3°C	M14x1.5	E	35.5 mm	110	8
X10232001008	96±3°C	M22x1.5	F	35.5 mm	110	8
X10232001009	100±3°C	M18x1.5	E	35.5 mm	110	8
X10232001010	105±3°C	M18x1.5	E	35.5 mm	160	8





Blade connector 6.3 x 0.8 mm (2x)

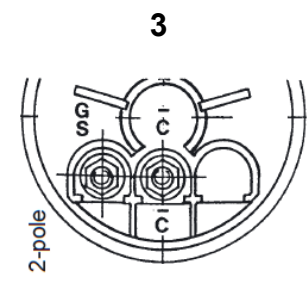
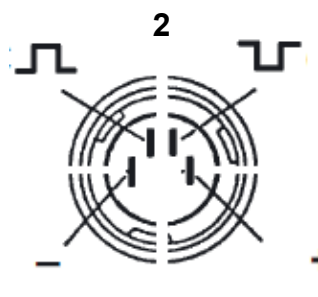
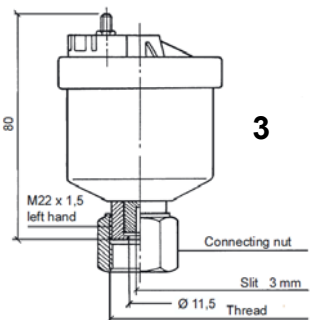
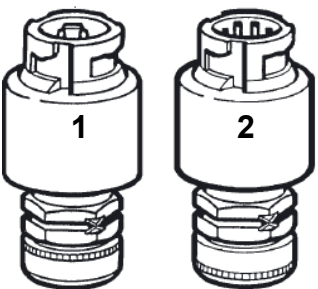


## Inductive

Part Number	Pic	Thread Size	L1 mm	L2 mm	L3 mm	L4 mm
340.007	B	M18x1.5 mm			25	
340.008	B	M18 x 1,5			44	
340.009	B	M18 x 1,5			84	
340804007013C	B	M18 x 1,5	27	34	35.1 ± 0.1	62
340804007004C	B	3/4-16 UNF-2A	27.5	28.5	29.6 ± 0.1	70
340804007011C	B	M18 x 1,5	33	34	35.1 ± 0.1	70
340804007019C	B	M18 x 1,5	18.2	70.7	71.8 ± 0.1	79.7
340804005015C	A	M18x1,5	18	99.1	101.15–100.55	135.6

## Hall Effect & AC Generator

Part Number	Voltage	Thread Size	Pic	Type	Imp/ Rev	Plug Kit
K46020	12/24V	M22x1.5	1	H/E	8	K72221
K46021	12/24V	7/8"-18UNF	1	H/E	8	K72221
K70450	12V	M22x1.5 L/ H Female	2	H/E	8	K72222
K70451	12V	7/8"18UNF Female	2	H/E	8	K72222
340808001004G		7/8 – 18 NS -2A left hand	3	Gen	4	





### Lever Fuel Sensor - with low fuel alarm

Part Number	Ohms Range	Adjustable	Pitch Ø
A2C59510165	Empty = 3 - Full = 180	<b>145 - 400 mm</b>	54 mm
A2C59510166	Empty = 240 - Full = 33	<b>145 - 400 mm</b>	54 mm
A2C59510167	Empty = 5 - Full = 90	<b>145 - 400 mm</b>	54 mm

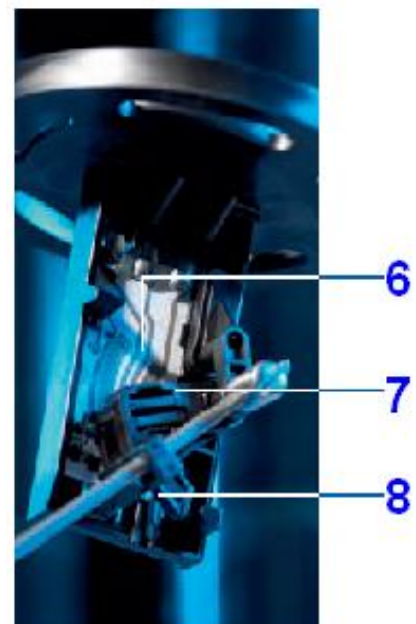
### Lever Fuel Sensor - without low fuel alarm

Part Number	Adjustable 145 - 400 mm	Ohms Range	Pitch Ø
A2C59510171	Empty = 3 - Full = 180	<b>145 - 400 mm</b>	54 mm
A2C59510172	Empty = 240 - Full = 33	<b>145 - 400 mm</b>	54 mm
A2C59510173	Empty = 5 - Full = 90	<b>145 - 400 mm</b>	54 mm

An economical and practical solution for fuel monitoring for tank depths from 140mm to 400mm

Engineered with a redundant dual wiper system, our unique VDO 'quiet arm' and thick film technology, this new VDO fuel sender leads the field in reliability and durability. In fact, this family of senders has the ability to withstand over one million swing arm cycles without failure. ALAS I senders feature our unique slotted SAE five-hole flange mount, an industry first that gives you the utmost in versatility for sender mounting positions. Three resistance values are available, 10-180 ohm, 240-33 ohm & 90-0 ohm. ALAS I senders are available with an optional low fuel warning contact circuit found in no other universal

1. Available with low fuel warning contact.
2. Redundant ground connection.
3. Unique SAE 5-hole slotted mounting plate allows for positioning sender for left or right hand applications.
4. Stainless steel float arm and pivot adjusts from 140mm to 400mm.
5. "No sink" solid float.
6. VDO thick film element with 39-step resolution.
7. Redundant dual wiper system.
8. 'Quiet arm' minimizes float movement.



## Fuel Senders with Suction / Return Tubes

VDO is first to market with the only adjustable fuel sender featuring interchangeable suction / return tubes, plus optional low fuel warning contact.

Just pick the length and diameter of the suction / return tubes based on your gas or diesel application, set the float length and you're ready for installation.

If you have several tank configurations, inventory is minimized with our 'one size fits all' design, without compromising the durability or integrity of the sender.

These units are fully adjustable from 140mm to 400mm.

Engineered with a redundant dual wiper system, the unique VDO 'quiet arm' and thick film technology leads the field in reliability and durability.

In fact, this family of senders has the ability to withstand over one million swing arm cycles without failure.

VDO senders feature our unique slotted SAE 5-hole flange mount, an industry first that gives you the utmost in versatility for sender mounting positions.

Three resistance values are available, 10-180 Ohms, 240-33 Ohms & 5 - 90Ohms.

The senders are available with an optional low fuel warning contact circuit that is not offered in other universal type senders.

Upon request, we can supply senders fully assembled to your specifications.

Each suction / return tube has 360° of positioning capability within the flange to meet your specific application.

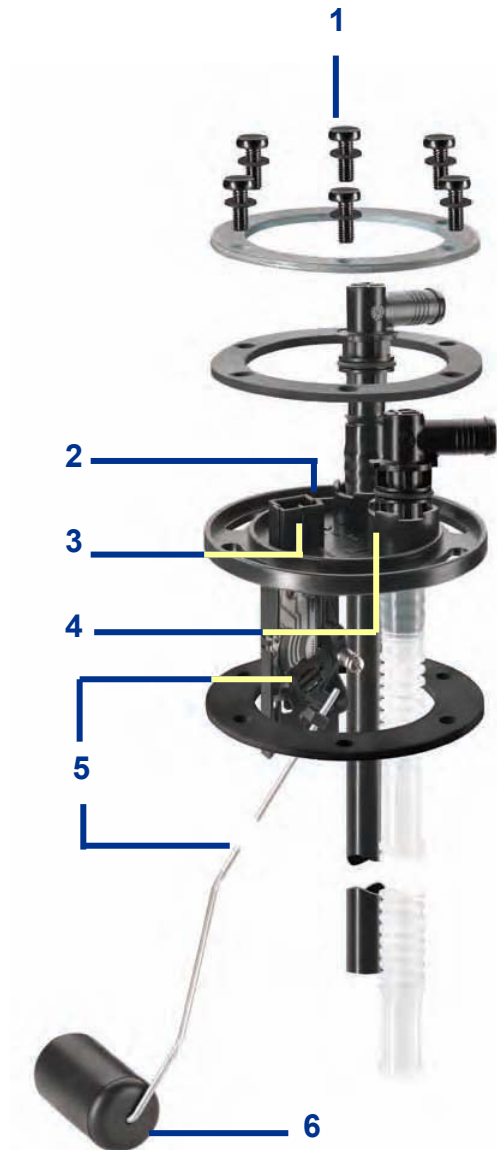
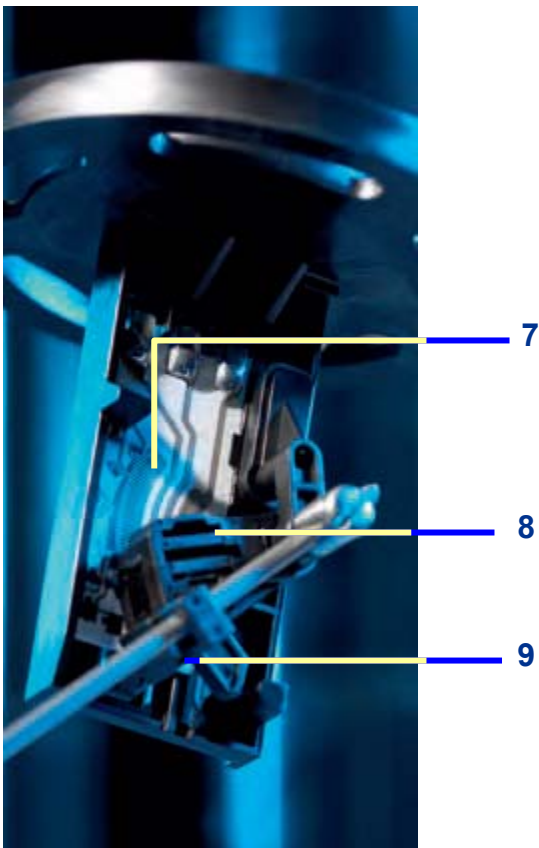
Suction / return tubes available in four different diameters (6.5mm, 8mm, 10 and 12mm), accommodating tank depths up to 400mm.

Where return tubes are not required, a port plug is available.



- Composite construction.
- Available with or without low fuel warning contact.
- Available factory set to customer specifications.
- Available in 10 - 180 Ohm, 240 - 33 Ohm, 5 - 90 Ohm range.

1. Steel reinforced mounting hardware.
2. Available with low fuel warning contact.
3. Redundant ground connection.
4. Unique SAE 5-hole slotted mounting plate allows for positioning sender for left or right hand applications.
5. Stainless steel float arm and pivot adjusts from 140mm to 400mm.
6. 'No sink' solid float.
7. VDO thick film element with 39-step resolution.
8. Redundant dual wiper system.
9. 'Quiet arm' minimizes float movement.





## Adjustable Lever Arm Sensor 140 - 400mm (Insulated return)

Part Number Qty 1	Part Number Qty 10	Description	Ohms Range
<b>226.946</b>	A2C59510946	Adjustable Lever Arm Sensor Flange for use with feed and return pipe.	Empty = 3 - Full = 180
<b>226.973</b>	A2C59510973	Adjustable Lever Arm Sensor Flange for use with feed and return pipe.	Empty = 240- Full = 33
<b>226.975</b>	A2C59510975	Adjustable Lever Arm Sensor Flange for use with feed and return pipe.	Empty = 5 - Full = 90

## Suction & Return Tubes

Part Number Qty 1	Part Number Qty 10	Suction Tube Inner Ø	Part Number Qty 1	Part Number Qty 10	Return Tube Inner Ø
<b>226.955</b>	A2C59510955	6.5 mm	<b>226.956</b>	A2C59510956	6.5 mm
<b>226.953</b>	A2C59510953	8.0 mm	<b>226.954</b>	A2C59510954	8.0 mm
<b>226.951</b>	A2C59510951	10.0 mm	<b>226.952</b>	A2C59510952	10.0 mm
<b>226.949</b>	A2C59510949	12.0 mm	<b>226.950</b>	A2C59510950	12.0 mm

## Accessories

Part Number Qty 1	Part Number Qty 10	Description
<b>226.965</b>	A2C59510965	Blind Plug (if one or both tubes are not required)
<b>A2C53326385</b>		Installation kit (Screws, Gasket, Flange, Washers)
<b>226.479</b>	A2C59511479	Lever Arm Sub-Assembly



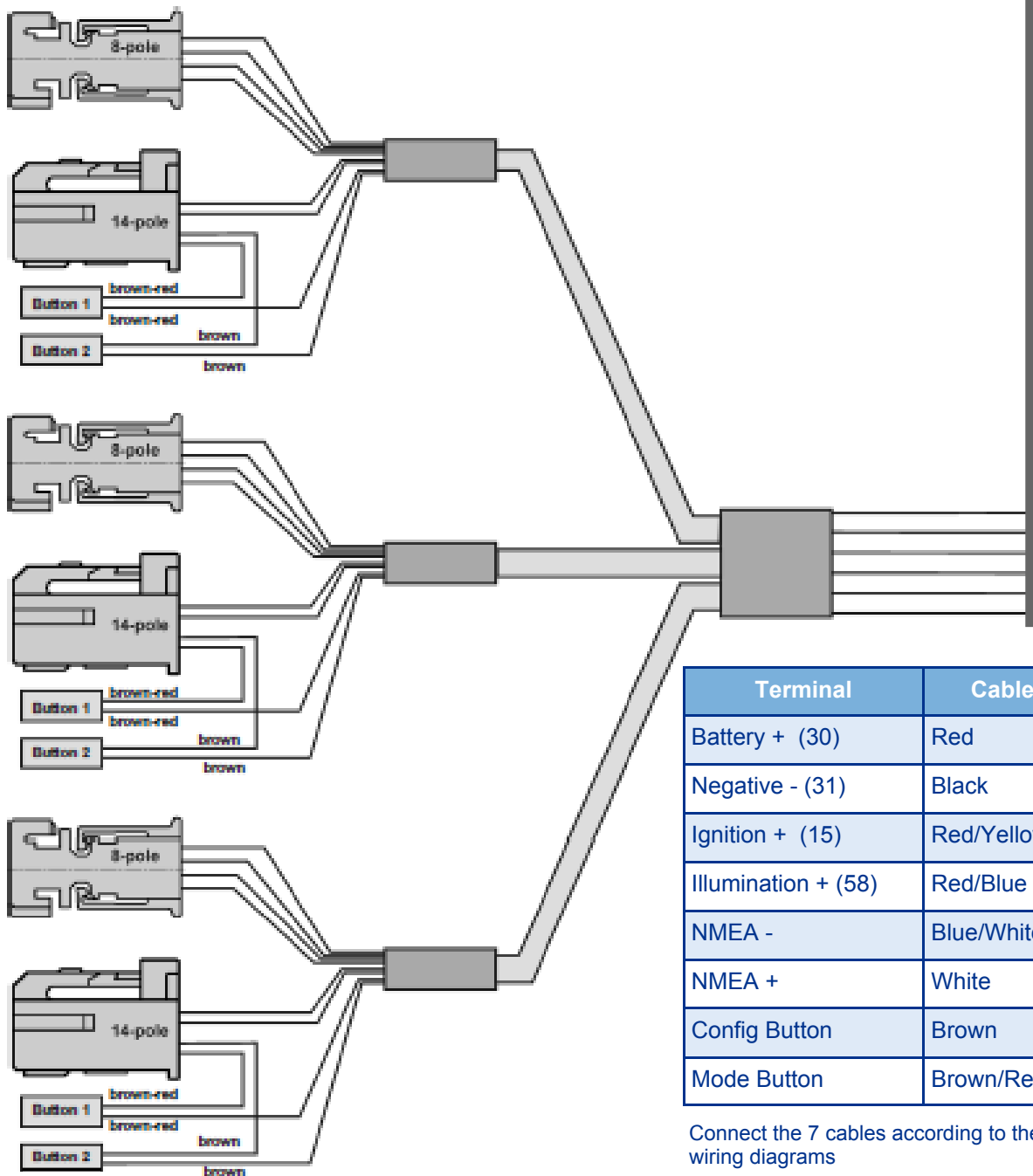
# Fitting Instructions

Description	Page #
<b>Wind Direction &amp; Speed</b>	
Depth	16
<b>Close Haul</b>	
<b>Sumlog &amp; Compass</b>	
Sumlog	46
Tachourmeter	47
Tachometer	48
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Rudder Angle Gauge	50
Fuel Level Gauge & Sender Arm / Reed Switch Type	51
Fuel Level Gauge & Sender Tubular Type	52
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Temp Gauge & Sender 40 - 120C / 50 - 150C	55
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Hourmeter	60
Alarm Switch	Temp - Pressure - Fuel
	62

# Wind - Close Haul



## Electrical diagram



Terminal	Cable Colour
Battery + (30)	Red
Negative - (31)	Black
Ignition + (15)	Red/Yellow
Illumination + (58)	Red/Blue
NMEA -	Blue/White
NMEA +	White
Config Button	Brown
Mode Button	Brown/Red

Connect the 7 cables according to the following wiring diagrams

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

# Sumlog - Depth



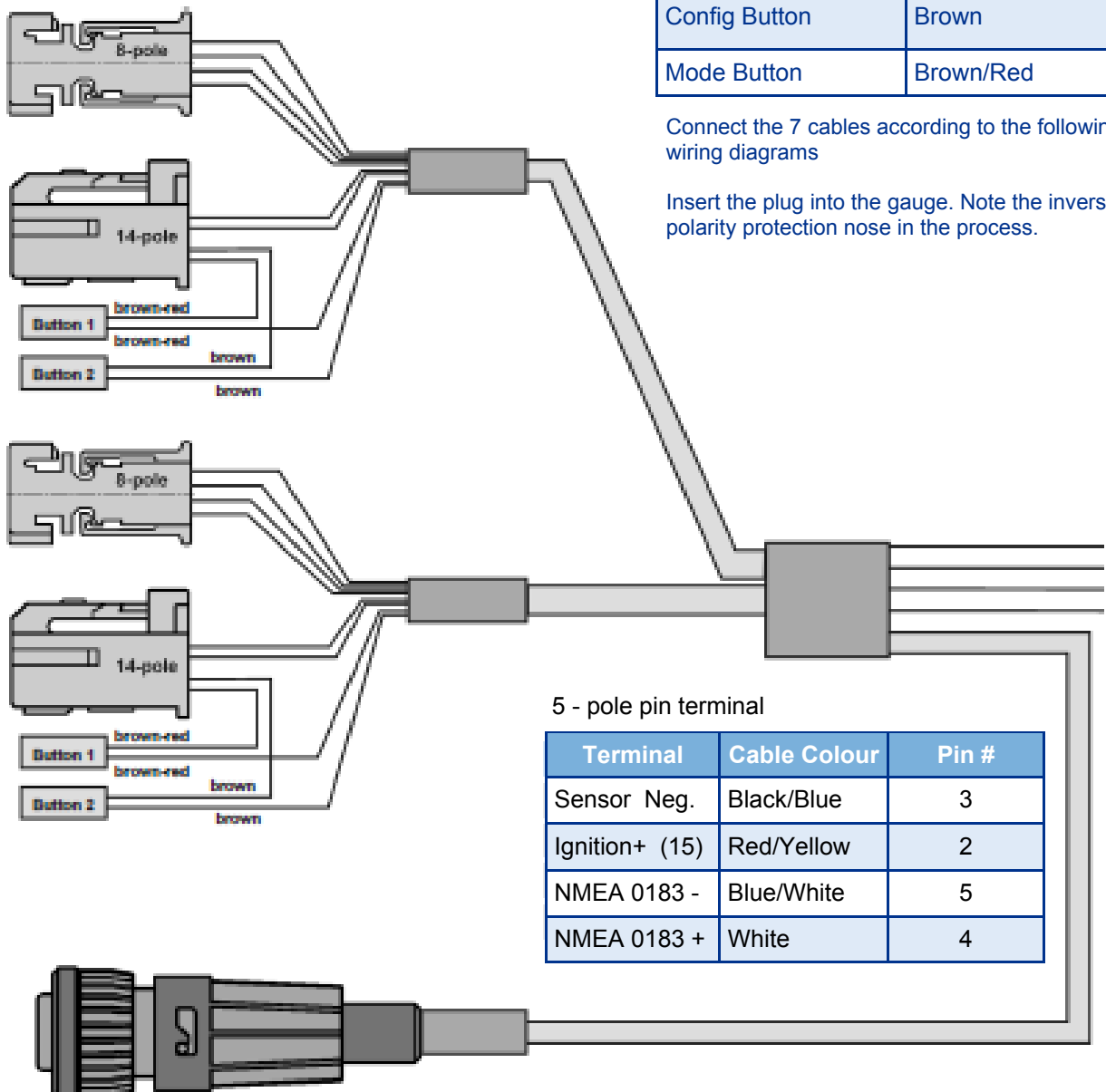
## Electrical diagram



Terminal	Cable Colour
Battery + (30)	Red
Negative - (31)	Black
Ignition + (15)	Red/Yellow
Illumination + (58)	Red/Blue
NMEA -	Blue/White
NMEA +	White
Config Button	Brown
Mode Button	Brown/Red

Connect the 7 cables according to the following wiring diagrams

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

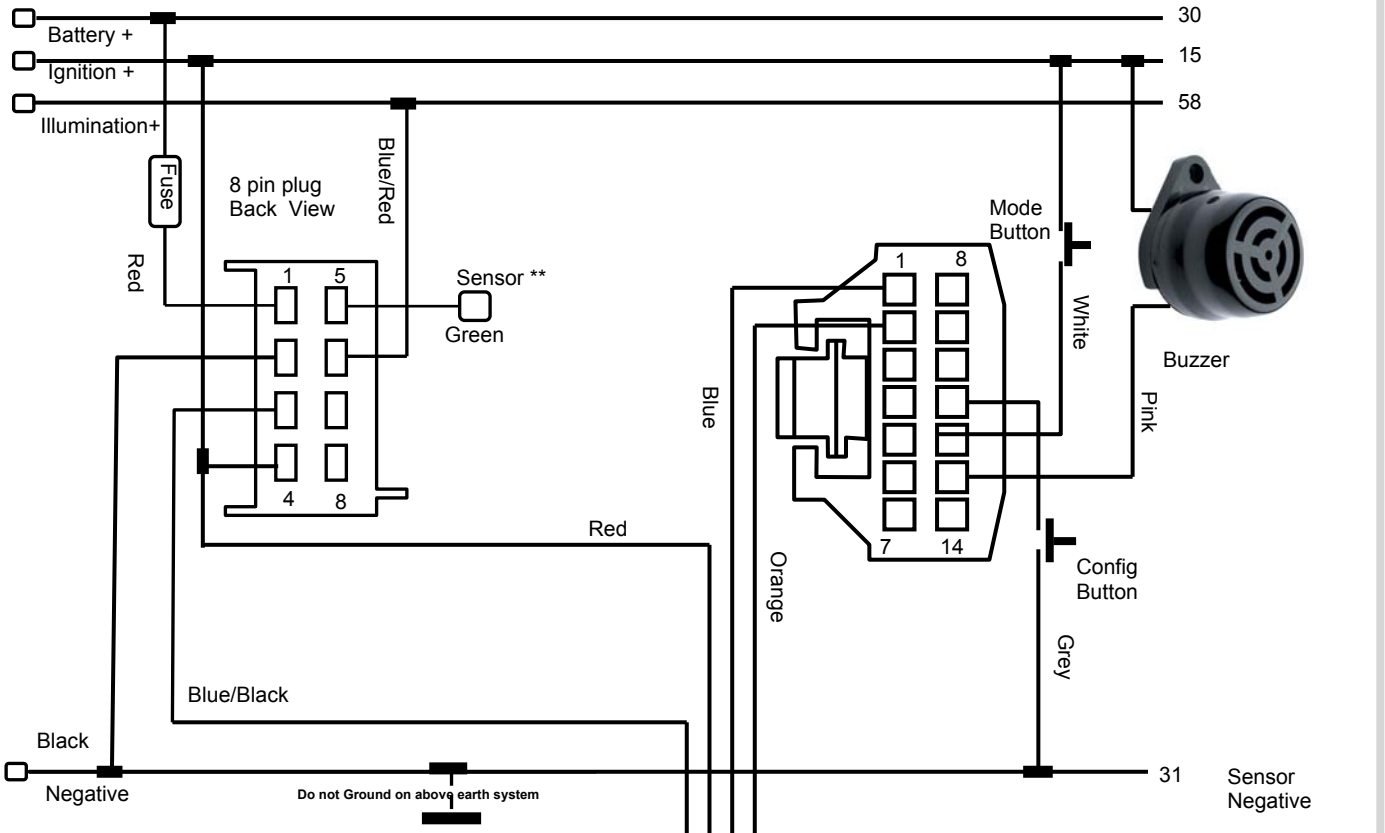


5 - pole pin terminal

Terminal	Cable Colour	Pin #
Sensor Neg.	Black/Blue	3
Ignition+ (15)	Red/Yellow	2
NMEA 0183 -	Blue/White	5
NMEA 0183 +	White	4



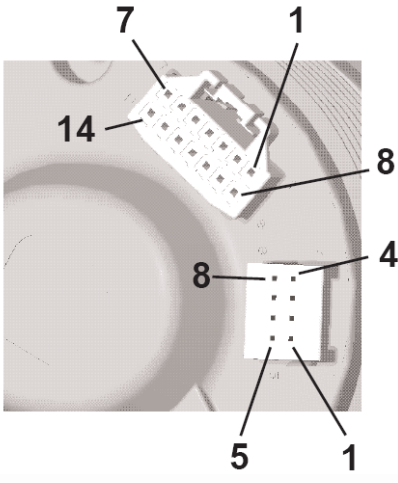
## Sumlog electrical diagram



A2C59513503 Sensor to Sumlog, Loom



8 way connector Kit  
p/n A2C59510850



Connector Kit 14-pin -  
p/n A2C59510851



NMEA0183 Sensor \*



Through-Hull Kit

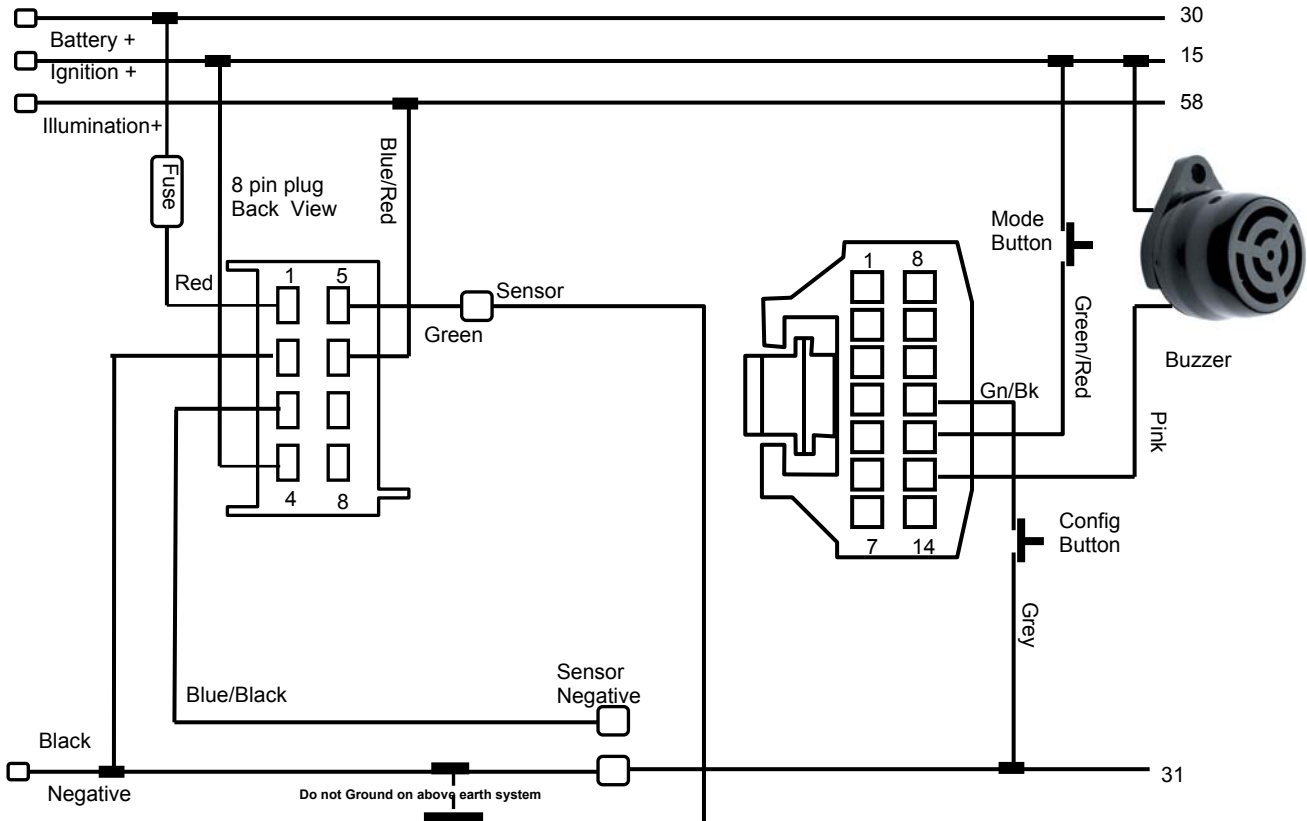


Transom Kit

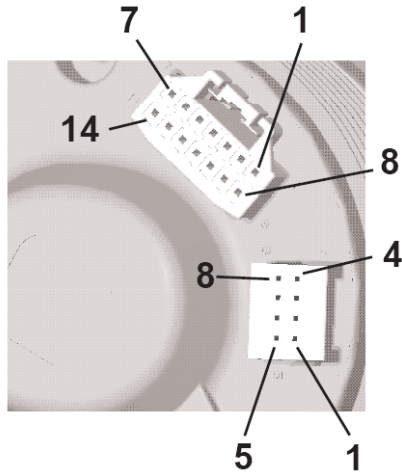
See page 72 for calibration procedures

Note: \* Set input calibration to NMEA0183 (No pulse calibration needed)  
\*\* Terminal 5 used only for Hall Effect Output Sensors

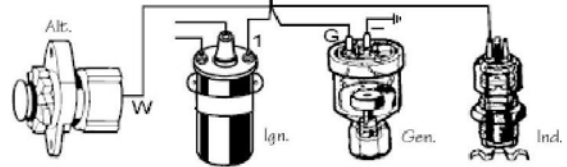
## Tachourmeter electrical diagram



8 way connector Kit  
p/n A2C59510850

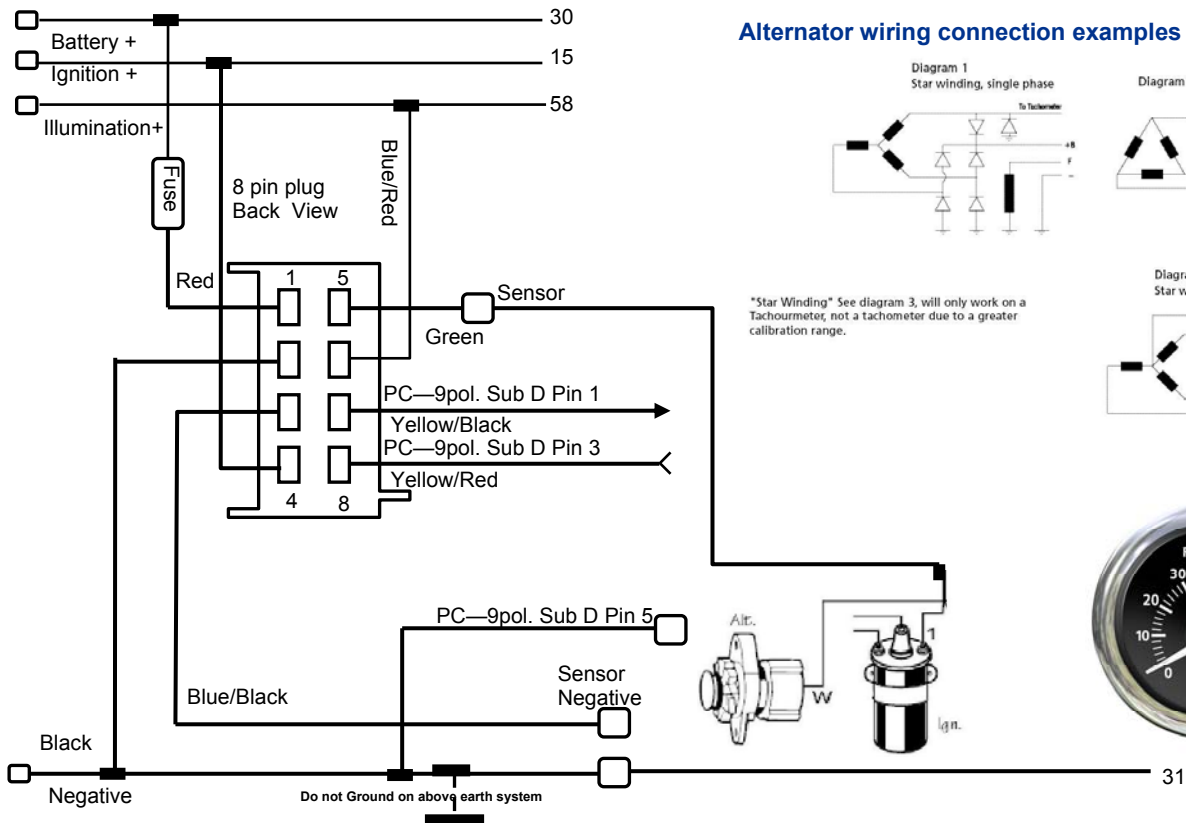


Connector Kit 14-pin -  
p/n A2C59510851

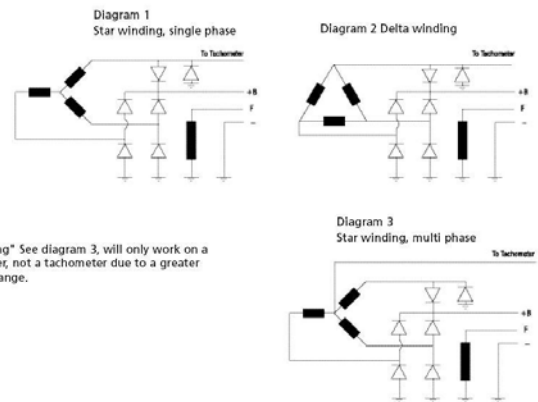


See page 76 for calibration procedures

## Tachometer electrical diagram



### Alternator wiring connection examples



\*Star Winding\* See diagram 3, will only work on a Tachourmeter, not a tachometer due to a greater calibration range.



### CALIBRATION

No. Cyl 's	Str	No. Cyl 's	Str	Imp/Rev	Switch 1	Switch 2	Switch 3
				XXX	0	0	0
2	4			1	1	0	0
4	4	2	2	2	0	1	0
6	4			3	1	1	0
8	4	4	2	4	0	0	1
				5	1	0	1
12	4	6	2	6	0	1	1
				8	1	1	1

### Negative side of ignition coil on an electronic pointless ignition system.

1. Switch **On** Battery power T. 30 (8-pin - Pin1)
2. Ignition power **Off** T. 15 (8-pin - Pin4)
3. Set impulse number according to chart below.

Ensure that switch position "1" is pointing toward the centre of instrument.

### Alternator signal

If the alternator is directly driven, by the engine shaft

Eg: Marine Outboard motors,

the tacho can be calibrated by knowing the imp/revolution of the alternator, using a single phase connection (not a Star multi phase).

The calibration can be processed by selecting the number of imp/rev according to the pole-pairs of the alternator.

For the standard alternator running off a pulley linked to the crankshaft pulley, the tachometer can only be calibrated by a VDO Service Agent using a special software.

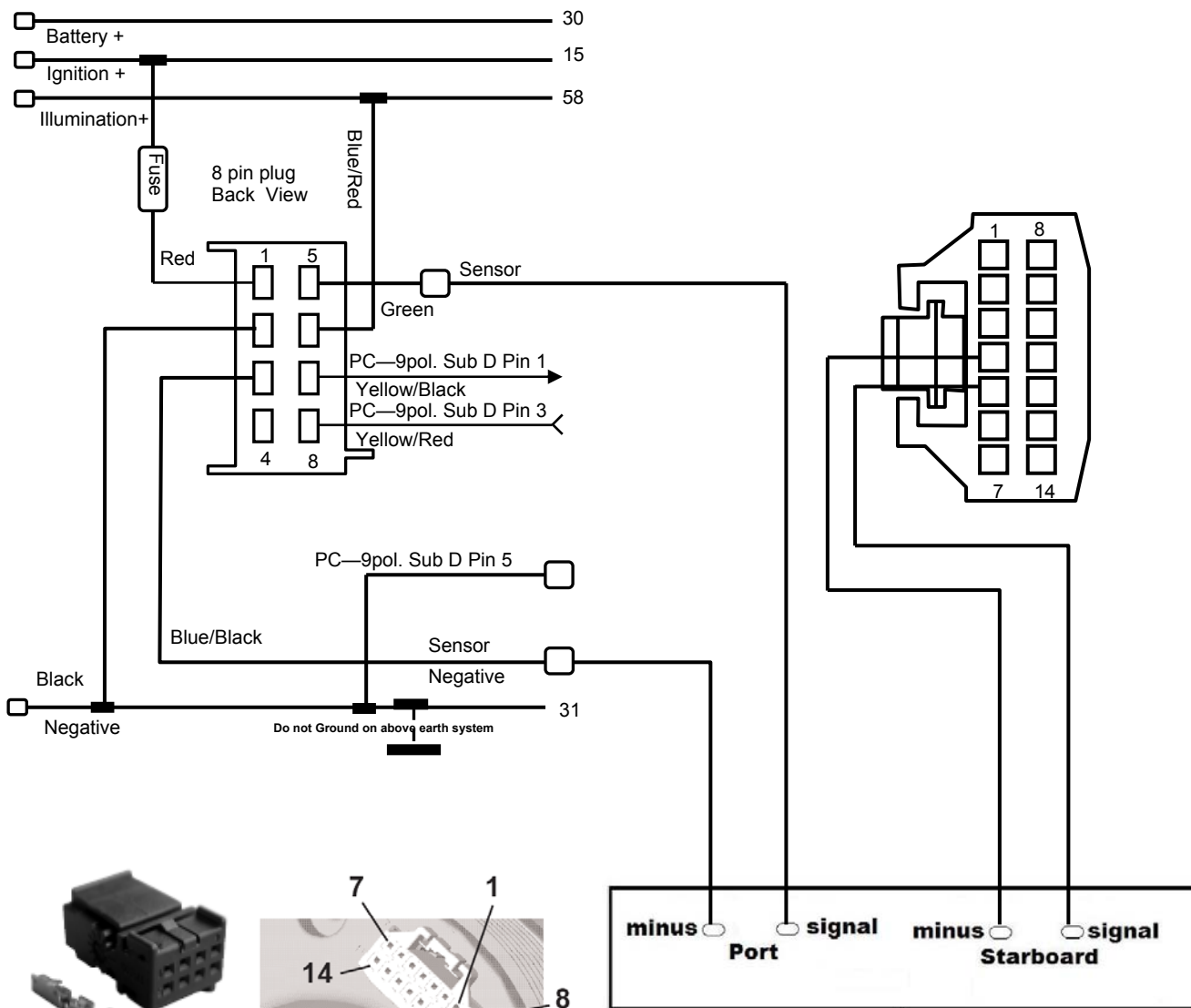
The alternative is to use a Tachourmeter where the calibration can be done via a configuration button without using the software.

**Note: Tachometer will not operate off a Magneto signal.**

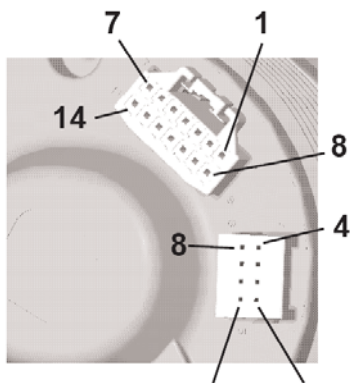
# Synchroniser



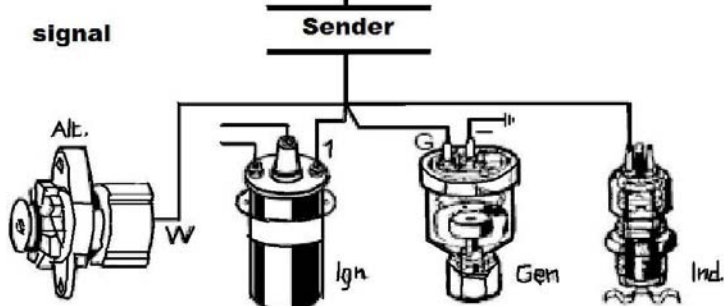
## Synchroniser Gauge Ø 85 mm



8 way connector Kit  
p/n A2C59510850



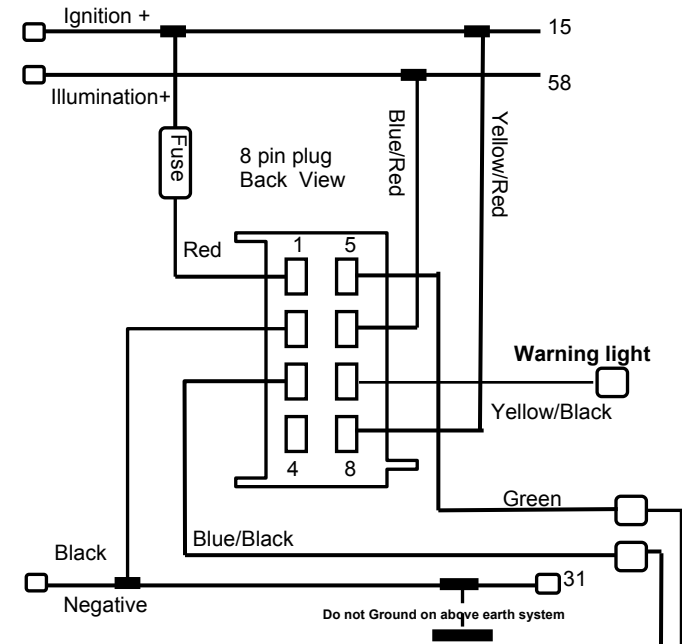
Connector Kit 14-pin -  
p/n A2C59510851



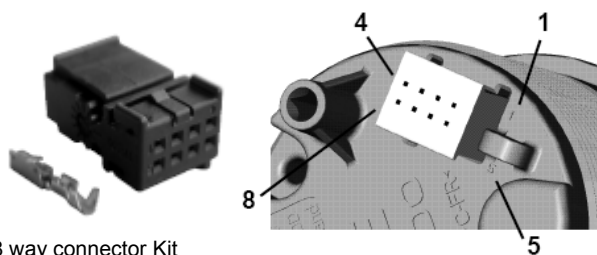
# Rudder Angle



## Rudder Angle Ø 52 mm & Ø 85 mm

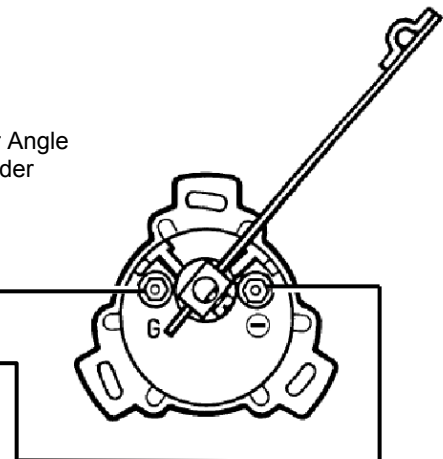


Note: For dual station installation, connect Green wire to second gauge

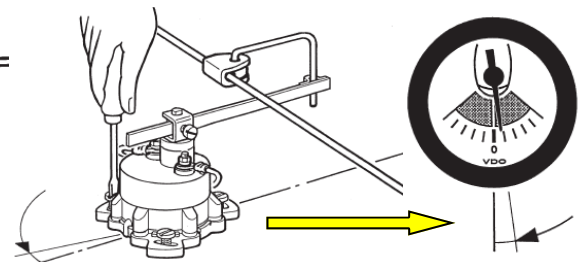
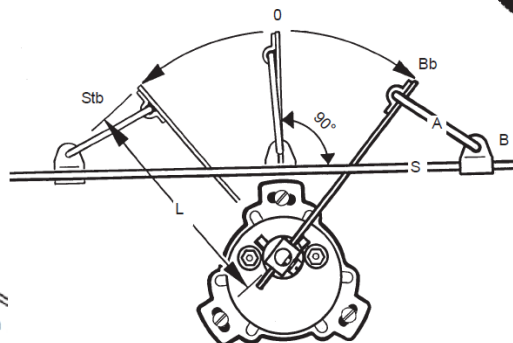
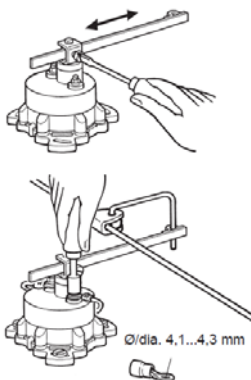


8 way connector Kit  
p/n A2C59510850

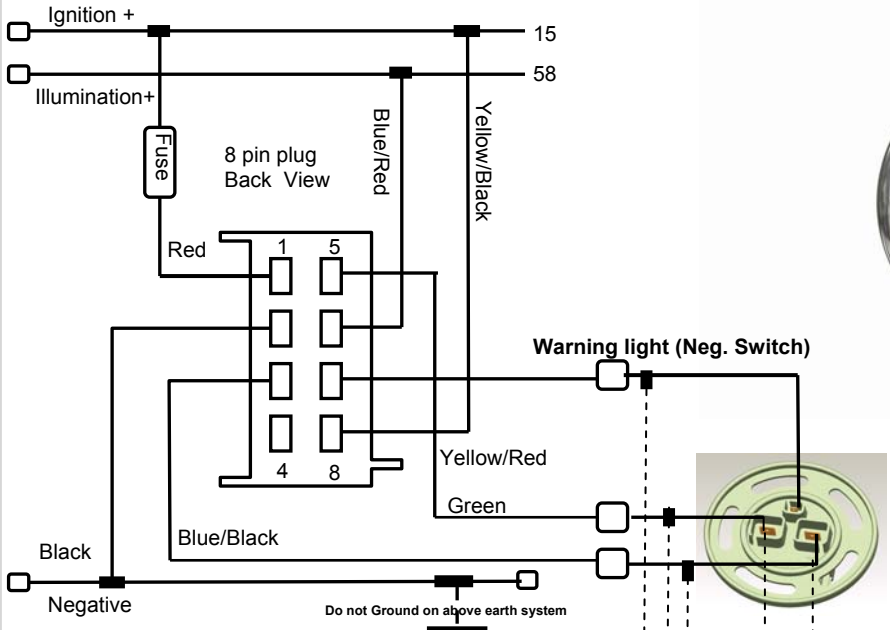
Rudder Angle  
Sender



## Rudder Angle sensor calibration



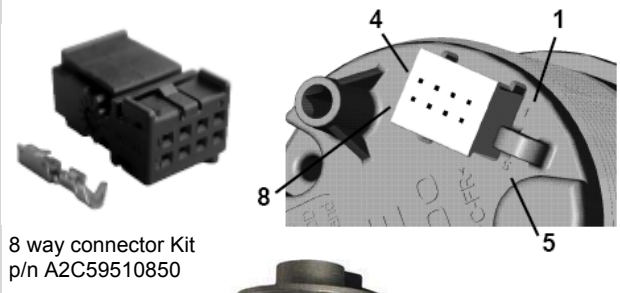
## Fuel Gauge – Arm & Reed Switch Type Senders



Version with Warning Contact

### Arm type sender

Version without Warning Contact



### Reed Switch sender

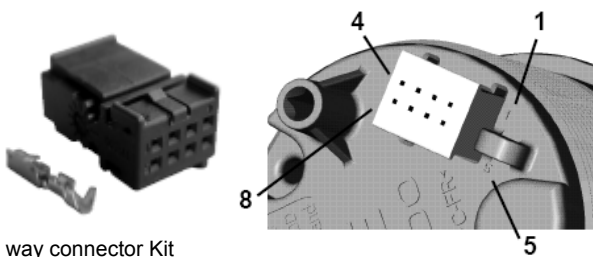
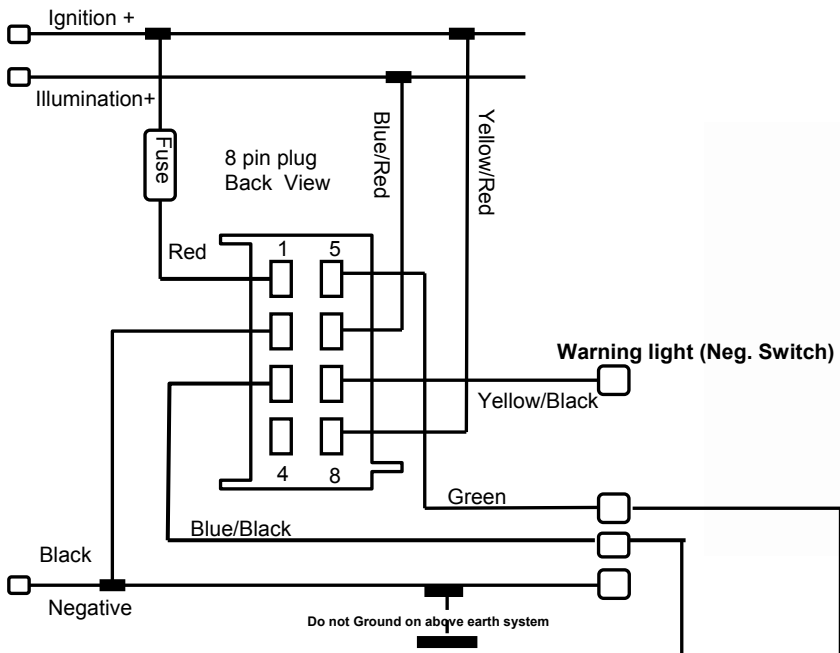


- Pin 1 - Wh - Low Fuel Warning
- Pin 2 - Bl - Output signal
- Pin 3 - Bk - Negative

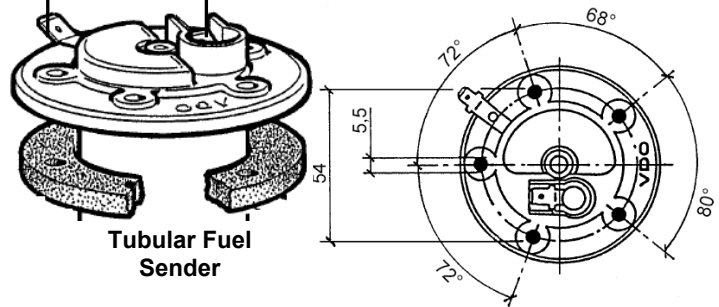
0 to 1/1

Indication	0	1/4	1/2	3/4	1/1
Resistance ( $\Omega$ )	3	45	85	138	180
Deflection ( $^\circ \angle$ )	0	17.2	41.2	73.8	88.8
Tolerance ( $^\circ \angle$ )	+ 3.6 - 3.6	$\pm$ 3.6	$\pm$ 3.6	$\pm$ 3.6	+ 3.6 - 3.6

## Fuel Gauge – Tubular Type Senders



8 way connector Kit  
p/n A2C59510850

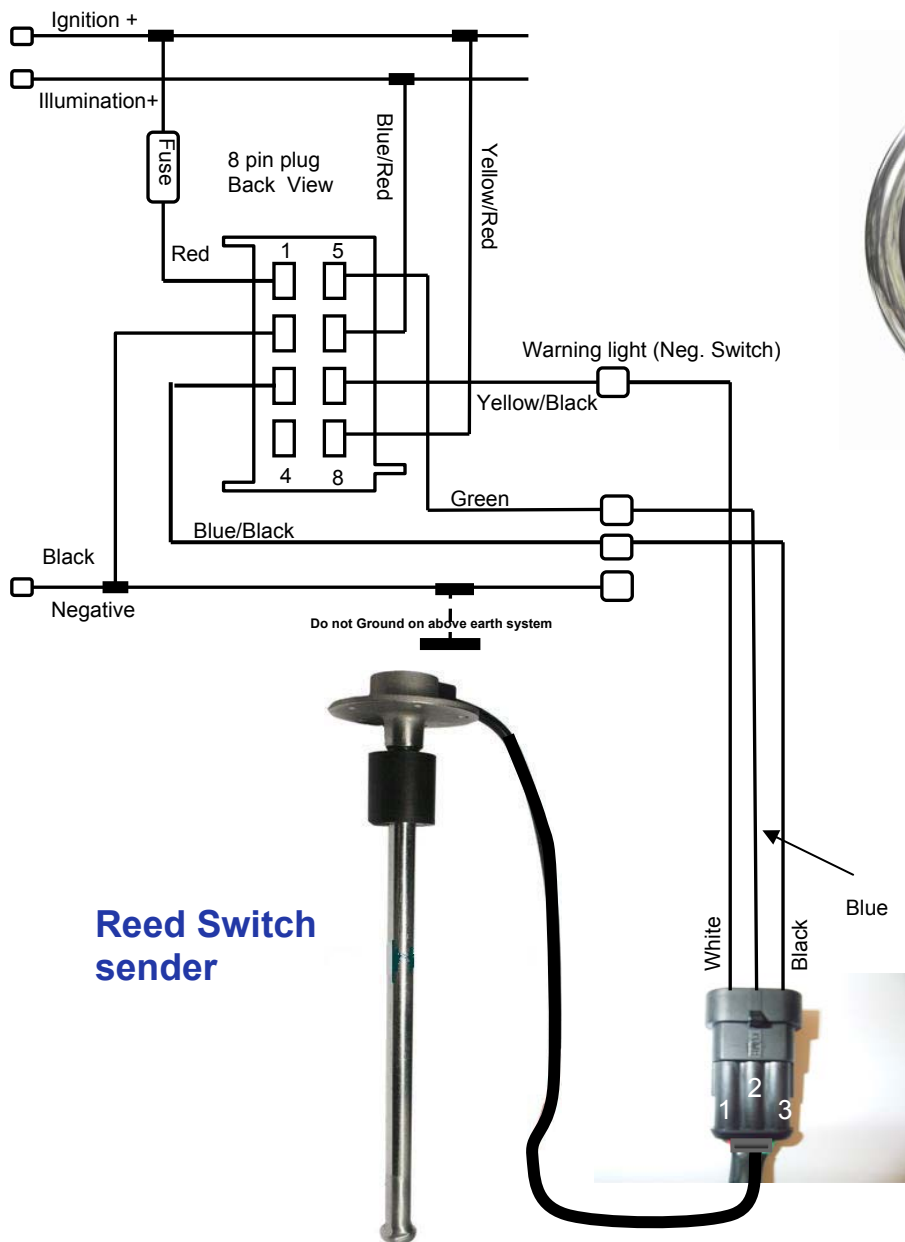


Tubular Fuel  
Sender

Sender Part No.	Length	Pitch Ø	Cut-out	Ohm Full	Ohms Empty
224011000015G	150mm	54mm	41mm	4.5	69
224011000016G	160mm	54mm	41mm	4.5	74
224011000017G	170mm	54mm	41mm	4.5	79.5
224011000018G	180mm	54mm	41mm	3	64
224011000019G	190mm	54mm	41mm	3	68
224011000020G	200mm	54mm	41mm	3	68
224011000021G	210mm	54mm	41mm	3	76
224011000022G	220mm	54mm	41mm	3	80
224011000023G	230mm	54mm	41mm	3	84
224011000024G	240mm	54mm	41mm	3	65.5
224011000025G	250mm	54mm	41mm	2.5	72
224011000026G	260mm	54mm	41mm	2.5	72
224011000027G	270mm	54mm	41mm	2.5	74.5
224011000028G	280mm	54mm	41mm	2.5	75.5
224011000029G	290mm	54mm	41mm	2.5	78
224011000030G	300mm	54mm	41mm	2.5	82.8

Sender Part No.	Length	Pitch Ø	Cut-out	Ohm Full	Ohms Empty
224011000031G	310mm	54mm	41mm	2.5	84
224011000032G	320mm	54mm	41mm	2.5	69.5
224011000033G	330mm	54mm	41mm	2.5	72
224011000034G	340mm	54mm	41mm	2.5	74
224011000035G	350mm	54mm	41mm	2.5	79.6
224011000036G	360mm	54mm	41mm	2.5	69
224011000037G	370mm	54mm	41mm	2.5	71
224011000038G	380mm	54mm	41mm	2.5	73
224011000039G	390mm	54mm	41mm	2.5	75
224011000040G	400mm	54mm	41mm	2.5	74.9
224011000045G	450mm	54mm	41mm	2.5	84.3
224011000050G	500mm	54mm	41mm	2.5	75.4
224011000055G	550mm	54mm	41mm	2.5	77.6
224011000060G	600mm	54mm	41mm	2.5	85.3
224011000065G	650mm	54mm	41mm	2.5	82.2
224011000070G	700mm	54mm	41mm	2	81.6
224011000075G	750mm	54mm	41mm	2	82
224011000080G	800mm	54mm	41mm	2	68.5

## Fresh Water Gauge – Reed Switch Senders



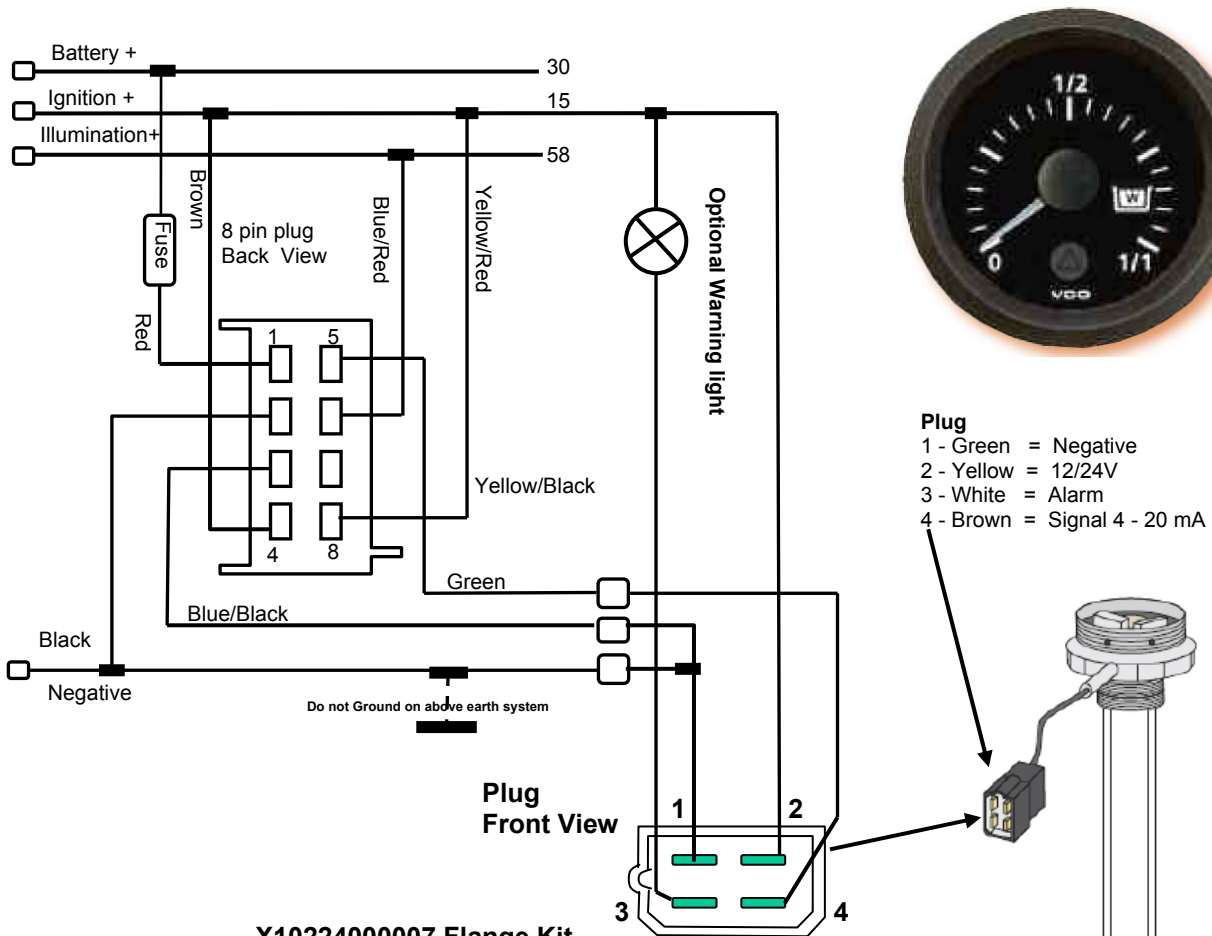
- Pin 1 - Wh - Low Water Warning
- Pin 2 - Bl - Output signal
- Pin 3 - Bk - Negative



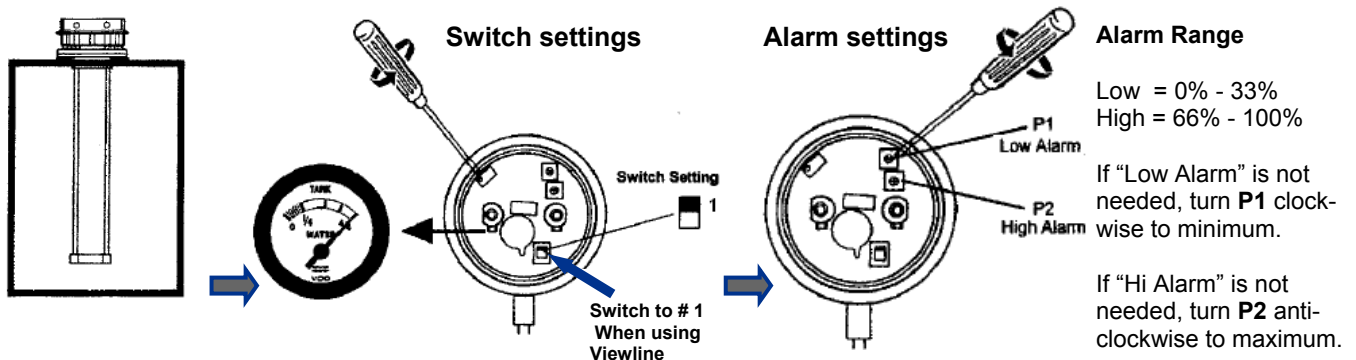
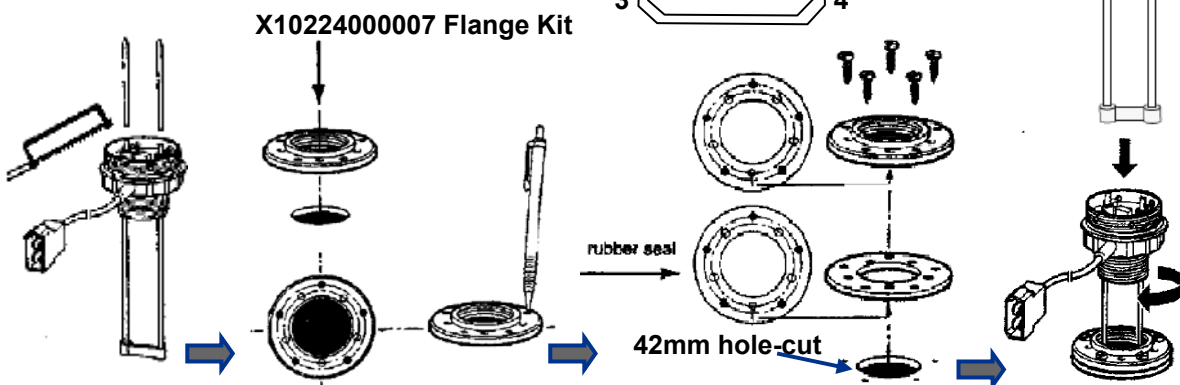
## Waste Water Gauge

Connected to a 4 - 20 mA Sender

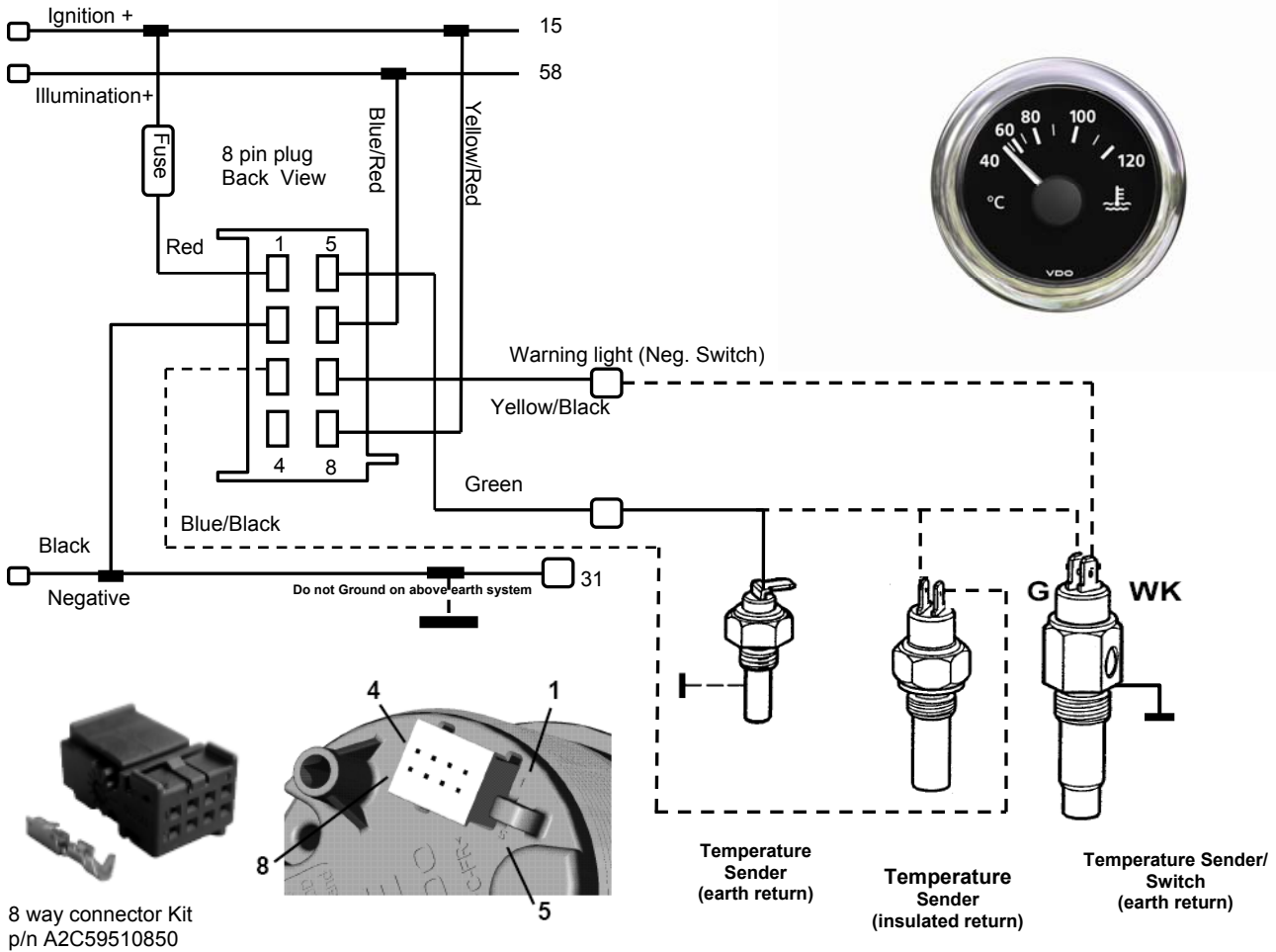
Dual Station: Two Gauges off one sensor, parallel the second gauge wires



- Plug**
- 1 - Green = Negative
  - 2 - Yellow = 12/24V
  - 3 - White = Alarm
  - 4 - Brown = Signal 4 - 20 mA



## Temp Gauges 120° C and 150° C



### 40 to 120 °C

Indication (°C)	40	50	60	70	80	90	100	110	120
Resistance (Ω)	287.4	193.3	134	95.2	69.1	51.3	38.6	29.4	22.7
Deflection (°∠)	0	3.3	8.3	15.5	25.8	40	58	75.2	88.2
Tolerance (°∠)	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6

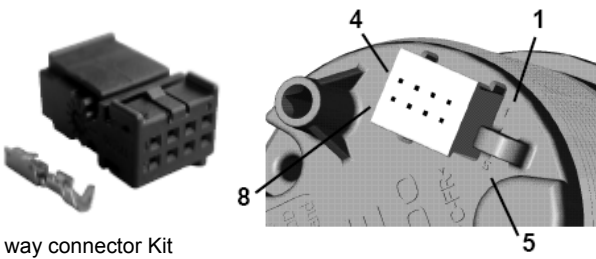
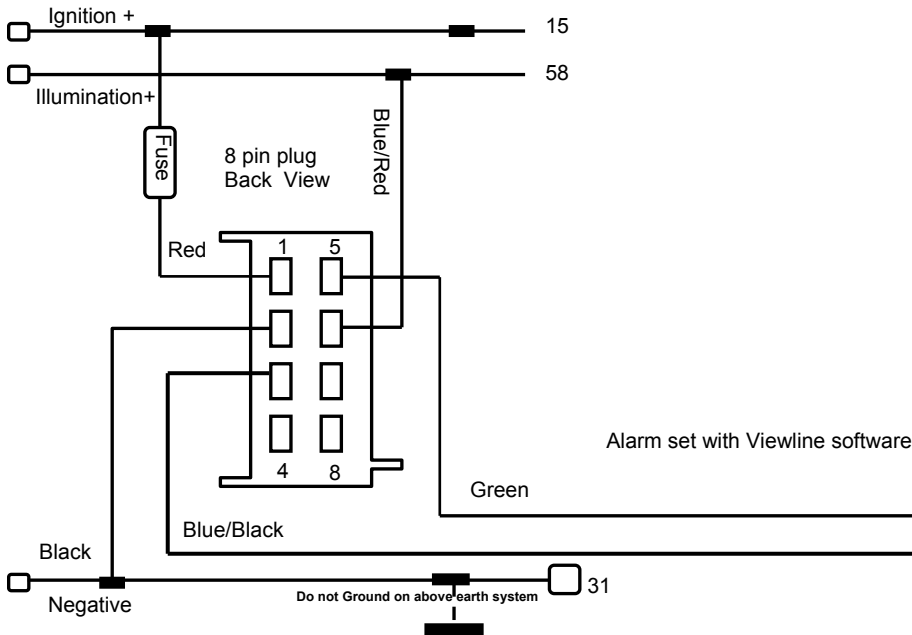
### 50 to 150 °C

Indication (°C)	50	80	90	100	110	120	130	140	150
Resistance (Ω)	322.8	112.5	83	62.2	47.5	36.5	28.9	23.1	18.6
Deflection (°∠)	0	12.4	19.8	29.6	42	56.8	69.7	80.2	88.1
Tolerance (°∠)	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6	± 3.6

# Temperature

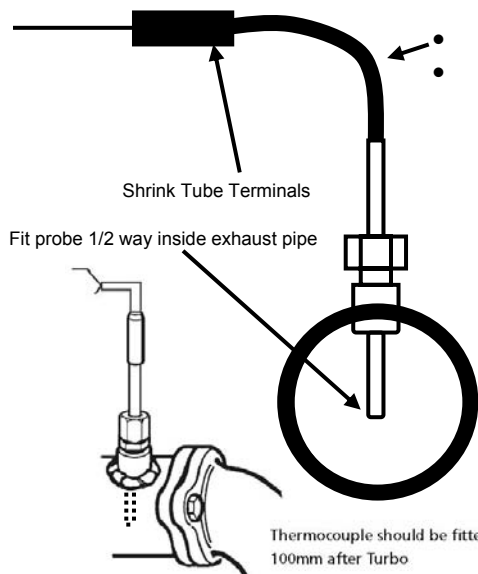


## Pyrometer 100°C - 900°C



8 way connector Kit  
p/n A2C59510850

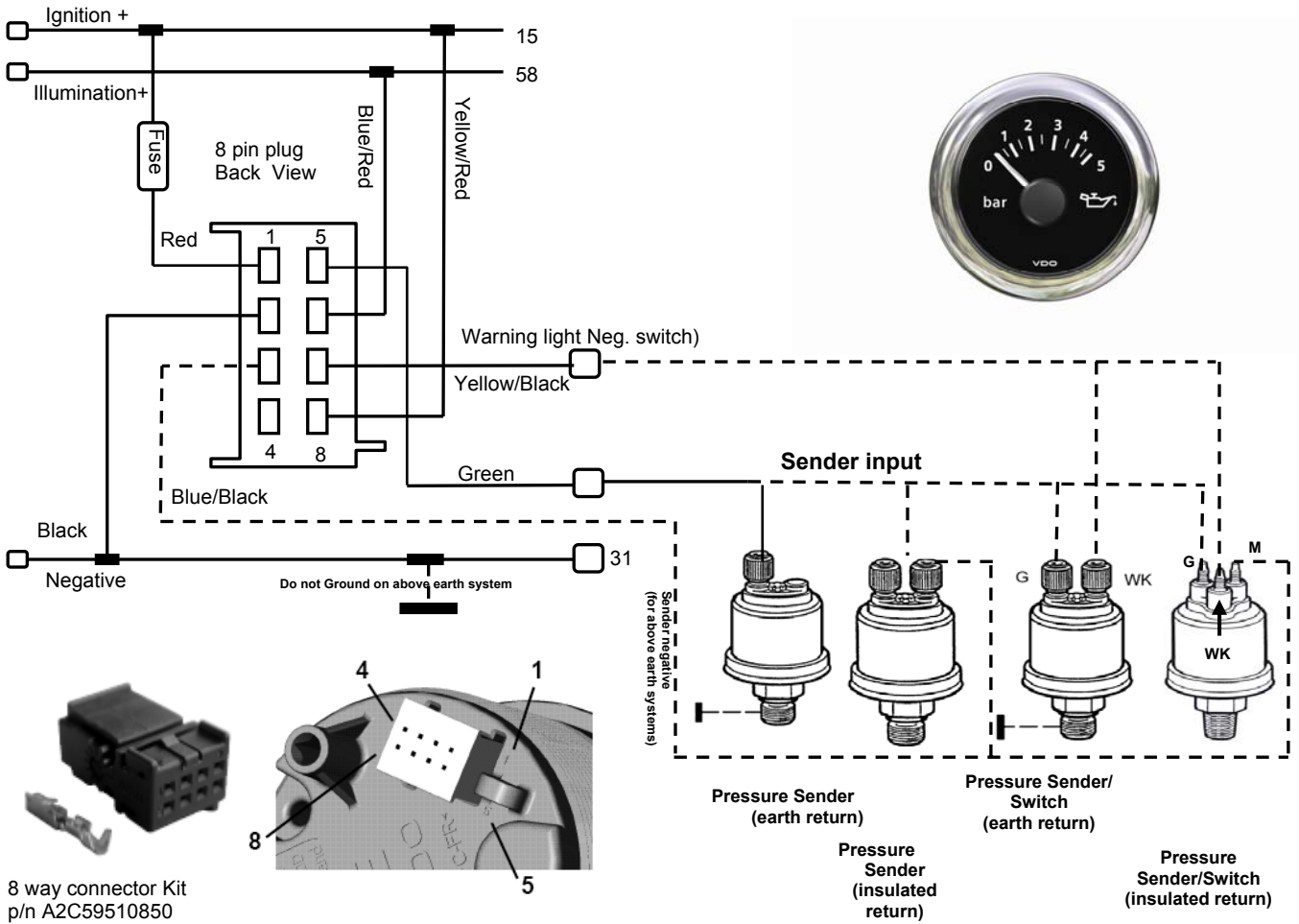
Thermocouple  
Sender



No sharp bend  
No coil-up lead to avoid damage the wire during engine vibration.

Deg °	Probe mV
100	4.04
200	8.137
300	12.20
400	16.4
500	20.64
600	24.902
700	29.128
800	33.277
900	37.325

## Pressure Gauges 2, 5, 7, 10 Bar



### Calibration Chart

#### 2 Bar

Bar (x100Kpa)	0	1	2
Resistance	10	99	184

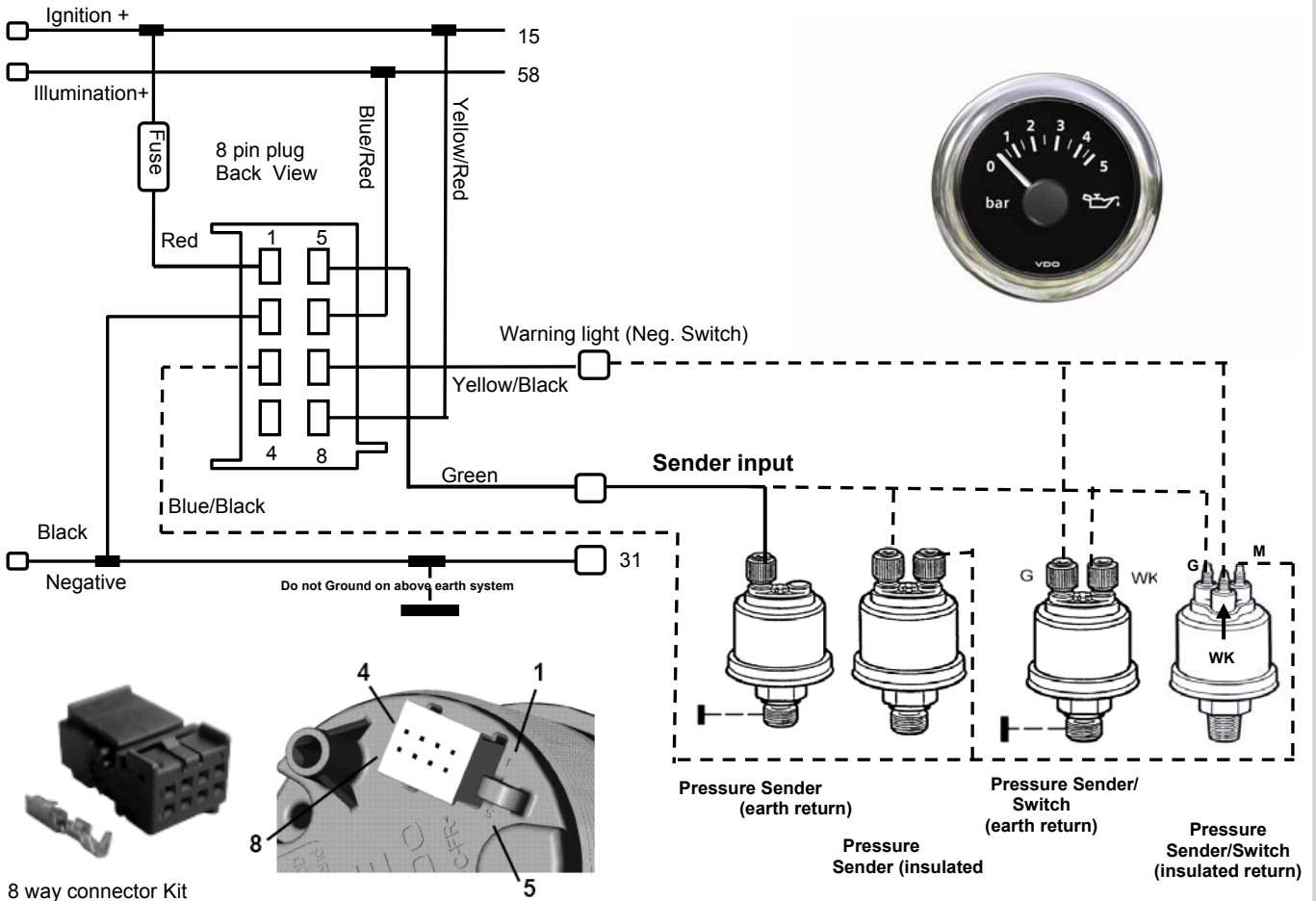
#### 5 Bar

Bar (x100Kpa)	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
Resistance	10	30	48	65	82	99	116	134	151	168	184

#### 10 Bar

Bar (x100Kpa)	0	1	2	3	4	5	6	7	8	9	10
Resistance	10	31	52	71	88	106	124	140	155	170	184

## Pressure Gauges 25, 30 Bar



### TIGHTENING TORQUES

- M10 x 1.0 10 Nm
- 1/8 – 27 NPTF 10 Nm
- M12 x 1.5 15 Nm
- 01.02.2020 15 Nm
- M14 x 1.25 20 Nm
- M14 x 1.5 20 Nm
- 1/4 – 18 NPTF 20 Nm
- 1/2 in. – 20 Whit. S 20 Nm
- 5/8 – 18 UNF-3A 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
- 3/8 – 18 NPTF 30 Nm
- 3/8 – 18 Dryseal NPTF 30 Nm
- 1/2 – 14 NPTF 30 Nm
- 3/4 – 16 UNF-3A 30 Nm
- R 3/8 30 Nm
- R 1/2 30 Nm

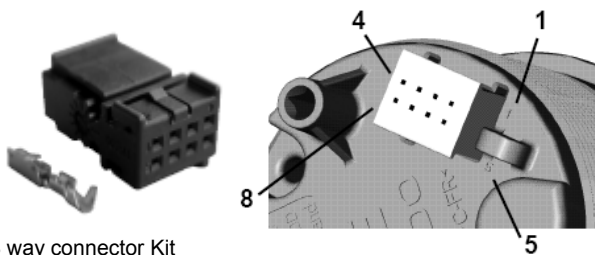
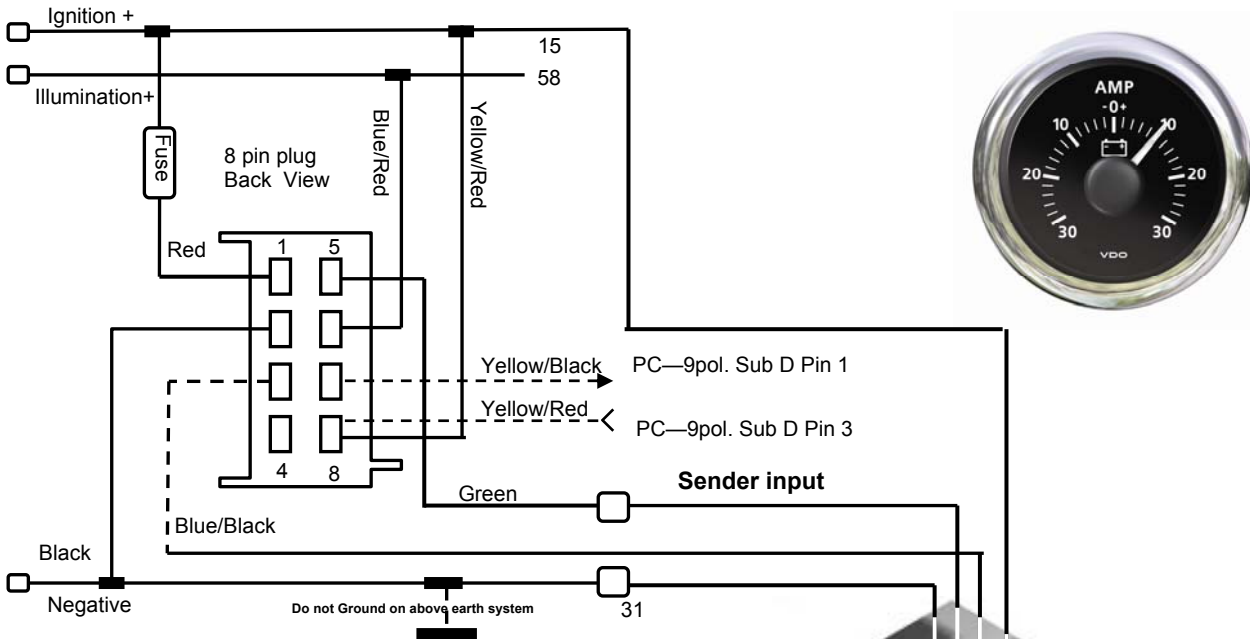
#### Note:

- Dual station senders have 1/2 of resistance range, Eg: 25 Bar is 92 Ohms
- For 0 to 30 Bar range application use a 0 to 25 Bar sender.

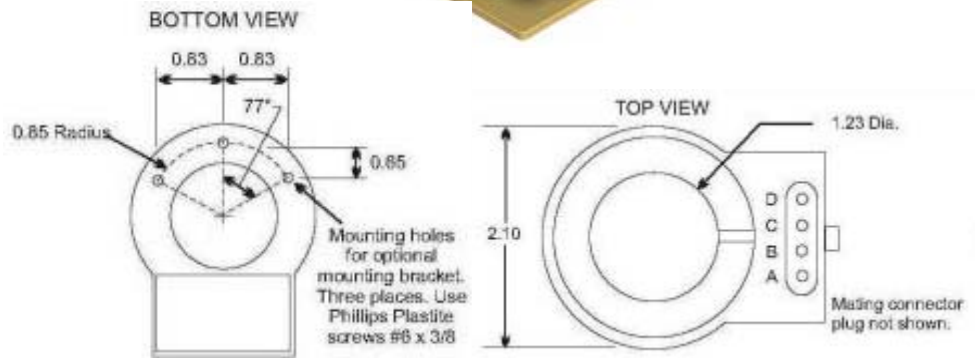
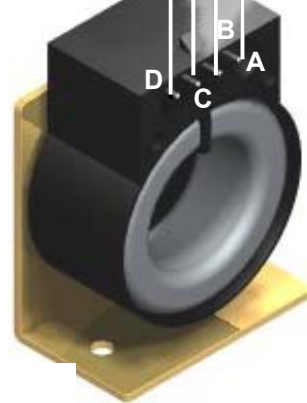
#### 25 Bar (30 Bar)

Bar (x100Kpa)	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25
Resistance	10	32	53	73	92	109	125	143	155	169	184

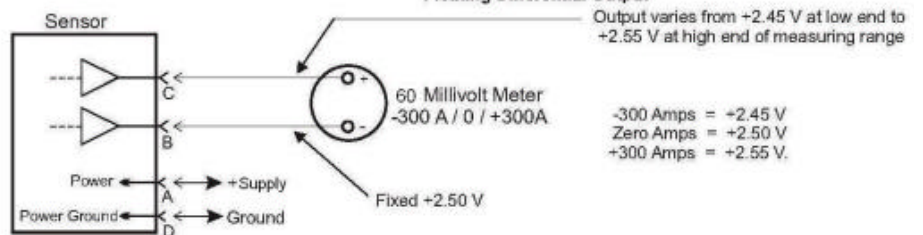
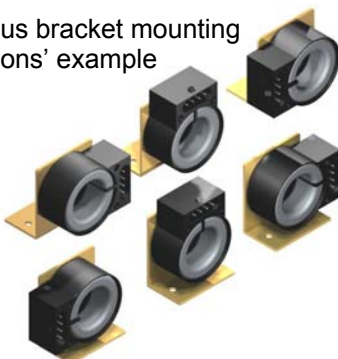
## Ammeter Gauges 30, 60, 100 & 150 AMPS



8 way connector Kit  
p/n A2C59510850

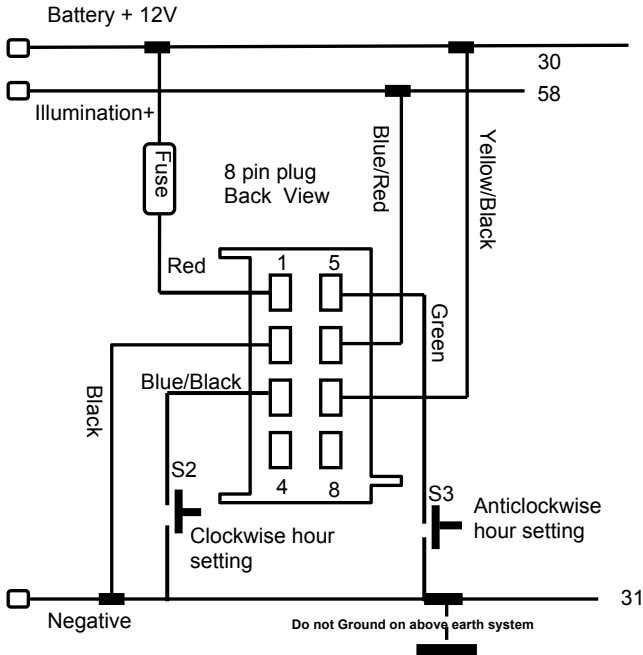


Various bracket mounting positions' example

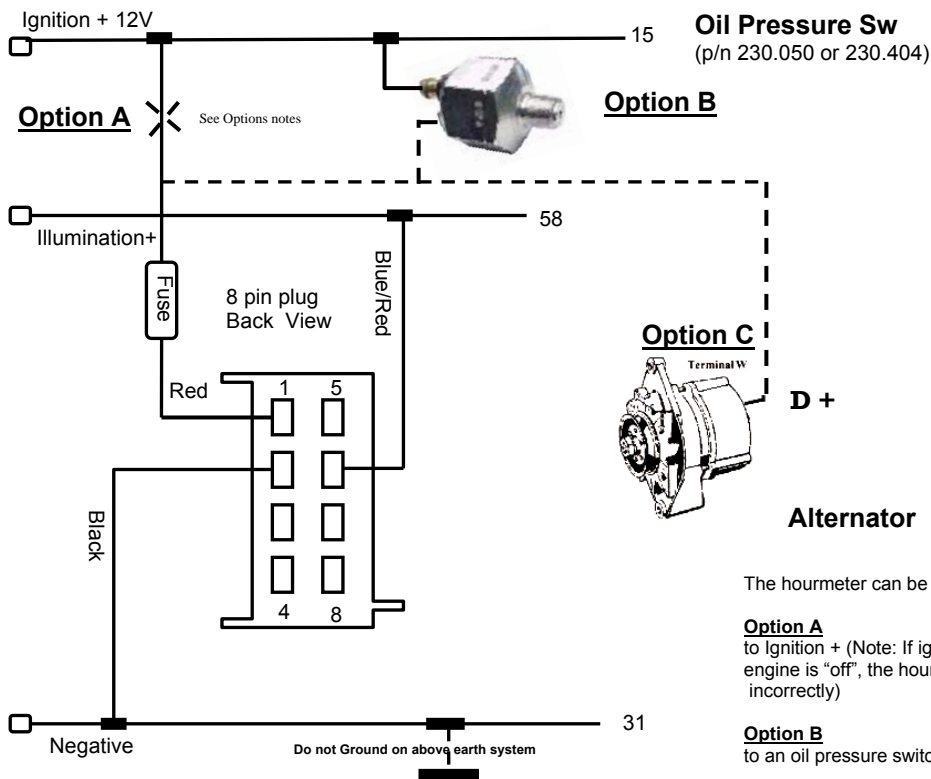


- P/n **UK-UE-188** Universal Mounting Bracket Kit
- P/n **UK-UE-184** Contactless Shunt Harness 3m

## Clock wiring diagram



## Hourmeter wiring diagram



The hourmeter can be connected to a 12V supply, as follows:

**Option A**  
to Ignition + (Note: If ignition power is let "on" and the engine is "off", the hourmeter will record engine time, incorrectly)

**Option B**  
to an oil pressure switch (Normally "Off" contact).

**Option C**  
to the alternator, terminal "D+"

## Electronic Alarm Switch

The Electronic Alarm Switch p/n A2C59510886 is designed to trigger the gauge's warning light at a pre-set point. It can be used on tank low level, high temp, low pressure, trim and rudder-angle. The unit has a pre-wired plug for the Viewline gauges. It operates on VDO and other manufacturers (resistive) sensors.



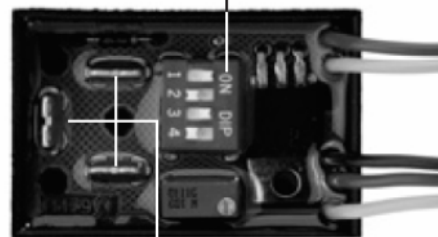
### Specification and technical data:

- Power supply: 12VDC or 24VDC
- Power consumption: < 10mA (warning lamp off)
- Operation temperature: -20°C to +70°C
- EMC: CE according to EMC Law 89/336/EEC
- Vibration resistance: max. 1g effective 25 Hz – 500Hz (duration 8 hours)
- Shock: 15g 1,5 ms half sine

Ø52mm gauges: Can be used on Temperature, Pressure, Tank, Trim, Rudder-angle.

Ø85/110mm: for optional warning lamps (Temperature, Pressure, Tank).

Adjustment/  
operating mode 1-2  
sensor selection 3-4



Connect sensor/  
power connection



# Gauges Overview



Chrome & Black Round Bezel



Chrome Triangular Bezel



Black & White Triangular Bezel



Black & White Triangular Bezel



## Bezels, Accessories and gauges details

### Bezels for - Ø80/85mm & Ø52 mm Gauges

Type	Black	Chrome	White
flat	A2C53192911	A2C53192910	A2C53192912
round	A2C53192913	A2C53192914	A2C53192916
triangle	A2C53192917	A2C53192918	A2C53192920
Type	Black	Chrome	White
flat	A2C53186040	A2C53186023	A2C53186022
round	A2C53186027	A2C53186029	A2C53186028
triangle	A2C53186024	A2C53186026	A2C53186025



Bezel shapes

### Accessories

Part number	Description
A2C59510854	VL Mounting Kit (studs and brackets) 52, 85, 110mm
A2C59510864	VL Mounting bracket flush mount
A2C53215641	VL Sealing Ring 85mm flush mount
A2C53215642	VL Sealing Ring 110mm flush mount
A2C59510850	Bush housing, 8-pin
A2C59510851	Bush housing, 14-pin
A2C53324664	Protective connector cap, 8-pin
A2C59513503	Adaptor cable Triducer® NMEA Sensor
A2C53324671	Protective connector cap, 14-pin
Tyco No. 539635-1	Hand pliers
Tyco No. 539682-2	Tool for hand pliers.
Tyco No. 1355718-1	Single contacts 0.14 – 0.22 mm <sup>2</sup> tin plated
Tyco No. 963729-1	Single contacts 0.5 – 0.75 mm <sup>2</sup> tin plated
Tyco No. 1355717-1	Strip 0.14 – 0.22 mm <sup>2</sup> tin plated
Tyco No. 928999-1	Strip 0.25 – 0.5 mm <sup>2</sup> tin plated
Tyco No. 963715-1	Strip 0.5 – 0.75 mm <sup>2</sup> tin plated
Tyco No. 1355718-5	Single contacts 0.14 – 0.22 mm <sup>2</sup> gold plated
Tyco No. 963726-5	Single contacts 0.25 – 0.5 mm <sup>2</sup> gold plated
Tyco No. 963729-5	Single contacts 0.5 – 0.75 mm <sup>2</sup> gold plated
Tyco No. 1355717-5	Strip 0.14 – 0.22 mm <sup>2</sup> gold plated
Tyco No. 928999-5	Strip 0.25 – 0.5 mm <sup>2</sup> gold plated
Tyco No. 963715-5	Strip 0.5 – 0.75 mm <sup>2</sup> gold plated



Flush mounted



Front mounted gauges



Double lens



A2C59510850



A2C59510851



Terminal  
(tin or gold plated)



Order Code: 3902160

Manufacturer Part No: 539635-1



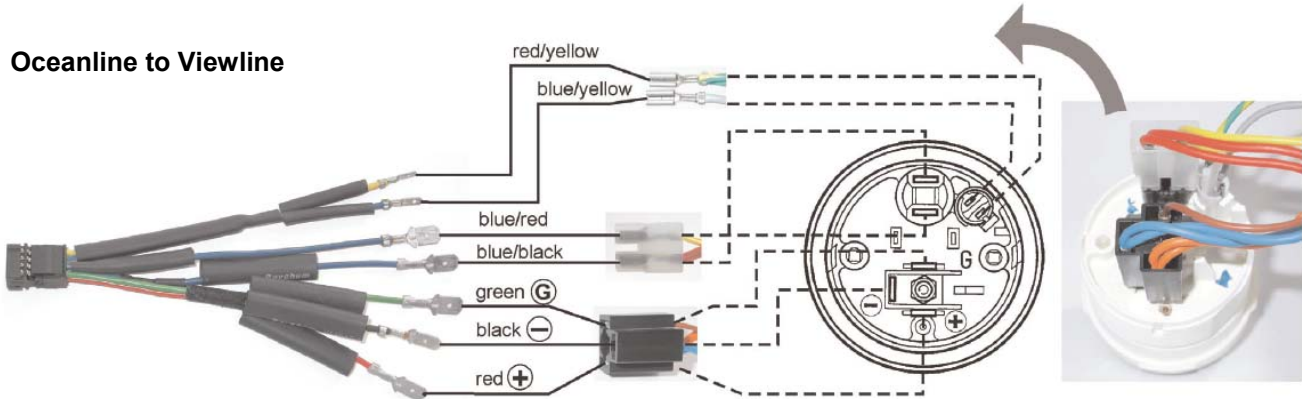
Order Code: 1330232

Manufacturer Part No: 539682-2

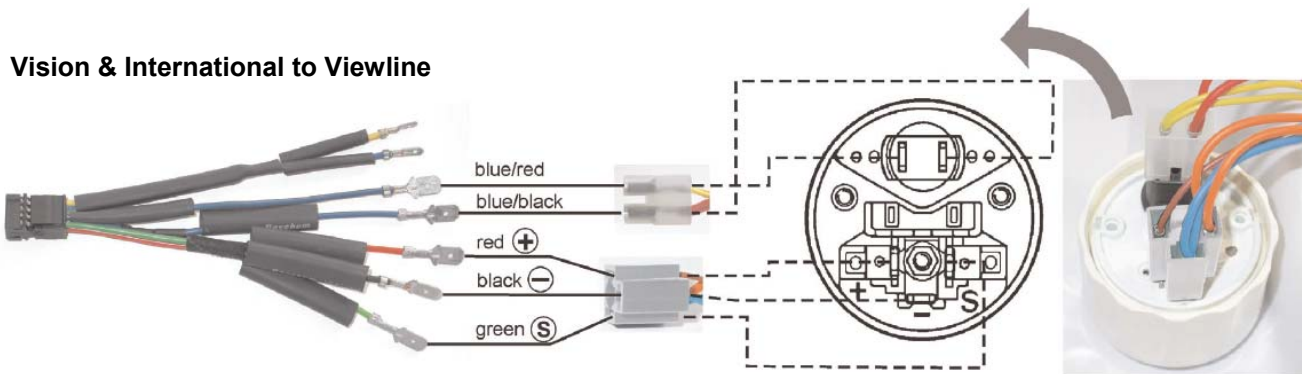
## Looms and Special application devices

**P/n A2C59510852** Conversion loom between Vision or International gauge and Viewline Ø 52 mm / Ø 80-85 mm gauges

### Oceanline to Viewline



### Vision & International to Viewline



**P/n A2C59512947** Harness with 8 terminals plug for Viewline Ø 52 mm / Ø 80-85 mm gauges



**P/n 660.990**

Over-Rev switch with single channel

The VDO RPM Switch has been designed to work with all standard ignition systems, and will provide a negative output once a predetermined RPM has been reached. In standard format the signal will turn off once the RPM falls below the pre-set point. Dip Switches are provided to program the level of hysteresis, or alternatively latch the relay on. Applications include driving a warning light or buzzer. Compatible with VDO Mega Light 600.895. 12V applications.



Switch Box 660.990

**P/n 410.060**

One channel, relay output warning switch

This module is designed to switch a 3A contact, in-built relay, at a preset voltage level. It can be used for thermatic fan, low fuel, high temp, low engine oil / transmission pressure, etc. alarm. The module can be connected to an existing sender/gauge or only to a sender.



12/24V

**P/n 410.061**

Three channels, warning switch

This module is designed to monitor three separate functions, by controlling three 1A transistors to switch negative when the pre-set alarm threshold is reached. It can be used to monitor/control thermatic fan, low fuel, high temp, low engine oil / transmission pressure, etc. The module can be connected to an existing sender/gauge or only to a sender.



12/24V

## Signal Amplifiers, Multiplier & Dividers

### P/n 411.110

#### Signal interface

The VDO Signal Amplifier/Divider is a general purpose module designed to convert the signal from square wave to sine wave and vice versa. It can divide as well as multiply the frequency in small steps up to three times plus or minus. Ideal for calibrating electronic boat speedo or tachometers.



12/24V

### P/n 410.020

#### Tachourmeter active signal filter

The VDO active filter can reduce the effect of electrical noise mixed with signal. This is in situation when the electrical interference is excessive and the speedo or tacho have a pointer fluctuation (erratic reading).  
Inputs: **Red** Battery +12/24V, **Orange** Ignition + 12/24V, **Green** Signal Input, **Blue** Signal Output  
Note: Connector IN & OUT made to suit the VDO, Vision & International Tachourmeter



12/24V

### P/n 411.096

#### Tachometer inductive sender, signal amplifier/Frequency Divider

The VDO Signal Amplifier/Divider is a general purpose module designed to work with most speedometer and tachometer signals. This box will amplify a low voltage signal to a 10V peak to peak square wave. This can be useful when a signal is too low to drive a speedometer, tacho, cruise control or any other such device. The signal may also be divided in frequency by a factor of 1, 2, 4, 8 or 16 to allow easier integration to another instrument.



12/24V

### P/n 411.101

#### Over-Rev switch with two independent channels

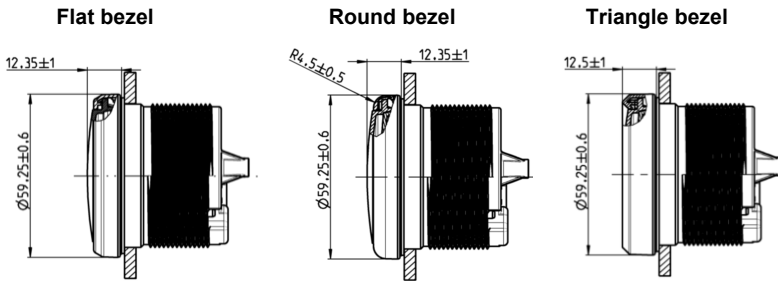
A microprocessor controlled electronic switch module that can be programmed for a number of different functions. With two separate signal inputs switching two separate 5A relays contact the module can be a number of functions' combination. RPM, Speed Shaft rotation monitoring.



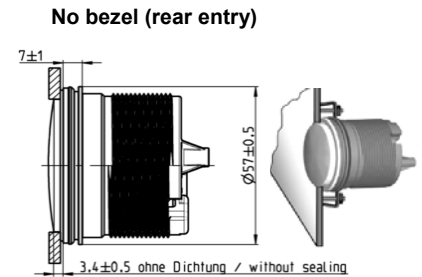
12/24V

## Gauges bezel types

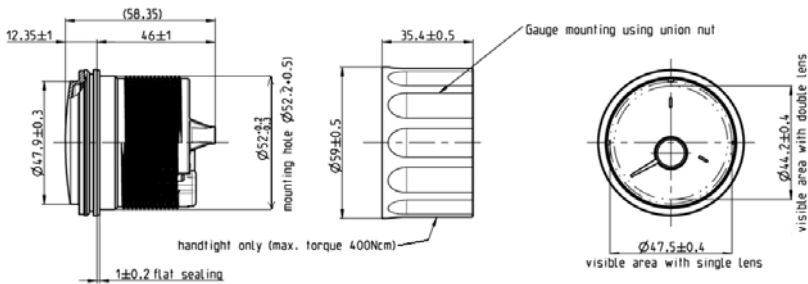
### Ø 52 mm Gauges front fitting



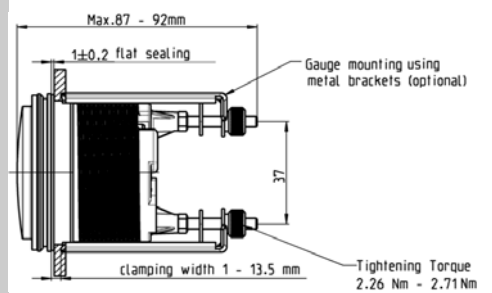
### Ø 52 mm Gauges flush fitting



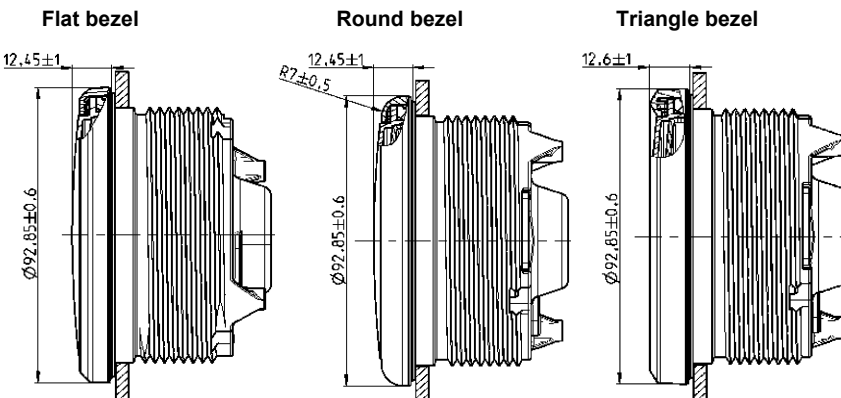
### Ø 52 mm Gauge and Clamp-Ring overall dimension



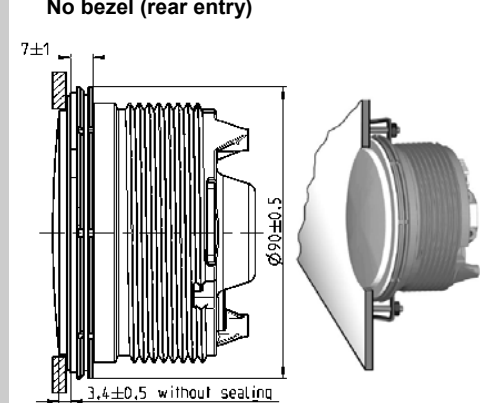
### Ø 52 mm Gauges & Brackets



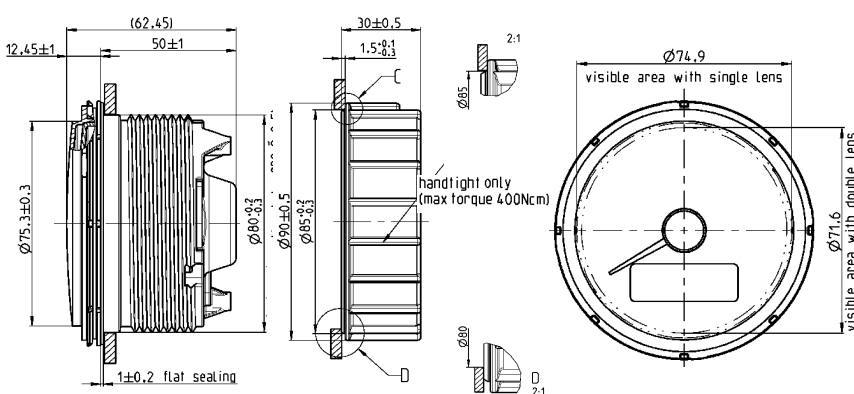
### Ø 85 mm Gauges front fitting



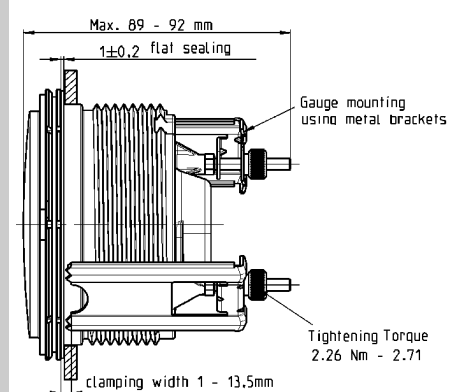
### Ø 85 mm Gauges flush fitting



### Ø 85 mm Gauge and Clamp-Ring overall dimension



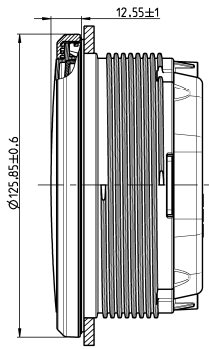
### Ø 85 mm Gauges & Brackets



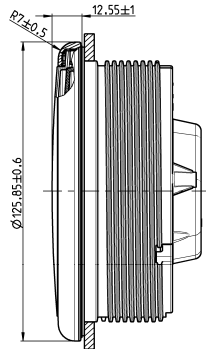
## Gauges bezel types

### Ø 110 mm Gauges front fitting

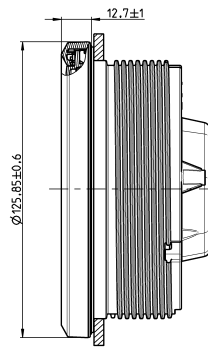
Flat bezel



Round bezel

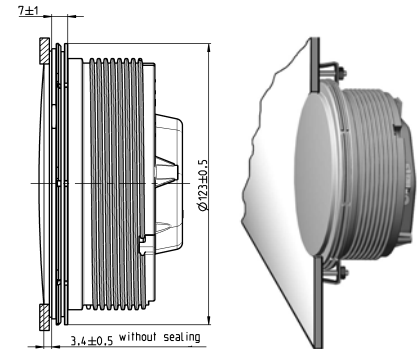


Triangle bezel

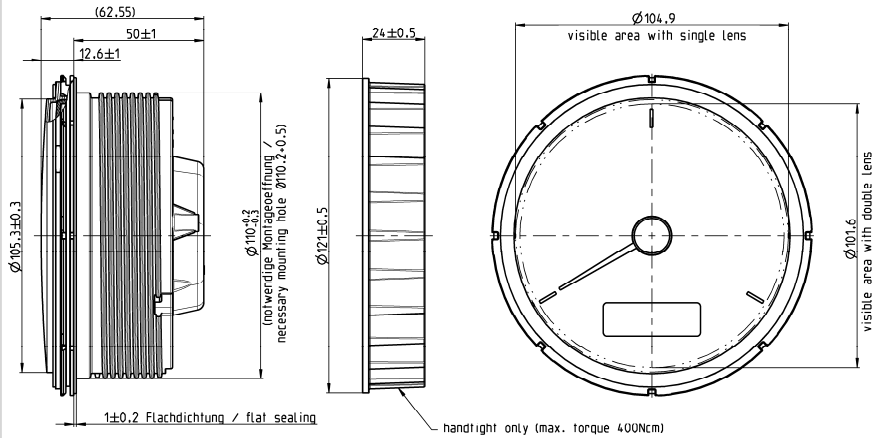


### Ø 110 mm Gauges flush fitting

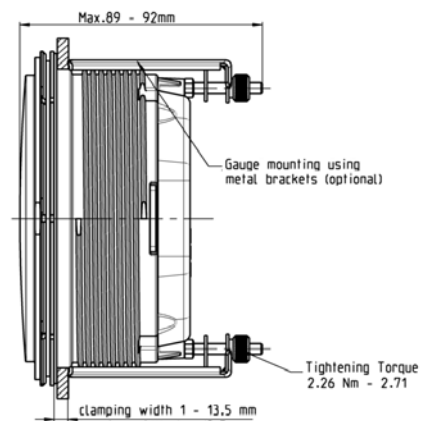
No bezel (rear entry)



### Ø 110 mm Gauge and Clamp-Ring overall dimension



### Ø 110 mm Gauges & Brackets



## Sumlog

### Technical Data

Measurement Range:	see Table
Sensors:	Sumlog SL/HS Sensor, Airmar Triducer <sup>®</sup> NMEA 0183
LCD-Size:	37 x 11 mm
Alarm output max:	100mA
Illumination:	amber, dimmable
Installation depth:	50mm
Installation diameter:	80 & 85mm
Deflection angle:	240°
Operating Voltage:	8,5 – 32 Volt (Sensor 8 – 16V)
Accuracy:	+/- 2,5% of full scale reading
Current consumption:	< 175 mA, including Warning LED
Operating temperature:	-20°C to +85°C; plated bezels (chrome) -20°C to +70°C
Storage temperature:	-40°C to +85°C for 48h; plated bezels (chrome) -40°C to +70°C +90°C for 1h
Temperature shock Range:	-40°C to +85°C; plated bezels (chrome) -40°C to +70°C
Transformation time:	10 seconds
Retention time:	2h
Climatic test Range:	+25°C to +55°C
Relative. Humidity:	80% to 100%
EMC:	in conformity with ISO 7637-1/2
ISO:	7637-3
ESD:	in conformity with DIN_EN 61000-4-2
ISO/CD:	10605
SAE:	J 551/15)
Vibration Sinus:	2g; 8-500Hz; duration 16h
Noise 4,2g; 10-1000Hz, duration 8h	
Mechanical shock continuous 25g; 6ms; 1Hz	
Single shock 100g; 11ms	
Free fall 1m; 3 times	
Chemical resistance against - preservative agent	
- preservative agent remover	
- cold cleaner	
- methylated spirit	
- interior cleaner	
- drinks containing caffeine and tannin	
Nominal position NL 0 to NL 85 (DIN16257)	
Protection class according to IEC 60529	
Front: IP67 (in Nominal position)	
Rear: IP52 (in Nominal position)	
Reverse polarity protection yes, 1 minute	
Short circuit protection yes, 1 minute	



### Features

High reliability  
Flush mount fitting  
LED Illumination  
Integrated Warning LED

### Design

Housing PC; flame retarding (UL94)  
Bezel PC or ABS; several colours and shapes (see table)  
Lens PMMA; double lens  
Dial backlight; different colours (see table)  
Pointer backlight, white on black dials; red on white dials  
Illumination Dial: LED amber (605nm)  
Pointer: LED red (632nm)  
Warning LED red (632nm), programmable  
Mounting spin-lock Nut; locking height 0,5mm – 20mm,  
optional Studs and Bracket; locking height 2 – 13mm  
Connection 8 pin MQS connector system

## Tachourmeter

### Technical Data

Measurement Range:	see Table
Sensors:	Terminal 1 (Ignition Coil, negative side)
LCD-Size:	37 x 11 mm
Alarm output max:	100mA
Illumination:	amber, dimmable
Installation depth:	50mm
Installation diameter:	80 & 85mm
Deflection angle:	240°
Operating Voltage:	8,5 – 32 Volt (Sensor 8 – 16V)
Accuracy:	+/- 2,5% of full scale reading
Current consumption:	< 175 mA, including Warning LED
Operating temperature:	-20°C to +85°C; plated bezels (chrome)
Storage temperature:	-40°C to +85°C for 48h; plated bezels (chrome) -40°C to +70°C +90°C for 1h
Temperature shock Range:	-40°C to +85°C; plated bezels (chrome)
Relative. Humidity:	80% to 100%
Protection class	IP67 (front) in accordance to IEC 60529



### Description

Gauge to indicate Engine Revolution, Engine Hours, Voltage & Clock.

### Features

Integrated Warning LED  
Changeable front bezel  
LED Illumination  
Flush mount possibility  
High Reliability

### Design

Housing PC; flame retarding (UL94)  
Bezel PC or ABS; several colours and shapes (see table)  
Lens PMMA; double lens  
Dial backlight; different colours (see table)  
Pointer backlight, white on black dials; red on white dials  
Illumination Dial: LED amber (605nm)  
Pointer: LED red (632nm)  
Warning LED red (632nm), programmable  
Mounting spin-lock Nut; locking height 0,5mm – 20mm,  
optional Studs and Bracket; locking height 2 – 13mm  
Connection 8 pin MQS connector system

## (Differential Tacho)

### Technical Data

**Sensors:** Hall sensor  
Inductive sensor  
Blocking oscillator  
Ignition Terminal 1  
Alternator Terminal W

**Illumination:** amber, dimmable

**Installation depth:** 50mm

**Installation diameter:** 80/85mm

**Deflection angle:** +/- 120°

**Operating Voltage:** 8,5 – 32 Volt

**Accuracy:** +/- 2,5% of full scale reading

**Current consumption:** < 175 mA, including Warning LED

**Operating temperature:** -20°C to +85°C; plated bezels (chrome) -20°C to +70°C

**Storage temperature:** -40°C to +85°C for 48h; plated bezels (chrome) -40°C to +70°C +90°C for 1h

**Temperature shock Range:** -40°C to +85°C; plated bezels (chrome) -40°C to +70°C

**Transformation time:** 10 seconds

**Retention time:** 2h

**Climatic test Range:** +25°C to +55°C

**Relative Humidity:** 80% to 100%

**EMC in conformity with ISO:** 7637-1/2  
ISO 7637-3

**ESD in conformity with DIN:** EN 61000-4-2  
ISO/CD 10605

**SAE:** J 551/15

**Vibration Sinus:** 2g; 8-500Hz; duration 16h

**Noise 4,2g; 10-1000Hz, duration 8h**

**Mechanical shock continuous 25g; 6ms; 1Hz**

**Single shock 100g; 11ms**

**Free fall 1m; 3 times**

**Chemical resistance against - preservative agent**  
- preservative agent remover  
- cold cleaner  
- methylated spirit  
- interior cleaner  
- drinks containing caffeine and tannin

**Nominal position NL 0 to NL 85 (DIN16257)**

**Protection class according to IEC 60529**  
Front: IP67 (in Nominal position)  
Rear: IP52 (in Nominal position)

**Reverse polarity protection yes, 1 minute**



### Features

High reliability  
Flush mount fitting  
LED Illumination  
Integrated Warning LED

### Concept

Housing PC; flame retarding (UL94)  
Bezel PC or ABS; several colours and shapes (see table)  
Lens PMMA; double lens  
Dial backlit; different colours (see table)  
Pointer backlit, white on black dials; red on white dials  
Illumination Dial: LED amber (605nm)  
Pointer: LED red (632nm)  
Warning LED red (632nm), programmable  
Mounting spin-lock Nut; locking height 0,5mm – 20mm, optional Studs and Bracket; locking height 2 – 13mm  
Connection 8 pin MQS connector system

## Press. - Temp. - Fuel - Trim - Ammeter - Volt - Pyro – Water

### Technical Specs

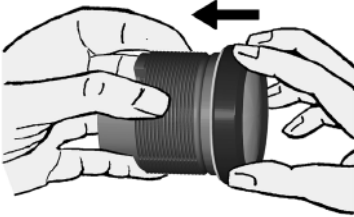
- 8 pole Tyco/Hirschmann MQS plug
- +/-3.6 ° angle degree accuracy over the entire display area
- Operating voltage 10–16 volt, 16–32 volt with dropping resistor
- Current consumption < 130 mA with LED warning light
- Reverse polarity protection
- Input signal: standard Ohm values
- 90 ° display angle
- 52 mm installation diameter
- Anti-fog double lens
- Front panel in compliance with IP 67 protection rating
- Red LED warning light
- Optional makepoint





## Fitting $\varnothing 52$ mm gauges

### To replace a bezel

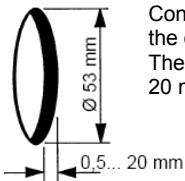


Place the new front ring on the instrument and press it on until it is flush with the instrument glass.

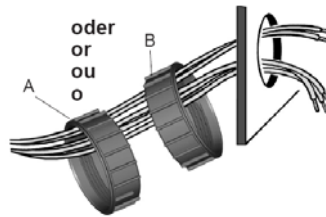


Front ring, flat; black	A2C53186040
Front ring, flat; white	A2C53186022
Front ring, flat; chrome	A2C53186023
Front ring, triangular; black	A2C53186024
Front ring, triangular; white	A2C53186025
Front ring, triangular; chrome	A2C53186026
Front ring, round; black	A2C53186027
Front ring, round; white	A2C53186028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

### To cut and fit gauge $\varnothing 52$ mm



Conventional assembly. (Instrument is put into the drill hole from the front). The panel width may be within a range of 2 to 20 mm.



For 52 mm instruments, the fastening nut can be mounted at position A or B. This allows you to fix the gauge in different panel bores.

#### Version A

Clamping height 0.5 – 10 mm

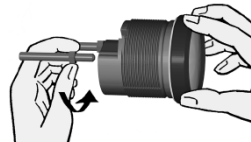
#### Version B

Clamping height 0.5 – 20 mm

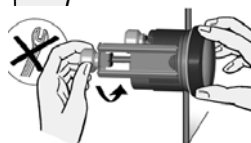


Align the instrument and hand-tighten the fastening nut. Ensure that the nut is not tightened with a torque greater than 400 Ncm.

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



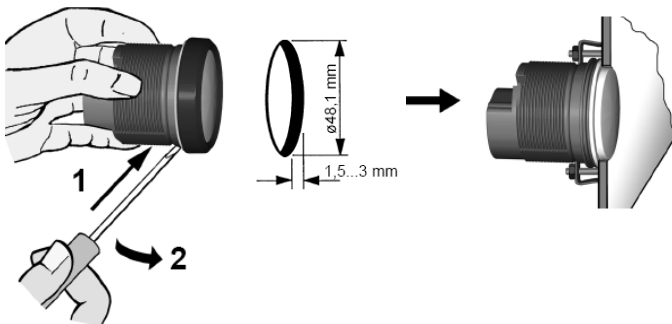
OR



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.

### To cut and fit gauge $\varnothing 52$ mm flush mount



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.

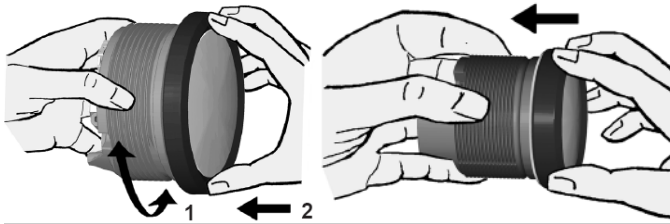
Press the instrument glass with both thumbs, while at the same time pressing the front ring forward from the instrument with both index fingers. Note the use of a tool in the adjacent figure.

Place the flush mount seal A2C53215640 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.

## Fittings $\varnothing$ 85mm gauges

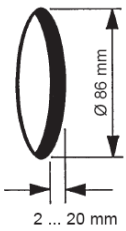
### To replace a bezel



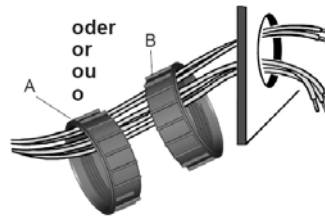
Place the new front ring on the instrument and press it on until it is flush with the instrument glass.

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

### To cut and fit gauge $\varnothing$ 85mm



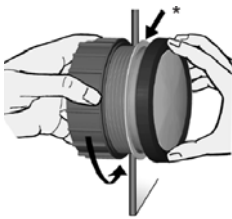
Conventional assembly. (Instrument is put into the drill hole from the front).  
The panel width may be within a range of 2 to 20 mm.



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

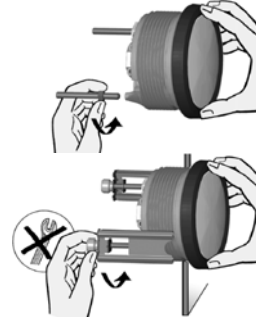
**Version A** Panel bore **80.5 - 81 mm**  
Circumferential lip away from instrument

**Version B** Panel bore **85.5 - 86 mm**  
Circumferential lip next to instrument



Align the instrument and hand-tighten the fastening nut. Ensure that the nut is not tightened with a torque greater than 400 Ncm.  
\* Make sure the seal lays flat between the panel and the front ring.

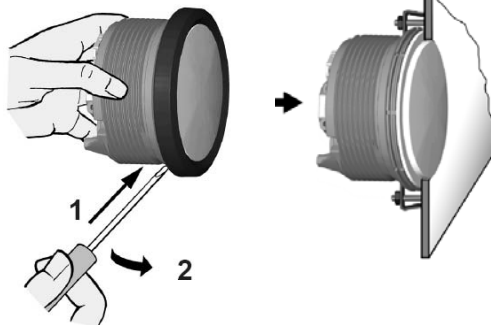
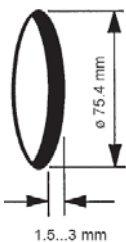
OR



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.

### To cut and fit gauge $\varnothing$ 85mm flush mount



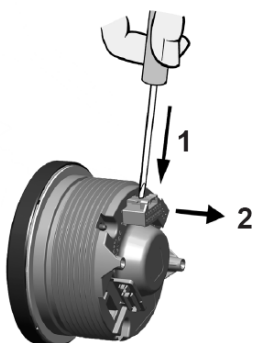
If the instrument is mounted flush (i. e., from the back so that the instrument glass and the panel form one plane), the front ring must be removed.

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.

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.

### To unplug connector



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

Note:  $\varnothing$  110 Gauges require a panel bore of  $\varnothing$  111 mm.  
Panel width may be within a range of 2 and 20 mm  
Flush mount seal is p/n A2C53215642

## Sumlog Calibration

Calibration for:

- Hall Effect Output Transducer

**For NMEA Transducer Change "Input" to NMEA. No pulse calibration needed.**

- ◆ 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

### To enter calibration mode



- ◆ Press and hold Configuration Key

Press the Config key to change over between the "Frequency" input (8 pole plug pin 5) and the NMEA0183 input (14 pole plug, pin 1 & 2)

- ◆ Press Configuration Key briefly

- ◆ Press and hold Configuration Key

Set impulses number is displayed.  
The first digit flushes.

- ◆ Press Configuration Key briefly

The flushing digit increases by 1.  
If the flushing digit is "9", the display returns to "0".

- ◆ Press Config key briefly

The next lower digit flushes

- ◆ Press Config key briefly

Deactivate Ignition power.  
This saves the impulse number in the display.  
Continue until the complete impulse number is set

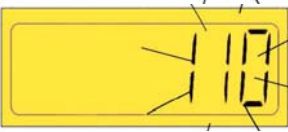
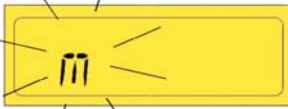
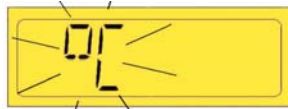
- ◆ Press and hold Config key

Deactivate Ignition power (T15).  
This saves the impulse number in the display.

## Sumlog Alarm Threshold

### Setting of unit and Alarm Threshold

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **Off** T. 15 (8-pin - Pin4)
- ◆ Press and hold Mode key (14-pin - Pin 12)



- ◆ Ignition Power **On** 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 to °F.

- ◆ Press and hold Mode key

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

- ◆ Press and hold Mode key

- ◆ Press and hold Mode key

- ◆ 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

The next lower digit flashes in the display.

- ◆ 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 Mode key

Switch **Off** Ignition power (T15).

This saves the unit and the alarm threshold in the display.

## Sumlog Operation

### Display Selection

- ◆ Switch **On** Battery Power T. 30 (8-pin - Pin1)
- ◆ Switch **On** Ignition Power T. 15 (8-pin - Pin4)

#### Odometer



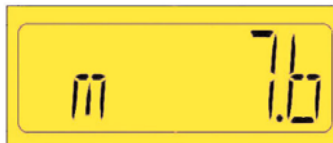
- ◆ Press and hold Mode Key

#### Tripmeter



- ◆ Press and hold Mode key

#### Depth



- ◆ Press and hold Mode key

#### Time



- ◆ Press and hold Mode key

#### Water temperature



- ◆ Press and hold Mode key

#### Battery voltage



### Resetting Trip Counter

- ◆ Switch **On** Battery Power T. 30 (8-pin - Pin1)
- ◆ Switch **On** Ignition Power T. 15 (8-pin - Pin4)

Press the Mode key repeatedly until the trip distance are displayed.



- ◆ Press and hold Mode key

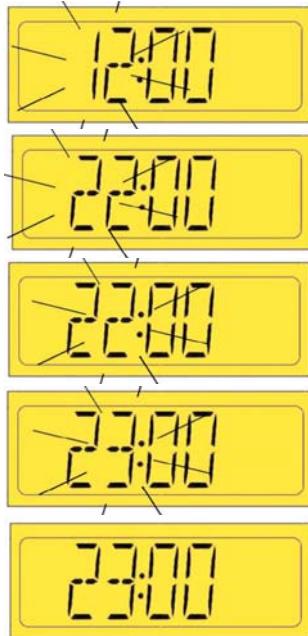


- ◆ Trip is now deleted

## Sumlog Clock & LCD Brightness Function

### Setting the Clock

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **On** T. 15 (8-pin - 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

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.

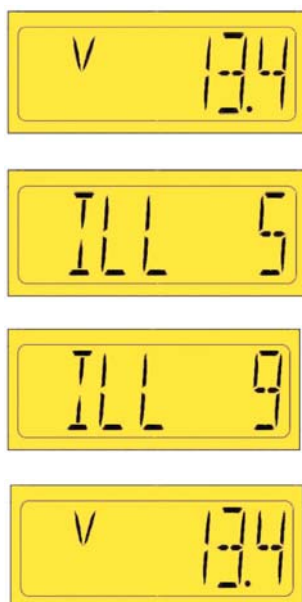
- ◆ Press Mode key briefly

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

### Setting the Brightness



- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **On** T. 15 (8-pin - Pin4)
- ◆ Press the Mode key repeatedly until the Voltmeter is displayed.

- ◆ Press Mode key briefly

- ◆ 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.

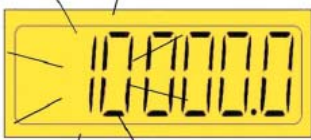
## Tachourmeter Calibration

### Setting impulses / revolution

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **Off** T. 15 (8-pin - Pin4)
- ◆ Press and hold Configuration key (14-pin - Pin 12)

### To enter calibration mode

- ◆ Ignition Power **On** T. 15
- ◆ Release Configuration key



- ◆ Press and hold Configuration Key

Set impulse number is displayed, the first digit flushes.

- ◆ Press Configuration key briefly

The flushing digit increases by 1. If the flushing digit is "9", the display returns to "0"

- ◆ Press and hold Configuration Key

The next lower digit flushes

- ◆ Press Configuration Key briefly

The flushing digit increases by 1.  
If the flushing digit is "9", the display returns to "0".  
Continue until the complete impulse number is set

- ◆ Press and hold Configuration Key

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

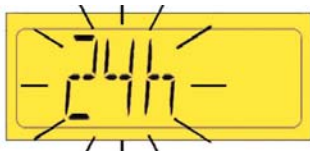
## Tachourmeter Calibration

### Setting the unit and alarm threshold

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **Off** T. 15 (8-pin - Pin4)
- ◆ Press and hold Mode key (14-pin - Pin 12)
- ◆ Ignition Power **On** 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



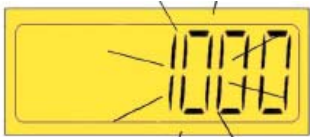
Set alarm threshold is displayed; the first digit flashes.

- ◆ Press Mode key briefly



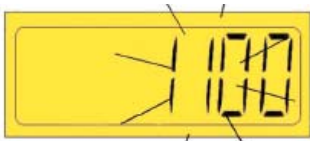
The flashing digit increases by 1. If the flashing digit is "9", the display returns to "0"

- ◆ Press Mode key briefly



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



Ignition Power **Off** T. 15.

This saves the unit and the alarm threshold in the display.



## Tachourmeter Calibration

### In operation Display indicator selection

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **On** T. 15 (8-pin - Pin4)

Total operating  hours

- ◆ Press Mode key briefly

Trip hours 

- ◆ Press Mode key briefly

Time 

- ◆ Press Mode key briefly

Vehicle voltage 

- ◆ Press Mode key briefly

### Resetting the day counter

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **On** T. 15 (8-pin - Pin4)

Press the Mode key repeatedly until the trip hours are displayed.



- ◆ Press and hold Mode key

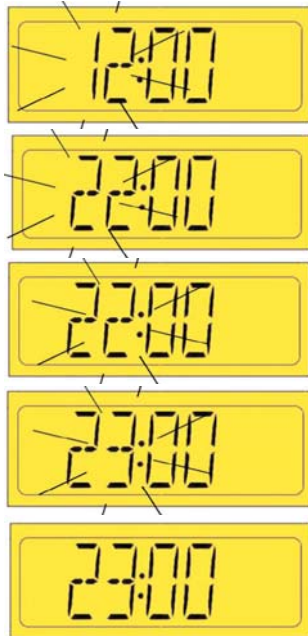


- ◆ Trip is now deleted.

## Tachourmeter Calibration

### Setting the Clock

- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **On** T. 15 (8-pin - 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

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.

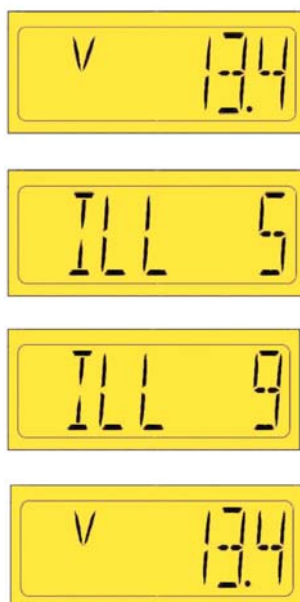
- ◆ Press Mode key briefly

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

### Setting the Brightness



- ◆ Battery Power **On** T. 30 (8-pin - Pin1)
- ◆ Ignition Power **On** T. 15 (8-pin - Pin4)
- ◆ Press the Mode key repeatedly until the Voltmeter is displayed.

- ◆ Press Mode key briefly

- ◆ 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.

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# Warranty Policy

Continental Pty Ltd (VDO) warrants the goods against defects in factory workmanship and materials within the warranty period.

The warranty period for automotive, commercial and marine products shall be 24 months from the date of invoice, subject to the usage limitation of 100,000 Km for goods installed in commercial vehicles.

The warranty period for audio and navigation products shall be 24 months from date of invoice.

The warranty period for repaired items shall be 90 days from the date of invoice.

The customer must notify the point of purchase / distributor of any defect coming within the provisions of this warranty within 30 days of the fault occurring.

A copy of the relevant invoice or the relevant invoice number as proof of the date of purchase must be provided with returned goods.

Continental P/L (VDO) liability with respect to this warranty shall be limited at the option of Continental P/L (VDO) to repair or replacement of the goods.

Removal and refitting costs and all freight costs associated with the warranty claims are the responsibility of the customer.

This warranty shall not apply to goods which have been opened by a third party. Contaminated by oil, water or grease, fitted in excessive vibration environments or improperly connected.

Glass and capillary breakages are excluded from the provisions of this warranty.

Save and except for the express warranty set out above and to the maximum extent permitted by law, all conditions and warranties which may at the time be implied by common law, Trade Practices Act, Fair Trading Act, Goods Act or any other state or Federal Act are excluded.

To the extent that these cannot be excluded and where the law permits.

Continental's liability in respect of any such condition or warranty, shall be limited at the option of Continental P/L (VDO) to repair or replacement of the goods or the supply of equivalent goods or the payment of the costs of the replacing or repairing the goods, or having them replaced or repaired.

The information provided in this brochure contains only general descriptions or performance characteristics, which do not always apply as described in case of actual use or which may change as a result of further development of the products. This information is merely a technical description of the product. This information is not meant or intended to be a special guarantee for a particular quality or a particular durability. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. We reserve the right to make changes in availability as well as technical changes without prior notice.

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