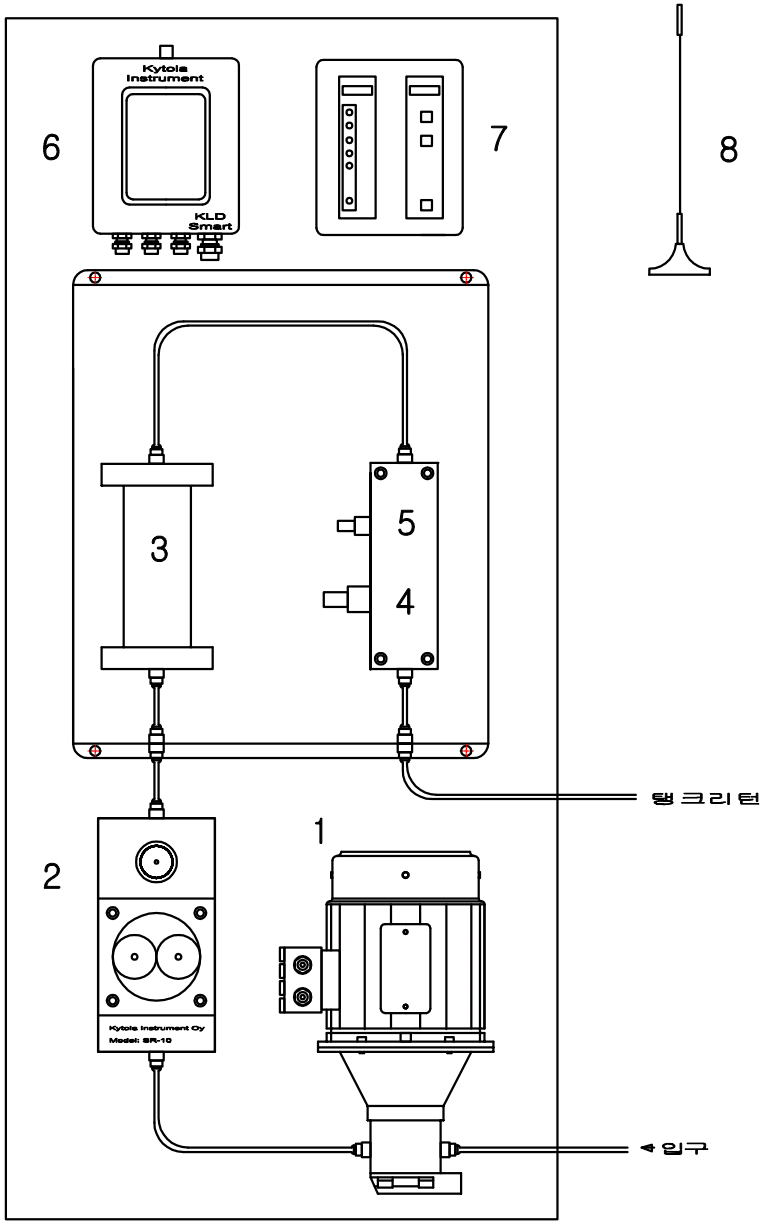


번 호	구성	모델		상세 설명
1	오일 펌프	RMF A21	Descase	8.1 l/min, 230VAC/60Hz, 단상
2	유량계	2950-10	Kytola	
3	마모 센서	DM 4500	Poseidon	
4	오일 센서	QW 3100	Poseidon	
5	점도 센서	VM 1100	Poseidon	
6	디스플레이유닛	KLD-S	kytola	
7	통신 모듈	AP 2200	Poseidon	
8	안테나	800/1900	Poseidon	

NOTES

1. 각 구성품에 대한 상세 기술자료는 카다로그 참고하시기 바랍니다.

2. 현장 여건에 따라 구성품에 대한 최종 배치는 변경될 수 있습니다.

3.펌프 흡입 라인은, 금속/비금속 마모 입자가 가장 많이 존재하는 곳으로 설치를 권고 합니다.

4. 리턴 라인 오일이 감속기 내부 낙하 시,
기포가 발생하지 않게 오일 레벨 이하로 설치를 권고 합니다.

5. 통신 모듈이나 모터에 이물질 낙하가 되지 않게 안전 커버 설치를 권고하며,
수분이나 온도가 높은 곳을 피합니다.

Name	Date	Revision	오일 모니터링 시스템	Design	Checked	Approved	Title	Description
DC Baek	June 27th. 2021	For approval		DC Baek	DC Baek	DC Baek	DWG no.	B2_FQMS_001
			B2solution Co., Ltd.				Page	
							File no.	POSCO_001

TRIDENT™ FQMS

Fluid Quality Monitoring System

Multi-sensor systems for advanced fluid quality analysis

PRODUCT OVERVIEW

Poseidon Systems offers fluid quality monitoring systems that accommodate a suite of sensors for assessing the condition of a lubricant through real-time, online measurements. Several sensor options are available to allow for customization to your application.

OIL CONDITION SENSOR

WEAR DEBRIS MONITOR

ONLINE VISCOMETER

The sensors are plumbed and wired into a 12”x12”x 6” NEMA 4 enclosure with external interfaces provided for fluid connections, power, and communications. An optional data acquisition system (Trident AP2200) handles all sensor data acquisition, storage, and relaying. Data can be directed to the Poseidon Live online data portal for trending, analysis, and automated alarm notifications or to a 3rd party historian.

BENEFITS

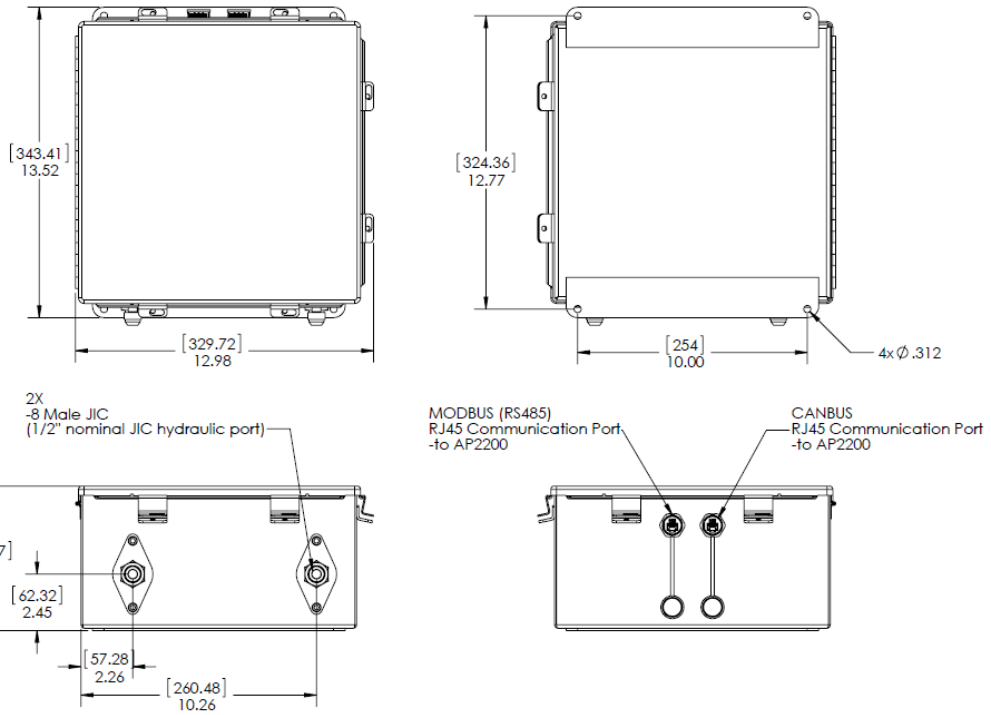
- Enable condition based fluid maintenance
- Identify equipment faults prior to failure
- Maximize equipment life
- Minimize reliance on offline analysis
- Optimize fluid drain intervals

KEY FEATURES

- Complete online fluid monitoring solution
- Easy-to-install, self-contained kit
- Optional data logger & network interface
- Customizable to user application
- In-depth fluid & system health insight

TECHNICAL SPECIFICATIONS

Fluid Temperature	-40 to 302°F (-40 to 100°C)
Working Pressure	150 psi (10.3 bar) max
Flow Rate	0.25 to 10 GPM (0.95 to 38 LPM)
Viscosity	Viscosity independent
Oil Connections	-8 JIC Male
Ingress Protection	IP67
Communications	CAN J1939 / RS485 Modbus RTU / Modbus TCP
Weight	25 lbs (11.3kg)



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www.PoseidonSys.com

POSEIDON SYSTEMS

TRIDENT ™ DM4500

Wear Debris Monitor

Real-time monitoring leads to improved asset health management

PRODUCT OVERVIEW

Poseidon Systems' Trident™ DM4500 Wear Debris Monitor is a real-time, in-line fluid sensing technology for the detection of metallic wear debris and particulates in a lubrication system. By continuously monitoring wear debris generation, the device alerts users to faults in their earliest stages, allowing for lower-cost corrective actions than conventional schedule based maintenance.

The DM4500 Wear Debris Monitor will detect, categorize (ferrous vs. non-ferrous), and size metals within a machinery lubrication system. The monitor will detect and measure particles with an estimated spherical diameter of 40 micron ferrous and 150 micron non-ferrous and larger. A wide range of output formats are available including particle type/size, approximate mass, and particle counts in user configurable bins.

The DM4500 is a standalone sensor supporting a variety of plumbing connections; JIC, SAE ORB, BSPP, and Compression fitting adapters are available. The DM4500 is also backward compatible with the TechAlert 10 (TA10) Debris Monitor.

BENEFITS

- Optimize machinery oil sample timing & maintenance intervals
- Improve asset health state awareness
- Advanced warning enables improved asset maintenance & logistics planning
- Reduce cost of unscheduled downtime

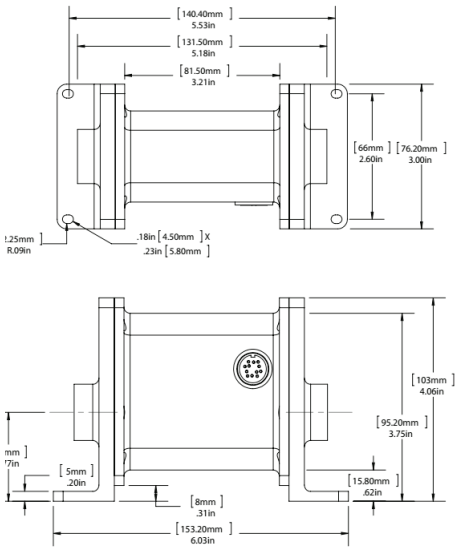
KEY FEATURES

- 40 micron ferrous & 150 micron non-ferrous debris detection ability
- Industry standard communication interface
- Mounting footprint matched to TA10 for drop-in replacement
- Particle size/mass estimates
- Volumetric flow rate estimates
- Total particle count estimation

POSEIDON SYSTEMS

TECHNICAL SPECIFICATIONS

Detection Sensitivity (Debris)	40 µm Ferrous & 150 µm Non-Ferrous Metallic Particles
Communications	RS485/RS232 Modbus RTU, Pulse Output
Oil Connection	SAE ORB Female
Ambient Temperature	-40 to 185˚F (-40 to 85˚C)
Fluid Temperature	-40 to 185˚F (-40 to 85˚C)
Volumetric Flow Rate	0.25 to 10 gpm (0.95 to 38 lpm)
Sensor Bore Diameter	0.472 inches (12 mm)
Ingress Protection	IP65
Power Supply	10-30 VDC, 300 mA
Weight	1.5 pounds (0.68 kg)
Working Pressure	150 psi (10.3Bar) Max



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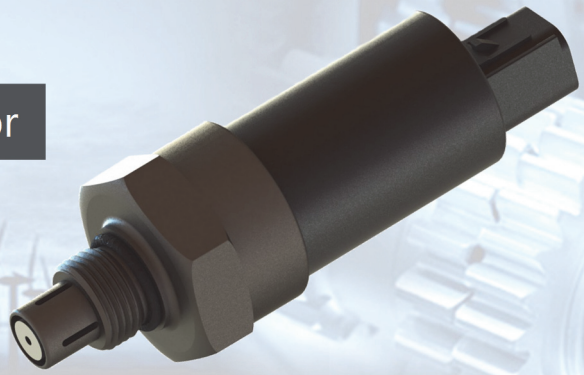
TRIDENT™ QW3100

Oil Quality and Water Contamination Monitor

Optimize lubrication maintenance practices



PRODUCT OVERVIEW

Poseidon Systems' Trident QW3100 is a real-time, in-line sensing technology for monitoring the health state of lubricating fluids. The device provides continuous insight to oil health, promoting condition-based maintenance practices such as optimized fluid drain intervals and reduced dependence on offline analysis.

The QW3100 utilizes electrochemical impedance spectroscopy (EIS) technology to measure a fluid's impedance spectrum and track its health. The impedance spectrum provides multiple condition indicators which can be used to assess the lubricant's additive package health, monitor breakdown, and identify the presence of contaminants. Additionally, an integrated water-in-oil sensor provides direct measurement of dissolved water content in the lubricant.

The QM3100 provides you with the power to improve your asset health management practices by enabling informed maintenance decisions based on real-time information.

APPLICATIONS

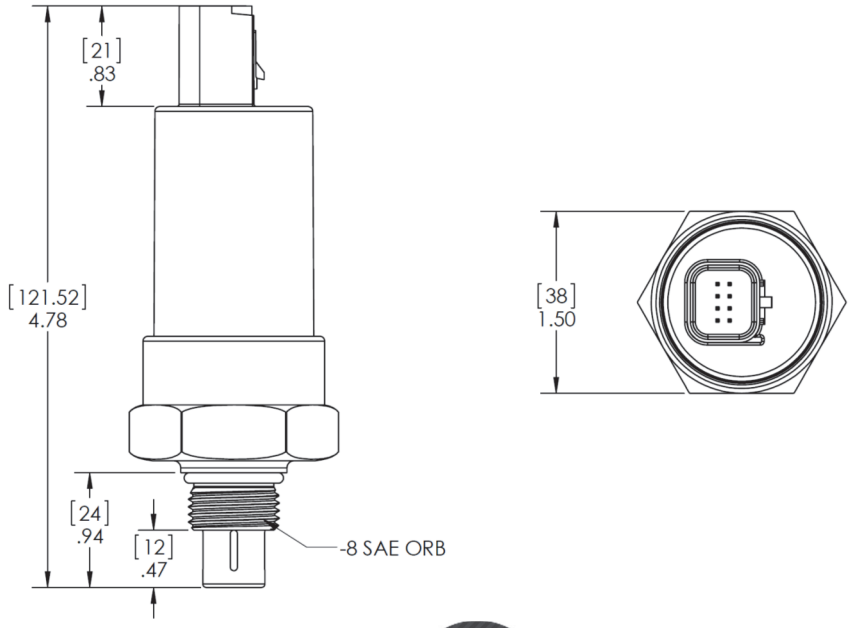
- Optimize oil drain and sampling intervals
- Improve asset health state awareness
- Identify contamination events
- Detect oil changes and top-up events
- Verify proper lubrication system maintenance
- Track water contamination levels

KEY FEATURES

- CAN-J1939 compatible
- RS485-Modbus RTU compatible
- Multi-frequency analysis
- Integrated water contamination sensor
- Small form factor, easy to install
- Supports all oil types

TECHNICAL SPECIFICATIONS

Fluid Temperature	-40 to 302°F (-40 to 150°C)
Working Pressure	150 psi (10.3 bar) max
Flow Rate	Flow rate independent
Viscosity	Viscosity independent
Water Measurement Accuracy	+/-3% RH
Port Specification	3/4”-16 or M16
Ingress Protection	IP67
Communications	CAN J1939 / RS485 Modbus RTU
Weight	0.4 lbs (0.18kg)
Power Supply	10-30 Vdc, 1.5 W max



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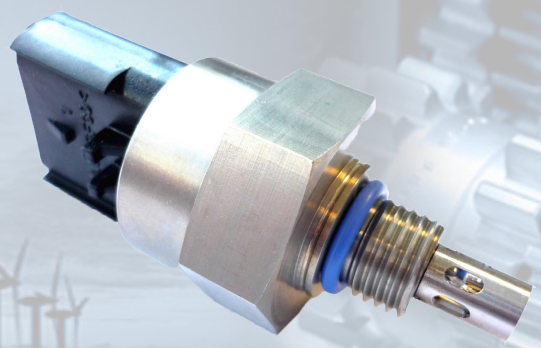
POSEIDON SYSTEMS

VM1100

Viscosity Sensor

Combines sensor and processing electronics



PRODUCT OVERVIEW

The VM1100 is a viscosity sensor that will directly and simultaneously measure the viscosity, density, and temperature of fluids. Relying on tuning fork technology, the sensor monitors the direct and dynamic relationship between multiple physical properties to determine the viscosity of fluids such as engine oil, fuel, transmission and brake fluid, hydraulic and gear oils, refrigerants and solvents.

The VM1100 provides in-line monitoring of fluids for a wide range of OEM and after market installations including fluid reservoirs, process lines and pressurized high flow conduits (e.g., engine oil gallery) for applications that include on and off highway vehicles, compressors, industrial equipment and turbines. A universal digital CAN J1939 compliant protocol provides easy to connect interface to main Host controller. A simple 4 pin connector allows for cost effective mounting options.

APPLICATIONS

- On and off highway vehicles
- Generators
- Compressors
- Industrial Equipment
- Gas & wind turbines

KEY FEATURES

- Rugged construction for high pressure & harsh environments
- Long-term stability
- Corrosion and contaminant resistant coating for wetted parts
- On-board processing for real-time data analysis
- 12-24 VDC supply

POSEIDON SYSTEMS

PERFORMANCE SPECIFICATIONS

MAXIMUM RATINGS

Ratings	Value	Unit
Supply Voltage (peak)	60	Vdc
Ambient Operating Temperature (electronics)*	-40 to +125	˚C (˚F)
Ambient Operating Temperature (fluids)*	-40 to +150	˚C (˚F)
Input Current @ 12VDC (in rush)	<200	mA
Operating Pressure	350	PSI

Peak Conditions: less than 10% of the operating time
***Ambient Operating Temperature:** Service temperature range at which the sensor and its electronics can operate securely

METROLOGICAL CHARACTERISTICS

Multi-Parametric Measurement Ranges	Symbol	Min	Typ	Max	Unit
Viscosity (dynamic)	μ	0.5	15	50	mPa-s (cP)
Viscosity (dynamic) Accuracy for viscosity > 10 mPa-s (cP)		-5	+/-2	+5	% Value
Viscosity (dynamic) Accuracy for viscosity < 10 mPa-s (cP)			+/-0.2		mPa-s (cP)
Density	p	0.65	0.85	1.50	gm/cc
Density Accuracy		-3	+/-1	+3	% Value
Fluid Temperature	T	-40		150	˚C (˚F)
Temperature Accuracy	T		0.1		˚C (˚F)

(@Vcc= 12V_{dc}, T= 100˚C, unless otherwise noted)

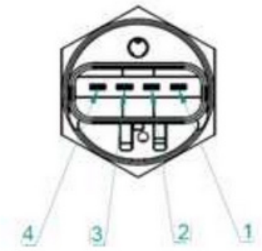
ELECTRICAL CHARACTERISTICS

Electrical Characteristics	Symbol	Min	Typ	Max	Unit
Viscosity (dynamic)	V_{cc}	9	12	36	Vdc
Viscosity (dynamic) Accuracy for viscosity > 10 mPa-s (cP)	I_{avg}		70	100	mA

(@Vcc= 12V_{dc}, T= 100˚C, unless otherwise noted)

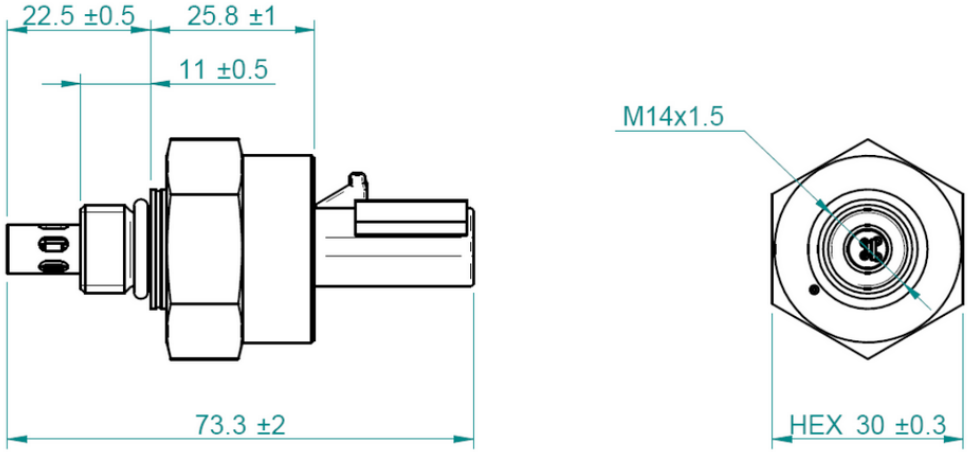
CONNECTING & MECHANICAL PACKAGING

PINOUT ASSIGNMENT



N_o	Function
1	CAN_H
2	CAN_L
3	GND - Ground
4	VCC - Voltage Supply

MECHANICAL CHARACTERISTICS: *VM1100 PACKAGE OUTLINE*



All dimensions are millimeters (mm). Mating connector type is FCI female receptacle ref. 5420049 (black-sealed).
Sensor body is stainless steel. M14 Viton O'ring provided for hermetical mounting.

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POSEIDON SYSTEMS

TRIDENT ™ AP2200

Acquisition Platform

Bridges the gap between Modbus RTU & the Internet

PRODUCT OVERVIEW

Poseidon Systems' Trident AP2200 is an easy to use platform for collecting sensor data, processing and interpreting measurements, and posting information to web servers for remote access.

The AP2200 makes collecting sensor data easy and reliable even in unreliable environments. Data is buffered in the 1.7 GB of on-board storage until successfully off-loaded via Ethernet, WIFI, mobile networks, and more.

The AP2200 is a versatile data collection platform. It can be used as a Modbus TCP gateway, allowing collection of data from two RS-232 ports, RS-485 port, and CAN bus ports. The cellular modem makes deployment easy even in remote locations.

Easily configure to query sensors and forward the data on to your HTTP or FTP servers, buffering locally as necessary. It is even possible to perform computations on-board, utilizing the Lua scripting engine.

APPLICATIONS

- Securely connect Modbus RTU devices to the Internet
- CAN/J1939 and Modbus data logging
- Industrial data gateway
- Asset monitoring and tracking
- CBM (condition based maintenance)

KEY FEATURES

- Direct support for sensors & Poseidon Live
- Web configurable
- Modbus TCP master, slave, and gateway
- DIN rail mountable
- GPRS and CDMA mobile networks
- Industrial temperature range (-40 to 85 C)
- CAN/J1939 option
- GPS option
- Lua scripting engine
- Self monitoring with reporting

SOFTWARE SPECIFICATIONS

- Modbus TCP gateway
- Modbus TCP master
- Modbus TCP slave
- Modbus RTU master
- JSON data exchange format
- Zerconf service discovery
- Lua scripting engine
- HTTP
- FTP
- Dynamic DNS (dyndns)
- Network time (NTP)
- DHCP
- J1939 (optional)

HARDWARE SPECIFICATIONS

- RS-485 port
- (2) RS-232 ports
- (2) CAN bus ports (1 standard)
- 10/100 Ethernet
- USB port
- Cellular modem (GPRS, CDMA, HSPA+ optional)
- GPS (optional)
- 802.11 b/g/n WIFI (optional)

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www.kytola.com

Kytola INSTRUMENTS

NEW

TOUCHSCREEN DISPLAY
KLD SMART

The Kytola® KLD Smart Touchscreen Display is designed to monitor and display flow rates and flow alarms measured by Kytola oval gear meters or other flow meters with pulse outputs.

KLD Smart is conveniently operated using a touchscreen, which enables easy monitoring of flow rates and alarms, and management of settings.

- Single or multi-channel models
- Stand-alone or connected to Kytola monitoring software or 3rd party system
- Pulse or mA input
- mA output
- Alarm relay
- Modbus RTU (RS-485), Modbus TCP (Ethernet) communication
- IP65
- Robust steel enclosure

ISO 9001 ISO 14001

FEATURES

- Flow measurement
- Totalizer counter and batching
- Multiple flow units
- Multiple flow alarm levels
- Visible indication of alarm type

TYPICAL APPLICATIONS

- Lubrication oil flow monitoring
- Industrial flow monitoring
- Process control
- Batching

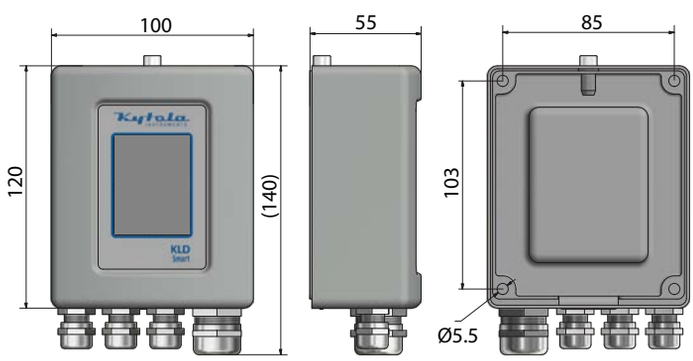
KLD SMART TECHNICAL DATA

Model	KLDS-1	KLDS-8
Supply voltage	10 – 30 VDC	10 – 30 VDC
Supply current (maximum)	60 mA	60 mA (190 mA with mA outputs)
Sensor types	Kytola coil, NAMUR, NPN, PNP	Kytola coil, NAMUR, NPN, PNP
Input frequency	0 – 5 kHz	0 – 5 kHz
Communication	Modbus RTU (RS-485), *Modbus TCP (Ethernet)	Modbus RTU (RS-485), *Modbus TCP (Ethernet)
Current output	*1 pc, 4 – 20 mA	*8 pcs, 4 – 20 mA
Current input	1 pc; linear, square root, table	None
Relay output	1 pc NC, max. 48 VAC/DC, 100 mA	1 pc NC, max. 48 VAC/DC, 100 mA
Enclosure	Painted steel, *stainless steel AISI 316	Painted steel, *stainless steel AISI 316
Protection class	IP65	IP65
Ambient temperature	–20°C...+60°C (relative humidity < 85 %, non-condensing)	–20°C...+60°C (relative humidity < 85 %, non-condensing)
Dimensions	100 x 140 x 55 mm	149 x 160 x 80 mm
Weight	0.7 kg	1.5 kg * Special construction

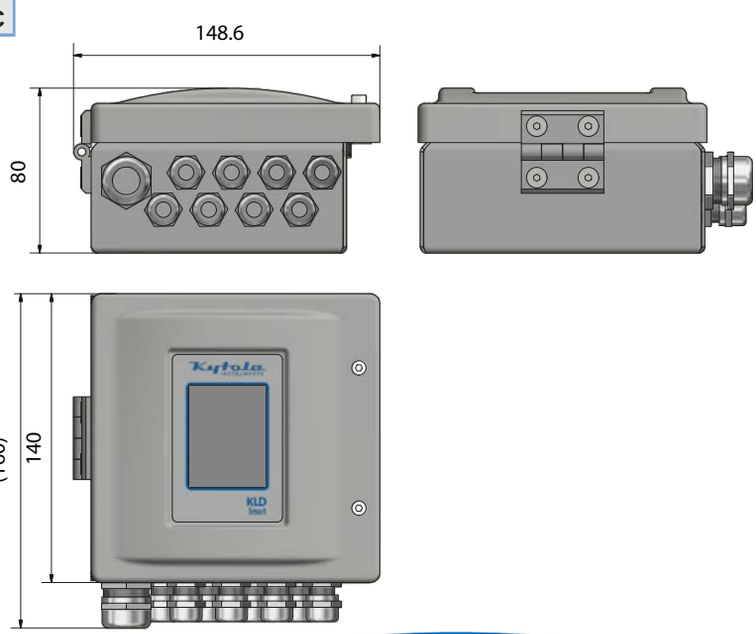
KLDS– ■ – ■ – ■ ■ ■

Number of Input Channels				
1 channel	1			
1–8 channels	8			
Outputs				
Relay output		0		
Relay and mA output		M		
Communication				
RS-485/Modbus RTU			0	
RS-485/Modbus RTU and Ethernet/Modbus TCP			E	
Enclosure				
Painted steel				0
Stainless steel AISI 316				H
KLDS-8 only				
KLDS-8 mounted on the left of the SR meter block				A
KLDS-8 without the SR meter block				C

KLDS-1



KLDS-8



KLDS-8

KLDS-8 with SR6 meter block

Kytola INSTRUMENTS
www.kytola.com

MANAGEMENT SYSTEM CERTIFICATION DNV·GL ISO 9001 = ISO 14001

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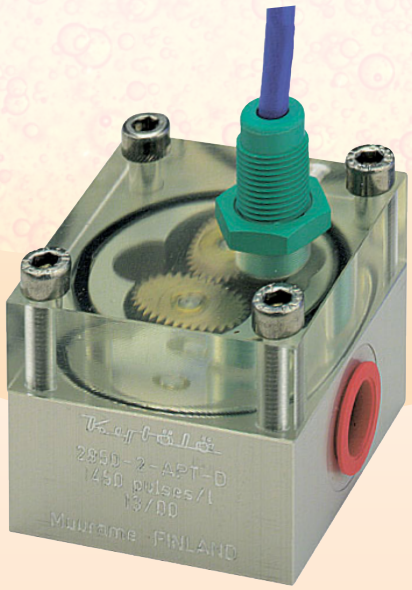
KYTOLA INSTRUMENTS

OVAL GEAR FLOW METER 2950

KYTOLA Oval Gear Meter Model 2950 is designed and developed for lubrication oil measurement in demanding industrial environments.

The oval gear meter is a positive displacement flow meter, which always shows the correct flow rate regardless of oil temperature or viscosity changes.



- For oil
- Max 100 L/min
- Alternative pulse sensors
- BSP or NPT connections
- Without flow adjustment valve
- ATEX version (II 2GD c TX) as option

ISO 9001:2008 ISO 14001:2004

The flow meter consists of two elliptical gears, which the flow rotates. A coil sensor or an inductive proximity switch picks up the rotation, and the pulse signal can be transferred to indicators, counters or automation systems.

FEATURES

- Several flow ranges
- Large viscosity range 30 – 1000 cSt
- Independent of viscosity changes
- Sturdy construction
- Pulse output

TYPICAL APPLICATIONS

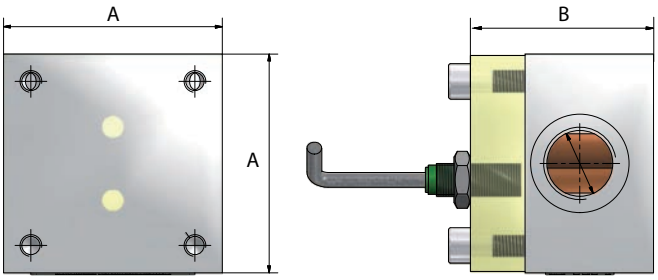
- Lubricant monitoring
- Industrial flow monitoring
- Process control

2950 TECHNICAL DATA

Model	2950-1	2950-2	2950-5	2950-10	2950-20	2950-30	2950-60	2950-100
Output (pulses/L)	820	450	290	126.8	75.8	49.8	22.4	12.4
Weight	265 g	255 g	280 g	1.1 kg	1.1 kg	1.5 kg	3.4 kg	12 kg
Connections	1/4”	1/4”	1/4”	3/4”	3/4”	3/4”	1”	1 ½”
Gears	Composite polymer or brass (depending on range)							
Body	Aluminium							
Cover	Polyamide							
Seals	Viton®							
Sensor	Namur; DIN 19234 (*Other types of inductive proximity sensor)							
Max. pressure	10 bar							
Max. temperature	+80°C							
Viscosity range	30 – 1000 cSt							
Accuracy	±5% of reading							

* Special construction on request

Model	A	B
2950-1	50	41
2950-2	50	41
2950-5	50	47
2950-10	80	67
2950-20	80	67
2950-30	80	87
2950-60	118	97
2950-100	199	107



2950– ■■■ –A ■■■ – ■■ ■■ ■■

Flow Range		
0.1 – 1	L/min	1
0.2 – 2	L/min	2
0.5 – 5	L/min	5
1 – 10	L/min	10
2 – 20	L/min	20
3 – 30	L/min	30
6 – 60	L/min	60
10 – 100	L/min	100

Gears	
Composite polymer (1–5 L/min)	K
Brass (10–100 L/min)	P

Cover	
Polyamide	T

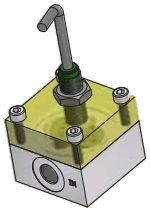
Connections	
BSP threads	*blank*
NPT threads	N

Sensor	
NAMUR sensor	*blank*
Without sensor (M12 x 1 thread)	D
PNP/NPN sensor (2-wire)	F
PNP sensor (3-wire)	P
NPN sensor (3-wire)	T
Coil sensor (compatible with Kytola readout units)	C

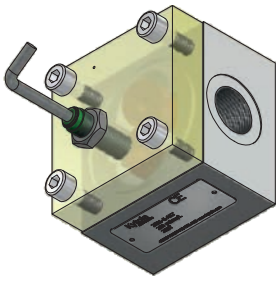
Special Feature	
ATEX version	Z

Standard feature: leave *blank*
Special feature: choose **C**haracter

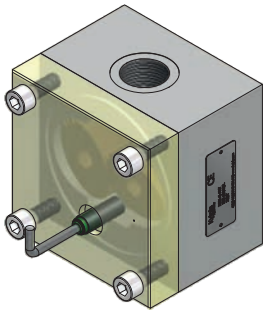
2950-1 ... 2950-5



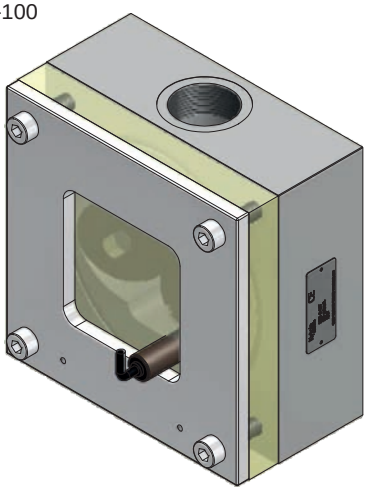
2950-10 ... 2950-30



2950-60



2950-100



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