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2009 Special OEM Instrumentation Catalog

Part #VSOC0908 (Supersedes Part #SVSOC0907)

- Measurement
- Control
- Monitoring

VDO

A heritage of engineering quality and innovation

We're focused on providing our customers with the best possible instrumentation – a goal that we've pursued since 1920. We continue to work to deliver the functionality, durability, and high quality finish that have earned our products a best-in-class reputation, worldwide. At the same time, we strive to continually pursue innovations that make our instrumentation more efficient, affordable, and useful to the people who own and operate vehicles and equipment that feature our products.

While we're aware of the vital role of our instruments as a human-machine interface and the importance of factors such as ergonomics, cost, and reliability, we haven't neglected aesthetics. Our latest styles include Vision and Severe Duty instruments offered with bezels in either classic black or the new sleek, polished chrome.

In this catalog you'll find expanded line options, our latest technologies, complete accessories, and technical data. From rugged analog gauges to sophisticated, flexible CAN bus platforms, we're working to give our customers choice, flexibility, and style for all their monitoring needs.



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VDO Vision instruments deliver world-class accuracy, reliability, and technology at very competitive pricing. These precision instruments feature stepper motor technology or air core movements for smooth, accurate performance and long-life dependability. Our unique VDO Spin-Lok™ mounting system makes installing Vision instruments fast and easy and provides a full 360 degrees of mounting force to prevent panel warping and gauge rotation.

Vision gauges incorporate easy-to-read white graphics on an illuminated black dial, and use red pointers featuring our exclusive Trioptic™ illumination for maximum nighttime

visibility. Optional light diffusers allow the dial illumination color to be changed to red or green.

Vision line instruments are offered with bezels in either classic black or sleek, polished chrome.

Vision Chrome Series

Our new VDO Vision Chrome series is based on the popular and reliable Vision line. These instruments feature stylish, stain-resistant chrome bezels and offer the same robust platform, accuracy, and dependability as our original Vision black bezel instruments.



Vision Chrome Series

Programmable Speedometers w/ resettable LCD trip odometer

Speedometer features push button odometer and trip odometer clearly displayed in the LCD window. Unique auto-calibration feature allows for easy adjustment and can

be used with Hall Effect and inductive senders or most electronic controlled transmissions outputs.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
120 mph	3 3/8" (85mm) dia	A	.250" Spade	12	437 191	437 191B

Programmable Tachometers w/ LCD hourmeter

Programmable for use with most engine electronic control ignitions with tachometer output terminal, standard coil ignition, alternator signal, and 12v

square wave applications. Non-resettable engine hourmeter is displayed in LCD window.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
3,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 192	333 192B
4,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 193	333 193B
6,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 194	333 194B

Programmable Tachometers w/o hourmeter

For use on 4,5,6,8 cylinder application engines with standard coil ignitions, most square wave electronic

control ignitions with tachometer output terminal, and alternators with "w" tachometer terminal.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
3,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 199	333 199B
6,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 197	333 197B

For technical specifications and dimensions, see pages 47-53.

Fluid Temperature Gauges, electrical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
220° F	"Water"	E	.250" Spade	-	12	310 194	310 194B
250° F	"Water"	E	.250" Spade	A	12	310 195	310 195B
300° F	"Oil"	E	.250" Spade	B	12	310 196	310 196B

See pages 34-35 for temperature sender tables.

Fluid Temperature Gauge Kits, electrical, includes sender, 2 1/16" (52mm) dia

Description	Thread Type	On Dial	Dwg	Terminal	Adapter Incl.	Voltage	Single Pack Part No.
250° F	US	"Water"	E	.250" Spade	1/4", 3/8", 1/2"	12	310 1951
250° F	Metric	"Water"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	310 1952
300° F	US	"Oil"	E	.250" Spade	1/4", 3/8", 1/2"	12	310 1961
300° F	Metric	"Oil"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	310 1962

Water Temperature Gauges, mechanical, 2 1/16" (52mm) dia

Description	Length	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
265° F	72"	"Water"	H	1/2-14 NPT	12	180 191	180 191B
265° F	96"	"Water"	H	1/2-14 NPT	12	180 192	180 192B

Adapters, for fluid temperature gauges, mechanical

Description	Single Pack Part No.
1/2-14 NPT	180 066
3/8-18 NPT	180 067

Pyrometers, electrical, 2 1/16" (52mm) dia 250° F-1650° F

Description	Dwg	Voltage	Single Pack Part No.	10 Pack Part No.
Complete kit with 12' lead wire	O	12	310 193	-
Gauge only	O	12	310 191	310 193B
Pyrometer sender only	-	-	323 892	-
30' extension wire	-	-	240 092	-

Oil Pressure Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
80 PSI	10-180	"Oil"	E	.250" Spade	1	12	350 194	350 194B
80 PSI	240-33	"Oil"	E	.250" Spade	2	12	350 195	350 195B
100 PSI	10-180	"Oil"	E	.250" Spade	3	12	350 196	350 196B
100 PSI	240-33	"Oil"	E	.250" Spade	4	12	350 197	350 197B
150 PSI	10-180	"Oil"	E	.250" Spade	5	12	350 198	350 198B
150 PSI	240-33	"Oil"	E	.250" Spade	-	12	350 199	350 199B

See pages 32-33 for pressure sender tables.

For technical specifications and dimensions, see pages 47-53.

Oil Pressure Gauge Kits, electrical, includes sender, 2 1/16" (52mm) dia

Description	Thread Type	Adapter Incl.	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.
80 PSI	US	1/4", 3/8", 1/2"	"Oil"	E	.250" Spade	12	350 1941
80 PSI	Metric	M10, M12, M14, M16, 1/8 BSP	"Oil"	E	.250" Spade	12	350 1942
100 PSI	US	1/4", 3/8", 1/2"	"Oil"	E	.250" Spade	12	350 1961
100 PSI	Metric	M10, M12, M14, M16, 1/8 BSP	"Oil"	E	.250" Spade	12	350 1962
150 PSI	US	1/4", 3/8", 1/2"	"Oil"	E	.250" Spade	12	350 1981
150 PSI	Metric	M10, M12, M14, M16, 1/8 BSP	"Oil"	E	.250" Spade	12	350 1982

Boost Pressure Gauges, mechanical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
15 PSI	"Boost"	I	1/8-27NPT	12	150 191	150 191B
30 PSI	"Boost"	I	1/8-27NPT	12	150 194	150 194B

Tubing kit not included, see page 41.

Oil Pressure Gauges, mechanical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
100 PSI	"Oil"	I	1/8-27NPT	12	150 197	150 197B
150 PSI	"Oil"	I	1/8-27NPT	12	150 192	150 192B

Tubing kit not included, see page 41.

Boost Pressure Gauge Kits, mechanical, includes 6ft of tubing & adapters, 2 1/16" (52mm) dia

Description	Thread Type	On Dial	Dwg	Adapters Incl.	Voltage	Single Pack Part No.
15 PSI	US	"Boost"	I	1/4", 3/8", 1/2"	12	150 1911
15 PSI	Metric	"Boost"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1912
30 PSI	US	"Boost"	I	1/4", 3/8", 1/2"	12	150 1941
30 PSI	Metric	"Boost"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1942

Oil Pressure Gauge Kits, mechanical, includes 6ft of tubing & adapters, 2 1/16" (52mm) dia

Description	Thread Type	On Dial	Dwg	Adapters Incl.	Voltage	Single Pack Part No.
100 PSI	US	"Oil"	I	1/4", 3/8", 1/2"	12	150 1971
100 PSI	Metric	"Oil"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1972
150 PSI	US	"Oil"	I	1/4", 3/8", 1/2"	12	150 1921
150 PSI	Metric	"Oil"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1922

Fuel Level Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
For VDO sender	10-180	"Fuel"	E	.250" Spade	9	12	301 194	301 194B
For U.S. sender	240-33	"Fuel"	E	.250" Spade	10	12	301 195	301 195B
For Tube Type	90-0 (ADJ)	"Fuel"	E	.250" Spade	12	12	301 197	301 197B

See pages 38-39 for fuel level sender tables.

Voltmeters, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
8-16V	"Volt"	E	.250" Spade	12	332 193	332 193B

For technical specifications and dimensions, see pages 47-53.



Vision Black Series

Programmable Speedometers w/ resettable LCD trip odometer

Speedometer features push button odometer and trip odometer clearly displayed in the LCD window. Unique auto-calibration feature allows for easy adjustment and can

be used with Hall Effect and inductive senders or most electronic controlled transmissions outputs.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
45 mph / 70 km/h	3 1/8" (80mm) dia	A	.250" Spade	12	437 160	437 160B
120 mph	3 1/8" (80mm) dia	A	.250" Spade	12	437 151	437 151B
140 mph / 220 km/h	3 1/8" (80mm) dia	A	.250" Spade	12	437 157	437 157B
200 km/h	3 1/8" (80mm) dia	A	.250" Spade	12	437 154	437 154B
85 mph / 130 km/h	3 3/8" (85mm) dia	A	.250" Spade	12	437 152	437 152B
120 mph	3 3/8" (85mm) dia	A	.250" Spade	12	437 153	437 153B
140 mph / 220 km/h	4" (100mm) dia	A	.250" Spade	12	437 158	437 158B
200 km/h	4" (100mm) dia	A	.250" Spade	12	437 156	437 156B
120 mph	4" (100mm) dia	A	.250" Spade	12	437 155	437 155B
220 mph	4" (100mm) dia	A	.250" Spade	12	437 159	437 159B

Programmable Tachometers w/ LCD hourmeter

Programmable for use with most engine electronic control ignitions with tachometer output terminal, standard coil ignition, alternator signal, and

12v square wave applications. Non-resettable engine hourmeter is displayed in LCD window.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
3,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 162	333 162B
4,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 163	333 163B
6,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 164	333 164B

Programmable Tachometers w/o LCD hourmeter

For use on 4,5,6,8 cylinder application engines with standard coil ignitions, most square wave electronic

control ignitions with tachometer output terminal, and alternators with "w" tachometer terminal.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
4,000 RPM	2 1/16" (52mm) dia	D	.250" Spade	12	333 156	333 156B
6,000 RPM	2 1/16" (52mm) dia	D	.250" Spade	12	333 158	333 158B
8,000 RPM	2 1/16" (52mm) dia	D	.250" Spade	12	333 159	333 159B
7,000 RPM	3 1/8" (80mm) dia	C	.250" Spade	12	333 151	333 151B
3,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 152	333 152B
7,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 155	333 155B
8,000 RPM	4" (100mm) dia	C	.250" Spade	12	333 160	333 160B

For technical specifications and dimensions, see pages 47-53.

Fluid Temperature Gauges, electrical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
220° F	"Water"	E	.250" Spade	-	12	310 104	310 104B
250° F	"Water"	E	.250" Spade	A	12	310 105	310 105B
300° F	"Oil"	E	.250" Spade	B	12	310 106	310 106B
300° F	"Trans"	E	.250" Spade	B	12	310 111	310 111B
400° F	"Trans"	E	.250" Spade	C	12	310 107	310 107B
120° C	"Water"	E	.250" Spade	A	12	310 108	310 108B
150° C	"Oil"	E	.250" Spade	B	12	310 109	310 109B

See pages 34-35 for temperature sender tables.

Fluid Temperature Gauge Kits, electrical, includes sender, 2 1/16" (52mm) dia

Description	Thread Type	On Dial	Dwg	Terminal	Adapters Incl.	Voltage	Single Pack Part No.
250° F	US	"Water"	E	.250" Spade	1/4", 3/8", 1/2"	12	310 1051
250° F	Metric	"Water"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	310 1052
300° F	US	"Oil"	E	.250" Spade	1/4", 3/8", 1/2"	12	310 1061
300° F	Metric	"Oil"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	310 1062
400° F	US	"Trans"	E	.250" Spade	1/4", 3/8", 1/2"	12	310 1071
400° F	Metric	"Trans"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	310 1072

Fluid Temperature Gauges, mechanical, 2 1/16" (52mm) dia

Description	Length	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
265° F	72"	"Water"	H	1/2-14 NPT	12	180 101	180 101B
340° F	72"	"Oil"	H	1/2-14 NPT	12	180 105	180 105B

Adapters, for fluid temperature gauges, mechanical

Description	Single Pack Part No.
1/2-14 NPT	180 066
3/8-18 NPT	180 067

Outside Temperature Gauges, electrical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Voltage	Single Pack Part No.	10 Pack Part No.
Complete Kit, Fahrenheit -10° F-120° F	"°F"	N	12	397 154	397 154B
Complete Kit, Celsius -25° C-40° C	"°C"	N	12	397 155	397 155B

For technical specifications and dimensions, see pages 47-53.

Pyrometers, electrical, 2 1/16" (52mm) dia, 250° F-1650° F

Description	On Dial	Dwg	Voltage	Single Pack Part No.	10 Pack Part No.
Complete kit with 12' lead wire	"°F"	O	12	310 153	-
Gauge only	"°F"	O	12	310 151	310 151B
Pyrometer sender only	-	O	-	323 892	-
30' extension wire	-	-	-	240 092	-

Oil Pressure Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
80 PSI	10-180	"Oil"	E	.250" Spade	1	12	350 104	350 104B
80 PSI	240-33	"Oil"	E	.250" Spade	2	12	350 105	350 105B
100 PSI	10-180	"Oil"	E	.250" Spade	3	12	350 106	350 106B
100 PSI	240-33	"Oil"	E	.250" Spade	4	12	350 107	350 107B
150 PSI	10-180	"Oil"	E	.250" Spade	5	12	350 108	350 108B
150 PSI	240-33	"Oil"	E	.250" Spade	-	12	350 109	350 109B
400 PSI	10-180	"Trans"	E	.250" Spade	7	12	350 110	350 110B
5 bar	10-180	Oil Symbol	E	.250" Spade	1	12	350 101	350 101B
10 bar	10-180	Oil Symbol	E	.250" Spade	5	12	350 102	350 102B

See pages 32-33 for pressure sender tables.

Oil Pressure Gauge Kits, electrical, includes sender, 2 1/16" (52mm) dia, 250° F-1650° F

Description	Thread Type	On Dial	Dwg	Terminal	Adapters Incl.	Voltage	Single Pack Part No.
80 PSI	US	"Oil"	E	.250" Spade	1/4", 3/8", 1/2"	12	350 1041
80 PSI	Metric	"Oil"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	350 1042
100 PSI	US	"Oil"	E	.250" Spade	1/4", 3/8", 1/2"	12	350 1061
100 PSI	Metric	"Oil"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	350 1062
150 PSI	US	"Oil"	E	.250" Spade	1/4", 3/8", 1/2"	12	350 1081
150 PSI	Metric	"Oil"	E	.250" Spade	M10, M12, M14, M16, 1/8 BSP	12	350 1082

Air Pressure Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
150 PSI	10-180	"Front Air"	E	.250" Spade	5	12	350 111	350 111B
150 PSI	10-180	"Rear Air"	E	.250" Spade	5	12	350 112	350 112B

See pages 32-33 for pressure sender tables.

Oil Pressure Gauges, mechanical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
100 PSI	"Oil"	I	1/8-27NPT	12	150 107	150 107B
150 PSI	"Oil"	I	1/8-27NPT	12	150 111	150 111B

Kit not included, see page 41.

For technical specifications and dimensions, see pages 47-53.

Oil Pressure Gauge Kits, mechanical, includes 6ft of tubing & adapters, 2 1/16" (52mm) dia

Description	Thread Type	On Dial	Dwg	Adapters Incl.	Voltage	Single Pack Part No.
100 PSI	US	"Oil"	I	1/4", 3/8", 1/2"	12	150 1071
100 PSI	Metric	"Oil"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1072
150 PSI	US	"Oil"	I	1/4", 3/8", 1/2"	12	150 1111
150 PSI	Metric	"Oil"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1112

Air Pressure Gauges, mechanical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
150 PSI	"Front Air"	I	1/8-27NPT	12	150 105	150 105B
150 PSI	"Rear Air"	I	1/8-27NPT	12	150 106	150 106B
150 PSI	"Air"	I	1/8-27NPT	12	150 112	150 112B

Turbo & Boost Gauges, mechanical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
15 PSI	"Boost"	I	1/8-27NPT	12	150 101	150 101B
30 PSI	"Boost"	I	1/8-27NPT	12	150 104	150 104B
0-30 in Hg to 0-25 PSI	"Turbo"	I	1/8-27NPT	12	150 121	150 121B
0-3 bar	"Boost"	I	1/8-27NPT	12	150 102	150 102B

Tubing kit not included, see page 41.

Turbo & Boost Gauge Kits, mechanical, includes 6ft of tubing & adapters, 2 1/16" (52mm) dia

Description	Thread Type	On Dial	Dwg	Adapters Incl.	Voltage	Single Pack Part No.
15 PSI	US	"Boost"	I	1/4", 3/8", 1/2"	12	150 1011
15 PSI	Metric	"Boost"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1012
30 PSI	US	"Boost"	I	1/4", 3/8", 1/2"	12	150 1041
30 PSI	Metric	"Boost"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1042
0-30 in Hg to 0-25 PSI	US	"Turbo"	I	1/4", 3/8", 1/2"	12	150 1211
0-30 in Hg to 0-25 PSI	Metric	"Turbo"	I	M10, M12, M14, M16, 1/8 BSP	12	150 1212

Fuel Level Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
For VDO sender	10-180	"Fuel"	E	9	12	301 104	301 104B
For U.S. sender	240-33	"Fuel"	E	10	12	301 105	301 105B
For GM sender (from 1965)	0-90	"Fuel"	E	11	12	301 106	301 106B
For tube type sender	90-0 (ADJ)	"Fuel"	E	12	12	301 107	301 107B

See pages 38-39 for fuel level sender tables.

For technical specifications and dimensions, see pages 47-53.

Vacuum Gauge, mechanical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
0-30 in Hg	"Vacuum"	I	1/8-27 NPT	12	150 131	150 131B

Tubing kit not included, see page 41.

Voltmeter, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
8-16V	"Volt"	E	.250" Spade	12	332 103	332 103B

Ammeters (non-shunted), electrical, 2 1/16" (52mm) dia

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
30 Amp	30 / 0 / 30	"Amp"	L	Stud	12	190 103	190 103B
60 Amp	60 / 0 / 60	"Amp"	L	Stud	12	190 104	190 104B
100 Amp	100 / 0 / 100	"Amp"	L	Stud	12	190 105	190 105B

Clocks, electrical, 2 1/16" (52mm) dia

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Analog	9-28V	-	J	.250" Spade	12 / 24	370 155	370 155B
Quartz, Adjuster on dial	-	-	-	.250" Spade	12 / 24	370 100	-

For technical specifications and dimensions, see pages 47-53.

Severe Duty Instruments

When an extreme working environment calls for a tough gauge, VDO Severe Duty instruments get the job done. Specially designed for industrial applications, these instruments are CE certified and incorporate our patented air core movements or stepper motor technology.

For maximum protection against the elements, Severe Duty instruments are made with corrosion-proof materials, silver contact connectors, and highly impact-resistant plastic lenses. A dual lens system prevents gauge fogging and contoured lenses minimize reflections, making Severe Duty instruments readable in almost any environment.

Severe Duty instruments are warning light capable and are

available in 12/24-volt applications. The dials are backlit using Trioptic™ illumination for optimum readability day or night. Our Spin-Lok™ mounting system makes for fast, secure installation – perfect for hassle-free retrofitting.

Available in a choice of black or chrome round bezels, Severe Duty instruments can also be adapted to a square bezel gauge by using an accessory kit (sold separately).

Severe Duty Chrome Series

Our new Severe Duty Chrome instruments feature polished chrome finish bezels and offer all of the benefits of the Severe Duty line.



Severe Duty Chrome Series

Programmable Tachometers w/ LCD hourmeter

Programmable for use with most engine electronic control ignitions with tachometer output terminal, standard coil ignition, alternator signal, and 12v square wave applications.

Non-resettable engine hourmeter is displayed in LCD window.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
4,000 RPM	3 3/8" (85mm) dia	R	.250" Spade	12 / 24	3334105	3334105B
6,000 RPM	3 3/8" (85mm) dia	R	.250" Spade	12 / 24	3334106	3334106B

Programmable Tachometers w/o hourmeter

For use on 4,5,6,8 cylinder application engines with standard coil ignitions, most square wave electronic control ignitions

with tachometer output terminal, and alternators with "w" tachometer terminal.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
4,000 RPM	3 3/8" (85mm) dia	S	.250" Spade	12	3334102	3334102B
4,000 RPM	3 3/8" (85mm) dia	S	.250" Spade	24	3334103	3334103B
6,000 RPM	3 3/8" (85mm) dia	S	.250" Spade	12	3334101	3334101B

For technical specifications and dimensions, see pages 47–53.

Severe Duty Instruments

Fluid Temperature Gauges, electrical, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
240° F / 100° C	Water Symbol	T	.250" Spade	A	12	3104101	3104101B
240° F / 100° C	Water Symbol	T	.250" Spade	A	24	3104102	3104102B
250° F / 120° C	Water Symbol	T	.250" Spade	A	12	3104103	3104103B
250° F / 120° C	Water Symbol	T	.250" Spade	A	24	3104104	3104104B
300° F / 150° C	Oil Symbol	T	.250" Spade	B	12	3104108	3104108B
300° F / 150° C	Oil Symbol	T	.250" Spade	B	24	3104109	3104109B
400° F	Gear Symbol	T	.250" Spade	C	12	3104107	3104107B

See pages 34–35 for temperature sender tables. Note: Warning lights must be ordered separately.

Pyrometer, electrical, 2 1/16" (52mm) dia, 250° F–1650° F

Description	Dwg	Voltage	Single Pack Part No.
Complete Kit with 13' extension wire	V	12	3104106
Pyrometer sender only			326 001
13' extension wire			326 002

Oil Pressure Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
80 PSI / 5 bar	10–180	Oil Symbol	T	.250" Spade	1	12	3504103	3504103B
80 PSI / 5 bar	10–180	Oil Symbol	T	.250" Spade	1	24	3504104	3504104B
80 PSI / 5 bar	240–33	Oil Symbol	T	.250" Spade	2	12	3504121	3504121B
100 PSI / 7 bar	240–33	Oil Symbol	T	.250" Spade	4	12	3504101	3504101B
100 PSI / 7 bar	240–33	Oil Symbol	T	.250" Spade	4	24	3504102	3504102B
150 PSI / 10 bar	10–180	Oil Symbol	T	.250" Spade	5	12	3504105	3504105B
150 PSI / 10 bar	10–180	Oil Symbol	T	.250" Spade	5	24	3504106	3504106B
150 PSI / 10 bar	240–33	Oil Symbol	T	.250" Spade	–	12	3504107	3504107B
150 PSI / 10 bar	240–33	Oil Symbol	T	.250" Spade	–	24	3504108	3504108B
400 PSI / 28 bar	10–180	Oil Symbol	T	.250" Spade	7	12	3504109	3504109B
400 PSI / 28 bar	10–180	Oil Symbol	T	.250" Spade	7	24	3504110	3504110B

See pages 32–33 for pressure sender tables. Note: Warning lights must be ordered separately.

Fuel Level Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
For VDO sender	10–180	Fuel Symbol	T	.250" Spade	9	12	3014103	3014103B
For VDO sender	10–180	Fuel Symbol	T	.250" Spade	9	24	3014104	3014104B
For U.S. sender	240–33	Fuel Symbol	T	.250" Spade	10	12	3014101	3014101B
For U.S. sender	240–33	Fuel Symbol	T	.250" Spade	10	24	3014102	3014102B
For tube type sender	90–0 (ADJ)	Fuel Symbol	T	.250" Spade	12	12	3014105	3014105B
For tube type sender	90–0 (ADJ)	Fuel Symbol	T	.250" Spade	12	24	3014106	3014106B

See pages 38–39 for fuel level sender tables. Note: Warning lights must be ordered separately.

Water Level Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
Water	10–180	Water Symbol	T	.250" Spade	13	12	3014109	3014109B
Water	10–180	Water Symbol	T	.250" Spade	13	24	3014121	3014121B

See pages 38–39 for water level sender tables. Note: Warning lights must be ordered separately.

For technical specifications and dimensions, see pages 47–53.

Severe Duty Instruments

Voltmeters, 2 1/16" (52mm) dia

Description	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
8-16V	Battery Symbol	T	.250" Spade	12	3324101	3324101B
18-32V	Battery Symbol	T	.250" Spade	24	3324102	3324102B

Note: Warning lights must be ordered separately.

Ammeters, 2 1/16" (52mm) dia

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
80A, gauge only	80 / 0 / 80	AMP	W	.250" Spade	12 / 24	1904101	1904101B
140A, gauge only	140 / 0 / 140	AMP	W	.250" Spade	12 / 24	1904102	1904102B
80A, shunt only						391 010	
140A, shunt only						391 011	

Clocks, 2 1/16" (52mm) dia

Description	Range	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Analog	9-28V	.250" Spade	12 / 24	3704101	3704101B

Hourmeters, 2 1/16" (52mm) dia

Description	Max Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Illuminated	10,000	"Engine Hours"	U	.250" Spade	12 / 24	3314101	3314101B

Optional In-Gauge Warning Lights

Description	Terminal	Voltage	Single Pack Part No.
For volt, temp, pressure and fuel	.250" Spade	12	05 800 762
For volt, temp, pressure and fuel	.125" Spade	24	05 800 764

For technical specifications and dimensions, see pages 47-53.

Severe Duty Instruments



Severe Duty Black Series

Programmable Tachometers w/ LCD hourmeter

Programmable for use with most engine electronic control ignitions with tachometer output terminal, standard coil ignition, alternator signal, and 12v square

wave applications. Non-resettable engine hourmeter is displayed in LCD window.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
3,000 RPM	3 3/8" (85mm) dia	R	.250" Spade	12 / 24	02 012 126D	02 012 126
4,000 RPM	3 3/8" (85mm) dia	R	.250" Spade	12 / 24	02 012 150D	02 012 150
6,000 RPM	3 3/8" (85mm) dia	R	.250" Spade	12 / 24	3331106	3331106B

Programmable Tachometers w/o hourmeter

For use on 4,5,6,8 cylinder application engines with standard coil ignitions, most square wave electronic

control ignitions with tachometer output terminal, and alternators with "w" tachometer terminal.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
3,000 RPM	3 3/8" (85mm) dia	S	.250" Spade	12	02 012 426D	02 012 426
4,000 RPM	3 3/8" (85mm) dia	S	.250" Spade	12	02 012 430D	02 012 430
6,000 RPM	3 3/8" (85mm) dia	S	.250" Spade	12	3331101	3331101B

Fluid Pressure Gauges, electrical, 2 1/16" (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	Bulk Pack Part No.
2 bar / 28 PSI	10-180	Oil Symbol	T	.250" Spade	8	12	02 124 122D	02 124 122
2 bar / 28 PSI	10-180	Oil Symbol	T	.250" Spade	8	24	02 124 522D	02 124 522
5 bar / 72 PSI	10-180	Oil Symbol	T	.250" Spade	1	12	02 124 126D	02 124 126
80 PSI / 5 bar	10-180	Oil Symbol	T	.250" Spade	1	12	3501103	3501103B
80 PSI / 5 bar	240-33	Oil Symbol	T	.250" Spade	2	12	02 124 162D	02 124 162
80 PSI / 5 bar	10-180	Oil Symbol	T	.250" Spade	1	24	3501104	02 124 528
80 PSI / 5 bar	240-33	Oil Symbol	T	.250" Spade	2	24	02 124 562D	02 124 562
150 PSI / 10 bar	10-180	Oil Symbol	T	.250" Spade	5	12	02 124 166D	02 124 166
150 PSI / 10 bar	10-180	Oil Symbol	T	.250" Spade	5	24	02 124 566D	02 124 566
400 PSI / 28 bar	10-180	Gear Symbol	T	.250" Spade	7	12	02 124 168D	02 124 168
400 PSI / 28 bar	10-180	Gear Symbol	T	.250" Spade	7	24	02 124 568D	02 124 568

See pages 32-33 for pressure sender tables. Note: Warning lights must be ordered separately.

For technical specifications and dimensions, see pages 47-53.

Severe Duty Instruments

Fluid Temperature Gauges, electrical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	Bulk Pack Part No.
250° F / 120° C	Water Symbol	T	.250" Spade	A	12	02 321 628D	02 321 628
250° F / 120° C	Water Symbol	T	.250" Spade	A	24	02 321 728D	02 321 728
300° F / 150° C	Oil Symbol	T	.250" Spade	B	12	3101108	3101108B
300° F / 150° C	Oil Symbol	T	.250" Spade	B	24	3101109	3101109B
400° F	Gear Symbol	T	.250" Spade	C	12	3101107	3101107B

See pages 34–35 for temperature sender tables. Note: Warning lights must be ordered separately.

Pyrometers, electrical, 2 1/16 (52mm) dia, 250° F–1650° F

Description	Dwg	Terminal	Voltage	Single Pack Part No.
Complete kit	V	.250" Spade	12	02 300 618D
Pyrometer sender only				326 001
13' extension wire				326 002

Fuel Level Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	Bulk Pack Part No.
For VDO sender	10–180	Fuel Level	T	.250" Spade	9	12	02 222 112D	02 222 112
For VDO sender	10–180	Fuel Level	T	.250" Spade	9	24	02 222 312D	02 222 312
For U.S. sender	240–33	Fuel Level	T	.250" Spade	10	12	02 222 106D	02 222 106
For U.S. sender	240–33	Fuel Level	T	.250" Spade	10	24	02 222 306D	02 222 306
For tube type sender	90–0 (ADJ)	Fuel Level	T	.250" Spade	12	12	02 222 512D	02 222 512
For tube type sender	90–0 (ADJ)	Fuel Level	T	.250" Spade	12	24	02 222 712D	02 222 712

See pages 38–39 for fuel level sender tables. Note: Warning lights must be ordered separately.

Water Level Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	Bulk Pack Part No.
Water	10–180	Symbol	T	.250" Spade	13	12	02 230 712D	02 230 712
Water	10–180	Symbol	T	.250" Spade	13	24	02 230 812D	02 230 812

See pages 38–39 for water level sender tables. Note: Warning lights must be ordered separately.

Voltmeters, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
8–16V	Battery Symbol	T	.250" Spade	12	02 410 806D	02 410 806
18–32V	Battery Symbol	T	.250" Spade	24	02 410 906D	02 410 906

Note: Warning lights must be ordered separately.

For technical specifications and dimensions, see pages 47–53.

Severe Duty Instruments

Ammeters, 2 1/16 (52mm) dia

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
80A, gauge only	80 / 0 / 80	AMP	W	.250" Spade	12 / 24	02 420 712D	02 420 712
80A kit with shunt	80 / 0 / 80	AMP	W	.250" Spade	12 / 24	02 400 310D	02 400 310
140A, gauge only	140 / 0 / 140	AMP	W	.250" Spade	12 / 24	1901102	1901102B
80A, shunt only						391 010	
140A, shunt only						391 011	

Position Indicator Gauges w/ sender, 2 1/16 (52mm) dia

Description	Range	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
Position Indicator	10–180	.250" Spade	12	03 200 514D	03 200 514
Replacement movement arm				440 100	

Clocks, 2 1/16 (52mm) dia

Description	Range	Dwg	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
Analog	9–28V	K	.250" Spade	12 / 24	03 270 612D	03 270 612

Hourmeters, 2 1/16 (52mm) dia

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
Illuminated	100,000	"Engine Hours"	U	.250" Spade	12 / 24	3311101	03 110 412

Acoustical Warning Alarm, 2 1/16 (52mm) dia

Description	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
Piezo Buzzer	.250" Spade	12 / 24	03 230 702D	03 230 702

Optional In-Gauge Warning Lights

Description	Terminal	Voltage	Single Pack Part No.
For volt, temp, pressure and fuel	.250" Spade	12	05 800 762
For volt, temp, pressure and fuel	.125" Spade	24	05 800 764

Optional Black Square Bezels

Description	Single Pack Part No.
For 2 1/16" (52mm)	600 001
For 3 3/8" (85mm)	600 002

For technical specifications and dimensions, see pages 47–53.

Cockpit International Instruments

World-class Cockpit International instruments are the standard in the industry for reliability and economy. These instruments feature our latest generation patented air core movements or stepper motor technology to deliver the precision and durability that has made VDO renowned as the leading brand in instrumentation.

VDO Cockpit International instruments are made for durability with a choice of two terminals: M4 studs or .250" male spades. Most 2 1/16" (52mm) instruments feature zinc-plated metal housing and black painted, brass bezels for rugged, reliable service. Cockpit International Instruments feature standard flood-lit illumination and are available in 12 / 24V applications.



Programmable Speedometers w/ resettable LCD trip odometer

Speedometer features push button odometer and trip odometer clearly displayed in the LCD window. Unique auto-calibration feature allows for easy

adjustment and can be used with Hall Effect and inductive senders or most electronic controlled transmissions outputs.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
45 mph / 75 km/h	3 3/8" (85mm) dia	A	.250" Spade	12 / 24	437 950	437 950B
130 km/h / 85 mph	3 3/8" (85mm) dia	A	.250" Spade	12 / 24	437 956	437 956B
120 mph / 200 km/h	3 3/8" (85mm) dia	A	.250" Spade	12 / 24	437 954	437 954B
120 mph	3 1/8" (80mm) dia	A	.250" Spade	12 / 24	437 050	437 050B
120 mph	3 3/8" (85mm) dia	A	.250" Spade	12 / 24	437 052	437 052B
160 mph	3 3/8" (85mm) dia	A	.250" Spade	12 / 24	437 053	437 053B

For 24V applications, use bulb #600 826 (2x).

Programmable Tachometers w/ LCD hourmeter

Programmable for use with most engine electronic control ignitions with tachometer output terminal, standard coil ignition, alternator signal, and 12v square

wave applications. Non-resettable engine hourmeter is displayed in LCD window.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
3,000 RPM	3 1/8" (80mm) dia	B	.250" Spade	12 / 24	333 961	333 961B
4,000 RPM	3 1/8" (80mm) dia	B	.250" Spade	12 / 24	333 964	333 964B
3,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12 / 24	333 962	333 962B
4,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12 / 24	333 963	333 963B

For 24V applications, use bulb #600 826 (2x).

For technical specifications and dimensions, see pages 47-53.

Cockpit International Instruments

Programmable Tachometers w/o LCD hourmeter

For use on 4,5,6,8 cylinder application engines with standard coil ignitions, most square wave electronic control ignitions

with tachometer output terminal, and alternators with "w" tachometer terminal.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
4,000 RPM (400-1300Hz)*	2 1/16" (52mm) dia	D	.250" Spade	12	333 969	333 969B
4,000 RPM (800-2400Hz)*	2 1/16" (52mm) dia	D	.250" Spade	12	333 965	333 965B
6,000 RPM	2 1/16" (52mm) dia	D	.250" Spade	12	333 958	333 958B
8,000 RPM	2 1/16" (52mm) dia	D	.250" Spade	12	333 959	333 959B
8,000 RPM (1 & 2 cyl)	2 1/16" (52mm) dia	D	.250" Spade	12	333 968	333 968B
7,000 RPM	3 1/8" (80mm) dia	C	.250" Spade	12	333 051	333 051B
3,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 952	333 952B
4,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 953	333 953B
7,000 RPM	3 3/8" (85mm) dia	C	.250" Spade	12	333 055	333 055B

For 2 1/16" 24V applications, use resistor kit #391 101. For 3 3/8" 24V applications, use resistor kit #391 103.

*For Alternator use only.

Fluid Temperature Gauges, electrical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
240° F / 110° C	Water Symbol	G	M4 Stud	-	12	310 907	310 907B
250° F / 120° C	Water	G	M4 Stud	A	12	310 039	310 039B
250° F / 120° C	Water Symbol	G	M4 Stud	A	12	310 909	310 909B
250° F / 120° C	Water Symbol	G	.250" Spade	A	12	310 934	310 934B
250° F / 120° C	Water Symbol	G	M4 Stud	A	24	310 910	310 910B
300° F / 150° C	Oil Symbol	-	.250" Spade	B	12	310 936	310 936B
300° F / 150° C	Oil Symbol	G	M4 Stud	B	12	310 915	310 915B
300° F / 150° C	Oil Symbol	G	M4 Stud	B	24	310 916	310 916B
300° F	"Oil"	E	.250" Spade	B	12	310 012	310 012B
400° F	Gear Symbol	G	.250" Spade	C	12	310 091	310 015B

See pages 34-35 for temperature sender tables.

Water Temperature Gauges, mechanical, 2 1/16 (52mm) dia

Description	Length	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
265° F	72"	"Water"	H	1/2-14 NPT	12	180 901	180 901B
265° F	96"	"Water"	H	1/2-14 NPT	12	180 902	180 902B
265° F	144"	"Water"	H	1/2-14 NPT	12	180 903	180 903B

For 24V applications, use bulb #600 826.

Adapters, for fluid temperature gauges, mechanical

Description	Single Pack Part No.
1/2-14 NPT	180 066
3/8-18 NPT	180 067

For technical specifications and dimensions, see pages 47-53.

Cockpit International Instruments

Cylinder Head Temperature Gauges, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
600° F, complete kit	Cyl Head Temp	P	Spade	12	310 901	-
600° F, gauge only	Cyl Head Temp	P	Spade	12	310 033	310 033B
14mm dia thermal sender (included in kit)	-	-	-	-	323 701	-
12mm dia thermal sender	-	-	-	-	323 705	-

For 24V applications, use bulb #600 807 (does not require separate 24V resistor).

Pyrometers, electrical, 2 1/16" (52mm) dia, 250° F-1650° F

Description	On Dial	Dwg	Voltage	Single Pack Part No.	10 Pack Part No.
Complete kit with 12' lead wire	°F	O	12	310 953	-
Gauge only	°F	O	12	310 951	310 951B
Pyrometer sender only	-	O	-	323 892	-
30' extension wire	-	-	-	240 092	-

For 24V applications, use resistor kit 391 101 (kit includes required bulb).

Fluid Pressure Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
80 PSI / 5 bar	10-180	Oil Symbol	G	M4 Stud	1	12	350 901	350 901B
80 PSI / 5 bar	10-180	Oil Symbol	E	.250" Spade	1	12	350 934	350 934B
80 PSI	10-180	"Oil"	E	.250" Spade	1	12	350 040	350 040B
100 PSI / 7 bar	10-180	Oil Symbol	G	M4 Stud	3	12	350 905	350 905B
150 PSI / 10 bar	10-180	Oil Symbol	G	M4 Stud	5	12	350 909	350 909B
150 PSI	10-180	"lbs/sq inch"	E	.250" Spade	5	12	350 041	350 041B
400 PSI / 25 bar	10-180	Gear Symbol	G	M4 Stud	7	12	350 913	350 913B
150 PSI	240-33	"Oil"	E	.250" Spade	-	12	350 109	350 109B
80 PSI / 5 bar	10-180	Oil Symbol	G	M4 Stud	1	24	350 902	350 902B
150 PSI / 10 bar	10-180	Oil Symbol	G	M4 Stud	5	24	350 910	350 910B

See pages 32-33 for pressure sender tables.

Oil Pressure Gauges, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
100 PSI	"Oil"	I	1/8-27 NPT	12	150 030	150 030B
150 PSI / 10 bar	Oil Symbol	I	1/8-27 NPT	12	150 904	150 904B
400 PSI / 25 bar	Oil Symbol	I	1/8-27 NPT	12	150 906	150 906B

Tubing kit not included, see page 41.

Single Air Pressure Gauge, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
150 PSI / 10 bar	Air Symbol	I	1/8-27 NPT	12	150 905	150 905B

For technical specifications and dimensions, see pages 47-53.

Cockpit International Instruments

Dual Air Pressure Gauges, mechanical, 2 1/16 (52mm) dia

Description	Size	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
150 PSI	2 1/16" (52mm) dia	"Air"	I	1/8-27 NPT	12	151 910	151 910B
150 PSI	3 1/8" (80mm) dia	"PSI"	I	1/8-27 NPT	12	151 002	151 002B

For 24V applications, use bulb #600 807 (1x for 151 910(B), 2x for 151 002(B)).

Vacuum Gauges, mechanical, 2 1/16 (52mm) dia, 0-30" Hg

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
Complete kit w/ 6ft of tubing	"Vacuum"	I	1/8-27 NPT	12	150 042	-
Gauge only	"Vacuum"	I	1/8-27 NPT	12	-	150 045B

For 24V applications, use bulb #600 826.

Boost Gauges, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
15 PSI	"Boost"	I	1/8-27 NPT	12	150 051	150 051B
30 PSI	"Boost"	I	1/8-27 NPT	12	150 052	150 052B

Tubing kit not included, see page 41.

Turbo Boost Gauge, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
0-30" Hg to 0-20 PSI	Turbo Symbol	I	1/8-27 NPT	12	150 921	150 921B

For 24V applications, use bulb #600 826. Tubing kit not included, see page 41.

Fuel Level Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
For VDO sender	10-180	"Fuel"	E	.250" Spade	9	12	301 015	301 015B
For VDO sender	10-180	Fuel Symbol	G	M4 Stud	9	12	301 901	301 901B
For U.S. sender	240-33	Fuel Symbol	G	M4 Stud	10	12	301 903	301 903B
For GM sender (from 1965)	0-90	"Fuel"	E	.250" Spade	11	12	301 030	301 030B
For Tube Type	90-0 (ADJ)	Fuel Symbol	G	M4 Stud	12	12	301 905	301 905B
For Tube Type	90-0 (ADJ)	Fuel Symbol	G	M4 Stud	12	24	301 906	301 906B
For OEM sender	0-90	Fuel Symbol	K	.250" Spade	11	12	301 930	301 930B
For VDO sender	10-180	Fuel Symbol	G	M4 Stud	9	24	301 902	301 902B
For U.S. sender	240-33	Fuel Symbol	G	M4 Stud	10	24	301 904	301 904B

See pages 38-39 for fuel level sender tables.

For technical specifications and dimensions, see pages 47-53.

Cockpit International Instruments

Series 1 Instruments

Voltmeters, 2 1/16 (52mm) dia, w/ ISO symbol

Description	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
8-16V, with colorband	Battery Symbol	G	M4 Stud	12	332 901	332 901B
8-16V, with colorband	Battery Symbol	E	.250" Spade	12	332 932	332 932B
8-16V, with colorband	Volt	E	.250" Spade	12	332 041	332 041B
18-32V, with colorband	Battery Symbol	G	M4 Stud	24	332 902	332 902B

Ammeters (non-shunted), electrical, 2 1/16 (52mm) dia

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
30 Amp	30 / 0 / 30	"AMP"	L	M4 Stud	12 / 24	190 903	190 903B
60 Amp	60 / 0 / 60	"AMP"	L	M4 Stud	12 / 24	190 904	190 904B

For 24V applications, use bulb #600 826.

Ammeter (shunted), electrical, 2 1/16 (52 mm) dia, complete kit w/ shunt

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
150 Amp, gauge only	150 / 0 / 150	"Amp"	M	.250" Spade	12	190 151	190 151B
150 Amp, shunt only	-	-	-	-	-	391 007	-
300 Amp kit	300 / 0 / 300	"AMP"	M	.250" Spade	12 / 24	190 966	-
300 Amp, gauge only	300 / 0 / 300	"AMP"	M	.250" Spade	12 / 24	190 963	190 963B
300 Amp, shunt only	-	-	-	-	-	391 009	-

For 24V applications, use resistor #391 101 (kit includes required bulb).

Clocks, 2 1/16" (52mm) dia

Description	Range	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Analog	9-28V	J	.250" Spade	12 / 24	370 955	370 955B

Hourmeters, 2 1/16" (52mm) dia

Description	Max Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Non-Illuminated	100,000	"Hours"	J	.250" Spade	12	331 953	331 953B
Illuminated	100,000	"Hours"	J	.250" Spade	12	331 957	331 957B
Illuminated	100,000	"Hours"	J	.250" Spade	24	331 960	331 960B

Hourmeters, 2 1/16" (52mm) dia w/ minute hand

Description	Max Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Illuminated	100,000	"Hours"	J	.250" Spade	12	331 959	331 959B

For technical specifications and dimensions, see pages 47-53.

VDO Series 1 instruments feature standard US scales, edge-lit dials, and easy-to-read white numerals and pointers on black faces. Step-type, chrome-plated brass bezels and zinc-plated steel housings make them attractive as well as

rugged. All 52mm gauges have metal housings, U-bracket mountings and stud-type connections, except where noted.



Programmable Speedometers w/ resettable LCD tripodometer

Speedometer features push button odometer and trip odometer clearly displayed in the LCD window. Unique auto-calibration feature allows for easy

adjustment and can be used with Hall Effect and inductive senders or most electronic controlled transmissions outputs.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
120 mph	3 3/8 (85mm) dia	A	.250" Spade	12	437 353	437 353B
160 mph	3 3/8 (85mm) dia	A	.250" Spade	12	437 354	437 354B

Mechanical Speedometers w/o tripodometer, 5/8-18 thread, 1.0 ratio

Description	Size	Voltage	Single Pack Part No.	10 Pack Part No.
120 mph / 200 km/h	3 3/8" (85mm) dia	12	120 302	120 302B

Programmable Tachometer w/ LCD hourmeter

Programmable for use with most engine electronic control ignitions with tachometer output terminal, standard coil ignition, alternator signal, and 12v square wave

applications. Non-resettable engine hourmeter is displayed in LCD window.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
4,000 RPM	3 3/8" (85mm) dia	B	.250" Spade	12	333 363	333 363B

Programmable Tachometers w/o LCD hourmeter

For use on 4,5,6,8 cylinder application engines with standard coil ignitions, most square wave electronic

control ignitions with tachometer output terminal, and alternators with "w" tachometer terminal.

Description	Size	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
4,000 RPM	3 3/8 (85mm) dia	C	.250" Spade	12	333 353	333 353B
7,000 RPM	3 3/8 (85mm) dia	C	.250" Spade	12	333 355	333 355B

For technical specifications and dimensions, see pages 47-53.

Series 1 Instruments

Fluid Temperature Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
250° F	10-180	"Water"	G	M4 Stud	A	12	310 304	310 304B
300° F	10-180	"°F"	G	M4 Stud	B	12	310 312	310 312B
400° F	10-180	"Trans"	G	M4 Stud	C	12	310 303	310 303B

See pages 34-35 for temperature sender tables.

Fluid Temperature Gauge Kits, electrical, includes sender, 2 1/16 (52mm) dia

Description	Thread Type	On Dial	Dwg	Terminal	Adapters Incl.	Voltage	Single Pack Part No.
250° F	US	"Water"	E	M4 Stud	1/4", 3/8", 1/2"	12	310 3041
250° F	Metric	"Water"	E	M4 Stud	M10, M12, M14, M16, 1/8 BSP	12	310 3042
300° F	US	"°F"	E	M4 Stud	1/4", 3/8", 1/2"	12	310 3051
300° F	Metric	"°F"	E	M4 Stud	M10, M12, M14, M16, 1/8 BSP	12	310 3052
400° F	US	"Trans"	E	M4 Stud	1/4", 3/8", 1/2"	12	310 3031
400° F	Metric	"Trans"	E	M4 Stud	M10, M12, M14, M16, 1/8 BSP	12	310 3032

Water Temperature Gauges, mechanical, 2 1/16 (52mm) dia

Description	Length	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
110-265° F	48"	"Water"	I	1/2-14 NPT	12	180 310	180 310B
110-265° F	72"	"Water"	I	1/2-14 NPT	12	180 301	180 301B
110-265° F	144"	"Water"	I	1/2-14 NPT	12	180 302	180 302B
110-265° F	288"	"Water"	I	1/2-14 NPT	12	180 308	180 308B

Oil Temperature Gauges, mechanical, 2 1/16 (52mm) dia

Description	Length	On Dial	Dwg	Fitting Size	Voltage	Single pack Part No.	10 Pack Part No.
120-340° F	72"	"Oil"	I	1/2-14 NPT	12	180 315	180 315B
120-340° F	144"	"Oil"	I	1/2-14 NPT	12	180 317	180 317B

Adapters, for fluid temperature gauges, mechanical

Description	Single Pack Part No.
1/2-14 NPT	180 066
3/8-18 NPT	180 067

Oil Pressure Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Terminal	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
80 PSI	10-180	"Oil"	G	M4 Stud	1	12	350 303	350 303B
100 PSI	10-180	"Oil"	G	M4 Stud	3	12	350 306	350 306B

See pages 32-33 for pressure sender tables.

For technical specifications and dimensions, see pages 47-53.

Series 1 Instruments

Oil Pressure Gauge Kits, electrical, includes sender, 2 1/16 (52mm) dia

Description	Thread Type	On Dial	Dwg	Terminal	Adapters Incl.	Voltage	Single Pack Part No.
80 PSI	US	"Oil"	G	M4 Stud	1/4", 3/8", 1/2"	12	350 3031
80 PSI	Metric	"Oil"	G	M4 Stud	M10, M12, M14, M16, 1/8 BSP	12	350 3032
100 PSI	US	"Oil"	G	M4 Stud	1/4", 3/8", 1/2"	12	350 3061
100 PSI	Metric	"Oil"	G	M4 Stud	M10, M12, M14, M16, 1/8 BSP	12	350 3062

Oil Pressure Gauges, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
100 PSI	"Oil"	I	1/8-27 NPT	12	150 330	150 330B
150 PSI	"Oil"	I	1/8-27 NPT	12	150 306	150 306B

Tube kit not included, see page 41.

Oil Pressure Gauge Kits, mechanical, includes 6ft of tubing and adapters, 2 1/16 (52mm) dia

Description	Thread Type	On Dial	Dwg	Adapters Incl.	Voltage	Single Pack Part No.
100 PSI	US	"Oil"	I	1/4", 3/8", 1/2"	12	150 3301
100 PSI	Metric	"Oil"	I	M10, M12, M14, M16, 1/8 BSP	12	150 3302
150 PSI	US	"Oil"	I	1/4", 3/8", 1/2"	12	150 3061
150 PSI	Metric	"Oil"	I	M10, M12, M14, M16, 1/8 BSP	12	150 3062

Air Pressure Gauge, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
150 PSI	"Air"	I	1/8-27 NPT	12	150 307	150 307B

Turbo Boost Gauges, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
0-30 in. Hg to 0-25 PSI	"Turbo"	I	1/8-27 NPT	12	150 361	150 361B

Tube kit not included, see page 41.

Turbo Boost Gauge Kits, mechanical, includes 6ft of tubing and adapters, 2 1/16 (52mm) dia

Description	Thread Type	On Dial	Dwg	Adapters Incl.	Voltage	Single Pack Part No.
0-30 in. Hg to 0-25 PSI	US	"Turbo"	I	1/4", 3/8", 1/2"	12	150 3611
0-30 in. Hg to 0-25 PSI	Metric	"Turbo"	I	M10, M12, M14, M16, 1/8 BSP	12	150 3612

For technical specifications and dimensions, see pages 47-53.

Series 1 Instruments

Fuel Level Gauges, electrical, 2 1/16 (52mm) dia

Description	Ohm Range	On Dial	Dwg	Sender Table	Voltage	Single Pack Part No.	10 Pack Part No.
For VDO sender	10-180	"Fuel"	G	9	12	301 301	301 301B
For U.S. sender	240-33	"Fuel"	G	10	12	301 302	301 302B
For GM sender	0-90	"Fuel"	G	11	12	301 303	301 303B

See pages 38-39 for fuel level sender tables.

Vacuum Gauges, mechanical, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Fitting Size	Voltage	Single Pack Part No.	10 Pack Part No.
0-30 in. Hg	"Vacuum"	I	1/8-27 NPT	12	150 301	150 301B

Tubing kit not included, see page 41.

Voltmeters, 2 1/16 (52mm) dia

Description	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
8-16V	"Volts"	G	M4 Stud	12	332 341	332 341B
8-16V, with colorband	"Volts"	G	M4 Stud	12	332 342	332 342B

Ammeter (non-shunted), electrical, 2 1/16 (52mm) dia

Description	Range	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
60 Amp	60 / 0 / 60	"Amp"	L	M4 Stud	12	190 301	190 301B

For technical specifications and dimensions, see pages 47-53.

Hourmeters (12/24V)

The VDO hourmeter line has been expanded to offer hourmeters in many sizes, styles and configurations. They include models which are illuminated and non-

illuminated and have recording hour ranges from 10,000 to 100,000 hours. VDO hourmeters are not resettable.



Cockpit International style, electrical, 2 1/16 (52mm) dia, chrome bezel

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Non-Illuminated	100,000	"Hours"	J	.250" Spade	12	331 955	331 955B

Cockpit International style, electrical, 2 1/16 (52mm) dia, black bezel

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Non-Illuminated	100,000	"Hours"	J	.250" Spade	12	331 953	331 953B
Illuminated	100,000	"Hours"	J	.250" Spade	12	331 957	331 957B
Illuminated	100,000	"Hours"	J	.250" Spade	24	331 960	331 960B

Severe Duty style, electrical, 2 1/16 (52mm) dia, chrome bezel

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Illuminated	100,000	"Engine Hours"	U	.250" Spade	12 / 24	3314101	3314101B

Severe Duty style, electrical, 2 1/16 (52mm) dia, black bezel

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.	10 Pack Part No.
Illuminated	100,000	"Engine Hours"	U	.250" Spade	12 / 24	3311101	03 110 412

Electrical, 2 1/16 (52mm) dia w/ minute hand

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.
Non-Illuminated	100,000	"Hours"	J	.250" Spade	12	331 959

Minis w/ 2 hole mounting flange, electrical, 1.42" W x .92"H x 2.81"D (36mm W x 23.4mm H x 71.1mm D)

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.
Non-Illuminated	10,000	"Quartz"	Q	.250" Spade	12-60	331 534
Non-Illuminated	10,000	"Quartz"	Q	.250" Spade	12-60	331 536
Non-Illuminated	100,000	"VDO"	Q	.250" Spade	12-60	331 539

Mini w/ flush mounting flange, electrical, 1.42" W x .92"H x 2.81"D (36mm W x 23.4mm H x 71.1mm D)

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.
Non-Illuminated	100,000	"VDO"	Q	.250" Spade	12-60	331 537

Mini w/ 3 hole round mounting flange, electrical, 1.42" W x .92"H x 2.81"D (36mm W x 23.4mm H x 71.1mm D)

Description	Maximum Hours	On Dial	Dwg	Terminal	Voltage	Single Pack Part No.
Non-Illuminated	10,000	"Quartz"	Q	.250" Spade	12-60	331 958

For technical specifications and dimensions, see pages 47-53.

Generic Analog Instrument Cluster Solutions

Centro Base 300 Series Analog Instrument Clusters

These units were developed to provide a flexible inexpensive solution for analog engine monitoring needs. The compact 100mm size allows for monitoring of several vehicle functions where space is limited. Available in 12/24 volt versions these units can be supplied fully programmed to your specification. Or by using our "Centrowin" software programming can be done easily in the field allowing one instrument to be used in various equipment applications. The dials also can be adapted to individual customer requirements in terms of design, scales, and symbols.



Model 300 – These multifunction instruments allow digital and analog displays to be combined. Two versions are available.

Technical Specifications

Diameter:	100mm
Housing:	PBT plastic white
Bezel:	PBT plastic black
Mounting:	Spin-Lok™ ring
Lens:	PMMA scratch resistant, non-reflective
Warning Indicators:	Super bright LED'S, switch to ground activation
LCD Illumination:	Yellow, LCD
Connector:	AMP 92143307, 32PIN, single cavity
Rated Voltage:	12 or 24 options available
Operating Voltage:	9V to 16V DC, 18V to 32V DC
Current consumption:	400mA ± 20%
EMC:	DIN 40 839, 95/54-89/336-EWG, ISO 7637-1-2
Vibration resistance:	TPV - UP 12;SAE J1810
Physical Shock:	SAE J1399
UV Protection:	Yes
Environmental Protection:	IP65 front side; IP30 backside ACC. to IEC 60 529
Corrosion Protection:	ACC. to IEC 60068-2-11/52
LCD:	6 character
Bar Graph:	10 bar display
Operating Temperature:	-30°C to +80°C
Display Temperature:	-20°C to +70°C
Storage Temperature:	-40°C to +85°C

	Centrobases 300	Centrobases 300 with analog instrument
Standard Features	Non resettable hourmeter	Non resettable hourmeter
		Analog instrument Accuracy ± 5°
		Analog dial, backlit white illumination
User Defined Features		Analog pointer white illumination
	12 individual telltales	8 individual telltales
	Pressure, temperature, or fluid level LCD bar graph	Pressure, temperature, or fluid level LCD bar graph
	1x resistance input	1x resistance or 1x frequency input

Centro Base 500 Series Multi Function Analog Cluster

Designed for that low volume vehicle or equipment that requires an 'off the shelf' instrument cluster solution without expensive tooling and development cost. Even though it is compact in size 291mm x 144mm it has 4 analogue instrument displays, 15 warning indicators and an LCD display. The LCD display can be programmed to monitor odometer including w/trip reset, cumulative and service hour meter, gear indicator and clock. The dials also can be adapted to individual customer requirements in terms of design, scales, and symbols.

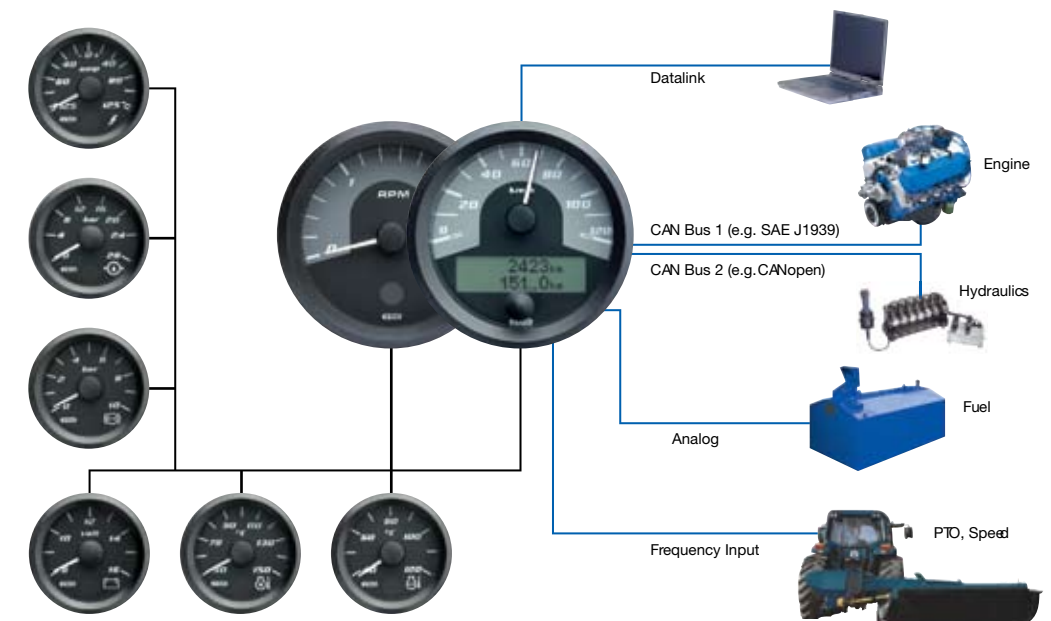


Model 500 – This intelligent instrument cluster with a central connector and compact housing offers versatile installation options.

Technical Specifications

Housing:	Plastic, black
Mounting:	"Push to Lock" vibration shock mount
Lens:	PMMA scratch resistant
Connector:	GNW, Nr. 14137, 28 Pin
5 Movements:	VDO proprietary stepper motor & cross coil
Input:	2X frequency 3X resistance PWM
LCD Display:	Odometer, Trip Odometer, Hour meter, service hour meter, clock & gear shift
Instrument Dial Illumination:	Green LED's
Instrument Pointer Illumination:	Red LED's
Programming:	Centrowin (Proprietary) software
Outputs:	C3-signal
Rated Voltage:	1v & 24 volt models
Operating Voltage:	9V to 16V DC 18V to 32V DC
Current consumption:	400mA ± 20%
EMC:	DIN 40 839, 95/54-89/336-EWG, ISO 7637-1-2
Operating Temperature:	-30°C to +75°C
Storage Temperature:	-40°C to +85°C
LCD Display Temperature:	-20°C to +65°C

CANcockpit Instrumentation System



VDO CANcockpit is a flexible, intelligent instrumentation system designed to operate in a Control Area Network (CAN) environment. The system can process digital signals from two CAN bus inputs simultaneously, as well as data provided from analog sensors, such as fuel tank level senders. VDO CANcockpit can process data protocols from all of the leading engine manufacturers. It is simple to expand and can be easily configured to meet specific application needs.

The CANcockpit system is built around a master instrument, which can stand alone or be used to control up to 16 additional display instruments. In addition to monitoring speed or RPM, the master instrument can also handle 25 additional engine signals via an integrated LCD display. Data such as temperature, pressure, or fill levels can be displayed using individual instruments, driven by the master instrument.

VDO CANcockpit can be easily programmed, using WINGauge software, to monitor critical operating parameters and trigger warning signals, or directly display warnings transmitted from the CAN bus when readings are out-of-range. It can also be customized to display service functions, such as specified engine service intervals, which can help reduce operating costs and make scheduling easier.

The CANcockpit System technology is completely self-contained and eliminates the cost and complexity of external "black boxes" and other interface electronics. Its programmable capability also helps manufacturers reduce production costs and minimizes wiring installation time and sensor assembly requirements.

The master instrument features a yellow backlit monochrome LCD 132 x 33 dot matrix display with white illumination. The housing is made from sturdy flame retardant plastic and mounts easily with our Spin-Lok™ mounting ring.

CANcockpit Technical Specifications:

Connector:	MP 26 pins MODU II, MATE-N-LOK 4 pins
Inputs:	2 x CAN inputs, 2 x frequency, 3 x resistance, 1 x 4-20mA, 1 x 0-5V
Outputs:	Up to 16 display instruments, 2 x switch output
Rated voltage:	12 to 24V DC
Operating voltage:	9 to 32V DC
Current:	50 mA +/- 10%
Operating temp:	-40° F to 176° F (-40° C to +85° C) (visible restrictions outside -4° F and 158° F [-20° C and +70° C])
Storage temp:	-40° F to 176° F (-40° C to +85° C)

CANcockpit Instrumentation System

CAN Severe Link

Description	Size	Voltage	Part No.
Ammeter			
Ammeter -125 / +125	2 1/16" (52mm) dia	12 / 24	A2C60000328
Level Gauges			
Level fresh water 0-1	2 1/16" (52mm) dia	12 / 24	A2C60000323
Level fuel 0-1	2 1/16" (52mm) dia	12 / 24	A2C60000322
Level fuel E-1/4-1/2-3/4-F	2 1/16" (52mm) dia	12 / 24	A2C60000333
Level waste water 0-1	2 1/16" (52mm) dia	12 / 24	A2C60000324
Pressure Gauges			
Pressure brake 150 PSI / 10 bar	2 1/16" (52mm) dia	12 / 24	A2C60000308
Pressure engine oil 100 PSI / 7 bar	2 1/16" (52mm) dia	12 / 24	A2C60000334
Pressure engine oil 150 PSI / 10 bar	2 1/16" (52mm) dia	12 / 24	A2C60000306
Pressure engine oil 80 PSI / 5 bar	2 1/16" (52mm) dia	12 / 24	A2C60000305
Pressure transmission oil 400 PSI / 28 bar	2 1/16" (52mm) dia	12 / 24	A2C60000311
Pressure turbo 2 bar	2 1/16" (52mm) dia	12 / 24	A2C60000312
Speedometers			
Speedometer 100 mph Master	3 3/8" (85mm) dia	12 / 24	A2C60000067
Speedometer 120 mph Master	3 3/8" (85mm) dia	12 / 24	A2C60000068
Speedometer 120 mph / 200 km/h Master	4" (100mm) dia	12 / 24	A2C60000119
Speedometer 140 mph / 220 km/h Master	4" (100mm) dia	12 / 24	A2C60000117
Speedometer 50 mph / 80 km/h Master	4" (100mm) dia	12 / 24	A2C60000116
Speedometer 60 km/h Master	3 1/8" (80mm) dia	12 / 24	A2C60000013
Speedometer 60 km/h Satellite	3 1/8" (80mm) dia	12 / 24	A2C60001892
Speedometer 80 mph Master	3 3/8" (85mm) dia	12 / 24	A2C60000066
Speedometer 80 mph / 120 km/h Master	3 1/8" (80mm) dia	12 / 24	A2C60000016
Tachometers			
Tachometer 3 k/min Satellite	2 1/16" (52mm) dia	12 / 24	A2C60000329
Tachometer 3 k/min Master	4" (100mm) dia	12 / 24	A2C60000111
Tachometer 3 k/min Master	3 1/8" (80mm) dia	12 / 24	A2C60000011
Tachometer 3 k/min Master	3 3/8" (85mm) dia	12 / 24	A2C60000061
Tachometer 3 k/min Satellite	4" (100mm) dia	12 / 24	A2C60001885
Tachometer 3 k/min Satellite	3 1/8" (80mm) dia	12 / 24	A2C60005001
Tachometer 4 k/min Master	4" (100mm) dia	12 / 24	A2C60000112
Tachometer 4 k/min Master	3 1/8" (80mm) dia	12 / 24	A2C60000012
Tachometer 4 k/min Master	3 3/8" (85mm) dia	12 / 24	A2C60000062
Tachometer 5 k/min Master	3 3/8" (85mm) dia	12 / 24	A2C60000069
Tachometer 8 k/min Master	3 1/8" (80mm) dia	12 / 24	A2C60000018
Temperature Gauges			
Temperature engine coolant 100-280° F / 40-120° C	2 1/16" (52mm) dia	12 / 24	A2C60000319
Temperature engine oil 120-300° F / 50-150° C	2 1/16" (52mm) dia	12 / 24	A2C60000331
Temperature hydraulic oil 20-120° C	2 1/16" (52mm) dia	12 / 24	A2C60000320
Temperature pyrometer 100-900° C	2 1/16" (52mm) dia	12 / 24	A2C60000321
Temperature transmission oil 120-300° F / 50-150° C	2 1/16" (52mm) dia	12 / 24	A2C60000335
Temperature transmission oil 50-150° C / 120-300° F	2 1/16" (52mm) dia	12 / 24	A2C60000315
Voltmeters			
Voltmeter 18-32V	2 1/16" (52mm) dia	24	A2C60000327
Voltmeter 8-16V	2 1/16" (52mm) dia	12	A2C60000325

All instruments must be programmed using VDO WINgauge software.

See page 43 for Harnesses and Harness Components.

Engines used in off-highway products increasingly feature electronic engine management. To meet these requirements, We now offer a modular instrumentation concept: VDO CAN Severe Link. The main element is a multifunction tachometer connected to the CAN bus with SAE J1939 protocol. The tachometer can display and/or forward all available data to a maximum of 20 satellite gauges. Installation is made simple with the plug and play design.

All satellite gauges have integrated wire harnesses for

daisy chaining, and with the VDO Easy Link architecture, these gauges can be connected in any sequence minimizing installation time and effort. Push Button programming on the front allows easy configuration to the user's specific requirements. Data displayed on the LCD and sent to the satellite gauges is updated every 20 msec.

All gauges offer white lettering on black dial faces, black plastic bezels, and superior red illumination with translucent backlighting. The pointer is white with a black hub.



Master Tachometer

Description	Size	Dwg	Voltage	Part No.
3,000 RPM	3 3/8" (85mm) dia	F	12 / 24	N02-012-920
4,000 RPM	3 3/8" (85mm) dia	F	12 / 24	N02-012-922
5,000 RPM	3 3/8" (85mm) dia	F	12 / 24	A2C59500012

Satellite Gauges

Pressure

Description	Size	Dwg	Voltage	Part No.
Engine Oil Pressure 150 PSI	2 1/16" (52mm) dia	F	12 / 24	N02-140-512
Gear Box Oil Press Gauge 300 PSI	2 1/16" (52mm) dia	F	12 / 24	N02-140-516

Temperature Gauges

Description	Size	Dwg	Voltage	Part No.
Engine Coolant Temp 100-250° F	2 1/16" (52mm) dia	F	12 / 24	N02-311-552
Engine Temp 100-300° F	2 1/16" (52mm) dia	F	12 / 24	N02-311-542
Exhaust Gas 200-1700° F	2 1/16" (52mm) dia	F	12 / 24	N02-311-546

Voltmeters

Description	Size	Dwg	Voltage	Part No.
Voltmeter 8-16V	2 1/16" (52mm) dia	F	12 / 24	N02-413-066
Voltmeter, 18-32V	2 1/16" (52mm) dia	F	12 / 24	N02-413-058

Fuel Gauge

Description	Size	Dwg	Voltage	Part No.
Fuel Level Gauge 0-4 / 4	2 1/16" (52mm) dia	F	12 / 24	N02-224-080

Harness

Description	Part No.
CAN Input to Master with two analog inputs	A2C53092432

For technical specifications and dimensions, see pages 47-53.

Pressure Senders

Pressure Senders

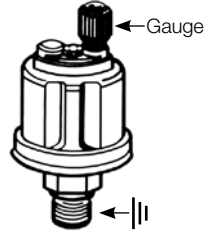
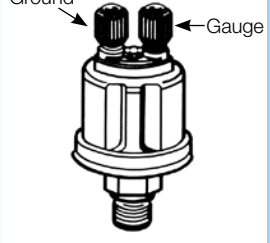
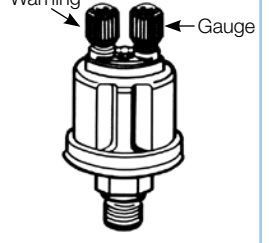
Types of Connections			Terminal Key
 <p>Illus. 1</p> <p>Standard Ground: sender case to common ground; and Dual Station Standard Ground</p>	 <p>Illus. 2</p> <p>Floating Ground: isolated terminal to common ground; and Dual Station Floating Ground</p>	 <p>Illus. 3</p> <p>Standard Ground with Warning Contact</p>	<p>All Pressure Senders have knurled nut terminals, except where noted:</p> <p>* w/ .250" Spade terminal</p> <p>** w/ M4 Stud</p> <p>*** w/ 10-32 Stud</p>

Table 1: 80 PSI / 5 bar (10-180 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT	-	360 003	-	-	-	29 / 4	-
1/8-27 NPT	-	-	360 410	-	-	32 / 1	-
1/8-27 NPT	-	-	-	-	362 001*	1 / 1	-
1/8-27 NPT	7.0 PSI	360 009	-	-	-	30 / 23	-
1/8-27 NPT	-	-	-	362 033*	-	3 / 1	-
1/4-18 NPT	-	360 005	-	-	-	29 / 8	-
1/4-18 NPT	8.0 PSI	360 019	-	-	-	30 / 20	-
1/4-18 NPT	-	-	360 441B	-	-	32 / 16	-
M10 x 1K	-	360 001	-	-	-	29 / 1	-
M10 x 1K	7.0 PSI	360 006	-	-	-	30 / 2	-
M10 x 1K	10.0 PSI	360 034	-	-	-	30 / 4	-
M12 x 1.5	-	360 002	-	-	-	29 / 85	X
M12 x 1.5	8.5 PSI	360 007	-	-	-	30 / 6	X
M14 x 1.5	-	360 027	-	-	-	29 / 26	X
M14 x 1.5	7.1 PSI	360 028	-	-	-	30 / 28	X

Table 2: 80 PSI / 5 bar (240-33 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT	-	360 801***	-	-	-	AT 84200	-

Table 3: 100 PSI / 7 bar (10-180 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT	-	360 086***	-	-	-	655	-

Warning Notice: VDO mechanical oil pressure senders are not to be used with any type of fuel application. VDO mechanical oil pressure senders may be used in

motor vehicles and boats only. VDO mechanical oil pressure senders are not suitable for use in aircraft or any other purposes.

Table 4: 100 PSI / 7 bar (240-33 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT	-	360 811***	-	-	-	734	-

Table 5: 150 PSI / 10 bar (10-180 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT	-	360 004	-	-	-	29 / 12	-
1/8-27 NPT	-	-	360 430	-	-	32 / 14	-
1/8-27 NPT	-	-	-	362 034	-	3 / 2	-
1/8-27 NPT	-	-	-	-	362 002*	1 / 2	-
1/8-27 NPT	11.4 PSI	360 025	-	-	-	30 / 15	-
1/8-28 BSP	-	360 081*	-	-	-	29 / 62	-
1/4-18 NPT	-	360 021	-	-	-	29 / 20	-
M10 x 1K	-	360 015	-	-	-	29 / 10	-
M10 x 1K	7.0 PSI	360 023	-	-	-	30 / 9	-
M10 x 1K	29.6 PSI	360 033	-	-	-	30 / 41	-
M12 x 1.5	-	360 016	-	-	-	29 / 13	X
M12 x 1.5	7.0 PSI	360 024	-	-	-	30 / 22	X

Table 6: 350 PSI / 25 bar (10-180 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT	-	-	360 431**	-	-	38 / 3	-
1/8-27 NPT	-	-	-	362 035*	-	4 / 1	-
1/8-27 NPT	-	-	-	-	362 003*	2 / 1	-
3/8-18 NPT	-	-	360 432*	-	-	38 / 2	-
3/8-18 NPT	-	-	-	-	362 007*	2 / 2	-
M14 x 1.5	-	-	360 442**	-	-	38 / 1	X

Table 7: 400 PSI / 28 bar (10-180 Ohm)

Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender
1/8-27 NPT	-	-	360 406	-	-	38 / 8
1/8-27 NPT	-	-	-	-	362 004	2 / 3

Table 8: 30 PSI / 2 bar (10-180 Ohm)

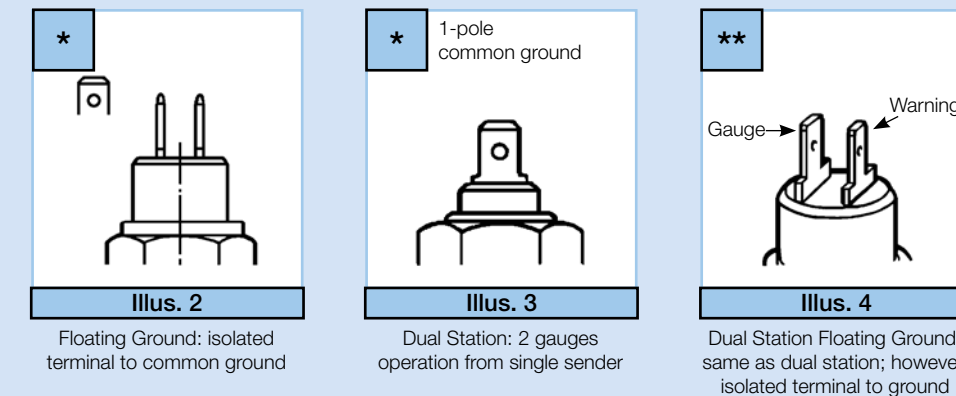
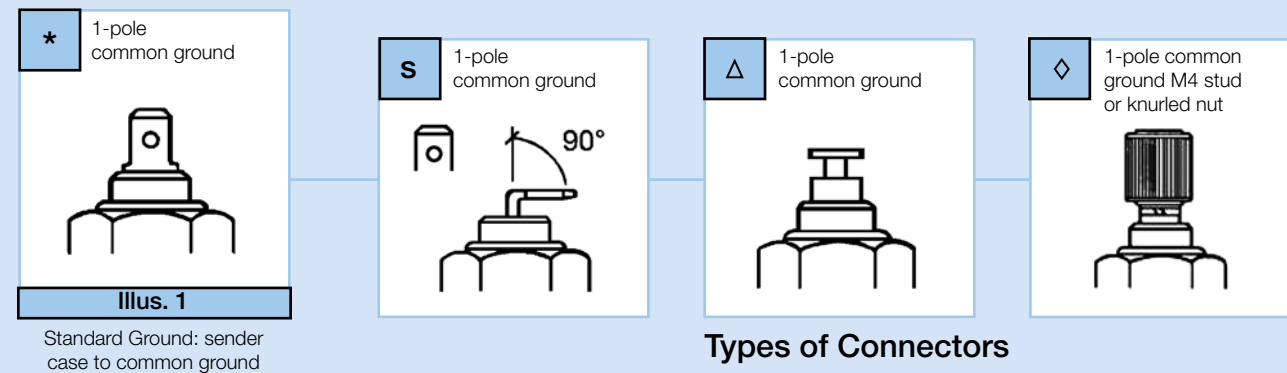
Thread	Warning Contact (illus. 3)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 1)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender
1/8-27 NPT	-	-	360 043*	-	-	32 / 25

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motor vehicles and boats only. VDO mechanical oil pressure senders are not suitable for use in aircraft or any other purposes.

Temperature Senders

Temperature Senders



Connection Key

- * Straight .250" spade terminal
- ◇ 4 mm screw stud
- S 90° angle .250" spade terminal
- Δ 56 Series "Packard" female terminal, unsealed w/ terminal housing
- ** Gauge .250" spade terminal; WARNING: .187" spade terminal

Table A: 250° F / 120° C

Thread	Terminal Type	Warning Contact (illus. 4)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 3)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT		-	323 095	-	-	-	801 / 5 / 1 or 151	-
1/4-18 NPT	*	-	323 420	-	-	-	801 / 1 / 9	-
1/4-18 NPT	*	-	-	323 477	-	-	805 / 1 / 7	-
1/4-18 NPT	*	-	-	-	325 001	-	801 / 2 / 1	-
1/4-18 NPT	*	-	-	-	-	325 002	805 / 3 / 1	-
3/8-18 NPT	*	-	323 094	-	-	-	801 / 1 / 7	-
3/8-18 NPT		-	323 421	-	-	-	801 / 1 / 38 or 118	-
3/8-18 NPT	*	-	-	323 479	-	-	805 / 1 / 5	-
3/8-18 NPT	*	-	-	-	325 008	-	801 / 2 / 4	-
3/8-18 NPT	*	-	-	-	-	325 007	805 / 3 / 3	-
1/2-14 NPT	*	-	323 093	-	-	-	801 / 1 / 10	-
1/2-14 NPT		-	323 419	-	-	-	801 / 1 / 16 or 116	-
1/2-14 NPT	**	205° F ± 5° F	323 098	-	-	-	803 / 1 / 19	-
1/2-14 NPT	**	217° F ± 5° F	323 099	-	-	-	803 / 1 / 25 or 315	-
1/2-14 NPT	**	230° F ± 5° F	323 100	-	-	-	803 / 1 / 32	-
1/2-14 NPT	*	-	-	323 478	-	-	805 / 1 / 4 or 514	-
5/8-18 NF-3	**	209° F ± 5° F	323 026	-	-	-	803 / 1 / 2	-
5/8-18 UNF	*	-	323 422	-	-	-	801 / 1 / 8	-
5/8-18 UNF	*	-	-	-	-	325 003	805 / 3 / 2	-
5/8-18 UNF	*	-	-	323 483	-	-	805 / 1 / 2	-
M10 x 1	Δ	-	323 088	-	-	-	801 / 17 / 1	X
M14 x 1.5		-	323 416	-	-	-	801 / 1 / 26	X
M14 x 1.5	*	-	-	323 425	-	-	805 / 1 / 1	X
M16 x 1.5	**	203° F ± 5° F	323 028	-	-	-	803 / 1 / 7	X
M16 x 1.5		-	323 417	-	-	-	801 / 1 / 29	X
M18 x 1.5	*	-	323 418	-	-	-	801 / 1 / 22	X

Senders available in bulk, please contact customer service for part number and detail.

Table B: 300° F / 150° C

Thread	Terminal Type	Warning Contact (illus. 4)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 3)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT		-	323 057	-	-	-	801 / 9 / 1 or 191	-
1/4-18 NPT		-	323 058	-	-	-	801 / 4 / 17	-
1/4-18 NPT	*	-	-	323 485	-	-	805 / 3 / 2	-
3/8-18 NPT	*	-	323 059	-	-	-	801 / 4 / 15 or 145	-
1/2-14 NPT		-	323 060	-	-	-	801 / 4 / 6	-
1/2-14 NPT	**	250° F ± 5° F	323 120	-	-	-	803 / 2 / 15	-
5/8-18 UNF		-	323 061	-	-	-	801 / 4 / 9 or 149	-
M10 x 1		-	323 423	-	-	-	801 / 9 / 3	X
M12 x 1.5		-	323 092	-	-	-	801 / 10 / 3	X
M14 x 1.5	S	-	323 055	-	-	-	801 / 12 / 2	X
M16 x 1.5	S	-	323 056	-	-	-	801 / 12 / 1	X
M18 x 1.5	S	-	323 064	-	-	-	801 / 12 / 3	X
M22 x 1.5	S	-	323 066	-	-	-	801 / 12 / 4	X

Table C: 400° F / 200° C

Thread	Terminal Type	Warning Contact (illus. 4)	Standard Ground (illus. 1)	Floating Ground (illus. 2)	Dual Station (illus. 3)	Dual Station Floating Ground (illus. 2)	# Stamped on Sender	Washer Required
1/8-27 NPT		-	323 050			(Long probe, 5/8" long) Ford	801 / 13 / 1 or 131	-
1/8-27 NPT		-	323 086			(Short probe, 3/8" long) GM	801 / 18 / 1 or 181	-
M10 x 1.5		-	323 091	-	-		801 / 3 / 1	X
M10 x 1		-	323 090	-	-		801 / 3 / 2	X

Heavy-Duty Pressure Switches

VDO Heavy-Duty Pressure Switches provide an economical and reliable choice for a multitude of pressure switch applications. Available in a variety of part numbers to cover most commonly demanded set points. Optional set points may also be field set to meet customer requirements.

Our Heavy Duty Pressure Switches are compact and compatible with a wide variety of fluids, making them ideal for most engine, brake, hydraulic and air system applications. All switches are provided with an insulated ground terminal to assure a quality ground circuit.

Normally Open—single circuit; 2 terminals, insulated ground

Range	Single Pack Part No.	10 Pack Part No.
4 PSI	230 404	230 404B
15 PSI	230 415	230 415B
60 PSI	230 460	230 460B

Normally Closed—single circuit; 2 terminals, insulated ground

Range	Single Pack Part No.	10 Pack Part No.
4 PSI	230 504	230 504B
15 PSI	230 515	230 515B
60 PSI	230 560	230 560B

Dual Circuit—normally open, normally closed, insulated ground

Range	Single Pack Part No.	10 Pack Part No.
4 PSI	230 604	230 604B
15 PSI	230 615	230 615B
60 PSI	230 660	230 660B

Overall dimensions: 2.52" (64mm) L X 1.47" (37mm) W

Heavy-Duty Pressure Switch Technical Specifications:

Normally Open: Contacts open until pressure rises which then completes the circuit.

Normally Closed: Contacts closed until pressure rises which then breaks the circuit.

Direct action blade contact pressure switches with adjustable contact ranges:

4-7 PSI +/- 1; 14-24 PSI +/- 3; 51-90 PSI +/- 7

Contacts: Silver alloy

Electrical Ratings

Resistive: 15 Amp-6 VDC

Operating Pressure (Set Point Range)

Resistive: 8 Amp-12 VDC

4-24 PSI = 150 PSI 25-90 PSI = 250 PSI

Resistive: 4 Amp-24 VDC

Proof Pressure: 500 PSI

Inductive: 1 Amp-120 VAC

Burst Pressure (Set Point Range)

Inductive: 0.5 Amp-240 VAC

4-24 PSI = 750 PSI 25-90 PSI = 1,250 PSI

Temperature Range: -40° F to 250° F

Base: Steel plated

Diaphragm: Polyimide film

Terminals: #8-32 screws

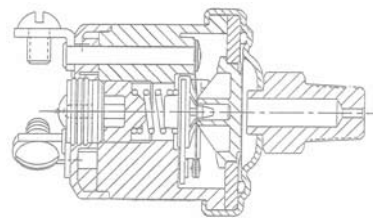
Cover: Glass reinforced polyester

Thread Size: 1/8-27 NPT

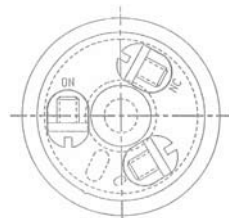
Warning Notice: VDO mechanical oil pressure senders are not to be used with any type of fuel application. VDO mechanical oil pressure senders may be used in motor vehicles and boats only. VDO mechanical oil pressure senders are not suitable for use in aircraft or any other purposes.

NO OTHER USE OR APPLICATION IS RECOMMENDED. ANY OTHER USE OR APPLICATION WILL AUTOMATICALLY VOID ANY WARRANTY.

VDO AUTOMOTIVE WILL NOT BE RESPONSIBLE FOR THE IMPROPER USE OF THE MECHANICAL OIL PRESSURE SENDERS.



(2 terminal configuration)



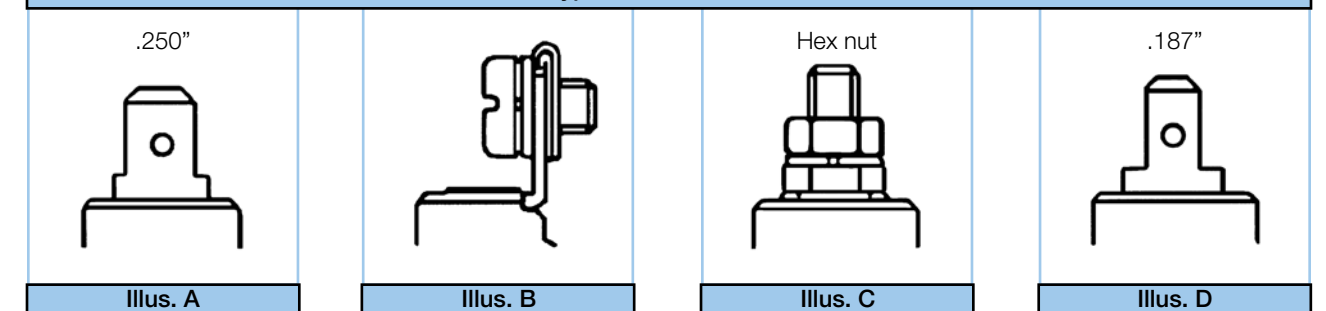
(3 terminal configuration)

Temperature Switches

Temperature Switches

Make Point C° / F°	Thread	Max Temp C° / F°	Conn. Illus.	L (mm)	Ø (mm)	Single Pack Part No.	10 Pack Part No.
195 +/- 10 / 383 +/- 18	M10 x 1.5	250 / 482	C	38.5	6.9	232 020	232 020B
170 +/- 5 / 338 +/- 9	M10 x 1.5	220 / 428	C	38.5	6.9	232 002	232 002B
150 +/- 5 / 302 +/- 9	M10 x 1.5	200 / 392	C	38.5	6.9	232 006	232 006B
145 +/- 5 / 293 +/- 9	M10 x 1.5	210 / 410	C	38.5	6.9	232 003	232 003B
130 +/- 10 / 275 +/- 18	M10 x 1.5	180 / 356	C	38.5	6.9	232 021	232 021B
125 +/- 5 / 257 +/- 9	M10 x 1.5	155 / 311	C	38.5	6.9	232 022	232 022B
120 +/- 3 / 248 +/- 5	3/4-16 UN	150 / 302	A	29	10	232 018	232 018B
120 +/- 3 / 248 +/- 5	1/2-14 NPTF	130 / 266	B	29	10	232 010	232 010B
110 +/- 3 / 230 +/- 5	M14 x 1.5	160 / 320	A	29	10	232 011	232 011B
110 +/- 3 / 230 +/- 5	M10 x 1	150 / 302	C	33	6.9	232 009	232 009B
105 +/- 3 / 221 +/- 5	M14 x 1	150 / 302	C	29	10	232 016	232 016B
105 +/- 3 / 221 +/- 5	1/2-14 NPTF	120 / 248	A	29	10	232 005	232 005B
105 +/- 3 / 221 +/- 5	3/8-27 NPTF	120 / 248	C	33	6.9	232 008	232 008B
105 +/- 3 / 221 +/- 5	3/8-18 NPTF	120 / 248	D	29	10	232 019	232 019B
103 +/- 3 / 217 +/- 5	1/2-14 NPTF	120 / 248	A	29	10	232 015	232 015B
103 +/- 3 / 217 +/- 5	3/8-18 NPTF	120 / 248	A	29	10	232 017	232 017B
95 +/- 3 / 203 +/- 5	1/2-14 NPTF	120 / 248	A	29	10	232 012	232 012B
96 +/- 3 / 205 +/- 5	1/8-27 NPTF	120 / 248	C	33	6.9	232 007	232 007B
90 +/- 3 / 194 +/- 5	M10 x 1.5	120 / 248	C	38.5	6.9	232 001	232 001B
70 +/- 3 / 158 +/- 5	M14 X 1.5	120 / 248	A	29	10	232 013	232 013B

Types of Connections



Temperature Switch Technical Specifications:

Switching Capacity: 1.2W to 3W, non-inductive for monitoring various mediums

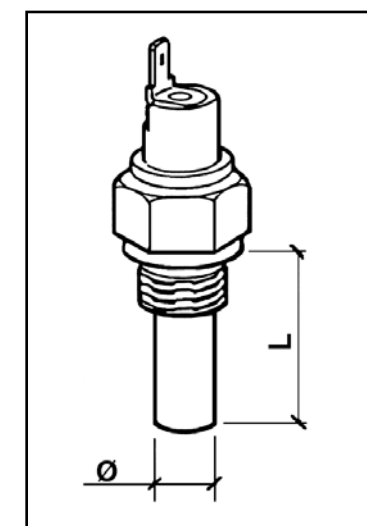
Normally Open, Single Circuit, Standard Ground Systems

Rated Voltage: 6V to 24V

Type of Contact: SS = contact close as temperature rises

Break Point: 5° C max. below make point

Contacting Mode: Slow-acting



Fuel and Water Level Senders

Plated Steel Construction

Designed for severe duty use, each of these senders contains an SAE standard five hole metal mounting flange and body components which can be adjusted from 6" to 23" tank depth. Adaptable to right hand or left hand swing arm. Each contains thick film resistor technology for greater resistance to wear associated with standard wire wound units. Each kit contains neoprene mounting gasket and mounting screws.

For tanks without flange mounting holes our optional tank mounting kit may be used.

Composite Construction

Our newest and most economical line of adjustable senders contain SAE standard five hole configuration and thick film resistor technology. These senders also are available with low fuel warning contact. Sender mounting gasket and hardware is included when bought in single pack version only.

Table 9: Fuel Level Senders (10–180 Ohm)

Description	Type	Tank Depth Min (inches)	Tank Depth Max (inches)	Voltage	Single Pack Part No.	Bulk Pack Part No.
Plated Steel Construction						
10–180 Ohm, without low fuel warning contact	Lever Arm	6	23	6–24	226 001	226 001B
10–180 Ohm, without low fuel warning contact, with mounting kit	Lever Arm	6	23	6–24	226 002	226 002B
Composite Construction						
10–180 Ohm, with low fuel warning contact	Lever Arm	6	15 3/4	6–24	226 162	226 162B
10–180 Ohm, without low fuel warning contact	Lever Arm	6	15 3/4	6–24	226 168	226 168B

Table 10: Fuel Level Senders (240–33 Ohm)

Description	Type	Tank Depth Min (inches)	Tank Depth Max (inches)	Voltage	Single Pack Part No.	Bulk Pack Part No.
Plated Steel Construction						
240–33 Ohm, without low fuel warning contact	Lever Arm	6	23	6–24	226 007	226 007B
Composite Construction						
240–33 Ohm, with low fuel warning contact	Lever Arm	6	15 3/4	6–24	226 163	226 163B
240–33 Ohm, without low fuel warning contact	Lever Arm	6	15 3/4	6–24	226 169	226 169B

Table 11: Fuel Level Senders (0–90 Ohm)

Description	Type	Tank Depth Min (inches)	Tank Depth Max (inches)	Voltage	Single Pack Part No.	Bulk Pack Part No.
Plated Steel Construction						
0–90 Ohm, without low fuel warning contact	Lever Arm	6	23	6–24	226 008	226 008B
Composite Construction						
0–90 Ohm, with low fuel warning contact	Lever Arm	6	15 3/4	6–24	226 164	226 164B
0–90 Ohm, without low fuel warning contact	Lever Arm	6	15 3/4	6–24	226 170	226 170B

Bulk pack fuel senders do not include mounting gasket. Composite construction fuel senders must be installed using mounting kit 600 408.



Composite Construction Sender



Plated Steel Construction Sender



Tubular Sender

Fuel and Water Level Senders

Table 12: Fuel Level Senders (90–0 Ohms)

Our tube senders contain an SAE standard five hole metal flange. These senders are ideal in applications where vehicle or equipment movement causes severe fuel sloshing and premature sender failure is a problem. The float, attached to resistive wires, is captive within the tube which limits exposure to fuel slosh thereby substantially increasing

sender life. These senders are well suited for instances where tank dimensions do not allow for swing arm type senders. Each sender is supplied with a neoprene mounting gasket. For tanks without flange mounting holes, our optional tank mounting kit may be used.

Length (inches)	Length (mm)	Reference No.	Single Pack Part No.	Bulk Pack Part No.
9.90	251.5	82/6/97	224 062	224 062B
11.00	279.5	82/7/22	224 055	224 055B
12.22	310.5	82/5/136	224 063	224 063B
14.6	372	82/7/4	224 065	224 065B
15.93	404.5	82/5/142	224 054	224 054B
17.07	433.5	82/5/98	224 066	224 066B
19.63	498.5	82/5/117	224 067	224 067B
21.32	541.5	82/7/58	224 003	224 003B
23.48	596.5	82/7/17	224 069	224 069B
27.22	691.5	82/5/11	224 004	224 004B
31.00	787.5	82/5/72	224 049	224 049B
32.9	835	82/5/34	224 051	224 051B
5.9	150	224-011-000-015X	224 215	224 215B
6.3	160	224-011-000-016X	224 216	224 216B
6.7	170	224-011-000-017X	224 217	224 217B
7.1	180	224-011-000-018X	224 218	224 218B
7.5	190	224-011-000-019X	224 219	224 219B
7.9	200	224-011-000-020X	224 220	224 220B
8.3	210	224-011-000-021X	224 221	224 221B
8.7	220	224-011-000-022X	224 222	224 222B
9.1	230	224-011-000-023X	224 223	224 223B
9.4	240	224-011-000-024X	224 224	224 224B
9.8	250	224-011-000-025X	224 225	224 225B

Length (inches)	Length (mm)	Reference No.	Single Pack Part No.	Bulk Pack Part No.
10.2	260	224-011-000-026X	224 226	224 226B
10.6	270	224-011-000-027X	224 227	224 227B
11.0	280	224-011-000-028X	224 228	224 228B
11.4	290	224-011-000-029X	224 229	224 229B
11.8	300	224-011-000-030X	224 230	224 230B
12.2	310	224-011-000-031X	224 231	224 231B
12.6	320	224-011-000-032X	224 232	224 232B
13.0	330	224-011-000-033X	224 233	224 233B
13.4	340	224-011-000-034X	224 234	224 234B
13.8	350	224-011-000-035X	224 235	224 235B
14.2	360	224-011-000-036X	224 236	224 236B
14.6	370	224-011-000-037X	224 237	224 237B
15.0	380	224-011-000-038X	224 238	224 238B
15.4	390	224-011-000-039X	224 239	224 239B
15.7	400	224-011-000-040X	224 240	224 240B
17.7	450	224-011-000-045X	224 245	224 245B
19.7	500	224-011-000-050X	224 250	224 250B
21.7	550	224-011-000-055X	224 255	224 255B
23.6	600	224-011-000-060X	224 260	224 260B
25.6	650	224-011-000-065X	224 265	224 265B
27.6	700	224-011-000-070X	224 270	224 270B
29.5	750	224-011-000-075X	224 275	224 275B
31.5	800	224-011-000-080X	224 280	224 280B

Table 13: Fresh Water Level Senders

Constructed of durable stainless steel, these senders are suitable for fresh water applications. Senders are adjustable

and use thick film resistor technology. Complete mounting kit is supplied with each sender.

Description	Type	Tank Depth Min (inches)	Tank Depth Max (inches)	Voltage	Single Pack Part No.	10 Pack Part No.
10–180 Ohm, without warning contact, Stainless Steel	Lever	8	24	6–24	226 452	226 452B

Speedometer and Tachometer Senders

Generator Senders

For use with VDO speedometers and tachometers designated as generator-type (4 pulses per revolution).

Senders w/o odometer revolution counter terminal (2 terminals)

Description	Part No.
7/8"-18 thread	340 001
M22 x 1.5 thread	340 002



340 001

Senders w/ odometer revolution counter terminal (3 terminals)

Description	Part No.
7/8"-18 thread	340 008
M22 x 1.5 thread	340 007



340 060

Drive Keys for generator senders listed above

Description	Part No.
.152"-tang	340 060
.187"-tang	340 061
.203"-tang	340 062
.104"-square	340 065



340 020

Inductive / Magnetic Pick-Up Senders

For inductive and programmable speedometers and tachometers.

Description	Part No.
2" (51mm) long, 3/4"-16 thread	340 020



340 011

Hall-Effect Senders

For electronic, programmable speedometers, 7/8"-18 thread, 16 pulse.

Description	Part No.
Standard, GM	340 011
GM, through-drive, for cruise control hook-up	340 012
Ford, plug-in	340 013
Ford, plug-in, through-drive	340 014



340 013

Instrument Accessories and Service Parts

Tubing Kits

Description	Fitting Size	Part No.
0-150 PSI nylon tubing (6')	1/8"-27 and 1/4"-18 NPT adapters	150 851
0-150 PSI nylon tubing (16')	1/8"-27 and 1/4"-18 NPT adapters	150 855
0-400 PSI copper tubing (6')	1/8"-27 and 1/4"-18 NPT adapters	150 856

Warning Notice: Tubing Kits are not for use on any aircraft, fuel, or brake applications (vacuum, hydraulic or air).



Nylon Tubing Kits

Copper Tubing Kits

Universal Bushing Kits

Inside diameter 1/8"-27 NPT, for use with all pressure and temperature senders.

Description	Part No.
Includes 1/4"-18, 3/8"-18, and 1/2"-14 bushings	240 903
Includes M16 x 1.5, M14 x 1.5, M12 x 1.0, M10 x 1.0, 1/8" x 28 BSP	240 904D



Universal Bushing Kit

Adapters and Fittings

Description	Part No.
Male 1/8"-27 NPT	240 855
Male M10 x 1	240 850
Weld-on Adaptor	240 863
1/8" male to 1/8" female Angled Brass Adaptor	240 828
Adaptor M10 Right Angle Oil Pressure Adaptor	240 041
Remote Hose ADP Kit M10 x 1	150 752



T-Adaptors

Anti-Glare Rings

Description	Part No.
2 pk. for 52mm gauge	240 005



Anti-glare Rings

Safety Mount Brackets

for 2 1/16" (52mm) dia instruments.

Made of a flexible, rubber material for cockpit safety. Matte black.

Description	Dimensions (H x D x L)	Part No.
1 opening	3 7/8" x 1 1/4" x 2 1/2" (98 mm x 32 mm x 64 mm)	240 802
2 openings	3 7/8" x 1 1/4" x 4 7/8" (98 mm x 32 mm x 124 mm)	240 803
3 openings	3 7/8" x 1 1/4" x 7 1/2" (98 mm x 32 mm x 191 mm)	240 804



Safety Mount Brackets

Mounting Cups

Steel mounting cups with smooth black or chrome finishes.

Description	Chrome Part No.	Black Part No.
For 2 1/16" (52mm) dia gauge	240 017*	240 016*
For 3 3/8" (85mm) dia gauge	240 019	240 018

Will not work with 2 1/16" (52mm) dia clocks, tachometers, outside temp. gauges or pyrometers.



Mounting Cups

Instrument Accessories and Service Parts

Adjustable Mounting Cups

In durable ABS plastic with matte black finish.

Description	Part No.
For all 2 1/16" (55mm) dia electrical gauges, except outside temp. gauge, pyrometer, clock, ammeter and 2 1/16" (55mm) dia tach.	240 100
2 1/16" (55mm) dia, long version for outside temp. gauge, pyrometer, clock, ammeter and 2 1/16" (55mm) dia tach.	240 101



Adjustable Mounting Cups

Mounting Brackets for 2 1/16" (52mm) dia instruments

VDO mounting brackets are metal with smooth black or chrome finishes. 1, 2, and 3 opening units.

Description	Dimensions (H x D)	Chrome Part No.	Black Part No.
1 opening	2 7/8" x 2 11/16" (73mm x 68mm)	240 034	240 027
2 openings	2 7/8" x 5 3/16" (73mm x 132mm)	240 035	240 028
3 openings	2 7/8" x 7 1/2" (73mm x 205mm)	240 036	240 029



Mounting Brackets

Instrument Panel Hole Covers

Description	Single Pack Part No.	10 Pack Part No.
2 1/16" (52mm) dia	240 864	240 864B
3 3/8" (85mm) dia	240 866	240 866B

Reducing Rings

VDO's matte black mounting rings permit the installation of smaller units in larger existing dashboard openings.

Description	Part No.
From 2 3/8" to 2 1/16" (60mm x 52mm)	600 851
From 3 3/8" to 3 1/8" (86mm x 79mm)	600 885



Instrument Panel Hole Cover

Position Indicator Senders

For use with VDO 12 / 24V gauges.

Description	Part No.
Single station transmitter, for operating one VDO indicator	440 003
Dual station transmitter, for operating two VDO indicators from one sender	440 004
Installation kit and arm assembly	440 050
Replacement arm	440 100



440 003

Instrument Accessories and Service Parts

Acoustical Warning Alarm, 2 1/16" (52mm) dia

Description	Terminal	Voltage	Single Pack Part No.	Bulk Pack Part No.
Piezo Buzzer	.250" Spade	12 / 24	03 230 702D	03 230 702



Acoustical Warning Alarm

Analog Instrument Wiring Harnesses and Accessories

Description	Part No.
6 Instrument Wire Harness w/ insulated connectors for VDO Instruments	240 022
Pyrometer Extension Cable (30 ft.)	240 092
6 Pin Tach/Speedo Connector with terminal end	240 053
8 Pin connector for Speedometer/Tachometer with hourmeter	240 024
8 Pin connector for Speedometer/Tachometer with hourmeter / 100 pk	240 024B
100 pk .25" Blade Terminals	240 045
Ammeter Wire Kit	240 021
Universal 1 Instrument Wire Kit	240 023
3-Prong Instrument connector w/ terminals	240 026
3-Prong Instrument connector w/o terminals	600 814
Housing w/ crimp connectors, for use on Vision and Cockpit International	240 025
Housing w/o crimp connectors, for use on Vision and Cockpit International / 100 pk	240 025B



240 022

CANcockpit Harnesses

Description	Part No.
Harness Type A (Master)	A2C53041729
Harness Type B (Master to Satellite)	A2C53171895
Harness Type C (Satellite to Satellite)	A2C53041730



240 026

CANcockpit Harness Components

Description	Part No.
Pin Housing for 26 Pin Connector	X11-602-000-001
Coupling for Pin Housing (26 Pin Connector)	X11-602-000-002
Pin for 26 Pin Connector (Master)	X11-602-000-003
Pin Locking for 26 Pin Housing (Master)	X11-602-000-004
Bracket for Coupling 26 Pin Housing (Master)	X11-602-000-005
4 pin connector for master	X11-602-000-006
Pin for 4+6 pin connector	X11-602-000-007
6 pin connector for satellite	X11-602-000-008

Instrument Accessories and Service Parts

Stud Mounting Kits

For converting Spin-Lok™ mounted instruments to stud type mounting.

Gauge Diameter	Part No.
2 1/16" (52mm)	600 402
3 1/8" (80mm), 3 3/8" (85mm)	600 401

Severe Duty Flush Mounting Kits

To flush mount Severe Duty Instruments from behind an instrument panel. Kit works with Severe Duty instruments only.

Description	Part No.
Severe Duty flush mount kit, 3 3/8" (85mm)	600 409
Severe Duty flush mount kit, 2 1/16" (52mm)	600 410

Replacement Spin-Lok™ Mounting Rings

Gauge Diameter	Part No.
2 1/16" (52mm)	600 404
3 1/8" (80mm)	600 405
3 3/8" (85mm)	600 406

Optional Black Square Bezels (Severe Duty only)

Description	Part No.
For 2 1/16" (52mm)	600 001
For 3 3/8" (85mm)	600 002

Fuel Sender Service Parts

Description	Part No.
Replacement float for lever arm type sender	600 601
Replacement neoprene gasket for fuel and water senders	226 053
SAE 5 hole mounting flange kit	226 451
Composite fuel sender mounting kit	600 408



600 402



Spin-Lok™ Mounting Rings



Black Square Bezels



600 601

Light Bulbs and Sockets

Type A (fits sockets #600 813, #600 816 and #600 817)

Description	Part No.
9/32" (7mm), 12V, 2W	600 802
9/32" (7mm), 24V, 3W	600 807

Type B: (fits sockets #600 818 and #600 819)

Description	Part No.
11/32" (9mm), 12V, 2W	600 804
11/32" (9mm), 12V, 4W	600 806

Type C: (fits socket #600 821)

Description	Part No.
3/8" (10mm), 12V, 2W	600 820

Type D (peanut type, fits socket #600 823)

Description	Part No.
Peanut bulb, 12V, 1.2W	600 809
Peanut bulb, 24V, 1.2W	600 829
Peanut bulb, 12V, 1.2W, red	600 830
Peanut bulb, 24V, 1.2W, red	600 822

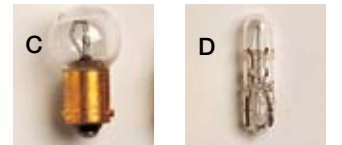
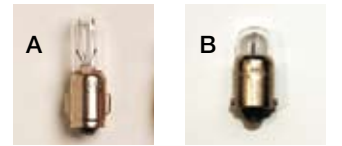
Type E: (fits socket #600 840)

Description	Part No.
Wedge-base bulb, 12V	600 815
Wedge-base bulb, 24V	600 826

Insulated Light Bulb Sockets

Description	Part No.
3/8" (10mm), uses bulb type A	600 813
15/32" (12mm), uses bulb type B	600 819
Uses wedge-type bulb E	600 840
Uses peanut-type bulb D	600 823
Illumination bulb holder, 3 3/8" (10mm), Severe Duty only	600 841
Illumination bulb holder, 2 1/16" (52mm), Severe Duty only	600 842
Severe Duty warning light bulb and socket, 12V	600 834
Severe Duty warning light bulb and socket, 24V	600 835

All bulbs sold in packages of four.



600 813 600 819



600 823 600 840

Light Bulbs and Sockets

Light Bulb Sockets

Description	Part No.
3/8" (10mm) steel, uses bulb type A	600 816
3/8" (10mm) brass, uses bulb type A	600 817
5/8" (16mm) steel, uses bulb type C	600 821
15/32" (12mm) steel, uses bulb type B	600 818



Panel Mount Warning Lights

12V snap-in warning lights with bulb. Requires 11/32" hole.

Description	Part No.
Red lens	600 844
Green lens	600 845
Yellow lens	600 846
Blue lens	600 847



Light Diffusers

The easy and convenient way to change the lighting color in your gauge. Diffuser simply slips over the existing light bulb. Sold in packages of four.

Description	Part No.
Red, Type A, 9/32" bulb	600 853
Green, Type A, 9/32" bulb	600 856
Red, Type B, 11/32" bulb	600 857
Green, Type B, 11/32" bulb	600 858
Red, Type D, "peanut" bulb	600 859
Green, Type D, "peanut" bulb	600 860
Red, Types E and C bulbs	600 861
Green, Types E and C bulbs	600 862
Blue, Types E and C bulbs	600 863



Warning Lights



Light Diffusers

Optional In-Gauge Warning Lights (Severe Duty only)

Description	Terminal	Voltage	Part No.
For volt, temp, pressure and fuel	.250" Spade	12	05 800 762
For volt, temp, pressure and fuel	.125" Spade	24	05 800 764

Technical Specifications and Dimensions

A Programmable Speedometer

Specifications
(Common to all Programmable Speedometers)

Operating Temperature: -4° F...+158° F (-20° C...+70° C)
Storage Temperature: -22° F...+185° F (-30° C...+85° C)

Illumination: 2 push-in, wedge-type lamp sockets:
 12 volt: VDO #600 815
 24 volt: VDO #600 826

Bezel Material: See product line for specific information
Lens: Window glass, clear

Dial Graphics: See product line for specific information

Connection: Tin-plated brass blade connectors (6.3 x 0.8 mm)

Mounting: Mounting clamp. Clamping range: 0 - 0.8" (0 - 20 mm).

Product Marking: Date of manufacture (Julian); part number; nominal voltage; gauge characteristics

Nominal Position: 0° to 90°-∅

Operating Voltage: 10.8 volts to 32 volts
Nominal Voltage: 12v-24v with insulated return
Current Consumption: < 100 mA, without illumination

Torque Values: For Spin-Lok™ Mounting Clamp:
 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Connections vary depending on application

Mounting Diameter = "A"
 Pushbutton Function Switch
 "A" = 3 1/8" (80 mm) or 3 3/8" (85 mm) or 4" (100 mm)

Mounting hole dimension: 3 1/8" (80 mm); or 3 3/8" (85 mm); or 4" (100 mm) Dimensions in inches (millimeters)

B Programmable Tachometers (with hourmeters)

Specifications
(Common to all Tachometers with Engine Hourmeter)

Operating Temperature: -4° F...+158° F (-20° C...+70° C)
Storage Temperature: -22° F...+185° F (-30° C...+85° C)

Illumination: 2 push-in, wedge-type lamp sockets:
 12 volt: VDO #600 815
 24 volt: VDO #600 826

Bezel Material: See product line for specific information
Lens: Window glass, clear

Dial Graphics: See product line for specific information

Connection: Tin-plated brass blade connectors (6.3 x 0.8 mm)

Mounting: Mounting clamp. Clamping range: 0 - 0.8" (0 - 20 mm).

Product Marking: Date of manufacture (Julian); part number; nominal voltage; gauge characteristics

Nominal Position: 0° to 90°-∅

Operating Voltage: 10.8 volts to 32 volts
Nominal Voltage: 12v-24v with insulated return
Current Consumption: < 100 mA, without illumination

Torque Values: For Spin-Lok™ Mounting Clamp:
 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Connections vary depending on application

Recessed Pushbutton for Setting and Adjustment

Mounting Diameter = "A"
 "A" = 3 1/8" (80 mm) or 3 3/8" (85 mm) or 4" (100 mm)

Mounting hole dimension: 3 1/8" (80 mm); or 3 3/8" (85 mm); or 4" (100 mm) Dimensions in inches (millimeters)

C Programmable Tachometers (without hourmeters)

Specifications
(Common to all Tachometers without Engine Hourmeters)

Operating Temperature: -4° F...+158° F (-20° C...+70° C)
Storage Temperature: -22° F...+185° F (-30° C...+85° C)

Illumination: 2 push-in, wedge-type lamp sockets:
 12 volt: VDO #600 815
 24 volt: VDO #600 826

Bezel Material: See product line for specific information
Lens: Window glass, clear

Dial Graphics: See product line for specific information

Connection: Tin-plated brass blade connectors (6.3 x 0.8 mm)

Mounting: Mounting clamp. Clamping range: 0 - 0.8" (0 - 20 mm).

Product Marking: Date of manufacture (Julian); part number; nominal voltage; gauge characteristics

Nominal Position: 0° to 90°-∅

Operating Voltage: 10.8 to 16 volts
Nominal Voltage: 12v with insulated return
Current Consumption: < 100 mA, without illumination

Torque Values: For Spin-Lok™ Mounting Clamp:
 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Connections vary depending on application

Recessed Potentiometer For Fine Calibration

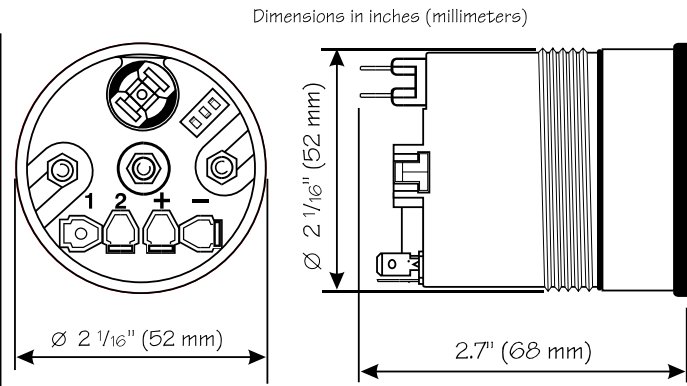
Mounting Diameter = "A"
 "A" = 3 1/8" (80 mm) or 3 3/8" (85 mm) or 4" (100 mm)

Mounting hole dimension: 3 1/8" (80 mm); or 3 3/8" (85 mm); or 4" (100 mm) Dimensions in inches (millimeters)

Technical Specifications and Dimensions

D Electronic Tachometer (2 1/16" (52 mm))

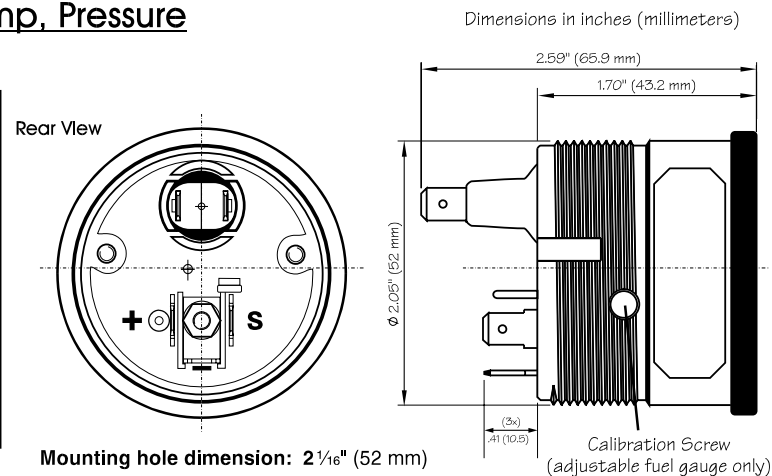
Specifications (Common to all 2 1/16" [52 mm] Tachometers)	
Operating Temperature:	-4° F...+158° F (-20° C...+70° C)
Storage Temperature:	-22° F...+185° F (-30° C...+85° C)
Illumination:	Push-In, wedge-type lamp sockets; 12 volt: VDO #600 809 24 volt: VDO #600 829
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Connection:	1/4" brass blade
Mounting:	Mounting clamp, Clamping range: 0 - 0.8" (0 - 20 mm), Or, with optional 2 brackets with 2 bolts (M4x45) and nuts (M4x10), Clamping range: 0-1/2" (0-12mm)
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0° to 90° ±
Operating Voltage:	10.8 to 16 volts
Nominal Voltage:	12v with insulated return
Current Consumption:	< 100 mA, without illumination
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)



Mounting hole dimension: 2 1/16" (52 mm)

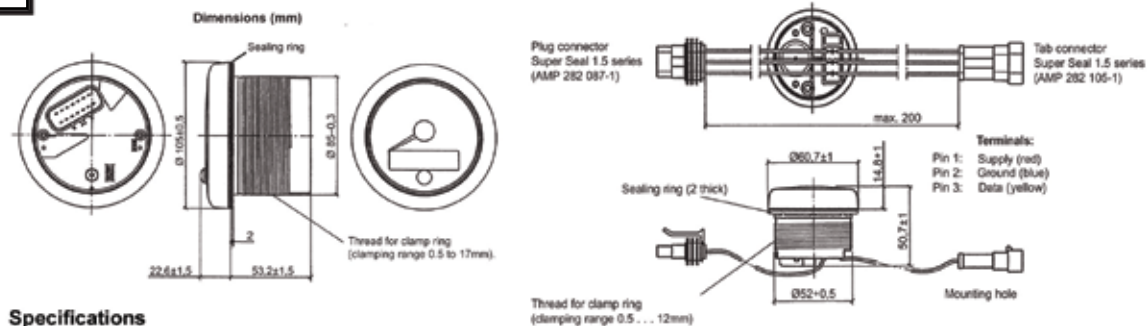
E Electric Fuel, Volt, Temp, Pressure (Spin-Lok™ clamp mount)

Specifications (Common to all Electric 2 1/16" (52 mm.) Instruments with VDO's Spin-Lok™ Mounting Clamp)	
Operating Temperature:	-22° F...+185° F (-30° C...+85° C)
Storage Temperature:	-40° F...+221° F (-40° C...+105° C)
Illumination:	Push-In wedge-base sockets, 12 volt: VDO #600 815 24 volt: VDO #600 826
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Dial Graphics:	See product line for specific information
Connection:	1/4" brass blade
Mounting:	Housing with 16 threads/inch, Class 2A fit and rotating plastic Spin-Lok™ clamp
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	NPO - 90° ±
Operating Voltage:	11-16 volts (12 v) or 21.5 - 30 volts (24 v)
Nominal Voltage:	12v or 24v, insulated return (floating ground)
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)



Mounting hole dimension: 2 1/16" (52 mm)

F Severe Link



Specifications

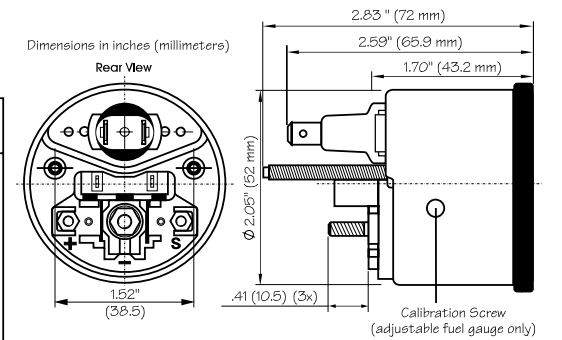
Operating Temperature: - 20°C to + 70°C
Storage Temperature: - 30°C to + 85°C
Protection: IP65 mounted (from front)
Illumination: Red LED (variable in 8 steps)
Connector on Master: Delphi GT Series (15326856)

Power Supply: 10.5 - 30V
Power Consumption:
 Master: 140 mA with illumination
 Satellite: <70 mA with illumination
Master Display LCD: 132 X 33 Dots

Technical Specifications and Dimensions

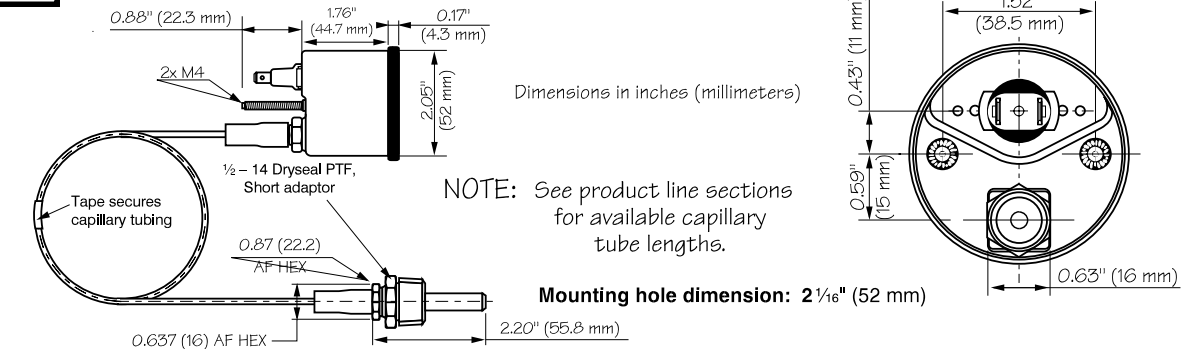
G Electric Fuel, Volt, Temp, Pressure (stud mount)

Specifications (Common to all Electric 2 1/16" (52 mm) Gauges with Stud Terminals and Stud Mounting)	
Operating Temperature:	-22° F...+185° F (-30° C...+85° C)
Storage Temperature:	-40° F...+194° F (-40° C...+90° C)
Illumination:	Push-in wedge-type lamp socket; 12 volt: VDO #600 815 24 volt: VDO #600 826
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Dial Graphics:	See product line for specific information
Connection:	M4 Stud
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0 - 90° ±
Operating Voltage:	11 - 16 volts (12v) or 21.5 - 30 volts (24v)
Nominal Voltage:	12 volts or 24 volts, insulated return (floating ground)
Torque Values:	For M4 nuts: 2.2 - 4.2 in.lb. (.25 - .47 Nm)



Mounting hole dimension: 2 1/16" (52 mm)

H Mechanical Temperature

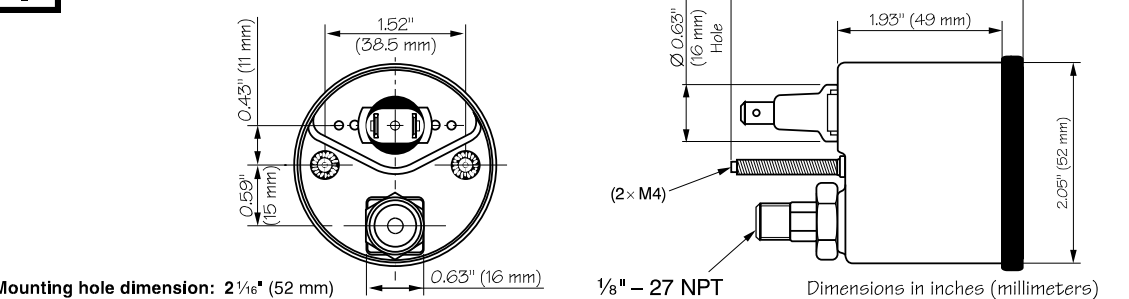


Dimensions in inches (millimeters)

NOTE: See product line sections for available capillary tube lengths.

Mounting hole dimension: 2 1/16" (52 mm)

I Mechanical Pressure



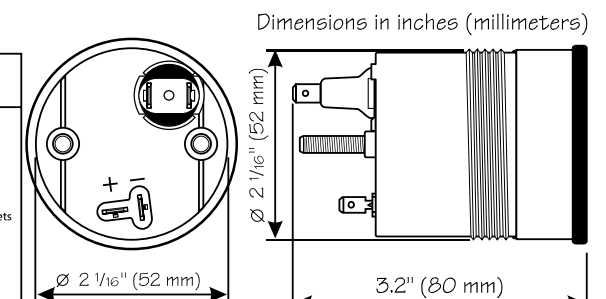
Mounting hole dimension: 2 1/16" (52 mm)

1/8" - 27 NPT

Dimensions in inches (millimeters)

J Clocks & Hourmeters (Cockpit International and Vision Lines Only)

Specifications (Common to all 2 1/16" [52 mm] Clocks and Hourmeters)	
Operating Temperature:	-4° F...+158° F (-20° C...+70° C)
Storage Temperature:	-22° F...+185° F (-30° C...+85° C)
Illumination:	Push-in, wedge-type lamp sockets; 12volt: VDO #600 815 24 volt: VDO #600 826
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Connection:	1/4" brass blade
Mounting:	Mounting clamp, Clamping range: 0 - 0.8" (0 - 20 mm), Or, with optional 2 brackets with 2 bolts (M4x45) and nuts (M4x10), Clamping range: 0-1/2" (0-12mm)
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0° to 90° ±
Operating Voltage:	10.8 volts to 32 volts
Nominal Voltage:	12v - 24v with insulated return
Current Consumption:	< 100 mA, without illumination
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)



Mounting hole dimension: 2 1/16" (52 mm)

Dimensions in inches (millimeters)

Technical Specifications and Dimensions

K Electric Fuel - Adjustable (stud mount)

Specifications	
(Common to all Electric 2 1/16" [52 mm] Gauges with Stud Terminals and Stud Mounting)	
Operating Temperature:	-22° F...+185° F (-30° C...+85° C)
Storage Temperature:	-40° F...+194° F (-40° C...+90° C)
Illumination:	Push-in wedge-type lamp socket; 12 volt: VDO #600 815
Connection:	1/2 brass blade
Bezel Material:	See product line for specific information
Dial Graphics:	See product line for specific information
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0 - 90°
Operating Voltage:	11 - 16 volts (12v) or 21.5 - 30 volts (24v)
Nominal Voltage:	12 volts or 24 volts, insulated return (floating ground)
Torque Values:	For M4 nuts: 2.2 - 4.2 in. lb. (.25 - .47 Nm)

Dimensions in inches (millimeters)

Mounting hole dimension: 2 1/16" (52 mm)

L Ammeter

Specifications	
(Common to all Ammeters)	
Operating Temperature:	-22° F...+185° F (-30° C...+85° C)
Storage Temperature:	-40° F...+194° F (-40° C...+90° C)
Illumination:	12 volt: VDO #600 815
Connection:	24 volt: VDO #600 826
Bezel Material:	See product line for specific information
Dial Graphics:	See product line for specific information
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristic
Nominal Position:	0 - 90°
Torque Values:	For M4 nuts: 2.2 - 4.2 in. lb. (.25 - .47 Nm)

Mounting hole dimension: 2 1/16" (52 mm)

Dimensions in inches (millimeters)

0.08" x 0.28" x 0.03" Tin-plated brass terminals

2 x M4

2 x M5

M5 30/60 Amp

M8 80/100 Amp

Alternator

Battery

M Shunted Ammeter

Specifications	
(Common to all 2 1/16" [52 mm] Shunted Ammeters)	
Operating Temperature:	-4° F...+158° F (-20° C...+70° C)
Storage Temperature:	-22° F...+185° F (-30° C...+85° C)
Illumination:	Push-in, wedge-type lamp sockets; 12 volt: VDO #600 809
Connection:	24 volt: VDO #600 829
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0° to 90°
Operating Voltage:	10.8 to 16 volts
Nominal Voltage:	12v with insulated return
Current Consumption:	< 100 mA, without illumination
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Mounting hole dimension: 2 1/16" (52 mm)

Dimensions in inches (millimeters)

Technical Specifications and Dimensions

N Outside Temperature

Specifications	
(Common to all 2 1/16" [52 mm] Outside Temperature Gauges)	
Operating Temperature:	-4° F...+158° F (-20° C...+70° C)
Storage Temperature:	-22° F...+185° F (-30° C...+85° C)
Illumination:	Push-in, wedge-type lamp sockets; 12 volt: VDO #600 809
Connection:	24 volt: VDO #600 829
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0° to 90°
Operating Voltage:	10.8 to 16 volts
Nominal Voltage:	12v with insulated return
Current Consumption:	< 100 mA, without illumination
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Mounting hole dimension: 2 1/16" (52 mm)

Dimensions in inches (millimeters)

O Pyrometer

Specifications	
(Common to all 2 1/16" [52 mm] Pyrometers)	
Operating Temperature:	-4° F...+158° F (-20° C...+70° C)
Storage Temperature:	-22° F...+185° F (-30° C...+85° C)
Illumination:	Push-in, wedge-type lamp sockets; 12 volt: VDO #600 809
Connection:	24 volt: VDO #600 829
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0° to 90°
Operating Voltage:	10.8 to 16 volts
Nominal Voltage:	12v with insulated return
Current Consumption:	< 100 mA, without illumination
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Mounting hole dimension: 2 1/16" (52 mm)

Dimensions in inches (millimeters)

P Cylinder Head Temperature Gauge

Specifications	
(Common to all 2 1/16" [52 mm] Cylinder Head Temperature Gauges)	
Operating Temperature:	-4° F...+158° F (-20° C...+70° C)
Storage Temperature:	-22° F...+185° F (-30° C...+85° C)
Illumination:	Push-in bulb; 12 volt: VDO #600 802
Connection:	24 volt: VDO #600 807
Bezel Material:	See product line for specific information
Lens:	Window glass, clear
Mounting Bracket:	Steel, zinc chromate plated
Mounting Nut:	Hexagon; steel, zinc chromate plated
Product Marking:	Date of manufacture (Julian); part number; nominal voltage; gauge characteristics
Nominal Position:	0° to 90°
Operating Voltage:	10.8 to 16 volts
Nominal Voltage:	12v with insulated return
Current Consumption:	< 100 mA, without illumination
Torque Values:	For Spin-Lok™ Mounting Clamp: 2.2 - 2.4 ft. lb. (3 - 8 Nm)

Mounting hole dimension: 2 1/16" (52 mm)

Dimensions in inches (millimeters)

Q Mini Hourmeter

Specifications	
(Common to all Mini Hourmeters)	
Temperature:	-40° F...+185° F (-40° C...+85° C)
Vibration Resistance:	Withstands 10 to 75 Hz at 1 to 8 g's
Terminations:	6.35 mm Male Blade Terminals
Protected From:	Alternator Load Dump, Inductive Switching and Reverse Polarity
Mounting:	Panel Mount with 2 holes (front or back)
Gauge Face:	White Characters on black background
Identification:	VDO P/N (1 763 003 213A) and description stamped on label; position of label as shown

Dimensions in millimeters

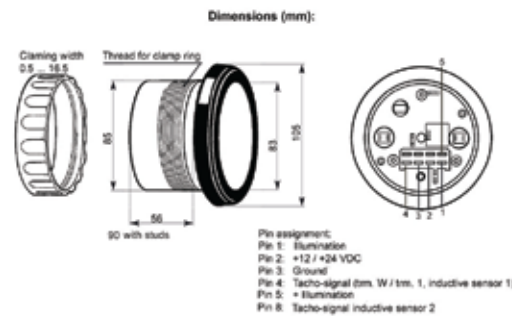
TOP VIEW

SIDE VIEW

Technical Specifications and Dimensions

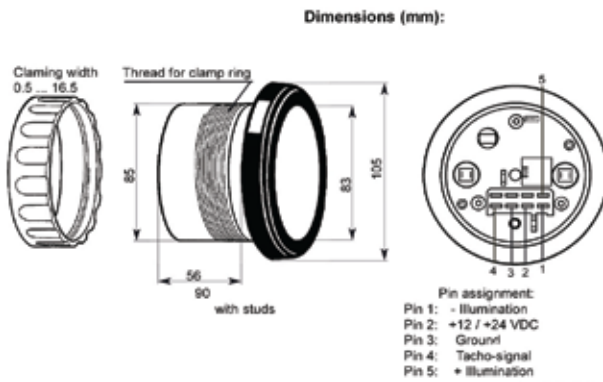
R Programmable Tachometers (with hourmeter) (Severe Duty)

Technical Data:	
Operating voltage:	12 / 24 VDC
Current consumption (without illumination):	max. 90 mA
Pickup:	Inductive sensor or:
Petrol engine:	Term. 1 ignition coil
Diesel engine:	Term. W alternator
Operating temperature:	-20°C to +70°C
Storage temperature:	-30°C to +85°C
Nominal position:	NL 0 to NL 90, DIN 16 257
Indication tolerance:	+/- 1.5% of final scale value at 14 VDC / 28 VDC, 23°C and NL 45
Protection:	IP65 DIN 40 050 from the front, after installation in acc. with IEC 529
Vibration resistance:	1g eff. max., 25Hz to 500Hz (duration 8 h)
Shock:	15g, 1.5 ms semi-sinusoidal used standards
EMC:	EN 50082-1, EN 50081-1 acc. to EMC direction 89/336/EWG
LCD:	permanent illuminated



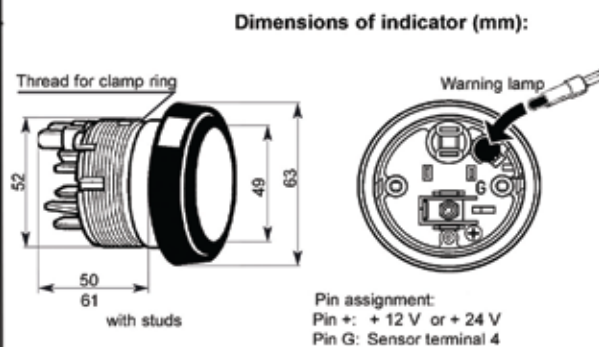
S Programmable Tachometers (without hourmeter) (Severe Duty)

Technical Data:	
Operating voltage:	12 / 24 VDC
Current consumption (without illumination):	max. 90 mA
Pickup:	Inductive sensor or:
Petrol engine:	Term. 1 ignition coil
Diesel engine:	Term. W alternator
Operating temperature:	-20°C to +70°C
Storage temperature:	-30°C to +85°C
Nominal position:	NL 0 to NL 90, DIN 16 257
Indication tolerance:	+/- 2.5% of final scale value at 14 VDC / 28 VDC, 23°C and NL 45
Protection:	IP65 DIN 40 050 from the front, after installation in acc. with IEC 529
Vibration resistance:	1g eff. max., 25Hz to 500Hz (duration 8 h)
Shock:	15g, 1.5 ms semi-sinusoidal used standards
EMC:	EN 50082-1, EN 50081-1 acc. to EMC direction 89/336/EWG



T Electric Fuel, Volt, Temp, Pressure (Severe Duty)

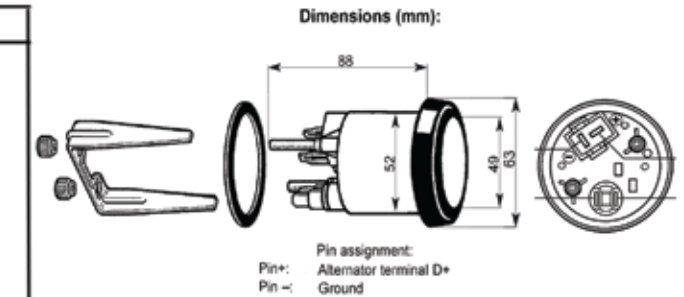
Technical Data:	
Operating voltage:	12 VDC or 24 VDC
Current consumption (without illumination):	max. 90 mA
Operating temperature:	-20°C to +70°C
Storage temperature:	-30°C to +85°C
Nominal position:	NL 0 to NL 90, DIN 16 257
Indication tolerance:	+/- 3.6° (14 V, 23°C, NL 45) +/- 4.6° (28 V, 23°C, NL 45)
Protection:	IP65 DIN 40 050 from the front, after installation in acc. with IEC 529
Vibration resistance:	1g eff. max., 25Hz to 500Hz (duration 8 h)
Shock:	15g, 1.5 ms semi-sinusoidal used standards
EMC:	EN 50082-1, EN 50081-1 acc. to EMC direction 89/336/EWG



Technical Specifications and Dimensions

U Hourmeter (Severe Duty)

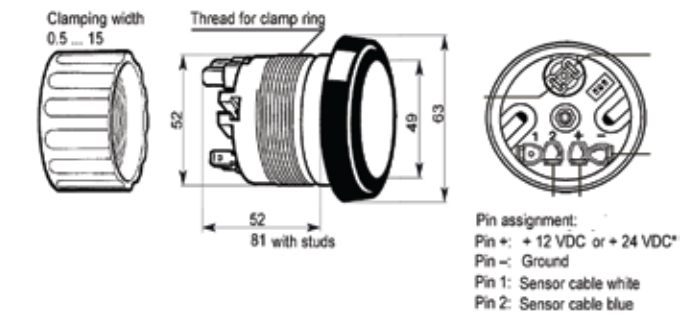
Technical Data:	
Operating voltage:	12 / 24 VDC
Current consumption (without illumination):	< 5 mA (12 V) < 15 mA (24 V)
Operating temperature:	-20°C to +70°C
Storage temperature:	-30°C to +85°C
Nominal position:	NL 0 to NL 90, DIN 16 257
Running precision:	+/- 5 sec./day at 14 VDC, 23°C and NL 45
Protection:	IP65 DIN 40 050 from the front, after installation in acc. with IEC 529
Vibration resistance:	1 g eff. max., 25Hz to 500Hz (duration 8 h)
Shock:	15 g, 1.5 ms semi-sinusoidal used standards
EMC:	EN 50082-1, EN 50081-1 acc. to EMC direction 89/336/EWG
Measuring Range	0 ... 99999.9 Std. / hours



V Pyrometer (Severe Duty)

Technical Data:	
Operating voltage:	10.8 ... 16 VDC*
Current consumption (without illumination):	< 100 mA
Operating temperature:	-20°C to +70°C
Storage temperature:	-30°C to +85°C
Indication tolerance:	+/- 2.5% of final scale value at 14 VDC, 23°C and NL 45
Nominal position:	NL 0 to NL 90, DIN 16 257
Protection:	IP65 DIN 40 050 from the front, after installation in acc. with IEC 529
Vibration resistance:	1g eff. max., 25Hz to 500Hz (duration 8 h)
Shock:	15g, 1.5 ms semi-sinusoidal used standards
EMC:	EN 50082-1, EN 50081-1 acc. to EMC direction 89/336/EWG

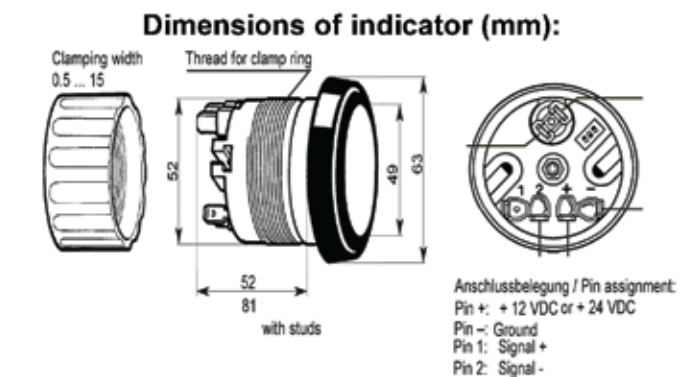
* An external compensating resistor (option) is needed when connected to 24 VDC.



W Ammeter (Severe Duty)

Technical Data (Indicator):	
Operating voltage:	10.8 ... 16 VDC*
Current consumption (without illumination):	< 100 mA
Operating temperature:	-20°C to +70°C
Storage temperature:	-30°C to +85°C
Indication tolerance:	+/- 2.5% of final scale value at 14 VDC, 23°C and NL 45
Nominal position:	NL 0 to NL 90, DIN 16 257
Protection:	IP65 DIN 40 050 from the front, after installation in acc. with IEC 529
Vibration resistance:	1g eff. max., 25Hz to 500Hz (duration 8 h)
Shock:	15g, 1.5 ms semi-sinusoidal used standards
EMC:	EN 50082-1, EN 50081-1 acc. to EMC direction 89/336/EWG

* An external compensating resistor (option) is needed when connected to 24 VDC.



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