

Condition Monitoring Essentials



Expanding your capabilities with SKF Machine Condition Advisor compatible accessories

Extension sensor kit, Model CMAC 112-K

The extension sensor kit CMAC 112-K contains an accelerometer with coiled integral cable (CMAC 111) and magnet (CMAC 109) with mounting stud. This kit is needed to take measurements from hard-to-reach places and for more repeatable and accurate measurement results.

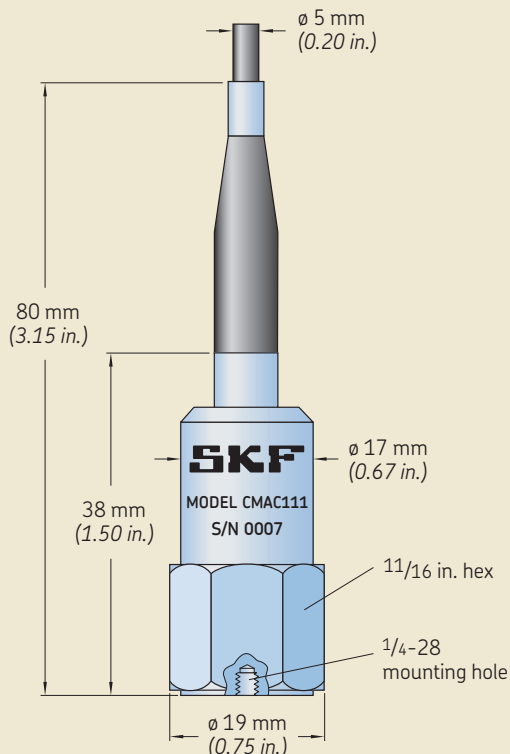


CMAC 112-K extension sensor kit

Accelerometer

- 100 mV/g sensitivity
- Small size case
- 0,4 to 12 000 Hz frequency response (± 3 dB)
- Submersible

CMAC 111 accelerometer dimensions



Accelerometer specifications:

Dynamic performance

- Sensitivity ($\pm 15\%$): 10,2 mV/(m/s²) (100 mV/g)
- Dynamic range: 784 m/s² (80 g peak)
- Frequency response:
 - ± 3 dB: 24 to 720 000 CPM (0,4 to 12 000 Hz)
 - $\pm 10\%$: 42 to 480 000 CPM (0,7 to 8 000 Hz)
 - $\pm 5\%$: 60 to 360 000 CPM (1,0 to 6 000 Hz)

Electrical

- Voltage source: 18 to 30 V DC
- Constant current excitation: 2 to 10 mA
- Spectral noise at:
 - 10 Hz: 7 μ g/ $\sqrt{\text{Hz}}$
 - 100 Hz: 4 μ g/ $\sqrt{\text{Hz}}$
 - 1 000 Hz: 2 μ g/ $\sqrt{\text{Hz}}$
- Output impedance: < 100 Ω
- Bias output voltage: 12 V DC
- Grounding: Case isolated, internally shielded

Physical

- Sensing element and structure: PZT, shear
- Weight: 150,5 g (3.5 oz.)
- Case material: 316L stainless steel
- Mounting: 1/4-28 tapped hole
- Resonant frequency: 1 800 000 CPM (30 000 Hz)
- Calibration certificate: CAL-Cert CMAC 111

Environmental

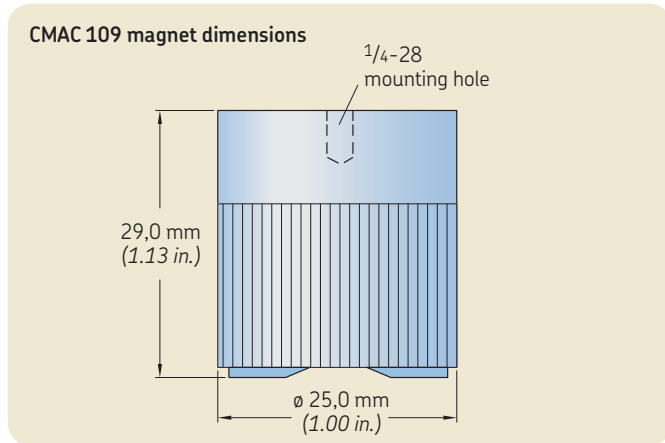
- Temperature range:
 - Sensor head: -50 to $+120$ $^{\circ}\text{C}$ (-60 to $+250$ $^{\circ}\text{F}$)
 - Cable: -40 to $+80$ $^{\circ}\text{C}$ (-40 to $+175$ $^{\circ}\text{F}$)
- Maximum shock protection: 49 km/s² peak (5 000 g peak)
- Electromagnetic sensitivity: CE
- Sealing welded: Hermetic
- Hydrostatic pressure: 100 psi

Integral cable

- Connector to SKF Machine Condition Advisor CMAS 100-SL
- CMAC 111 standard coiled cable length:
 - Cable length at rest: 0,95 m (3.0 ft)
 - Cable length extended: 2,3 m (7,5 ft)
- CMAC 111-5M straight cable, length: 5 m (16,4 ft)
- CMAC 111-10M straight cable, length: 10 m (32,8 ft)

Magnet

- 14 kg (30 lbs.) pull-strength
- 25 mm (1 in.) diameter
- 1/4-28 mounting hole
- Case material: Stainless steel
- Magnet material: Neodymium

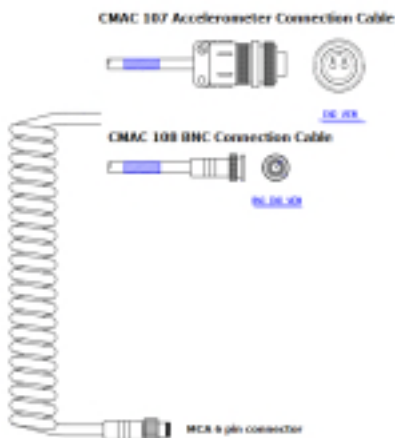


Accelerometer connection cable, coiled (extended 2,3 m), Model CMAC 107

Optional connection cable for standard constant current accelerometers with 100 mV/g, MIL-SPEC connector.

BNC connection cable, coiled (extended 2,3 m), Model CMAC 108

Optional connection cable for standard BNC connectors (e.g., the CMSS 300 and CMSS 310 series of BNC junction boxes that connect to constant current accelerometers with 100 mV/g.



Connection options

Ordering information

SKF Machine Condition Advisor CMAS 100-SL includes:

- SKF Machine Condition Advisor unit
- Belt holster [CMAC 102]
- Charger, international DC power supply [CMAC 8004]
- User manual, English hard copy [32131800-EN]
- CD containing:
 - User manual available in PDF files in English, French, German, Portuguese, Spanish and Swedish
 - Link to training on SKF @ptitude Exchange
 - SKF Machine Condition Advisor trend worksheet (Excel .xls file)
 - SKF Condition Monitoring Essentials catalog available in PDF file in English [CM/P1 11704 EN]

Accessories

- Extension kit, 100 mV/g accelerometer with 2,3 m coiled integral cable and magnet [CMAC 112-K]
- Extension kit, 100 mV/g accelerometer with 5 m straight integral cable and magnet [CMAC 112-K-5M]
- Extension kit, 100 mV/g accelerometer with 10 m straight integral cable and magnet [CMAC 112-K-10M]
- Accelerometer connection cable, coiled with MIL-SPEC type connector for standard constant current 100 mV/g accelerometer [CMAC 107]
- BNC connection cable, coiled with standard BNC connectors [CMAC 108]

Replacement

- Charger, international DC power supply, +5 V, 1 600 mA, 90 to 264 V AC, 47 to 63 Hz [CMAC 8004]
- Magnet, magnet base, 1,0 in. diameter, 30 lbs. pull-strength [CMAC 109]
- Belt holster [CMAC 102]

Optional kits that include the SKF Machine Condition Advisor CMAS 100-SL

- SKF Basic Condition Monitoring kit [CMAK 400-ML]
- SKF Electric Motor Assessment kit [CMAK 200-EN]
- SKF Bearing Assessment kit [CMAK 300-SL]

Hard case

A water resistant, dust-proof case which holds the unit (and magnetic stand) and measures 330 × 197 × 66 mm (13.00 × 7.75 × 2.60 in.) is included.

Specification

- Measurement range: -60 to +1 000 °C (-75 to +1 800 °F)
- Operating range: 0 to 50 °C (30 to 120 °F)
- Accuracy ($T_{\text{object}} = 15 \text{ to } 35 \text{ °C (60 to 95 °F)}$, $T_{\text{ambient}} = 25 \text{ °C (75 °F)}$): $\pm 1 \text{ °C (}\pm 2 \text{ °F)}$
- Accuracy ($T_{\text{object}} = 35 \text{ to } 1\,000 \text{ °C (90 to 1\,800 °F)}$; $T_{\text{ambient}} = 25 \text{ °C, } \pm 3 \text{ °C (75 °F, } \pm 5 \text{ °F)}$): $\pm 2\%$ of reading or $+2 \text{ °C (+4 °F)}$, whichever is greater
- Update frequency: 1,4 Hz
- Wave length response: 8 to 14 μm
- Emissivity range: 0,95 default – adjustable 0,1 to 1 step 0,01
- Relative humidity: 5 to 95% non-condensing
- Resolution, from -9,9 to +199,9 °C (14.2 to 391.8 °F): 0,1 °C (0.2 °F)
- Response time (90%): < 1 sec
- Distance spot ratio: 50:1
- Dimensions:
 - Height: 203,3 mm (7.90 in.)
 - Width: 197,0 mm (7.71 in.)
 - Depth: 47,0 mm (1.85 in.)
- Weight: 386,1 g (13.62 oz.) including batteries
- Power: Two AAA batteries (included)
- Battery life: Typical 180 hours, minimum 140 hours continuous use (Alkaline, without laser and back light)

- Modes: Maximum, Minimum, Average, Difference (MAX-MIN), Lock (allows for continuous temperature scan)

Note:

Under an electromagnetic field of 3 V/m from 90 to 360 MHz the maximum error is $\pm 10 \text{ °C (}\pm 18 \text{ °F)}$.

National Institute of Standards and Technology (NIST), traceable factory calibration available.

Ordering information

- SKF non-contact Infrared Thermometer, including quick start guide in standard languages (English, French, German, Portuguese, Spanish and Swedish), two AAA batteries, hard carrying case and magnetic stand [CMSS 3000-SL]
- DOC-CAL CERT CMSS 3000, NIST Certificate of Calibration Accuracy (Watlow-Gordon XACT-CAL)



LCD display



Optional kits that includes the SKF Infrared Thermometer, CMSS 3000-SL

- SKF Basic Condition Monitoring kit [CMAK 400-ML]
 - SKF Machine Condition Advisor [CMAS 100-SL]
 - Extension kit, 100 mV/g accelerometer with coiled integral cable and magnet [CMAC 112-K]
 - SKF Infrared Thermometer [CMSS 3000-SL]
 - SKF Inspector Ultrasonic Probe [CMIN 400]
- SKF Bearing Assessment kit [CMAK 300-SL]
 - SKF Machine Condition Advisor [CMAS 100-SL]
 - SKF Infrared Thermometer [CMSS 3000-SL]
 - SKF OilCheck [THEH1]

SKF Inspector 400 Ultrasonic Probe Stethoscope/Scanner kit includes:

- SKF Inspector 400 Ultrasonic Probe pistol housing with LED bar graph meter, eight-position sensitivity selection, low battery indicator
- Scanning module
- Rubber focusing probe
- Stethoscope module
- Lightweight foam lined headset
- 9 V alkaline battery (replaceable)
- Cordura/Nylon soft pack carrying case
- Comprehensive instruction manual (English language)

Specifications

- Construction: Handheld ABS pistol type ultrasonic processor, stainless steel sensor enclosures
- Circuitry: SMD / solid state hybrid heterodyne receiver
- Frequency response: 20 to 100 kHz (centered at 38 to 42 kHz)
- Indicator: 10 segment LED bar graph (red)
- Sensitivity selection: Eight-position precision attenuation
- Power: 9 V alkaline battery
- Low battery voltage indicator: LED
- Headset: Lightweight foam lined double headset wired mono-phononic impedance; 16 Ω
- Probes: Scanning module stainless steel unisonic (single transducer) piezoelectric crystal type; stethoscope/contact module stainless steel plug-in type with 14 cm (5.5 in.) stainless steel waveguide
- Rubber focusing probe: Shields stray ultrasonic signals and focuses detected signals
- Response time: 300 m/s
- Ambient operating temperature range: 0 to 50 °C (30 to 120 °F)
- Relative humidity: 10 to 95% non-condensing at up to 30 °C (85 °F)
- Storage temperature: -20 to 55 °C (0 to 130 °F)
- Dimensions:
 - Height: 133 mm (5.25 in.)
 - Width: 50 mm (2.00 in.)
 - Length: 203 mm (8.00 in.)
- Weight: 320 g (11 oz.)
- Carrying case: Cordura/Nylon soft pack with die cut foam

Ordering information

- SKF Inspector 400 Ultrasonic Probe Stethoscope/Scanner kit [CMIN 400-K] including:
 - Probe pistol housing with LED bar graph meter, eight-position sensitivity selection, low battery indicator, scanning module, rubber focusing probe, stethoscope module
 - Lightweight foam headset
 - 9 V alkaline battery
 - Instruction manual hard copy in English language



Accessories and replacement parts

- Lightweight foam lined headset [CMAC 8600-1]
- Deluxe noise isolating headphones [CMAC 8600-2]
- Deluxe noise isolating headphones to be worn with hard hat [CMAC 8600-3]
- Utility belt with holster [CMAC 8600-4]
- Stainless steel unisonic scanning module [CMAC 8600-6]
- Stainless steel stethoscope/contact module [CMAC 8600-7]
- Stethoscope extension rods [CMAC 8600-8]
- Rubber focusing probe [CMAC 8600-9]

Optional kits that includes the SKF Inspector 400 Ultrasonic Probe, CMIN 400-K

- SKF Basic Condition Monitoring kit [CMAK 400-ML]
 - SKF Machine Condition Advisor [CMAS 100-SL]
 - Extension kit, 100 mV/g accelerometer with coiled integral cable and magnet [CMAC 112-K]
 - SKF Infrared Thermometer [CMSS 3000-SL]
 - SKF Inspector Ultrasonic Probe [CMIN 400]

SKF Basic Condition Monitoring kit

CMAK 400-ML

An essential collection of measurement tools for all industrial manufacturing plants, the SKF Basic Condition Monitoring kit makes machine health monitoring a simple task for maintenance, operations, reliability and vibration analysis departments.

Features

- Assessment of overall machine condition
- Test bearings, pumps, motors, compressors, etc.

Multi-parameter machine assessment with the SKF Basic Condition Monitoring kit:

SKF Machine Condition Advisor CMAS 100-SL

The SKF Machine Condition Advisor simultaneously measures machine vibration signals and temperature to indicate machine health and bearing condition.

SKF external sensor kit for the SKF Machine Condition Advisor CMAC 112-K

The external vibration sensor with magnet provides convenience for hard-to-reach surfaces and more repeatable and accurate measurements.

SKF Infrared Thermometer CMSS 3000-SL

The heavy duty SKF Infrared Thermometer is a dual laser sighted, non-contact instrument for long range application.

SKF Inspector 400 Ultrasonic Probe CMIN 400-K

The SKF Inspector 400 Ultrasonic Probe senses high frequency sounds produced by operating equipment, leaks and electrical discharges and makes them audible. The SKF Basic Condition Monitoring kit features all of the accessories from the SKF Inspector 400 Ultrasonic Probe kit.

Carrying case

The instruments are packaged in a light, durable aluminium carrying case for industrial environments.

- Style: Riveted construction
- Weight: 2,6 kg (5.7 lb.) case only



- Dimensions:
 - Length: 450 mm (18 in.)
 - Width: 330 mm (13 in.)
 - Depth: 150 mm (6 in.)
- Material: 0.040 5052 H34 (or H32) aluminium – satin (mill) finish
- Features:
 - Valance (extrusion) – at joining ends (aluminium)
 - Continuous hinge (aluminium) – full length
 - Tubular handle (plated steel)
 - Two locking draw bolts (plated steel)
 - Eight reinforced corners (plated steel)
 - Four plastic bumpers – hinge side
 - Made in the USA
 - Briefcase pallet (faux leather)
 - Custom dye cut foam interior (1.3 lb/ft³ density)
- Color: Powder coated (blue)

Ordering information

SKF Basic Condition Monitoring kit [CMAK 400-ML] includes:

- SKF Machine Condition Advisor [CMAS 100-SL]
 - External sensor kit, 100 mV/g accelerometer with coiled integral cable and magnet [CMAC 112-K]
- SKF Infrared Thermometer [CMSS 3000-SL]
- SKF Inspector 400 Ultrasonic Probe kit [CMIN 400-K]
 - Ultrasonic Probe pistol housing with LED bar graph meter
 - Lightweight foam lined headset [CMAC 8600-1]
 - Stainless steel unisonic scanning module [CMAC 8600-6]
 - Stainless steel stethoscope/contact module [CMAC 8600-7]
 - Stethoscope extension rods [CMAC 8600-8]
 - Rubber focusing probe [CMAC 8600-9]

SKF Machine Condition Advisor



External sensor kit



SKF Infrared Thermometer



SKF Inspector 400 Ultrasonic Probe



Carrying case



For additional information on the instruments included in the kit, please refer to the previous, respective sections.