PAQUIN SENSORS
A Division of The Paquin Company™

Oil Quality Sensor

- Detects oil wear and contamination through dielectric constant measurement
- Universal design for use with mineral and synthetic oils
- LED (orange/green) visual status indication
- Continuous oil condition monitoring with 0–10 VDC voltage output
- Robust, clog-resistant construction with IP68 protection
- Adjustable LOW/HIGH sensitivity using the included magnetic pen
- Temperature compensated

About

The P170 is an oil quality sensor designed to continuously monitor oil condition using a relative permittivity, or dielectric constant, measurement principle. It is intended to detect oil wear and contamination caused by water, acid, fuel, viscosity changes, different oil types, carbon, particles, and abrasion particles. The sensor works with mineral and synthetic oils and can be installed on engines, gearboxes, hydraulic systems, or electrical transformer systems while equipment remains in operation. It provides a simple 0 ... 10 VDC analog output, supports high or low sensitivity setup using a magnetic pen, and operates across a process temperature range of 14 to 140°F (-10 to 60°C).

Applications

- ✓ Engine oil condition monitoring
- ✓ Gearbox oil monitoring
- ✓ Hydraulic system oil monitoring
- ✓ Electrical transformer oil monitoring
- ✓ Continuous oil contamination and wear detection in operating equipment

PAQUIN SENSORS
A Division of The Paquin Company™

About The P170

About

Easily fitted, the P170 will continuously monitor, measure and report actual oil condition with absolute accuracy and reliability. A simple analogue voltage output fits into your existing monitoring systems.

It works with any oil type, mineral/synthetic, and can be fitted to any engine, gearbox, hydraulic or electrical transformer system while in full operation. The unique oil condition monitoring technology ensures any wear and/or contamination is instantly detected, measured and reported.

Helping you prevent unnecessary breakdowns, eliminate unnecessary maintenance and reduce your operating costs.

Relative permittivity is a parameter that universally indicates the quality and type of oil. Any change in oil quality (presence of abrasion particles or water) will result in an increase in relative permittivity or in some cases also decrease. Sensor can react to both changes.

To successfully start oil quality monitoring, the sensor needs to be set up with an initial sample of reference (clean) oil.

Build Your Part Number

Series P170

Example: P170SG3VC5

PSE152

Series
P170

Hazard Performance - *select one*	
S	Standard atmosphere (non-explosive)

Process Connection - *select one; see diagram on page 4*	
G3	Pipe thread G 3/4"

Output - *select one*	
V	0...10 VDC

Electrical Connection - *select one*	
PT	Gland with pre-installed cable
C	M12x1

Cable Length – *please inform only when option PT is selected, otherwise skip*	
	Cable length in meters (Example: 15 meters = 15)

Mating Electrical Connection Assembly – *optional; only when option C is selected*	
Part#	
PSE1	M12x1, 5-pole female straight with cable gland, field wireable
PSE150	M12x1, 5-pole female straight with 1 meter PVC shielded cable
PSE151	M12x1, 5-pole female straight with 3 meter PVC shielded cable
PSE152	M12x1, 5-pole female straight with 5 meter PVC shielded cable
PSE153	M12x1, 5-pole female straight with 7.5 meter PVC shielded cable
PSE154	M12x1, 5-pole female straight with 10 meter PVC shielded cable
PSE155	M12x1, 5-pole female straight with 20 meter PVC shielded cable

Note: Product Includes 1 magnetic pen MP-8 and 1 O-ring (NBR, EPDM, FPM/Viton)

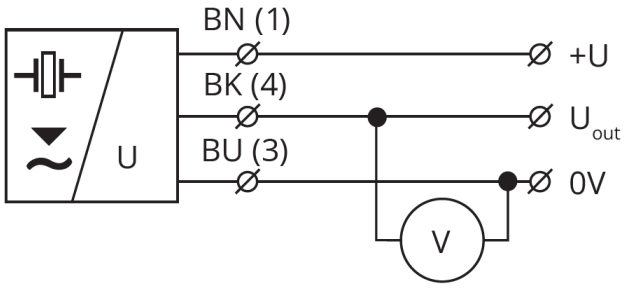
PAQUIN SENSORS
A Division of The Paquin Company™

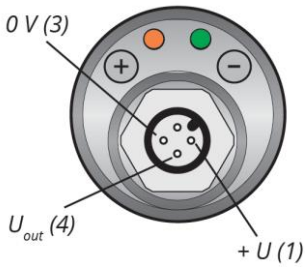
Technical Parameters

Technical Parameters		
Electrical	Supply Voltage	12 ... 34 VDC
	Voltage Output	0 ... 10 VDC
	Status Indication	2x LED (Orange and Green)
Environmental	ε_r Temperature Drift Compensation	+9.6 x 10^{-4} / °C
	ε_r Range – High Sens.	-0.01 ... $\varepsilon_{r\ ref}$ ... +0.04
	ε_r Range – Low Sens.	-0.05 ... $\varepsilon_{r\ ref}$ ... +0.20
	$\varepsilon_{r\ ref}$	1.90 ... 2.30
	$\varepsilon_{r\ ref}$ For fresh mineral oils	Typ 2.00
	Process Temperature Range	14°F ... 140 °F (-10°C ... 60°C)
	Pressure Resistance	290 PSI (20 bar)
	Protection Class	IP68
Materials	Process Connection	Pipe thread G 3/4"
	Weight (Without Cable)	Approx. 0.15kg

Electrical Connection

The positive pole of the supply voltage (+U) is connected to the brown wire BN or pin connector no.1, the negative pole (0 V) is connected to the blue wire BU or pin connector no. 3 and output voltage (Uout) to the black wire BK or pin connector no. 4.



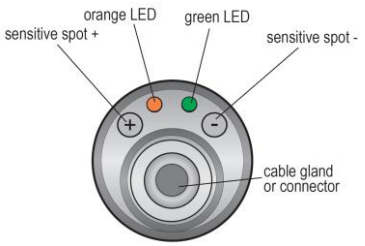


Legend:
(1...) – terminal numbers connector sockets
BN – brown
BU – blue
BK – black

Settings

The sensor can be set to LOW or HIGH sensitivity. The last setting is valid.

Setting the device is done after its installation by touching the magnetic pen to sensitive spots ⊖ and ⊕. The setting process is indicated by the orange LED "STATE". Connect the level meter to the power supply. Using a measuring device or associated device, check its output - current or voltage.



PROCEDURE FOR SETTINGS LOW SENSITIVITY

1. Flood the electrode of the sensor to REFERENCE OIL.
2. Touch the magnetic pen for min. 1 seconds on the sensitive spot ⊖ of the sensor.
3. Then put away the magnetic pen from sensitive spot and the LED indicator "STATE" will briefly flash 3x to confirm the setting of the sensitivity.

Output Voltage	Dielectric Constant*
0 V	$\varepsilon_{r\ ref}$ -0.05 (Used Oil)
2 V	$\varepsilon_{r\ ref}$ of Reference Oil
10 V	$\varepsilon_{r\ ref}$ +0.20 (Used Oil)

*$\varepsilon_{r\ ref}$ dielectric constant (rel. permittivity) for fresh mineral oils

PROCEDURE FOR SETTINGS HIGH SENSITIVITY

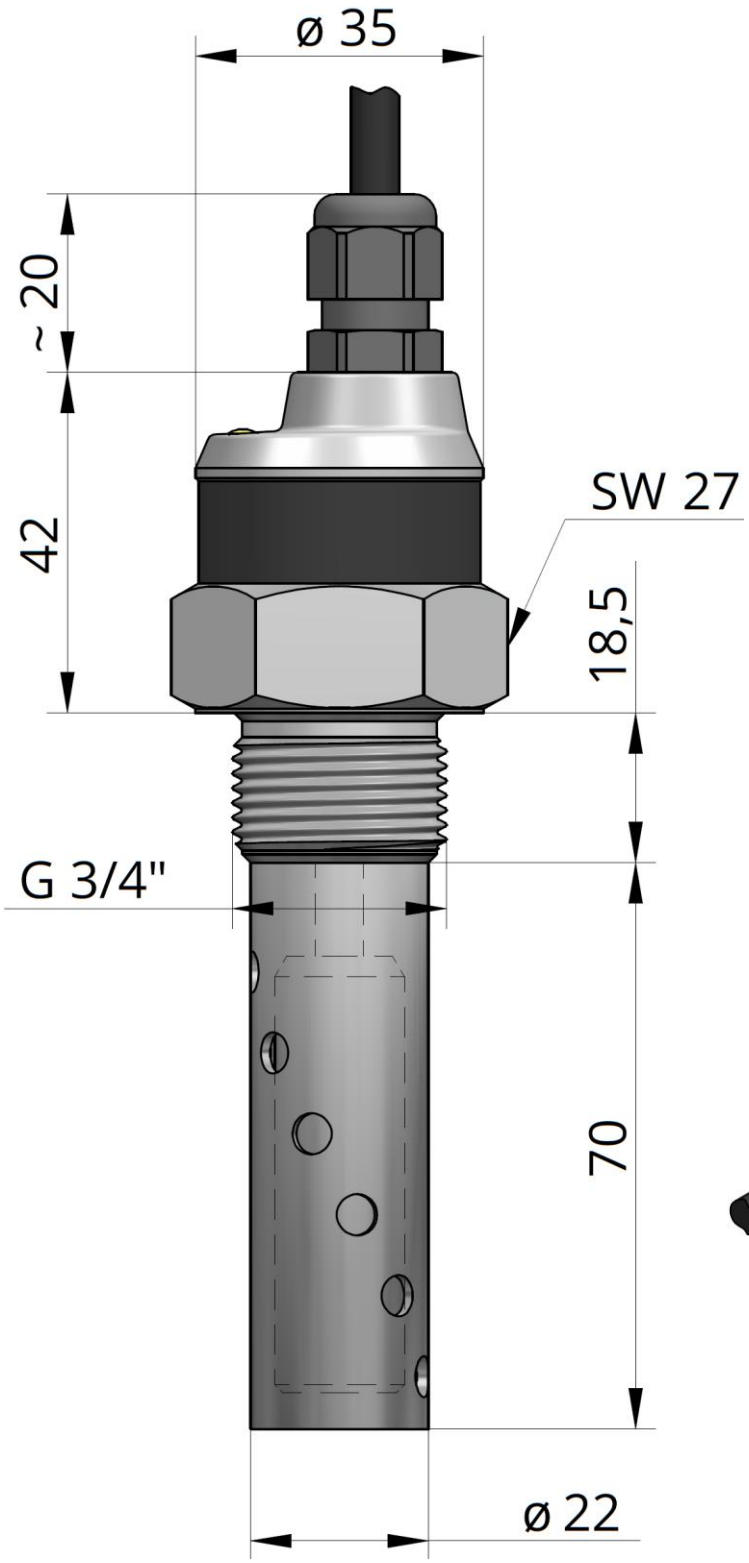
1. Flood the electrode of the sensor to REFERENCE OIL.
2. Touch the magnetic pen for min. 1 seconds on the sensitive spot ⊕ of the sensor.
3. Then put away the magnetic pen from sensitive spot and the LED indicator "STATE" will briefly flash 3x to confirm the setting of the sensitivity.

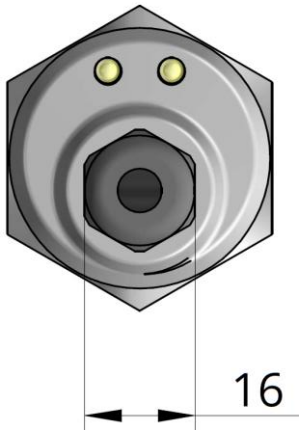
Output Voltage	Dielectric Constant*
0 V	$\varepsilon_{r\ ref}$ -0.01 (Used Oil)
2 V	$\varepsilon_{r\ ref}$ of Reference Oil
10 V	$\varepsilon_{r\ ref}$ +0.04 (Used Oil)

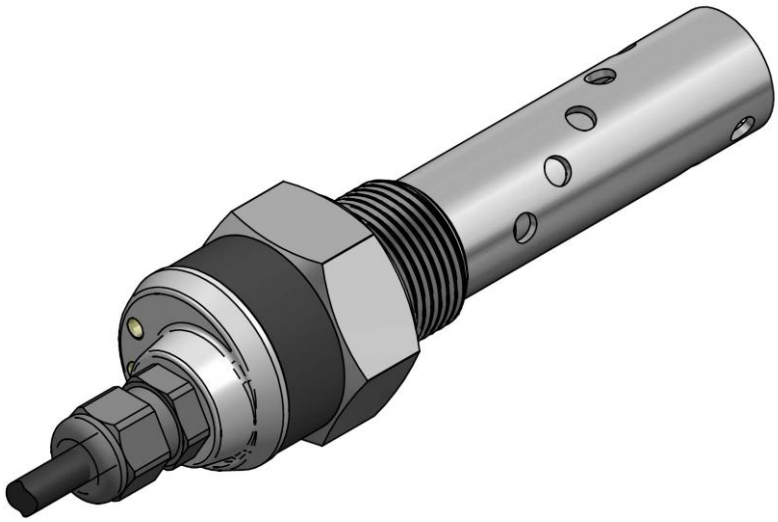
*$\varepsilon_{r\ ref}$ dielectric constant (rel. permittivity) for fresh mineral oils

PAQUIN SENSORS
A Division of The Paquin Company™

Dimensions







Additional Information

Paquin Sensors' product portfolio is designed to provide options to fit the most diverse range of specifications.

We collaborate with our customers to match the best product technologies with your unique application requirements.

Please contact us or call +1 (800) 831-8217 anytime to discuss your needs!