Selecting An Eddy Probe System

A wide variety of SKF systems are offered to meet the requirements of virtually any application. Probe range is limited largely by the probe's diameter. The standard SKF probe diameters are 5mm (CMSS 65), 8mm (CMSS 68), and 19mm (CMSS 62).

The following should be considered when selecting a system:

RANGE

Gap over which the system must accurately operate.

SENSITIVITY

Must be compatible with monitors or other companion instruments.

SYSTEM LENGTH

The physical length of the systems is approximate to the electrical length. Excess cable in certain installations is typically coiled and tied with no harmful effects.

PROBE CASE

The size of the probe mounting case may be a factor in some installations (several case options are available indicated under ordering information).

Standard SKF Eddy Probe Systems.

System	Usable Range	Sensitivity	System Length	Standard Case	Comments
CMSS 65/CMSS 665	80 Mils	200 mV/Mil	5 Meters	1/4-28	Standard System
CMSS 68/CMSS 668	90 Mils	200 mV/Mil	5 Meters	3/8-24	Meets Intent Of API 670
CMSS 68/CMSS 668-1	90 Mils	200 mV/Mil	10 Meters	3/8-24	Long System Length
CMSS 68/CMSS 668-2	90 Mils	200 mV/Mil	15 Meters	3/8-24	Long System Length
CMSS 62/CMSS 620-2	60-300 Mils	50 mV/Mil	10.8 Meters	1"–12 UNF	Long Range
CMSS 68/CMSS 668-5	15-160 Mils	100 mV/Mil	10 Meters	3/8-24	Long Range

Some Eddy Probe Options

ARMOR

A flexible stainless steel jacket protects the cable. Recommended when the cable is not protected by conduit. Available on Probe Cables and Extension Cables. Not compatible with Cable Packing Glands.

CERTIFICATION

Approved Probes and Drivers can be supplied with either nonincendive or intrinsic safetly approvals. Nonincendive products are supplied with FM (Factory Mutual) certification tags attached. Intrinsically safe products are supplied with triple agency approval certification tags attached (EECS [BASEEFA], FM [Factory Mutual Systems] and CSA).

CE ***CE Mark***

Beginning January 1996, European Community requires equipment sold in their area to be a CE marked product. Because sensors have an active component such as the integrated circuit amplifier, the sensor should have the CE mark.

A Word About . . .

PROBE TIPS

SKF uses RYTON® for Eddy Probe tips because it is simply the best material for the job. RYTON has high dimensional stability reducing probe coil shape variations with temperature and humidity and maintaining system accuracy, linearity, and resolution. RYTON is a "super plastic" that has no known solvent below +400°F (+205°C) and therefore highly resistant to the acids, bases and solvents handled by process machinery.

INSTALLATION

Major considerations include temperatures, pressures, and mechanical stress to which the Probe, Driver, and cables are subjected. It is essential that the Probe be rigidly mounted, yet easily adjusted (SKF mounting accessories are ideal for this). If long cable runs between the Driver and Monitor are required, consult the table to the right to determine the maximum recommended wire length (use 3-conductor shielded wire).

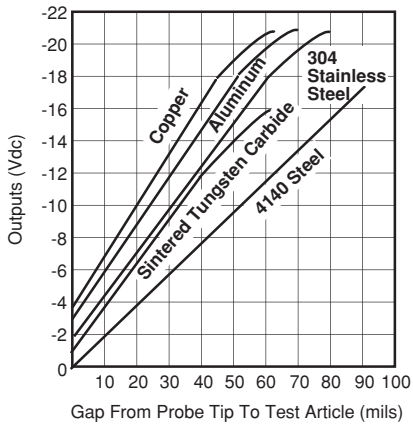
TARGET MATERIAL

Standard systems are calibrated to observe 4140 steel. As recommended by API Standard 670, Probe calibration should be verified on a target with the same electrical characteristics as the shaft. The SKF CMSS 601 Static Calibrator and the Driver trim control, permit verification and convenient field calibration within a ± 5% range on the shaft itself. Response is dependent upon the conductance of the target material, as illustrated on the chart. Drivers may be special ordered for calibrated response to different metal types. Customers will be requested to provide samples of the metal types.

RUNOUT

Because the Eddy Probe works on the principle of conductivity, shaft irregularities (flat spots, scratches, plating, hardness variations, carbon inclusions, magnetized regions, etc.) may produce false vibration signals. API Standard 670 recommends combined total electrical and mechanical runout does not exceed 0.25 mils maximum. Some irregularities, such as plated shafts, cannot be reduced to an acceptable level with traditional methods (peening, knurling, etc.).

Wire Size (AWG)	Distance (Maximum)
22	500 Feet (150 meters)
20	1,000 Feet (300 meters)
18	2,000 Feet (600 meters)
16	3,000 Feet (900 meters)



System response varies with the target material.

Selecting An Eddy Probe System

INTRINSIC SAFETY

SKF Monitors provide current limited power to Eddy Probe Systems which meet safety requirements of most applications. However, if intrinsic safety barriers (Zener barriers) will be used, consult the local sales representative to ensure range, linearity, and power requirements will be met.

API STANDARD 670

The American Petroleum Institute has published Standard 670 as an aid to the procurement of standardized non-contacting vibration, axial position, and temperature monitoring systems. The standard is based on the accumulated knowledge and experience of petroleum refiners and monitoring system manufacturers. API Standard 670 is a valuable reference tool for all machinery users and manufacturers, and is highly recommended as a guide for defining, purchasing, and installing machinery monitoring systems.

API 670 was written to define reliable protection systems for rotating equipment operating in the harsh conditions found in oil production, refining, and chemical processing. SKF RYTON based Eddy Current Probes were designed using a unique temperature chamber to test the Probes over the wide temperature range required by API. The output sensitivity of conventional Eddy Current Probe systems typically falls off as temperature increases. A unique Probe winding technique was developed by SKF that strives to maintain output sensitivity over the specified temperature range.

"Super tough" Eddy Current Probe systems are thoroughly field tested and proven, with thousands of units installed.

SKF has been using RYTON in its transducer designs for many years. RYTON's strength approaches that of metal. The material is now beginning to be used in the manufacture of automobile engine camshafts. That's what we mean when we say "Super tough".

SKF Eddy Current Probes are available in a variety of case mounting configurations and length options to meet difficult installation requirements.

RYTON is impervious to any solvent at temperatures up to +400°F (+205°C). For this reason, SKF Driver Housings are also made of this same super tough material. An added benefit is that there is no longer a need to electrically isolate drivers during installation to prevent troublesome ground loops. RYTON's proven resistance to extreme harsh environments protects the complex electronics required to operate Eddy Current Probes. An internal sealing system protects these components from moisture ingression and corrosion. This increases system reliability by eliminating the need to totally encapsulate these components. Due to its unique construction, both the Driver Housing and the internal circuits react to severe thermal excursions at the same rate. This reduces internal stresses created by routine machinery transients or load changes, providing for a longer driver life.

SKF Drivers are EMI/RFI shielded, and the mounting scheme allows them to fit the same "footprint" as previous SKF Driver Housings, or they can be snapped onto type C-DIN rails for high density applications and quick installation. The compression connector for terminating the power and signal wiring further aids in the ease and cost of installation. A fixed connector version is also available.

SKF Eddy Current Probe systems are constantly temperature and performance tested in a continuing effort to improve what is already the best Probe available for the measurement of vibration in rotating equipment. They are available with armored and fiberglass sleeving, and may be offered EECS (BASEEFA)/ CSA/FM certified.

The small tip diameter (5mm) of the CMSS 65 Eddy Current Probe systems, coupled with the stringent controls under which they are produced, effectively reduces calibration error due to shaft curvature. This makes the CMSS 65 an exceptional choice for measuring vibration in small diameter shafts. The CMSS 65 is available in 5 meter systems (Probe with Integral Cable, or a combination of Probe Cable and Extension Cable) and has a typical usable range of 10 mils to 90 mils with a 200 mV/mil sensitivity. A specific CMSS 665 Driver is required for each of the standard length systems (refer to chart on page 3).

The larger tip diameter (8mm) of the CMSS 68 SKF Transducer is used for large diameter shafts as well as long range axial position (thrust) measurements. The CMSS 68 is available in 5, 10 or 15 meter systems and has a typical usable range of 10 mils to 100 mils with a 200 mV/mil (7.87 V/mm) sensitivity. The CMSS 668-5 Driver provides a usable range of 15 mils to 160 mils with a sensitivity of 100 mV/ mil (3.94 V/ mm); it is available only as a 10 meter system.

Temperature conversion table.

Fahrenheit to Celsius: °C = 5/9 (°F – 32)
Celsius to Fahrenheit: °F = 9/5 (°C) + 32

Conversion Between °F and °C

← °F			← °F		
°C	°C → °F		°C	°C → °F	
-40.0	-40.0	-40.0	+4.4	40.0	104.0
-28.9	-20.0	-4.0	10.0	50.0	122.0
-23.3	-10.0	+14.0	15.6	60.0	140.0
-20.6	-5.0	23.0	21.1	70.0	158.0
-17.8	0	32.0	26.7	80.0	176.0
-15.9	+5.0	41.0	32.2	90.0	194.0
-12.2	10.0	50.0	37.8	100.0	212.0
-6.7	20.0	68.0	93.3	200.0	392.0
-1.1	30.0	86.0			

Length conversion table.

0.5 Meters ≈ 20 Inches (1.7 Feet)
1.0 Meters ≈ 39 Inches (3.3 Feet)
5.0 Meters ≈ 196 Inches (16.0 Feet)
10.0 Meters ≈ 393 Inches (33.0 Feet)
15.0 Meters ≈ 590 Inches (49.0 Feet)

Mils × (25.4×10^{-6}) = Microns
Microns ÷ (25.4×10^{-6}) = Mils

1 Mils = 25.4 Microns	80 Mils = 2.0320mm
5 Mils = 127.0 Microns	90 Mils = 2.2860mm
10 Mils = 254.0 Microns	100 Mils = 2.5400mm
20 Mils = 508.0 Microns	110 Mils = 2.7940mm
30 Mils = 762.0 Microns	120 Mils = 3.0480mm
40 Mils = 1.0160mm	130 Mils = 3.3020mm
50 Mils = 1.2700mm	140 Mils = 3.5560mm
60 Mils = 1.5240mm	150 Mils = 3.8100mm
70 Mils = 1.7780mm	

CMSS 65/CMSS 665 Series 5mm Eddy Probe System RYTON® – Based Eddy Current Transducers

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

CSA *EECS (BASEEFA)* *FM*

Specifications

The following specifications apply to a complete CMSS 65 Eddy Current Probe System comprising a CMSS 65 Eddy Current Probe, a CMSS 958 Extension Cable and a CMSS 665 or CMSS 665P Driver. ***These specifications may vary with different options and systems configurations.***

ELECTRICAL

Usable Range: 80 mils (10 mils to 90 mils)

Sensitivity: 200 mV/mil; ± 5% of 200 mV/mil, (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1 mil of best straight line over 80 mil range of unit at +73°F (+23°C)

Frequency Range: DC to 600,000 CPM; down maximum of 3 dB at 600,000 CPM

Driver Signal Output:

Impedance: Minimum calibrated load resistance of 3k Ω; output is protected against miswiring

Voltage: Nominal 200 mV/mil corresponding to -18 Vdc at 90 mils with -24 Vdc supply

Interchangeability: Probes, Extension Cables and Drivers may be interchanged with 5% or less performance change without recalibration. All units factory calibrated at +73°F (+23°C). Trim calibration adjustment on Driver provides duplication of characteristics after replacement of any component.

Power Supply Requirements: 15 mA from -24 Vdc to -30 Vdc

ENVIRONMENTAL AND MECHANICAL

CMSS 65 Eddy Current Probe

Operating Temperature Range: -30°F to +250°F (-35°C to +120°C)

EECS (BASEEFA) tagged are limited to +212°F (+100°C) maximum.

Differential Pressure: To 60 psi

Case Material: 300 Stainless Steel

Tip Material: RYTON®

Connectors: Nickel plated stainless steel; weatherproof, sealable

Cable: Coaxial with Teflon® insulation; High tensile and flexible strength

Mounting: Any position; recommend clearance of 1/2 Probe Tip diameter around the Probe Tip to maintain factory calibration.

CMSS 665 and CMSS 665P Driver

Operating Temperature Range: -30°F to +150°F (-35°C to +65°C)

Connections: (Power, Signal, GND) Five terminal removable and reversible compression terminal block accepting up to 14 AWG wire. Three connections necessary per block (-24 Vdc; GND; Signal). The CMSS 665P has a permanent fixed connector with same connection characteristics.

Mounting: C-DIN Rail Mount which bolts onto Driver enclosure, or the standard four number 10 clearance holes in a square on (2.5") 63mm centers.

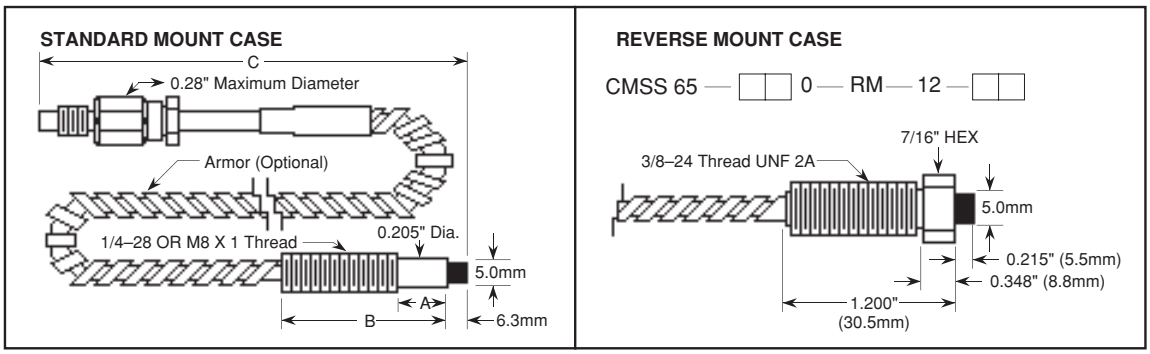
CMSS 958 Extension Cable

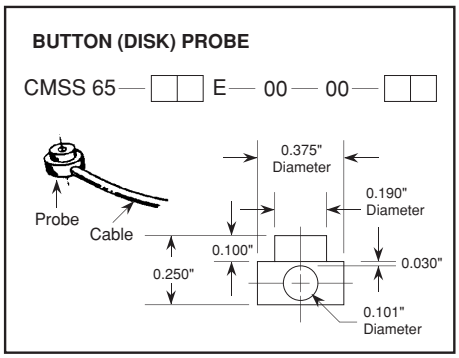
Temperature ranges, connectors, cable same as CMSS 65 Eddy Current Probe.

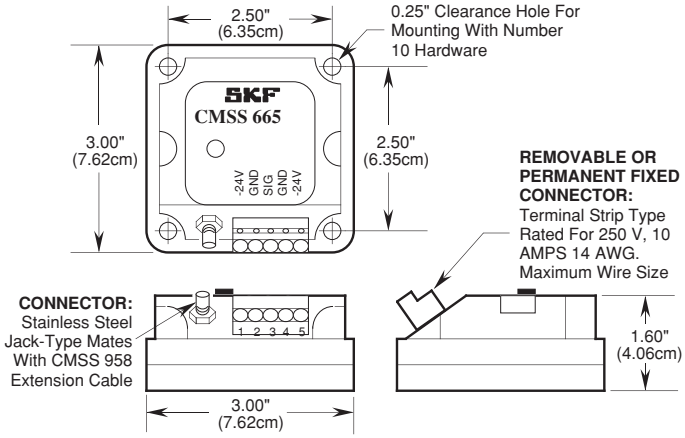
CMSS 65/CMSS 665 Series 5mm Eddy Probe System

Ordering Information

DIMENSIONS IN INCHES, EXCEPT AS NOTED







Part 1: Eddy Current Probe (SKF Standard: CMSS 65-002-00-12-10)

CMSS 65 — □□□ — □□ — □□ — □□

CABLE	
Standard	00
Armored	01
Fiberglass Sleeved	02
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified	07
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified and Armored	08
FM (non-incendive)	09
FM (non-incendive) Armored	0B

CASE	
2	1/4–28 Threads (Standard)
3	M8 X 1 Threads
0	3/8–24 Threads
1	M10 X 1 Threads
4	No Case
E	Button Probe (Fiberglass)

"A" UNTHREADED CASE LENGTH	
Fully Threaded	00
0.1 Inches To 5.0 Inches Unthreaded	01 To 50
5.1 Inches To 9.9 Inches	51 To 99
Reverse Mount 3/8–24 Thread	RM

"B" CASE LENGTH	
Standards:	
No Case	00
0.8 Inches	08
1.2 Inches	12
1.5 Inches	15
2.0 Inches	20
2.5 Inches	25
3.0 Inches	30
4.0 Inches	40
4.7 Inches	47
6.0 Inches	60
9.0 Inches	90
SPECIALS	
0.9 To 5.9 Inches	09 To 59
9.1 To 9.9 Inches	91 To 99

"C" OVERALL LENGTH +1	
05	0.5 Meter
10	1.0 Meter (Standard)
5A	5.0 Meter

+1: Length is **Nominal Electrical:** physical length may vary.

Compatible Systems:

0.5m Probe:
5.0m System:
CMSS 958 - XX - 045/CMSS 665
1.0m Probe:
5.0m System:
CMSS 958 - XX - 040/CMSS 665
5.0m Probe:
5.0m System: CMSS 665
The 5A units have integral cable and mate directly to the Driver.

– NOTE –

See catalog page 34 for recommended Intrinsic Safety (I-S) Barriers and entity parameters.

CMSS 65/CMSS 665 Series 5mm Eddy Probe System

Part 2: Extension Cable (SKF Standard: CMSS 958-00-040)

CMSS 958 — [ ][ ] — [ ][ ][ ]

CABLE	
Standard	00
Armored	01
Fiberglass Sleeved	02
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified	09
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified and Armored	0A
FM (non-incendive)	0H
FM (non-incendive) Armored	0J

LENGTH (Compatible System Listed)	
CMSS 665, 2.0m CMSS 65	030
CMSS 665, 1.0m CMSS 65	040
CMSS 665, 0.5m CMSS 65	045

Part 3: Driver (SKF Standard: CMSS 665)

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

CMSS 665/CMSS 665P

SKF Standard (200 mV/mil). Use with 1.0m Probe and 4.0m Extension Cable, 0.5m Probe and 4.5m Extension Cable or 5.0m Probe.

CMSS 665-8/CMSS 665P-8

Specifications same as standard driver, that is also filled with potting material to provide additional measure of protection when operated in adverse environmental conditions (200 mV/mil).

CMSS 665-16-9/ CMSS 665P-16-9

CSA/FM/BASEEFA (Intrinsically Safe) Certified Driver for 5.0m System. Use with CSA/FM/BASEEFA (Intrinsically Safe) Certified 1.0m CMSS 65 Probe and 4.0m CMSS 958 Extension Cable. For intrinsic safety installations drivers must be installed with intrinsic safety (I-S) barriers.

Usable Range: 45 mils (10 mils to 55 mils)

Sensitivity: 200 mV/mil, ± 5% of 200 mV/mil at +73°F (+23°C) (-24 Vdc supply)

Linearity: ± 1 mil from best straight line over 45 mil range at +73°F (+23°C)

CMSS 665-16-XX/ CMSS 665P-16-XX

CSA/FM/BASEEFA (Intrinsically Safe) Certified Driver for 5.0m System calibrated for shaft materials other than standard 4140 stainless steel. Use with CSA/FM/BASEEFA (Intrinsically Safe) Certified 1.0m CMSS 65 Probe and 4.0m CMSS 958 Extension Cable. For intrinsic safety installations drivers must be installed with intrinsic safety (I-S) barriers.

Usable Range: Best attainable for specific shaft material provided. Customer to provide identification of shaft material ***and*** sample (approximately 2.0" diameter disk, 0.5" thick). Range not expected to exceed the 45 mils of standard unit.

Sensitivity: 200 mV/mil, ± a to be determined (TBD) percentage of 200 mV/mil dependent on the shaft sample material (-24 Vdc supply).

Linearity: ± the minimum deviation (in mils) from the best straight line attainable for the sample shaft material provided.

CMSS 665-20-00/CMSS 665P-20-00

FM (non-incendive) Certified Driver for the 5.0m System. Use with FM (non-incendive) Certified 1.0m CMSS 65 Probe and CMSS 958 Extension Cable. The installed system is FM approved for Class 1, Division 2, Groups A, B, C, and D when connected in accordance with National Electric Code®.

Usable Range: 80 mils (10 mils to 90 mils)

Sensitivity: 200 mV/mil, ± 5% of 200 mV/mil, (-24 Vdc supply) at +73°F (+23°C)

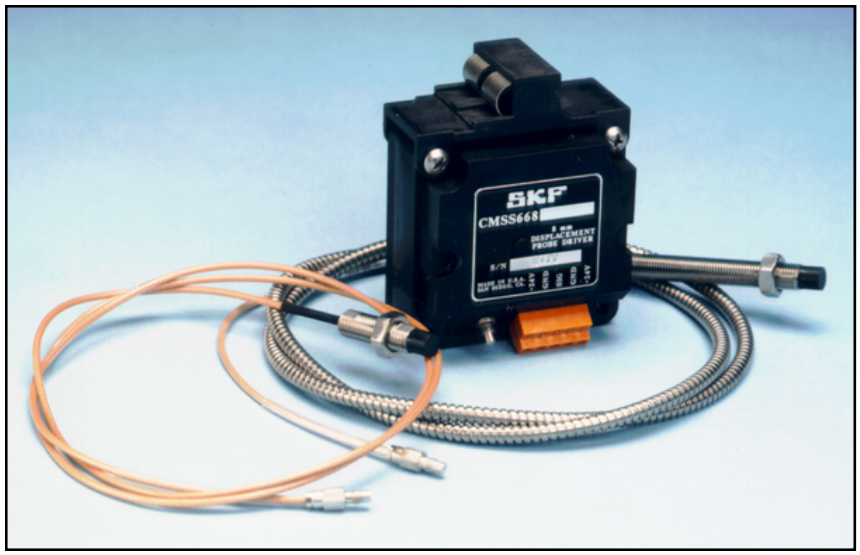
Linearity: ± 1 mil of best straight line over 80 mil range of unit at +73°F (+23°C)

– NOTE –

All circuit boards used in SKF CMSS 665 Series Drivers are conformal coated as standard procedure.

CMSS 68/CMSS 668 Series 8mm Eddy Probe System RYTON® – Based Eddy Current Transducers

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



CSA *EECS (BASEEFA)* *FM*

Specifications

The following specifications apply to a complete CMSS 68 Eddy Current Probe System comprising a CMSS 68 Eddy Current Probe, a CMSS 958 Extension Cable and a CMSS 668 Driver. ***These specifications may vary with different options and systems configurations.***

ELECTRICAL

Usable Range: 90 mils (10 mils to 100 mils)

Sensitivity: 200 mV/mil; ± 5% of 200 mV/mil, (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1 mil of best straight line over 90 mil range of unit at +73°F (+23°C)

Frequency Range: DC to 600,000 CPM; down maximum of 3 dB at 600,000 CPM

Driver Signal Output:

Impedance: Minimum calibrated load resistance of 3k Ω; output is protected against miswiring

Voltage: Nominal 200 mV/mil corresponding to -18 Vdc at 90 mils with -24 Vdc supply

Interchangeability: Probes, Extension Cables and drivers may be interchanged with 5% or less performance change without recalibration. All units factory calibrated at +73°F (+23°C). Trim calibration adjustment on Driver allows duplication of exact characteristics after replacement of any component.

Power Supply Requirements: 15 mA from -24 Vdc to -30 Vdc

ENVIRONMENTAL AND MECHANICAL

CMSS 68 Eddy Current Probe

Operating Temperature Range: -30°F to +250°F (-35°C to +120°C)

EECS (BASEEFA) tagged are limited to +212°F (+100°C) maximum.

Differential Pressure: To 60 psi

Case Material: 300 Stainless Steel

Tip Material: RYTON®

Connectors: Nickel plated stainless steel; weatherproof, sealable

Cable: Coaxial with Teflon® insulation; High tensile and flexible strength

Mounting: Any position; recommend clearance of 1/2 Probe Tip diameter around the Probe Tip to maintain factory calibration.

CMSS 668 and CMSS 668P Driver

Operating Temperature Range: -30°F to +150°F (-35°C to +65°C)

Connections: (Power, Signal, GND) Five terminal removable and reversible compression terminal block accepting up to 14 AWG wire. Three connections necessary per block (-24 Vdc; GND; Signal). The CMSS 668P has a permanent fixed connector with same connection characteristics.

Mounting: C-DIN Rail Mount which bolts onto Driver enclosure, or the standard four number 10 clearance holes in a square on (2.5") 63mm centers.

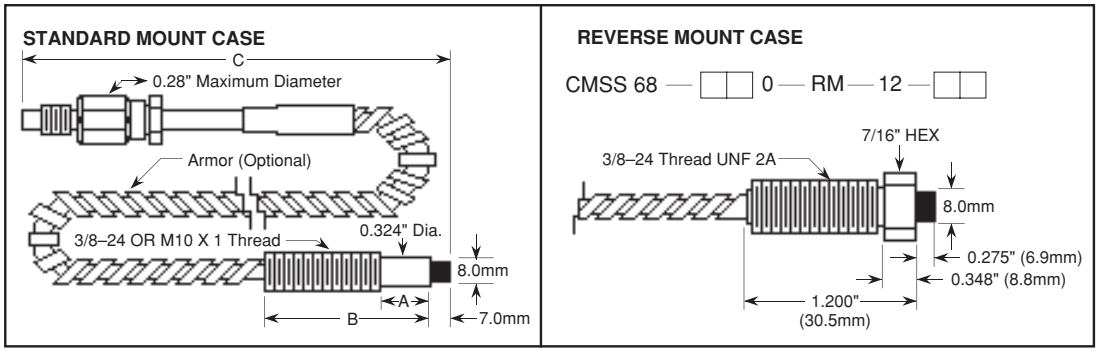
CMSS 958 Extension Cable

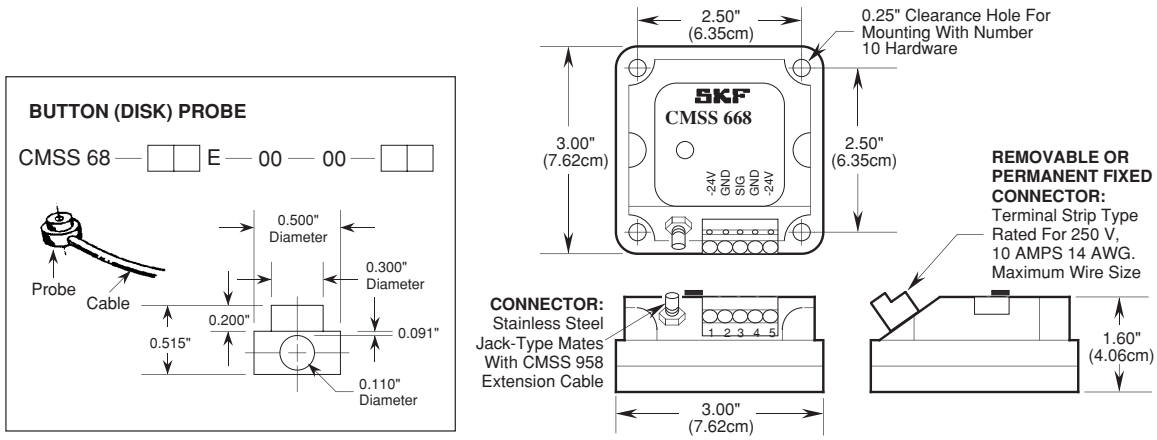
Temperature ranges, connectors, cable same as CMSS 68 Eddy Current Probe.

CMSS 68/CMSS 668 Series 8mm Eddy Probe System

Ordering Information

DIMENSIONS IN INCHES, EXCEPT AS NOTED





Part 1: Eddy Current Probe (SKF Standard: CMSS 68-000-00-12-10)

CMSS 68 — □□□ — □□ — □□ — □□

CABLE	
Standard	00
Armored	01
Fiberglass Sleeved	02
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified	07
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified and Armored	08
FM (non-incendive)	09
FM (non-incendive) Armored	0B

CASE	
0	3/8–24 Threads (Standard)
1	M10 X 1 Threads
4	No Case
E	Button Probe (Fiberglass)

"A" UNTHREADED CASE LENGTH	
Fully Threaded	00
0.1 Inches To 5.0 Inches Unthreaded	01 To 50
5.1 Inches To 9.9 Inches	51 To 99
Reverse Mount 3/8–24 Thread	RM

"B" CASE LENGTH	
Standards:	
No Case	00
0.8 Inches	08
1.2 Inches	12
1.5 Inches	15
2.0 Inches	20
2.5 Inches	25
3.0 Inches	30
4.0 Inches	40
4.7 Inches	47
6.0 Inches	60
9.0 Inches	90
SPECIALS	
0.9 To 5.9 Inches	09 To 59
9.1 To 9.9 Inches	91 To 99

"C" OVERALL LENGTH +1	
05	0.5 Meter
10	1.0 Meter (Standard)
5A	5.0 Meter
AA	10.0 Meter
FA	15.0 Meter

+1: Length is **Nominal Electrical:** physical length may vary.

Compatible Systems:

0.5m Probe:
5.0m System:
CMSS 958 - XX - 045/CMSS 668
1.0m Probe:
5.0m System:
CMSS 958 - XX - 040/CMSS 668
5.0m Probe:
5.0m System: CMSS 668
10.0m Probe:
10.0m System: CMSS 668-1
15.0m Probe:
15.0m System: CMSS 668-2

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

– NOTE –

See catalog page 34 for recommended Intrinsic Safety (I-S) Barriers and entity parameters.

CMSS 68/CMSS 668 Series 8mm Eddy Probe System

Part 2: Extension Cable (SKF Standard: CMSS 958-00-040)

CMSS 958 — [ ][ ] — [ ][ ][ ]

CABLE	
Standard	00
Armored	01
Fiberglass Sleeved	02
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified	09
CSA/FM/EECS (BASEEFA) (Intrinsically Safe) Certified and Armored	0A
FM (non-incendive)	0H
FM (non-incendive) Armored	0J

LENGTH (Compatible System L ted)	
CMSS 668, 1.0m CMSS 68	040
CMSS 668, 0.5m CMSS 68	045
CMSS 668-1, 1.0m CMSS 68	090
CMSS 668-1, 0.5m, CMSS 68	095
CMSS 668-2, 1.0m, CMSS 68	140

Part 3: Driver (SKF Standard: CMSS 668)

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

CMSS 668/CMSS 668P

SKF Standard (200 mV/mil). Use with 1.0m Probe and 4.0m Extension Cable, 0.5m Probe and 4.5m Extension Cable or 5.0m Probe.

CMSS 668-1/CMSS 668P-1

Driver for 10.0m System (200 mV/mil). Use with 1.0m Probe and 9.0m Extension Cable or 10.0m Probe.

Usable Range: 90 mils (10 mils to 100 mils)

Sensitivity: 200 mV/mil, ± 10% of 200 mV/mil (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1.5 mil from best straight line at +73°F (+23°C)

CMSS 668-2/CMSS 668P-2

Driver for 15.0m System (200 mV/mil). Use with 1.0m Probe and 14.0m Extension Cable or 15.0m Probe.

Usable Range: 90 mils (10 mils to 100 mils)

Sensitivity: 200 mV/mil, ± 10% of 200 mV/mil (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1.5 mil from best straight line over 90 mil range at +73°F (+23°C)

CMSS 668-5/CMSS 668P-5

Driver for extended range (15 mils to 160 mils) used with 10.0m System. Use with 1.0m Probe and 9.0m Extension Cable or 10.0m Probe.

Usable Range: 145 mils (15 mils to 160 mils)

Sensitivity: 100 mV/mil, ± 10% of 200 mV/mil (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1 mil from best straight line over 145 mil range at +73°F (+23°C)

CMSS 668-8/CMSS 668P-8

Specifications same as standard Driver, that is also filled with potting material to provide additional measure of protection where operated in adverse environmental conditions (200 mV/mil).

CMSS 668-16-9/ CMSS 668P-16-9

CSA/FM/BASEEFA (Intrinsically Safe) Certified Driver for 5.0m System. Use with CSA/FM/BASEEFA (Intrinsically Safe) Certified 1.0m CMSS 68 Probe and 4.0m CMSS 958 Extension Cable. For intrinsic safety installations drivers must be installed with intrinsic safety (I-S) barriers.

Usable Range: 65 mils (10 mils to 75 mils)

Sensitivity: 200 mV/mil, ± 5% of 200 mV/mil (-18 Vdc or -24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1 mil from best straight line over 65 mil range at +73°F (+23°C)

– NOTE –

All circuit boards used in SKF CMSS 668 Series Drivers are conformal coated as standard procedure.

CMSS 68/CMSS 668 Series 8mm Eddy Probe System

Part 3: Driver (SKF Standard: CMSS 668)

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

CMSS 668-16-15/CMSS 668P-16-15

CSA/FM/BASEEFA (Intrinsically Safe) Certified Driver for 10.0m System. Use with CSA/FM/ BASEEFA (Intrinsically Safe) Certified 1.0m CMSS 68 probe and 9.0m CMSS 958 Extension Cable. For intrinsic safety installations drivers must be installed with intrinsic safety (I-S) barriers.

Usable Range: 60 mils (10 mils to 70 mils)

Sensitivity: 200 mV/mil, ± 10% of 200 mV/mil (-18 Vdc or -24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1.5 mil from best straight line over 60 mil range at +73°F (+23°C)

CMSS 668-16-XX/CMSS 668P-16-XX

CSA/FM/BASEEFA (Intrinsically Safe) Certified Driver for 5.0m System calibrated for shaft materials other than standard 4140 stainless steel. Use with CSA/FM/BASEEFA (Intrinsically Safe) Certified 1.0m CMSS 68 probe and 4.0m CMSS 958 Extension Cable. For intrinsic safety installations drivers must be installed with intrinsic safety (I-S) barriers.

Usable Range: Best attainable for specific shaft material provided. Customer to provide identification of shaft material ***and*** sample (approximately 2.0" diameter disk, 0.5" thick). Range not expected to exceed the 60 mils of the standard unit.

Sensitivity: 200 mV/mil, ± a to be determined (TBD) percentage of 200 mV/mil dependent on the shaft sample material (-18 Vdc or -24 Vdc supply).

Linearity: ± the minimum deviation (in mils) from the best straight line attainable for the sample shaft material provided.

CMSS 668-20-00/CMSS 668P-20-00

FM (non-incendive) Certified Driver for the 5.0m System. Use with FM (non-incendive) Certified 1.0m CMSS 65 Probe and CMSS 958 Extension Cable. The installed system is FM approved for Class 1, Division 2, Groups A, B, C, and D when connected in accordance with National Electric Code®.

Usable Range: 80 mils (10 mils to 100 mils)

Sensitivity: 200 mV/mil, ± 5% of 200 mV/ mil, (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 1 mil of best straight line over 80 mil range of unit at +73°F (+23°C)

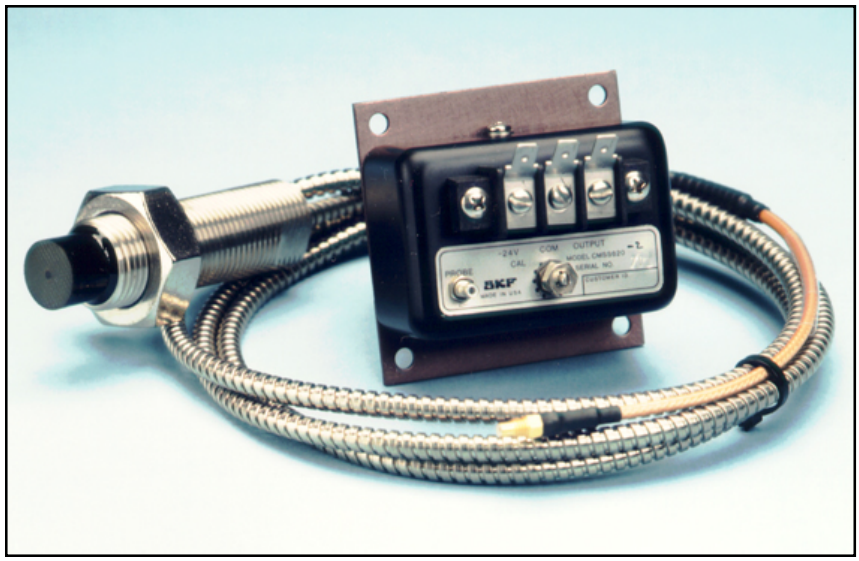
– NOTE –

All circuit boards used in SKF CMSS 668 Series Drivers are conformal coated as standard procedure.

CMSS 62/CMSS 620 Series 19mm Eddy Probe System

For long range (wide gap) measurements

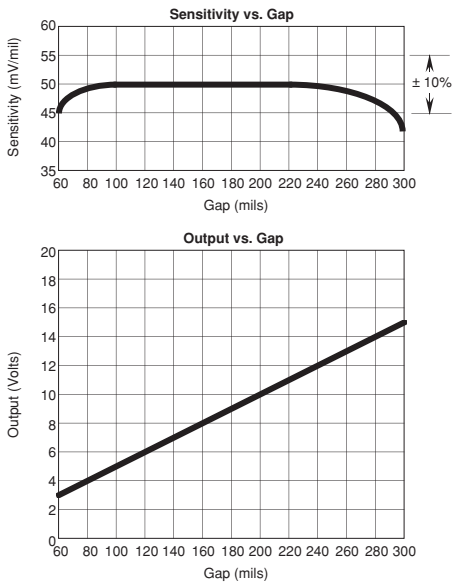
- ***60 mils to 300 mils usable range at 50 mV/mil (1.96 V/mm)sensitivity***
- ***10.8 meter overall cable lengths***
- ***Dependable eddy current operation***
- ***Readily interchangeable on-site***
- ***Durable, high-temperature probe tip***
- ***Rugged long life connectors***



The CMSS 62 Eddy Probe, when used with a CMSS 620-2 Driver, has a usable range that is typically 60 mils to 300 mils. The standard output sensitivity of the system is 50 mV/mil (1.96 V/mm).

The CMSS 62 packs a long range into a rugged industrial probe. It is used extensively in those applications involving large position measurement.

Typical CMSS 62/CMSS 620-2 Performance



– NOTE –

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

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: 60 mils to 300 mils

Sensitivity: 50 mV/mil, ± 10% (1.96 V/mm) (-24 Vdc supply) at +73°F (+23°C)

Linearity: ± 2 mil of best straight line from 80 mils to 280 mils gap, ± 10% of 50 mV/mil sensitivity from 80 mils to 280 mils absolute gap at +73°F (+23°C)

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: 50 mV/mil

Maximum Output: -19 V with -24 V supply

Power: -24 Vdc

CMSS 620-2 Driver

Operating Temperature Range: -30°F to +150°F (-35°C to +65°C)

Calibration Probe Temperature: +73°F (+23°C)

Connections (Power, Output, Common): Three terminal barrier strip (accepts #6 spade lugs)

Mounting Holes: Four #10 clearance holes in a square on 2.5" (63mm) 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: -30°F to +250°F (-35°C to +120°C)

Case Material: 300 Stainless Steel

Connections: Stainless Steel. Weather-proof, sealable.

Cable: Coaxial with Teflon® insulation. High tensile and flexural strength.

Mounting: Any position

CMSS 900 Extension Cable

Operating Temperature Range: -30°F to +250°F (-35°C to +120°C)

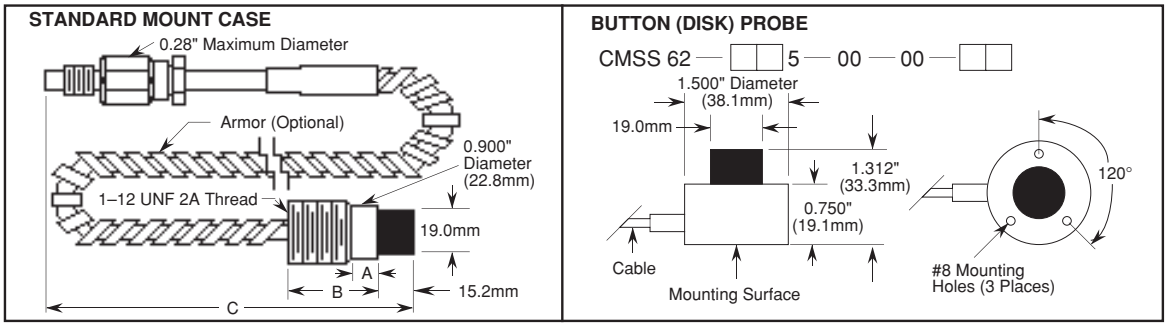
Connections: Stainless Steel. Weather-proof, sealable.

Cable: Coaxial with Teflon® insulation. High tensile and flexural strength.

CMSS 62/CMSS 620 Series 19mm Eddy Probe System

Ordering Information

DIMENSIONS IN INCHES, EXCEPT AS NOTED



Part 1: Eddy Current Probe (SKF Standard: CMSS 62-000-00-30-20)

CMSS 62 — □□□ — □□ — □□ — □□

CALIBRATION TEMPERATURE	
75°F; Operation < 200°F (Use CMSS 620-2 Driver)	0

CABLE	
Standard	0
Radiation Resistant	1
Armored	4
Armored and Radiation Resistant	5
Fiberglass Sleeved	8
Radiation Resistant, Fiberglass Sleeved	9

CASE	
0	1–12 UNF 2A Threads (Standard)
4	No Case
5	Button (Disk) Probe
6	Right Angle Cable Exit 1–12 UNF 2A Threads

"A" UNTHREADED CASE LENGTH	
00	Fully Threaded
01 To 50	0.1 Inches To 5.0 Inches Unthreaded

"B" CASE LENGTH	
	Standards:
00	No Case
10	1.0 Inches
15	1.5 Inches
30	3.0 Inches
35	3.5 Inches
50	5.0 Inches

"C" OVERALL LENGTH	
10	1.0 Meter
20	2.0 Meters (Standard)
40	4.0 Meters

Part 2: Extension Cable (SKF Standard: CMSS 900-00-088)

CMSS 900 — □□□ — □□□

CABLE	
Standard	0
Armored	1
Radiation Resistant	2
Armored and Radiation Resistant	3
Fiberglass Sleeving	4
Fiberglass Sleeving and Radiation Resistant	5

CONNECTORS	
Both Straight	0
One Right Angle	1
Both Right Angle	2

LENGTH *	
6.8 Meters: Use With 4.0 Meter Probe and CMSS 620-2 Driver	068
8.8 Meters: Use With 2.0 Meter Probe and CMSS 620-2 Driver	088
9.8 Meters: Use With 1.0 Meter Probe and CMSS 620-2 Driver	098

Radiation resistant probes must use radiation resistant extension cables.

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

Part 3: Probe Driver (SKF Standard: CMSS 620-2)

Use with: 1.0 Meter Probe and 9.8 Meter Extension Cable
2.0 Meter Probe and 8.8 Meter Extension Cable
4.0 Meter Probe and 6.8 Meter Extension Cable