Eddy probe systems

CMSS 65 / CMSS 665 series

5 mm eddy probe system, Ryton–based eddy current transducers

Option now available with either the standard removable/reversible connector or the optional permanent fixed connector.

Introduction

The eddy probe is used to measure radial or axial shaft motion. It is mounted through or to the side of a bearing cap and observes the shaft's movement relative to its mounting position. An eddy probe system comprises a probe, a driver (oscillator demodulator) and an optional extension cable.

Eddy probe systems have excellent frequency response. They have no lower frequency limit and are used to measure shaft axial position as well as vibration.

Specifications

CMSS 65 eddy current probe system

Unless otherwise noted, the following specifications apply to a complete CMSS 65 eddy current probe system, at 23 °C *(73 °F)*, with a –24 V DC supply and target of AISI 4140 steel, comprising of:

- CMSS 65: Eddy current probe
- CMSS 958: Extension cable
- CMSS 665 or CMSS 665P: Driver

Note: These specifications may vary with different options and systems.

Electrical

- Usable range: 2 mm (0,2 to 2,3 mm); *80 mils (10 to 90 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* of best straight line over 2 mm *(80 mil)* range
- Frequency range: DC to 10 kHz (600 000 CPM), down maximum of 3 dB at 10 kHz
- Driver signal output:
  - Impedance: Minimum calibrated load resistance of 3 kΩ; output is protected against miswiring
  - Voltage: Nominal 7,87 mV/µm *(200 mV/mil)* corresponding to –18 V DC at 2,3 mm *(90 mils)* with –24 V DC supply
- Power supply requirements: 15 mA from –24 to –30 V DC
- Interchangeability:
  - Probes, extension cables and drivers are compliant to API 670 requirement and may be interchanged with 5% or less performance change without recalibration
  - All units are factory calibrated at 23 °C *(73 °F)*
  - Trim calibration adjustment on driver provides duplication of characteristics after replacement of any component

Environmental and mechanical

CMSS 65 probe

- Operating temperature range: –35 to +175 °C *(–30 to +350 °F)* (**Note:** Ex i regulations restrict upper limit to 100 °C *(210 °F)*)
- Differential pressure: To 4 bar *(60 PSI)*
- Materials:
  - Case: Grade 300 stainless steel
  - Tip material: Ryton
  - Connectors: Nickel plated stainless steel; weatherproof, sealable
  - Cable: Coaxial with fluorine based polymer insulation; high tensile and flexible strength
- Mounting: Recommend minimum clearance of 1/2 probe tip diameter around the probe tip to maintain factory calibration

CMSS 958 extension cable

The temperature ranges, connectors and cable are the same as the CMSS 65 eddy current probe.

CMSS 665 and CMSS 665P drivers

- Operating temperature range: 0 to 65 °C *(30 to 150 °F)*
- Connections (Power, Signal, GND):
  - Five terminal removable and reversible compression terminal block accepting up to 2 mm^2 *(14 AWG)* wire
  - Three connections necessary per block (–24 V DC, GND, Signal)
  - The CMSS 665P has a permanent fixed connector with the same connection characteristics
- Mounting: C-DIN rail mount that bolts onto the driver enclosure, or the standard four 4,8 mm *(0.19 in. or #10)* clearance holes in a square on 63,5 mm *(2.5 in.)* centers

System performance

The following performance characteristics apply for the CMSS 65 eddy current probe system in addition to quoted nominal specifications:

- Extended temperatures: With 1 m *(3.3 ft.)* probe and 4 m *(13.1 ft.)* extension cable operating in a range of –35 to +120 °C *(–30 to +250 °F)* and driver in the range of 0 to +65 °C *(30 to 150 °F)*
- Sensitivity: ±10% of 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(±1 mil)* of best straight line over 2 mm *(80 mil)* range
- Minimum target size:
  - Flat surface: 10 mm *(0.39 in.)*
  - Shaft diameter: 15 mm *(0.59 in.)*

Hazardous area approvals

North America

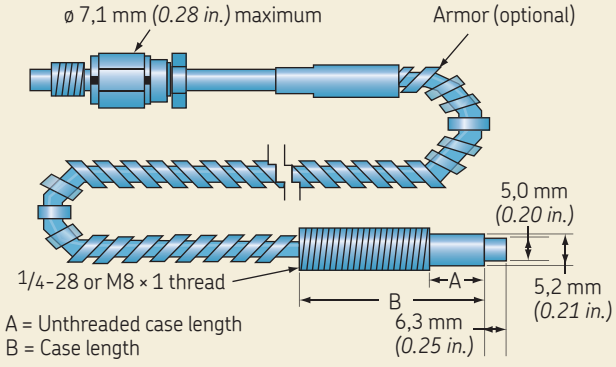
- Approvals granted by Factory Mutual (FM) and Canadian Standards Association (CSA)
- **Class I, Division 1 Groups A, B, C, D** when used with intrinsically safe Zener barriers or galvanic isolators; contact your local SKF sales representative for details
- **Class I, Division 2 Groups A, B, C, D** when connected with National Electric Code (NEC) without Zener barriers or galvanic isolator; contact your local SKF sales representative for details

Europe

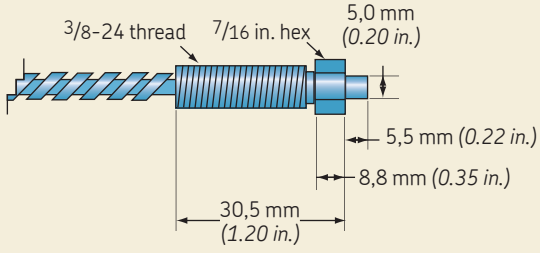
- Certification to ATEX directive
  - Drivers: Ex II 1 G EEx ia IIC T4 (–20 ≤ T_a ≤ +75 °C) *(–5 ≤ T_a ≤ +165 °F)*; certificate number BAS02ATEX1168X
  - Probes: Ex II 1 G EEx ia IIC T4 or T2; certificate number BAS02ATEX1169
  - System: EEx ia IIC T4 or T2 (as per schedule); certificate number Ex 02E2170
- Intrinsic safety requires use of Zener barriers; contact your local SKF sales representative for details

Note: See ordering details for probe and driver designations for hazardous area approved models.

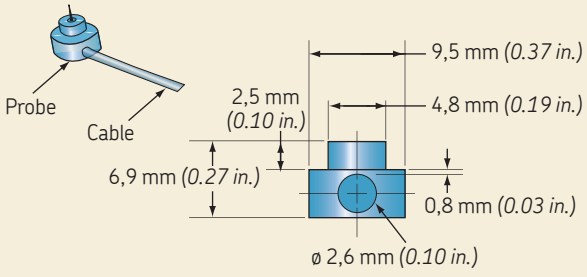
Standard mount case



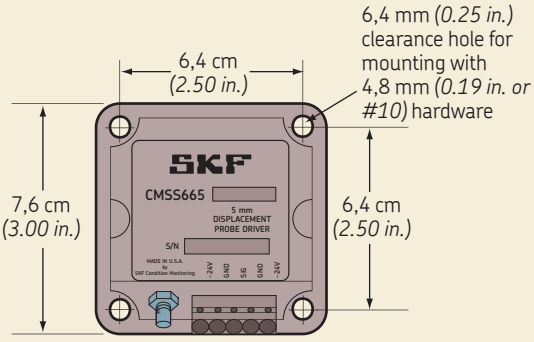
Reverse mount case



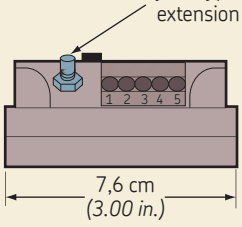
Button (disk) probe



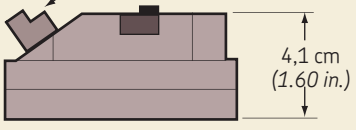
CMSS 665 dimensions



Connector: Stainless steel jack-type mates with CMSS 958 extension cable



Removable or permanent fixed connector: Terminal strip type rated for 250 V, 10 A, 14 AWG maximum wire size



Ordering information – Part 1: Eddy current probe

Ordering information

CMSS 65 Eddy current probe.
(SKF standard: CMSS 65-002-00-12-10)

Part number **CMSS 65–aab-cc-dd-ee**

aa	**Cable**
00	Standard
01	Armored
02	Fiberglass sleeved
07	CSA/FM/SIRA (ATEX) (Intrinsically Safe) certified
08	CSA/FM/SIRA (ATEX) (Intrinsically Safe) certified and armored
09	FM (non-incendive)
0B	FM (non-incendive) armored

b	**Case**
2	1/4-28 threads (standard)
3	M8 × 1 threads
0	3/8-24 threads
1	M10 × 1 threads
4	No case
E	Button probe (Fiberglass)

cc	**Unthreaded case length**
00	Fully threaded
01 to 50	2,5 to 127,0 mm *(0.1 to 5.0 in.)* (unthreaded)
51 to 99	129,5 to 251,5 mm *(5.1 to 9.9 in.)*
RM	Reverse mount, 3/8-24 threads

dd	**Case length**
00	Standard: No case
08	Standard: 2,0 cm *(0.8 in.)*
12	Standard: 3,0 cm *(1.2 in.)*
15	Standard: 3,8 cm *(1.5 in.)*
20	Standard: 5,1 cm *(2.0 in.)*
25	Standard: 6,4 cm *(2.5 in.)*
30	Standard: 7,6 cm *(3.0 in.)*
40	Standard: 10,2 cm *(4.0 in.)*
47	Standard: 11,9 cm *(4.7 in.)*
60	Standard: 15,2 cm *(6.0 in.)*
90	Standard: 22,9 cm *(9.0 in.)*
09 to 59	Special: 2,3 to 15,0 cm *(0.9 to 5.9 in.)*
91 to 99	Special: 23,1 to 25,1 cm *(9.1 to 9.9 in.)*

ee	**Overall length***
05	0,5 m *(1.6 ft.)*
10	1,0 m *(3.3 ft.)* (standard)
5A	5,0 m *(16.4 ft.)*

* Length is nominal electrical; physical length may vary.

Compatible systems:

- 0,5 m probe / 5,0 m system: CMSS 958-xx-045 / CMSS 665
- 1,0 m probe / 5,0 m system: CMSS 958-xx-040 / CMSS 665
- 5,0 m probe / 5,0 m system: CMSS 665

The 5A units have an integral cable and mate directly to the driver.

Reverse mount case and button (disk) probe:

- Reverse mount case: **CMSS 65-aa0-RM-12-ee**
- Button (disk) probe: **CMSS 65-aaE-00-00-ee**

Ordering information – Part 2: Extension cable

Ordering information

CMSS 958 Extension cable.
(SKF standard CMSS 958-00-040)

Part number **CMSS 958–aa-bbb**

aa	**Cable**
00	Standard
01	Armored
02	Fiberglass sleeved
09	CSA/FM/SIRA (ATEX) (Intrinsically Safe) certified
0A	CSA/FM/SIRA (ATEX) (Intrinsically Safe) certified and armored
0H	FM (non-incendive)
0J	FM (non-incendive) armored

bbb	**Length (compatible system listed)**
030	3,0 m *(9.8 ft.)* (CMSS 665, 2,0 m *(6.56 ft.)* CMSS 65)
040	4,0 m *(13.1 ft.)* (CMSS 665, 1,0 m *(3.28 ft.)* CMSS 65)
045	4,5 m *(14.8 ft.)* (CMSS 665, 0,5 m *(1.64 ft.)* CMSS 65)
090	9,0 m *(29.5 ft.)* (CMSS 665-1, 1,5 m *(3.28 ft.)* CMSS 65)
095	9,5 m *(31.2 ft.)* (CMSS 665-1, 0,5 m *(1.64 ft.)* CMSS 65)

Ordering information – Part 3: Driver (SKF standard: CMSS 665)

Drivers containing "P" in the model number denote those models with a permanent fixed connector.

Driver (5 m system) – CMSS 665 / CMSS 665P

7,87 mV/µm *(200 mV/mil)*. Use with:

- 1,0 m probe and 4,0 m extension cable
- 0,5 m probe and 4,5 m extension cable
- 5,0 m probe

Driver (10 m system) – CMSS 665-1 / CMSS 665P-1

Use with a 1 m probe and 9 m extension cable or a 10 m probe.

- Usable range: 2 mm (0,25 to 2,30 mm); *80 mils (10 to 90 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*, ±10%
- Linearity: ±38 µm *(1.5 mil)* from best straight line

Enhanced environmental protection – CMSS 665-8 / CMSS 665P-8

Specifications for an enhanced environmental protection driver are the same as for the standard driver; however, the enhanced environmental protection driver is also filled with potting material to provide an additional measure of protection when operated in adverse environmental conditions.

- Sensitivity: 7,87 mV/µm *(200 mV/mil)*

Hazardous area approval (Intrinsic Safety) with 4140 stainless steel target – CMSS 665-16-9 / CMSS 665P-16-9

This driver is CSA/FM/SIRA (Intrinsically Safe) certified for a 5 m system. Use it with CSA/FM/SIRA (Intrinsically Safe) certified 1 m CMSS 65 probe and 4 m CMSS 958 extension cable. For intrinsic safety installations, drivers must be installed with intrinsic safety (I-S) barriers.

Barriers

- For FM approval:
  - Power: Stahl 8901/30-280/085/00
  - Signal: Stahl 8901/30-199/038/00
- For CSA and SIRA approval:
  - Power/Signal: MTL 7096 Dual (neg)

Contact your local SKF sales representative for details.

- Usable range: 1,15 mm (0,25 to 1.4 mm); *45 mils (10 to 55 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* from best straight line over 1,15 mm *(45 mil)* range

CMSS 665-16-xx / CMSS 665P-16-xx*

These are CSA/FM/SIRA (Intrinsically Safe) certified drivers for a 5 m system calibrated for shaft materials other than standard 4140 stainless steel. Use this driver with CSA/FM/SIRA (Intrinsically Safe) certified 1 m CMSS 65 probe and 4 m CMSS 958 extension cable. For intrinsic safety installations, drivers must be installed with intrinsic safety (I-S) barriers (see *CMSS 665-16-9*).

- Usable range:
  - Best attainable for specific shaft material provided
  - Customer to provide identification of shaft material and sample (approximately 5,1 cm *(2.0 in.)* diameter disk, 1,3 cm *(0.5 in.)* thick)
  - Range not expected to exceed the 1,1 mm *(45 mils)* of standard unit
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*, ± to be determined percentage of 7,87 mV/µm *(200 mV/mil)* dependent on the shaft sample material (–24 V DC supply)
- Linearity: ± the minimum deviation (in µm or mils) from the best straight line attainable for the sample shaft material provided

* xx = System calibrated for shaft materials other than standard 4140 stainless steel. For custom configurations, please contact an SKF sales representative.

Hazardous area approval (non-incendive) with 4140 stainless steel target – CMSS 665-20-00 / CMSS 665P-20-00

This FM (non-incendive) certified driver for the 5 m system is used with the FM (non-incendive) certified 1 m CMSS 65 probe and CMSS 958 extension cable.

- Usable range: 2 mm (0,25 to 2,25 mm); *80 mils (10 to 90 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* of best straight line over 2 mm *(80 mil)* range

Note: All circuit boards used in SKF CMSS 665 series drivers are conformal coated as standard procedure.

CMSS 68 / CMSS 668 series

8 mm eddy probe system, Ryton–based eddy current transducers

Option now available with either the standard removable/reversible connector or the optional permanent fixed connector.

Introduction

The eddy probe is used to measure radial or axial shaft motion. It is mounted through or to the side of a bearing cap and observes the shaft's movement relative to its mounting position. An eddy probe system comprises a probe, a driver (oscillator demodulator) and an optional extension cable.

Eddy probe systems have excellent frequency response. They have no lower frequency limit and are used to measure shaft axial position as well as vibration.

Specifications

CMSS 68 eddy current probe system

Unless otherwise noted, the following specifications apply to a complete CMSS 68 eddy current probe system, at 23 °C (73 °F), with a –24 V DC supply and target of AISI 4140 steel, comprising of:

- CMSS 68: Eddy current probe
- CMSS 958: Extension cable
- CMSS 668 or CMSS 668P: Driver

Note: These specifications may vary with different options and systems.

Electrical

- Usable range: 2,3 mm (0,2 to 2,5 mm); *90 mils (10 to 100 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* of best straight line over 2,3 mm *(90 mil)* range
- Frequency range: DC to 10 kHz (600 000 CPM), down maximum of 3 dB at 10 kHz
- Driver signal output:
  - Impedance: Minimum calibrated load resistance of 3 kΩ; output is protected against miswiring
  - Voltage: Nominal 7,87 mV/µm *(200 mV/mil)* corresponding to –18 V DC at 2,3mm *(90 mils)* with –24 V DC supply
- Power supply requirements: 15 mA from –24 to –30 V DC
- Interchangeability:
  - Probes, extension cables and drivers are compliant to API 670 requirement and may be interchanged with 5% or less performance change without recalibration
  - All units factory calibrated at 23 °C *(73 °F)*
  - Trim calibration adjustment on driver provides duplication of characteristics after replacement of any component

Environmental and mechanical

CMSS 68 probe

- Operating temperature range: –35 to +175 °C *(–30 to +350 °F)* (**Note:** Ex i regulations restrict upper limit to 100 °C *(210 °F)*)
- Differential pressure: To 4 bar *(60 PSI)*
- Materials:
  - Case: Grade 300 stainless steel
  - Tip material: Ryton
  - Connectors: Nickel plated stainless steel; weatherproof, sealable
  - Cable: Coaxial with fluorine based polymer insulation; high tensile and flexible strength
- Mounting: Recommend minimum clearance of 1/2 probe tip diameter around the probe tip to maintain factory calibration

CMSS 958 extension cable

The temperature ranges, connectors and cable are the same as the CMSS 68 eddy current probe.

CMSS 668 and CMSS 668P drivers

- Operating temperature range: 0 to 65 °C *(30 to 150 °F)*
- Connections (Power, Signal, GND):
  - Five terminal removable and reversible compression terminal block accepting up to 2 mm² *(14 AWG)* wire
  - Three connections necessary per block (–24 V DC, GND, Signal)
  - The CMSS 668P has a permanent fixed connector with the same connection characteristics
- Mounting: C-DIN rail mount that bolts onto the driver enclosure or the standard four 4,8 mm *(0.19 in. or #10)* clearance holes in a square on 63,5 mm *(2.5 in.)* centers

System performance

The following performance characteristics apply for the CMSS 68 eddy current probe system in addition to quoted nominal specifications:

- Extended temperatures: With 1 m *(3.3 ft.)* probe and 4 m *(13.1 ft.)* extension cable operating in a range of –35 to +120 °C *(–30 to +250 °F)*, and driver in the range of 0 to 65 °C *(30 to 150 °F)*
- Sensitivity: ±10% of 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* of best straight line over 2,3 mm *(90 mil)* range
- Minimum target size:
  - Flat surface: 16 mm *(0.63 in.)*
  - Shaft diameter: 24 mm *(0.93 in.)*

Hazardous area approvals

North America

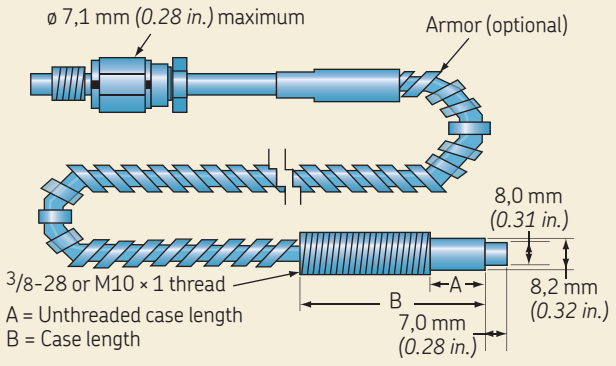
- Approvals granted by Factory Mutual (FM) and Canadian Standards Association (CSA)
- **Class I, Division 1 Groups A, B, C, D** when used with intrinsically safe Zener barriers or galvanic isolators; contact your local SKF sales representative for details
- **Class I, Division 2 Groups A, B, C, D** when connected with National Electric Code (NEC) without Zener barriers or galvanic isolator; contact your local SKF sales representative for details

Europe

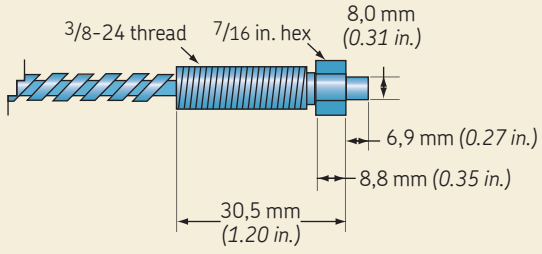
- Certification to ATEX Directive
  - Drivers: Ex II 1 G EEx ia IIC T4 (–20 ≤ T_a ≤ +75 °C) *(–5 ≤ T_a ≤ +165 °F)*; certificate number BAS02ATEX1168X
  - Probes: Ex II 1 G EEx ia IIC T4 or T2; certificate number BAS02ATEX1169
  - System: EEx ia IIC T4 or T2 (as per schedule); certificate number Ex 02E2170
- Intrinsic Safety requires use of Zener barriers; contact your local SKF sales representative for details

Note: See ordering details for probe and driver designations for hazardous area approved models.

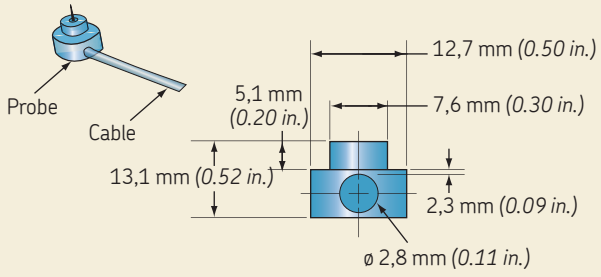
Standard mount case



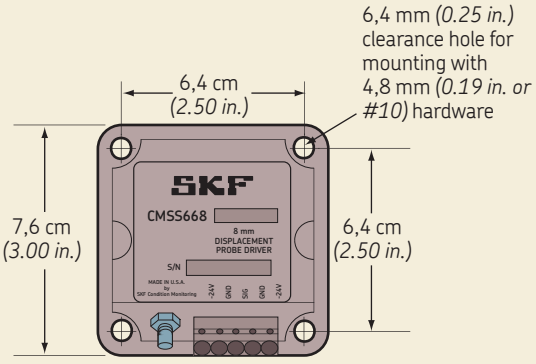
Reverse mount case

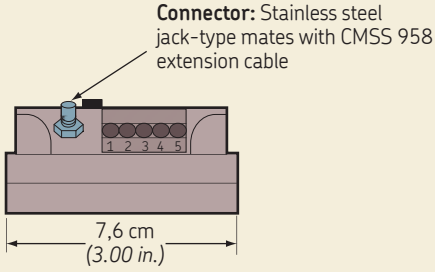


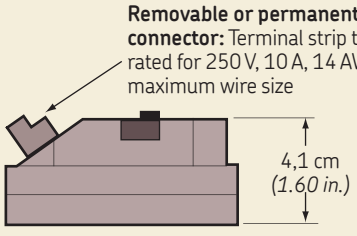
Button (disk) probe



CMSS 668 dimensions







Ordering information – Part 1: Eddy current probe

Ordering information

CMSS 68 eddy current probe.
(SKF standard: CMSS 68-000-00-12-10)

Part number **CMSS 68–aab-cc-dd-ee**

aa **Cable**
00 Standard
01 Armored
02 Fiberglass sleeved
07 CSA/FM/SIRA (ATEX) (IS) certified
08 CSA/FM/SIRA (ATEX) (IS) certified and armored
09 FM (non-incendive)
0B FM (non-incendive) armored
14 Standard for CMSS 668H-5 use
15 Armored for CMSS 668H-5 use
16 Fiberglass sleeved for CMSS 668H-5 use

b **Case**
0 3/8-24 threads (standard)
1 M10 × 1 threads
4 No case
E Button probe (Fiberglass)

cc **Unthreaded case length**
00 Fully threaded
01 to 50 2,5 to 127,0 mm *(0.1 to 5.0 in.)* (unthreaded)
51 to 99 129,5 to 251,5 mm *(5.1 to 9.9 in.)*
RM Reverse mount, 3/8-24 threads

dd **Case length**
00 Standard: No case
08 Standard: 2,0 cm *(0.8 in.)*
12 Standard: 3,0 cm *(1.2 in.)*
15 Standard: 3,8 cm *(1.5 in.)*
20 Standard: 5,1 cm *(2.0 in.)*
25 Standard: 6,4 cm *(2.5 in.)*
30 Standard: 7,6 cm *(3.0 in.)*
40 Standard: 10,2 cm *(4.0 in.)*
47 Standard: 11,9 cm *(4.7 in.)*
60 Standard: 15,2 cm *(6.0 in.)*
90 Standard: 22,9 cm *(9.0 in.)*
09 to 59 Special: 2,3 to 15,0 cm *(0.9 to 5.9 in.)*
91 to 99 Special: 23,1 to 25,1 cm *(9.1 to 9.9 in.)*

ee **Overall length***
05 0,5 m *(1.6 ft.)*
10 1,0 m *(3.3 ft.)* (standard)
5A 5,0 m *(16.4 ft.)*
AA 10,0 m *(32.8 ft.)*
FA 15,0 m *(49.2 ft.)*

* Length is nominal electrical; physical length may vary.

Compatible systems:

- 0,5 m probe / 5,0 m system: CMSS 958-xx-045 / CMSS 668
- 1,0 m probe / 5,0 m system: CMSS 958-xx-040 / CMSS 668
- 5,0 m probe / 5,0 m system: CMSS 668
- 10,0 m probe / 10,0 m system: CMSS 668
- 15,0 m probe / 15,0 m system: CMSS 668

The 5A, AA and FA units have an integral cable and mate directly to the driver.

Reverse mount case and button (disk) probe:

- Reverse mount case: **CMSS 68-aa0-RM-12-ee**
- Button (disk) probe: **CMSS 68-aaE-00-00-ee**

Ordering information – Part 2: Extension cable

Ordering information

CMSS 958 Extension cable.
(SKF standard CMSS 958-00-040)

Part number **CMSS 958–aa-bbb**

aa **Cable**
00 Standard
01 Armored
02 Fiberglass sleeved
09 CSA/FM/SIRA (ATEX) (Intrinsically Safe) certified
0A CSA/FM/SIRA (ATEX) (Intrinsically Safe) certified and armored
0H FM (non-incendive)
0J FM (non-incendive) armored
50 Standard for CMSS 668H-5 use
51 Armored for CMSS 668H-5 use
52 Fiberglass sleeved for CMSS 668H-5 use

bbb **Length (compatible system listed)**
040 4,0 m *(13.1 ft.)* (CMSS 668, 1,0 m *(3.28 ft.)* CMSS 68)
045 4,5 m *(14.8 ft.)* (CMSS 668, 0,5 m *(1.64 ft.)* CMSS 68)
090 9,0 m *(29.5 ft.)* (CMSS 668-1, 1,0 m *(3.28 ft.)* CMSS 68)
095 9,5 m *(31.2 ft.)* (CMSS 668-1, 0,5 m *(1.64 ft.)* CMSS 68)
140 14,0 m *(45.9 ft.)* (CMSS 668-2, 1,0 m *(3.28 ft.)* CMSS 68)

Ordering information – Part 3: Driver (SKF standard: CMSS 668)

Drivers containing "P" in the model number denote those models with a permanent fixed connector.

Driver (5 m system) – CMSS 668 / CMSS 668P

7,87 mV/µm *(200 mV/mil)*. Use with:

- 1,0 m probe and 4,0 m extension cable
- 0,5 m probe and 4,5 m extension cable
- 5,0 m probe

Driver (10 m system) – CMSS 668-1 / CMSS 668P-1

Use with a 1 m probe and 9 m extension cable or a 10 m probe.

- Usable range: 2,3 mm (0,25 to 2,5 mm); *90 mils (10 to 100 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)* ±10%
- Linearity: ±38 µm *(1.5 mil)* from best straight line

Driver (15 m system) – CMSS 668-2 / CMSS 668P-2

Use with a 1 m probe and 14 m extension cable or a 15 m probe.

- Usable range: 2,3 mm (0,25 to 2,5 mm); *90 mils (10 to 100 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)* ±10% at 23 °C *(73 °F)*
- Linearity: ±38 µm *(1.5 mil)* from best straight line over 2,3 mm at 23 °C *(73 °F)*

Driver (extended range) – CMSS 668H-5 / CMSS 668HP-5

Use with a 1 m probe and 9 m extension cable or a 10 m probe.

- Usable range: 3,6 mm (0,4 to 4,0 mm); *145 mils (15 to 160 mils)*
- Sensitivity: 3,94 mV/µm *(100 mV/mil)* ±10% at +23 °C *(73 °F)*
- Linearity: ±25,4 µm *(1 mil)* from best straight line over 3,6 mm at 23 °C *(73 °F)*

Enhanced environmental protection – CMSS 668-8 / CMSS 668P-8

Specifications for an enhanced environmental protection driver are the same as for the standard driver; however, the enhanced environmental protection driver is also filled with potting material to provide an additional measure of protection when operated in adverse environmental conditions

- Sensitivity: 7,87 mV/µm *(200 mV/mil)*

Hazardous area approval (Intrinsic Safety) with 4140 stainless steel target – CMSS 668-16-9 / CMSS 668P-16-9

This driver is CSA/FM/SIRA (Intrinsically Safe) certified for a 5 m system. Use it with CSA/FM/SIRA (Intrinsically Safe) certified 1 m CMSS 68 probe and 4 m CMSS 958 extension cable. For intrinsic safety installations, drivers must be installed with intrinsic safety (I-S) barriers.

Barriers

- For FM approval:
  - Power: Stahl 8901/30-280/085/00
  - Signal: Stahl 8901/30-199/038/00
- For CSA and SIRA approval:
  - Power/Signal: MTL 7096 Dual (neg)

Contact your local SKF sales representative for details.

- Usable range: 1,6 mm (0,25 to 1,9 mm); *65 mils (10 to 75 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* from best straight line over 1,15 mm *(45 mil)* range

CMSS 668-16-xx / CMSS 668P-16-xx*

These are CSA/FM/SIRA (Intrinsically Safe) certified drivers for a 5 m system calibrated for shaft materials other than standard 4140 stainless steel. Use this driver with CSA/FM/SIRA (Intrinsically Safe) certified 1 m CMSS 68 probe and 4 m CMSS 958 extension cable. For intrinsic safety installations, drivers must be installed with intrinsic safety (I-S) barriers (see *CMSS 668-16-9*).

- Usable range:
  - Best attainable for specific shaft material provided
  - Customer to provide identification of shaft material and sample (approximately 5,1 cm *(2.0 in.)* diameter disk, 1,3 cm *(0.5 in.)* thick)
  - Range not expected to exceed the 1,651 mm *(65 mils)* of standard unit
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*, ± to be determined percentage of 7,87 mV/µm *(200 mV/mil)* dependent on the shaft sample material (–24 V DC supply)
- Linearity: ± the minimum deviation (in µm or mils) from the best straight line attainable for the sample shaft material provided

***** xx = System calibrated for shaft materials other than standard 4140 stainless steel. For custom configurations, please contact an SKF sales representative.

Hazardous area approval (non-incendive) with 4140 stainless steel target – CMSS 668-20-00 / CMSS 668P-20-00

This FM (non-incendive) certified driver for the 5 m system is used with the FM (non-incendive) certified 1 m CMSS 68 probe and CMSS 958 extension cable.

- Usable range: 2,3 mm (0,25 to 2,5 mm); *90 mils (10 to 100 mils)*
- Sensitivity: 7,87 mV/µm *(200 mV/mil)*
- Linearity: ±25,4 µm *(1 mil)* of best straight line over 2,3 mm *(90 mil)* range

Note: All circuit boards used in SKF CMSS 668 series drivers are conformal coated as standard procedure.

CMSS 62 / CMSS 620 series

19 mm eddy probe system

For long range (wide gap) measurements.

- 1,5 to 7,6 mm *(60 to 300 mils)* usable range at 1,96 V/mm *(50 mV/mil)* sensitivity
- 10,8 m *(35.4 ft.)* overall cable lengths
- Dependable eddy current operation
- Readily interchangeable on-site
- Durable, high-temperature probe tip
- Rugged, long life connectors

Introduction

The CMSS 62 eddy probe, when used with a CMSS 620-2 driver, has a usable range that is typically 1,5 to 7,6 mm *(60 to 300 mils)*. The standard output sensitivity of the system is 1,96 V/mm *(50 mV/mil)*.

The CMSS 62 packs a long range into a rugged industrial probe. It is used extensively in those applications involving large position measurement. Differential expansion measurement is an ideal application for the CMSS 62.

The CMSS 62 is available in several probe case configurations and environmental options to meet a wide range of installation requirements.

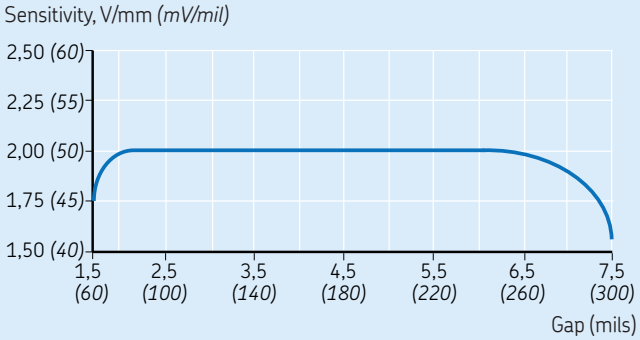
Specifications

The following specifications apply to a system including the CMSS 62 eddy probe, CMSS 620-2 driver and CMSS 900 extension cable.

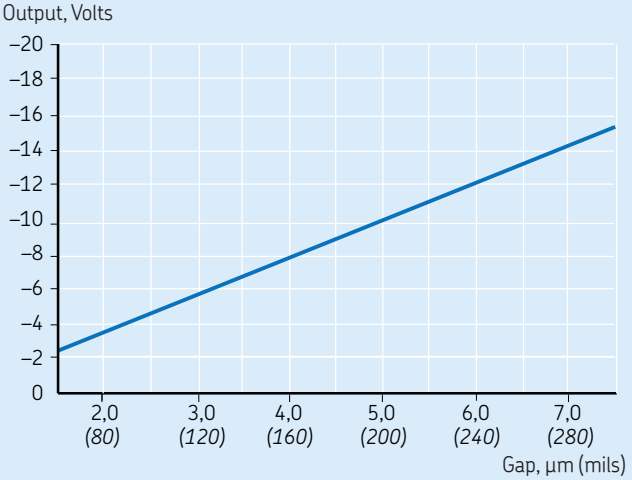
Electrical

- Usable range: 1,5 to 7,6 mm *(60 to 300 mils)*
- Sensitivity: 1,96 V/mm *(50 mV/mil)*, ±10% (–24 V DC supply) at 23 °C *(73 °F)*
- Linearity: ±2 mil of best straight line from 2 to 7 mm *(80 to 280 mils)* gap, ±10% of 1,96 V/mm *(50 mV/mil)* sensitivity from 2 to 7 mm *(80 to 280 mils)* absolute gap at 23 °C *(73 °F)*
- Frequency range: Static to 600 000 CPM; down to 3 dB at 600 000 CPM
- Driver signal output:
  - Impedance: 30 Ω
  - Current: 4 mA maximum
  - Voltage:
    - Nominal: 1,96 V/mm *(50 mV/mil)*
    - Maximum output: –19 V with –24 V supply
- Power: –24 V DC

Typical CMSS 62 / CMSS 620-2 performance: sensitivity vs. gap



Typical CMSS 62 / CMSS 620-2 performance: output vs. gap



Note: Performance specifications are based on a 4140 steel target. Consult an SKF sales representative for calibration requirements on other materials.

CMSS 620-2 driver

- Operating temperature range: –35 to +65 °C *(–30 to +150 °F)*
- Calibration probe temperature: 23 °C *(73°F)*
- Connections (power, output, common): Three terminal barrier strip (accepts 3,5 mm *(0.14 in. or #6)* spade lugs)
- Mounting holes: Four 4,8 mm *(0.19 in. or #10)* clearance holes in a square on 63 mm *(2.5 in.)* centers
- Interchangeability:
  - Probes and drivers may be interchanged with 10% or less performance change without calibration
  - All units factory calibrated
  - Trim calibration adjustment on driver allows duplication of replacement

Environmental and mechanical

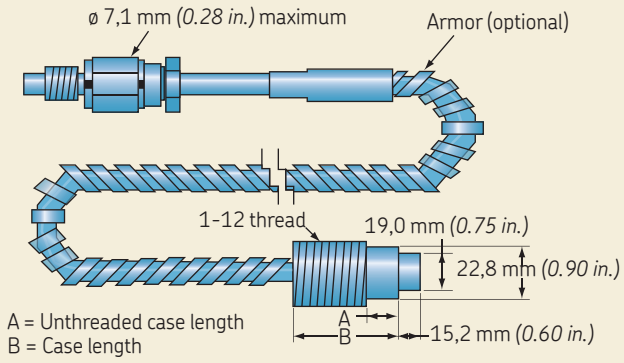
CMSS 62 probe

- Operating temperature range: –35 to +175 °C *(–30 to +350 °F)*
- Case material: Grade 300 stainless steel
- Connections: Stainless steel; weather-proof, sealable
- Cable: Coaxial with fluorine based polymer insulation; high tensile and flexural strength
- Mounting: Any position

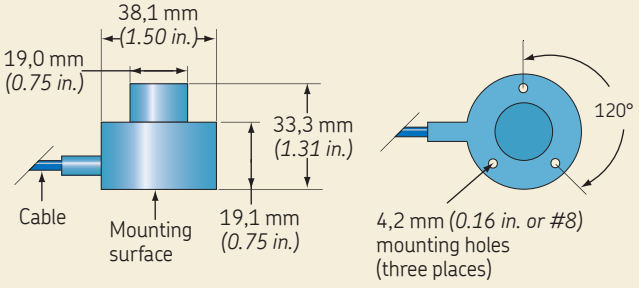
CMSS 900 extension cable

- Operating temperature range: –35 to +120 °C *(–30 to +250 °F)*
- Connections: Stainless steel; weather-proof, sealable
- Cable: Coaxial with fluorine based polymer insulation; high tensile and flexural strength

Standard mount case



Button (disk) probe



Ordering information – Part 1: Eddy current probe

Ordering information

CMSS 62 eddy current probe.
(SKF standard: CMSS 62-000-00-30-20)

Part number **CMSS 62–abc-dd-ee-ff**

a **Calibration temperature**
0 25 °C *(75 °F)*; operation < 95°C *(200 °F)* (use CMSS 620-2 driver)

b **Cable**
0 Standard
1 Radiation-resistant
4 Armored
5 Armored and radiation-resistant
8 Fiberglass sleeved
9 Radiation-resistant, fiberglass sleeved

c **Case**
0 1-12 2A threads (standard)
4 No case
5 Button (disk) probe
6 RIght angle cable exit 1-12 2A threads

dd **Unthreaded case length**
00 Fully threaded
01 to 50 2,5 to 127,0 mm *(0.1 to 5.0 in.)* (unthreaded)

ee **Case length**
00 Standard: No case
10 Standard: 2,5 cm *(1.0 in.)*
15 Standard: 3,8 cm *(1.5 in.)*
30 Standard: 7,6 cm *(3.0 in.)*
35 Standard: 8,9 cm *(3.5 in.)*
50 Standard: 12,7 cm *(5.0 in.)*

ff **Overall length**
10 1,0 m *(3.3 ft.)*
20 2,0 m *(6.6 ft.)* (standard)
40 4,0 m *(13.1 ft.)*

Button (disk) probe:

- **CMSS 62-ab5-00-00-ff**

Ordering information – Part 2: Extension cable

Ordering information

CMSS 900 Extension cable.
(SKF standard CMSS 900-00-088)

Part number **CMSS 900–ab-ccc**

a **Cable**
0 Standard
1 Armored
2 Radiation-resistant
3 Armored and radiation-resistant
4 Fiberglass sleeved
5 Fiberglass sleeved and radiation-resistant

b **Connectors**
0 Both straight
1 One right angle
2 Both right angle

ccc **Length***
068 6,8 m *(22.3 ft.)*: use with 4,0 m *(13.1 ft.)* probe and CMSS 620-2 driver
088 8,8 m *(28.9 ft.)*: use with 2,0 m *(6.6 ft.)* probe and CMSS 620-2 driver
098 9,8 m *(32.2 ft.)*: use with 1,0 m *(3.3 ft.)* probe and CMSS 620-2 driver

Note: Radiation-resistant probes must use radiation-resistant extension cables and driver.

* Probe overall lengths and extension cable lengths are nominal and will vary to meet electrical interchangeability requirements. Contact your local SKF sales representative for unlisted options.

Ordering information – Part 3: Driver (SKF standard: CMSS 620-2; radiation-resistant CMSS 620-6)

Use with:

- 1,0 m *(3.3 ft.)* probe and 9,8 m *(32.2 ft.)* extension cable
- 2,0 m *(6.6 ft.)* probe and 8,8 m *(28.9 ft.)* extension cable
- 4,0 m *(13.1 ft.)* probe and 6,8 m *(22.3 ft.)* extension cable