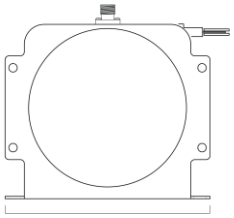
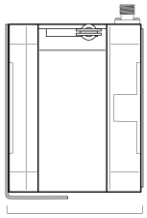




SK1

Cable Actuated Sensor
Voltage Divider Output Signal

Linear Position to 400 inches (10 m)

Compact Design • Simple To Install

User Adjustable Measuring Cable Orientation

IN STOCK for Quick Delivery!

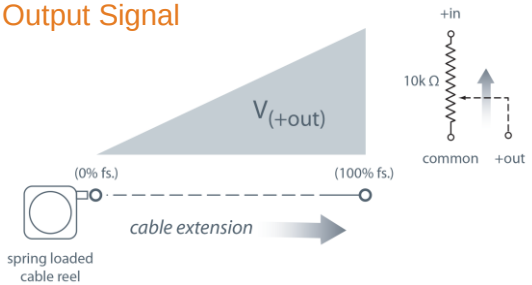
The SK1 is the perfect off-the-shelf linear position sensor for applications ranging from mobile construction equipment to hydraulic lift tables and anything else in between. Available in both 250 and 400-inch stroke ranges, this model offers the ultimate ease-of-use, compact design and user flexibility. Need to mount it upside down? Simply rotate its stainless mounting bracket to where you want it. Need the electrical connector to point in a different direction? Just rotate the rear cover to point the connector to the desired direction.

The SK1 is manufactured with a precision high-cycle plastic hybrid potentiometer and an extremely durable spring-loaded stainless steel measuring cable to deliver an accurate reliable voltage divider position feedback signal over the entire stroke. This model is economically priced making it the perfect solution for both the single piece user and OEM customers alike.

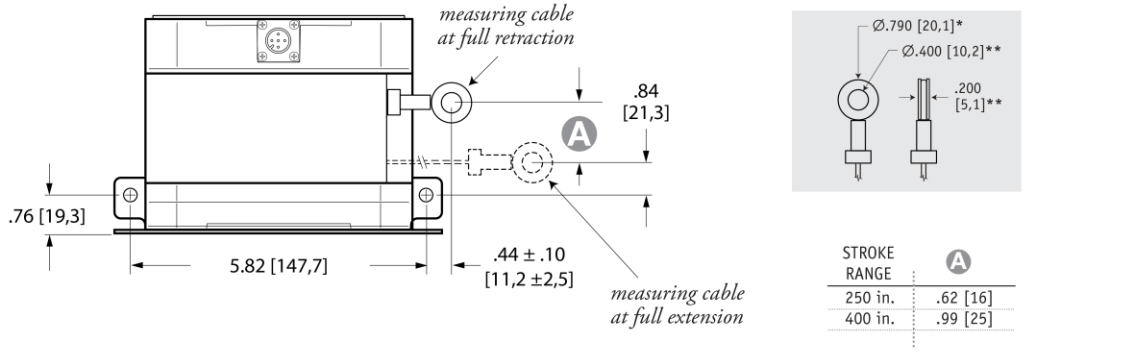
Specifications

Stroke Range Options	250 inches (6.4 m), 400 inches (10.2 m)
Output Signal	voltage divider (potentiometric)
Accuracy	.35% FS.
Repeatability	.05% FS.
Resolution	essentially infinite
Measuring Cable	.031-inch dia. bare stainless steel
Maximum Cable Velocity	60 inches per second
Maximum Cable Acceleration	5 g
Measuring Cable Tension	23 oz. (6,4 N) ±40%
Sensor	plastic-hybrid precision potentiometer
Input Resistance	10K ohms, ±10%
Power Rating, Watts	2.0 at 70°F
Recommended Maximum Input Voltage	30 V (AC/DC)
Output Signal Change Over Full Stroke Range	94% ±4% of V(+in)
Cycle Life	≥ 250,000
Electrical Connection	4-pin M12 connector, mating plug included
Enclosure	glass-filled polycarbonate
Environmental	IP67
Operating Temperature	-40˚ to 185˚ F (-40˚ to 85˚ C)

Output Signal



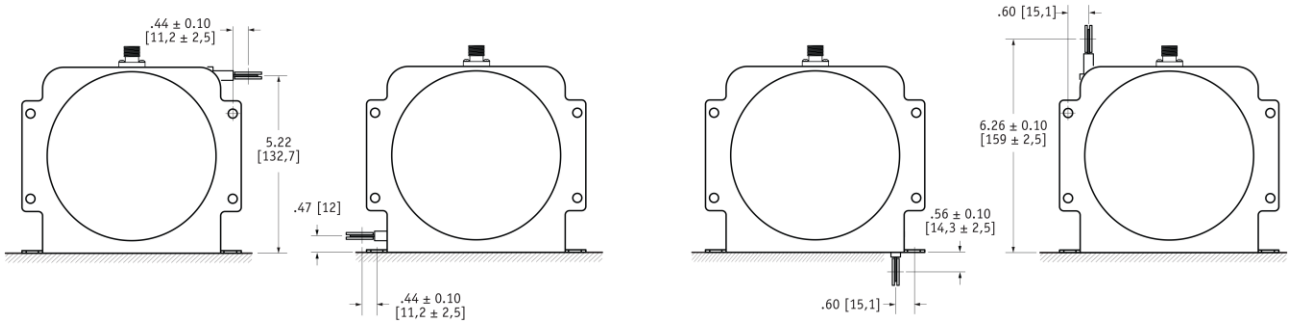
Outline Drawing



DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.04 IN. [1,0 MM] unless otherwise noted.

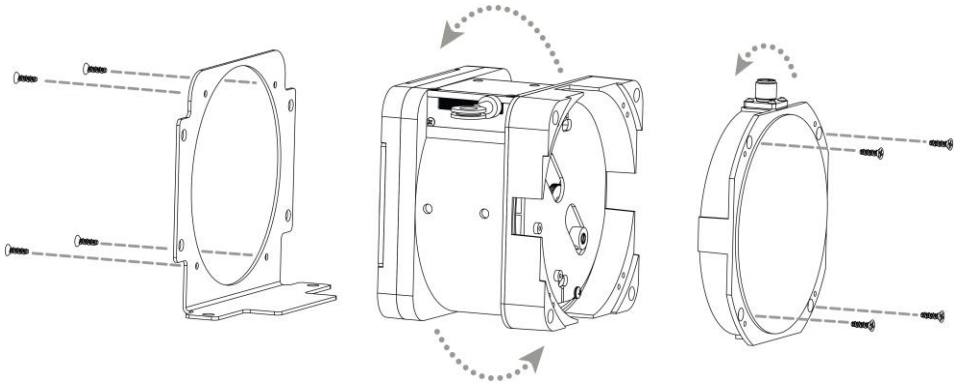
* tolerance = +.005 –.001 [+0,1 –0,0]
** tolerance = +.005 –.005 [+0,1 –0,1]

Mounting Options

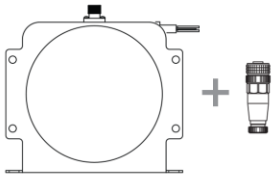


To change cable exit direction: simply remove the 4 bracket mounting screws and rotate sensor body to desired direction.

To change electrical connector orientation: remove the 4 rear screws and carefully remove the rear cover and rotate cover.

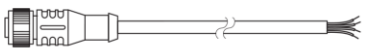


Ordering Information

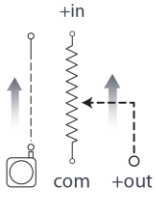


Part Number	full stroke range	accuracy	max. acceleration	measuring cable tension (± 40%)
SK1-250-3	250 in (6.4 m)	.35%	5 g	23 oz. (6,4 N)
SK1-400-3	400 in (10.2 m)	.35%	5 g	23 oz. (6,4N)

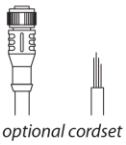
includes mounting bracket & mating connector.

Optional Cordsets	Part Number	length	wire size	connector
	**9036810-0040**	13 ft (4 m)	22 AWG (.34mm²)	straight 4-pin M12
	**9036810-0041**	13 ft (4 m)	22 AWG (.34mm²)	90° 4-pin M12

Electrical Connection




field installable connector

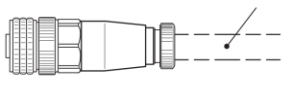

optional cordset

signals	pin	pin - color
+in	1	1 - brown
common	2	2 - white
+out	3	3 - blue
n/c	4	4 - black

field installable connector

contact view

customer supplied electrical cable (.25 in [6 mm] max. dia.)


2.4" [60mm]

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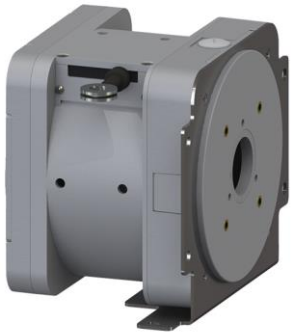
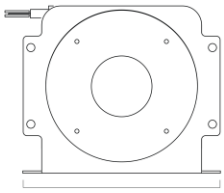
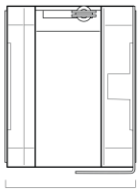
SK1 12/01/2015







SK6

Cable Actuated Encoder Reel

Converts Rotary Encoder to Linear Position Sensor

Use with Popular Square Flange & Servo Mount Style

User Adjustable Measuring Cable Orientation

IN STOCK for Quick Delivery!

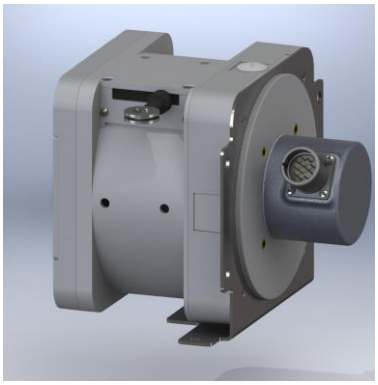
Specifications

Stroke Range	400 inches (10.2 m)
Rotary to Linear Conversion Ratio	1 turn = 15.020 inches
Accuracy	.04% FS.
Measuring Cable	.031-inch dia. bare stainless steel
Maximum Cable Velocity	60 inches per second
Maximum Cable Acceleration	5 g
Measuring Cable Tension	23 oz. (6,4 N) ±40%
Operating Temperature	-40˚ to 185˚ F (-40˚ to 85˚ C)

The SK6 easily converts just about any rotary encoder into the perfect off-the-shelf 400-inch linear position sensor for just about any application ranging from factory automation equipment to hydraulic lift tables and anything else in between.

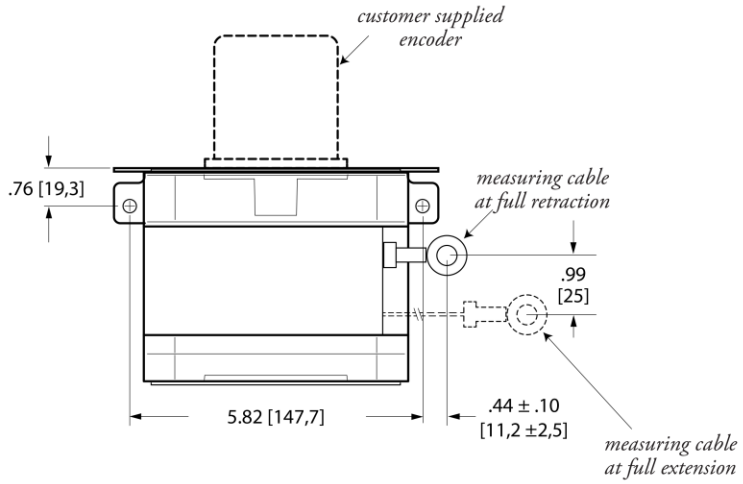
This model offers the ultimate ease-of-use, compact design and user flexibility. Designed for popular 2½ inch square flange and 58mm diameter synchro-mount flange encoder styles, the SK6 comes with everything you need to attach your own encoder. Also included is a stainless steel mounting bracket which lets the user easily change measuring cable orientation to one of the 4 different directions.

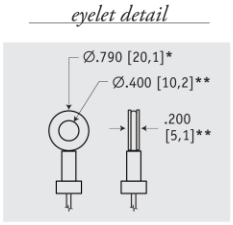
2.5-inch Square Flange Style

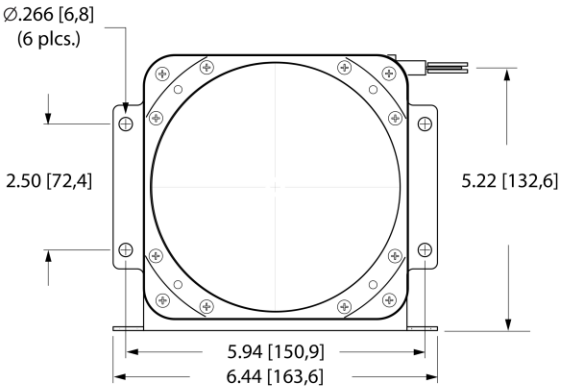


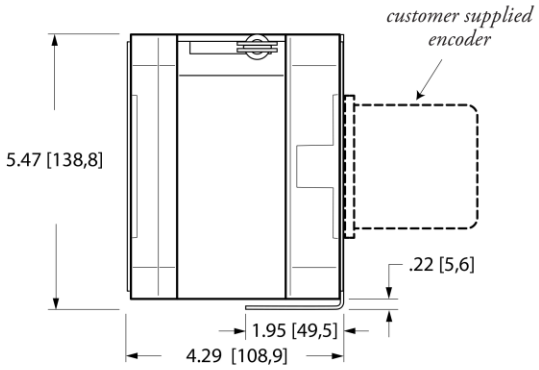
Ø58 mm Synchro-Mount Style

Outline Drawing





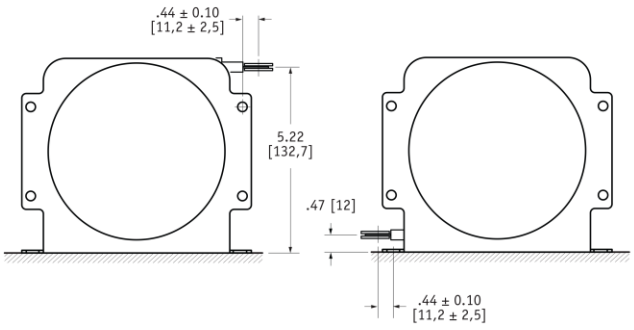


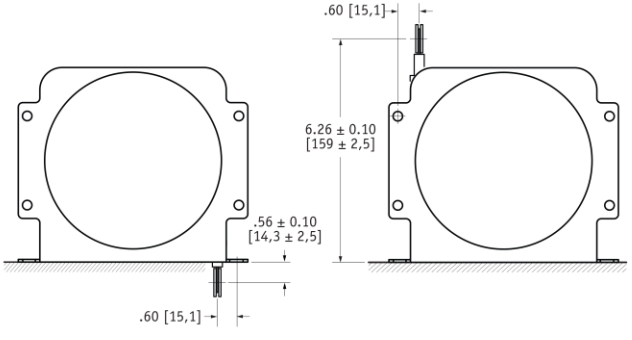


DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.04 IN. [1,0 MM] unless otherwise noted.

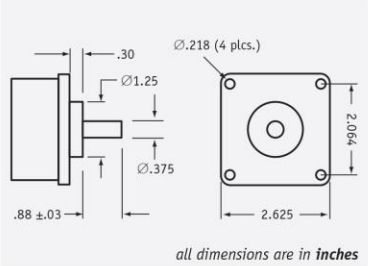
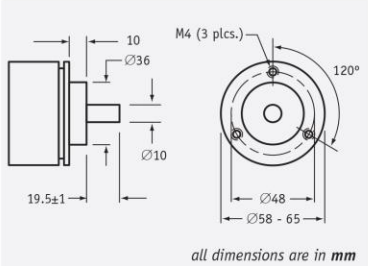
* tolerance = +.005 –.001 [+0,1 –0,0]
** tolerance = +.005 –.005 [+0,1 –0,1]

Mounting Options

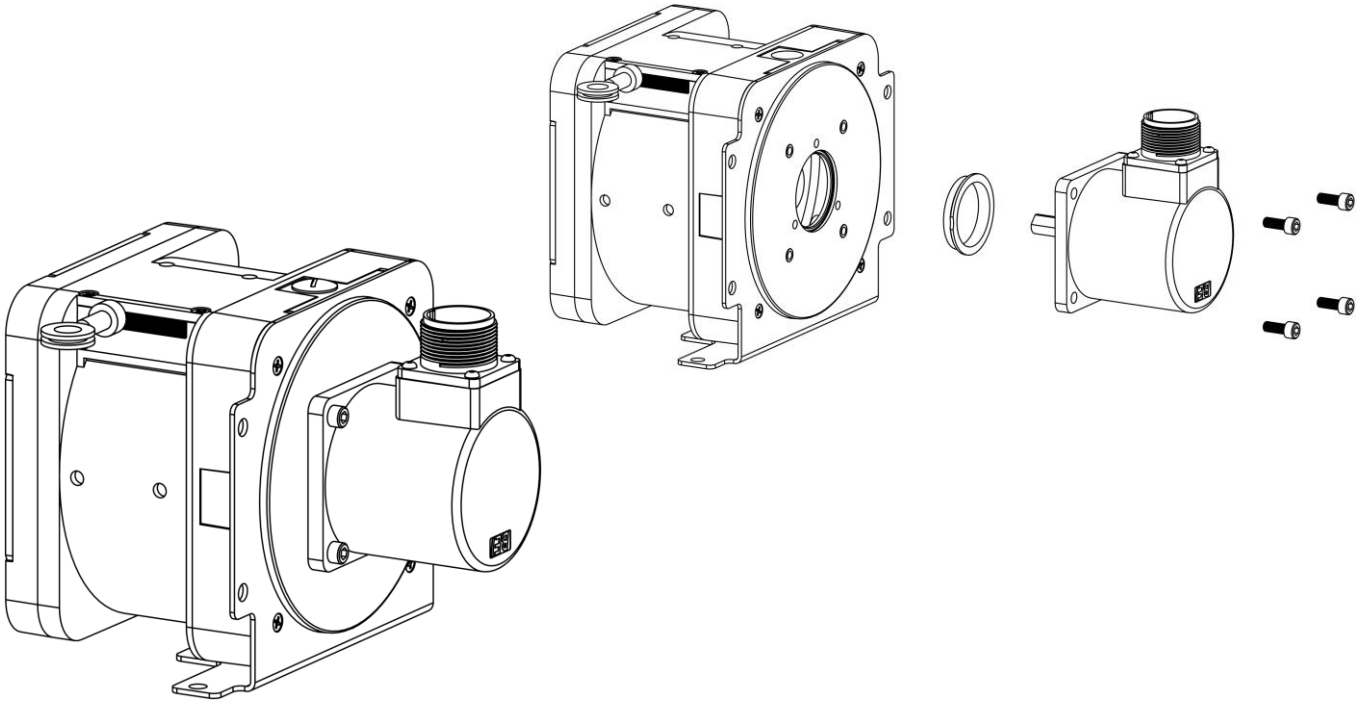




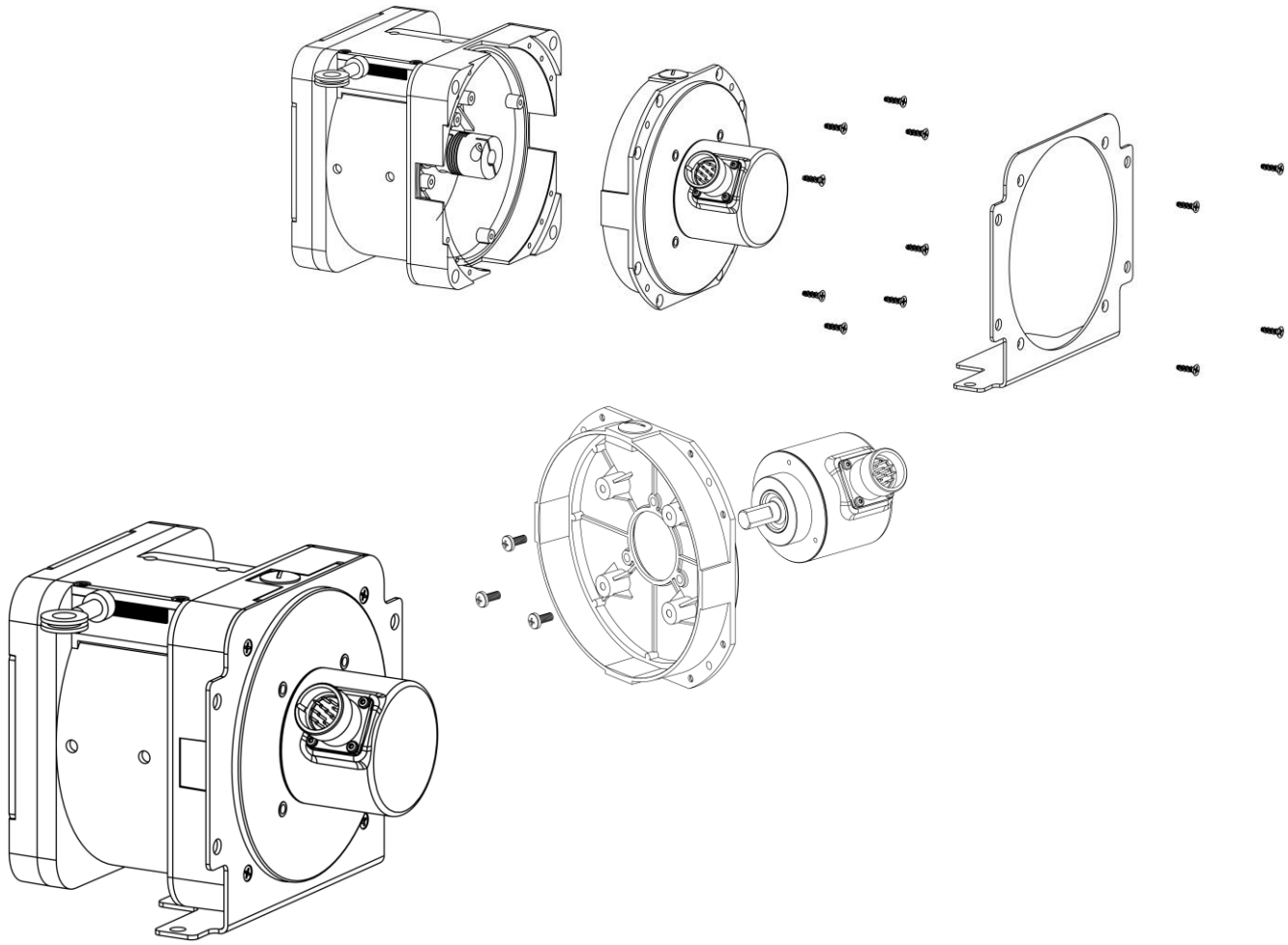
Ordering Information

Order Number	Encoder Mounting Style		stroke range
SK6-400-F01		**F01** 2½-inch Sq. Flange with 3/8-inch shaft	400 inches (10,2 m)
SK6-400-S02		**S02** Synchro-Mount (Face Mount) with 10mm shaft / M4 screws	400 inches (10,2 m)

2.5-inch Square Flange Encoder Installation



Synchro-Mount Encoder Installation



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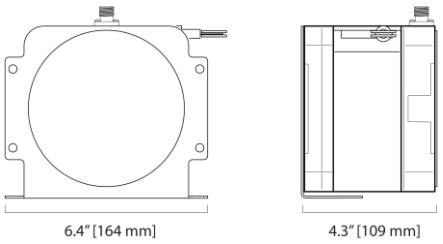


SKD

Cable Actuated Sensor
User Selectable 4..20mA / 0..10Vdc Output

Linear Position to 400 inches (10 m)

Compact Design • Simple To Install

User Adjustable Measuring Cable Orientation

IN STOCK for Quick Delivery!

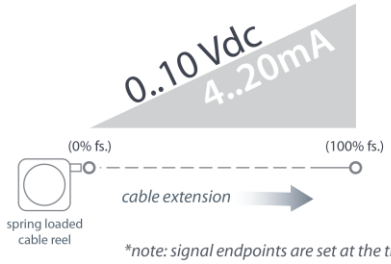
Available in both 250 and 400-inch stroke ranges, this off-the-shelf linear position sensor is the perfect solution for applications ranging from mobile construction equipment to hydraulic lift tables and anything else in between. The SKD offers compact design, ease of use and the utmost in flexibility. Every unit offers the customer a user-selectable 4-20 mA or 0-10VDC output signal option, an easily adjustable stainless steel mounting bracket for multiple installation options and the ability to change the direction of the electrical connector to accommodate the user's wiring needs.

Our unique electronic circuitry and an extremely durable spring-loaded stainless steel measuring cable deliver an accurate reliable "absolute" position feedback signal over the entire stroke. This model is economically priced making it the perfect solution for both the single piece user and OEM customers alike.

Specifications

Stroke Range Options	250 inches (6.4 m), 400 inches (10.2 m)
User Selectable Output Signal	4...20mA (2-wire) / 0...10 Vdc
Input Voltage, 4...20mA Option	8-40 VDC
Input Voltage, 0...10 VDC Option	12-32 VDC
Accuracy	.35% FS.
Repeatability	.05% FS.
Resolution	essentially infinite
Measuring Cable	.031-inch dia. bare stainless steel
Maximum Cable Velocity	60 inches per second
Maximum Cable Acceleration	5 g
Measuring Cable Tension	23 oz. (6,4 N) ±40%
Sensor	plastic-hybrid precision potentiometer
Cycle Life	≥ 250,000
Electrical Connection	4-pin M12 connector, mating plug included
Enclosure	glass-filled polycarbonate
Environmental	IP67
Operating Temperature	-40˚ to 185˚ F (-40˚ to 85˚ C)

Output Signal

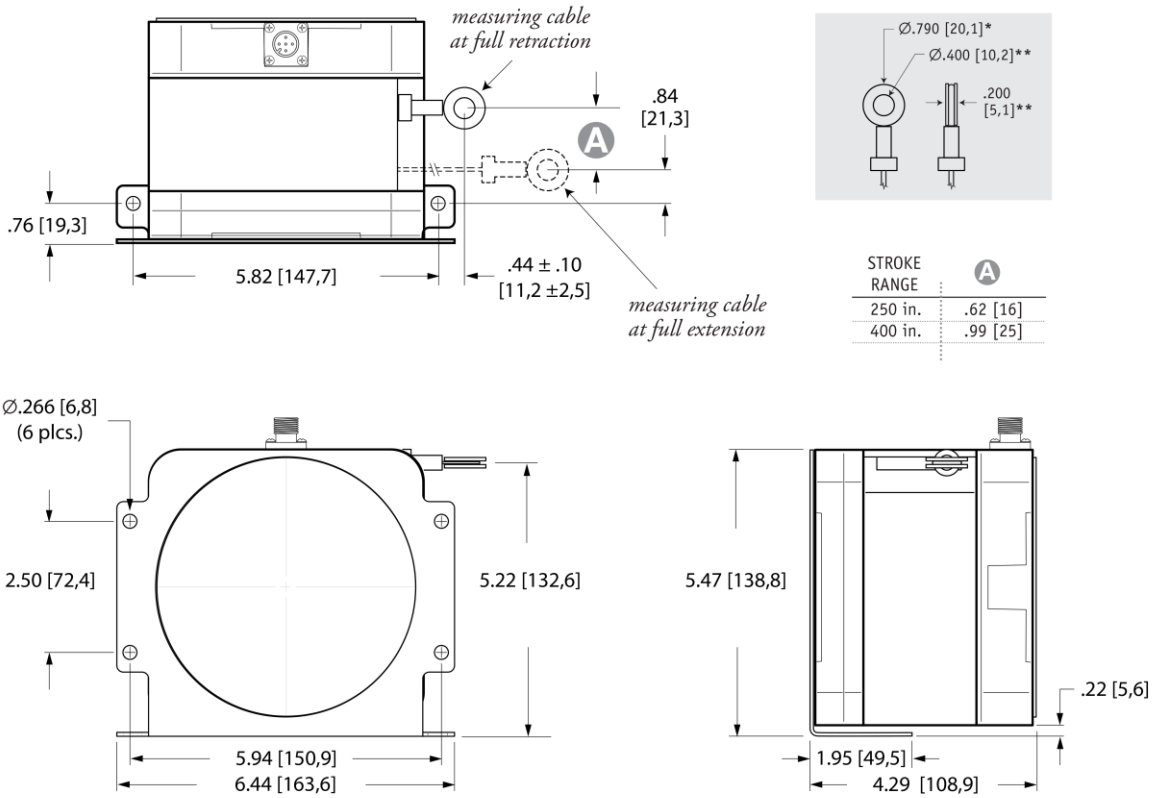


signal endpoint tolerances

*Output Signal**	*0% fs.*	*100% fs.*
4..20 mA	*4 – 4.25 mA*	*19.2 – 20 mA*
0..10 Vdc	*0 – .2 Vdc*	*9.5 – 10 Vdc*

**note: signal endpoints are set at the time of manufacture and cannot be adjusted*

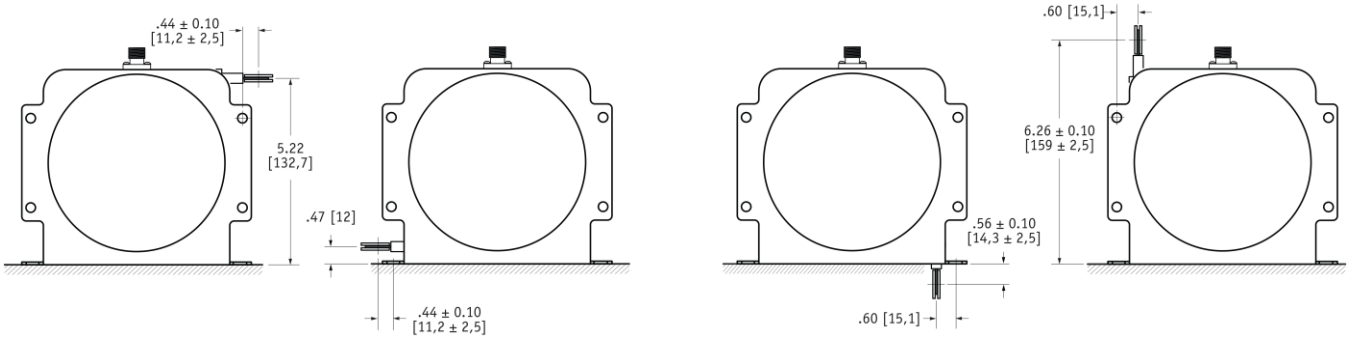
Outline Drawing



DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.04 IN. [1,0 MM] unless otherwise noted.

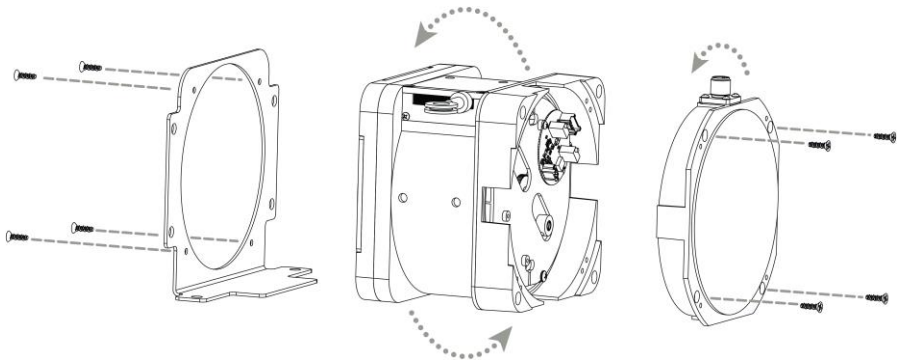
* tolerance = +.005 –.001 [+0,1 –0,0]
** tolerance = +.005 –.005 [+0,1 –0,1]

Mounting Options

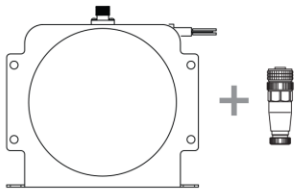


To change cable exit direction: simply remove the 4 bracket mounting screws and rotate sensor body to desired direction.

To change electrical connector orientation: remove the 4 rear screws and carefully remove the rear cover and rotate cover.

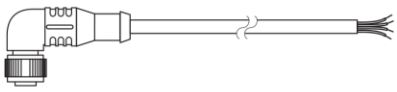


Ordering Information



Part Number	full stroke range	accuracy	max. acceleration	measuring cable tension (± 40%)
SKD-250-3	250 in (6.4 m)	.35%	5 g	23 oz. (6,4 N)
SKD-400-3	400 in (10.2 m)	.35%	5 g	23 oz. (6,4N)

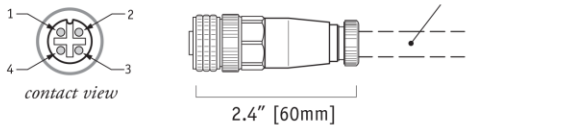
includes mounting bracket & mating connector.

Optional Cordsets	Part Number	length	wire size	connector
	**9036810-0040**	13 ft (4 m)	22 AWG (.34mm²)	straight 4-pin M12
	**9036810-0041**	13 ft (4 m)	22 AWG (.34mm²)	90° 4-pin M12

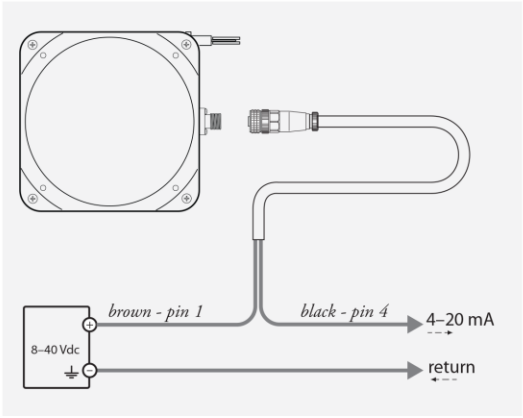
Electrical Connection

Output Signals		*field installable connector*	*optional cordset*	
0..10Vdc	4..20mA	pin	pin -	color
12..32 Vdc	8..40 Vdc	1	1 -	brown
0..10 Vdc	n/c	2	2 -	white
n/c	n/c	3	3 -	blue
common	4..20 mA	4	4 -	black

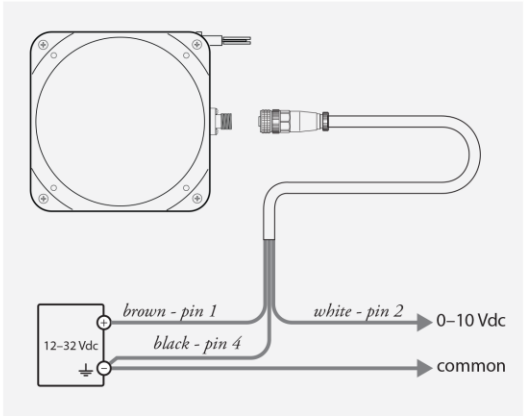
field installable connector



4...20 mA Signal Connections



0...10 Vdc Signal Connections



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SKD 12/01/2015

SKH

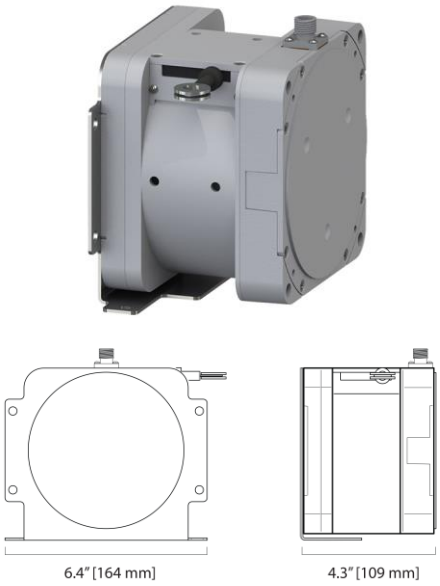
Cable Actuated Sensor
CANOpen Output Signal

Linear Position to 400 inches (10 m)

Compact Design • Simple To Install

User Adjustable Measuring Cable Orientation

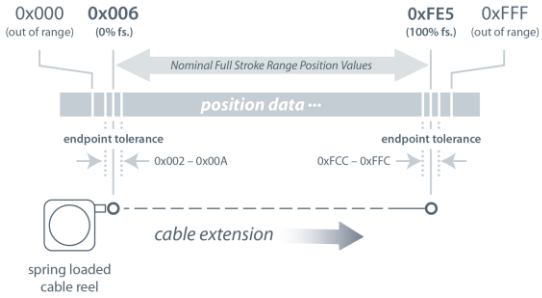
IN STOCK for Quick Delivery!



Available in both 250 and 400-inch stroke ranges, this off-the-shelf linear position sensor is the perfect solution for applications ranging from mobile construction equipment to hydraulic lift tables and anything else in between. The SKD offers compact design, ease of use and the utmost in flexibility. Every unit offers the customer a user-selectable 4-20 mA or 0-10VDC output signal option, an easily adjustable stainless steel mounting bracket for multiple installation options and the ability to change the direction of the electrical connector to accommodate the user's wiring needs.

Our unique electronic circuitry and an extremely durable spring-loaded stainless steel measuring cable deliver an accurate reliable "absolute" position feedback signal over the entire stroke. This model is economically priced making it the perfect solution for both the single piece user and OEM customers alike.

Output Signal



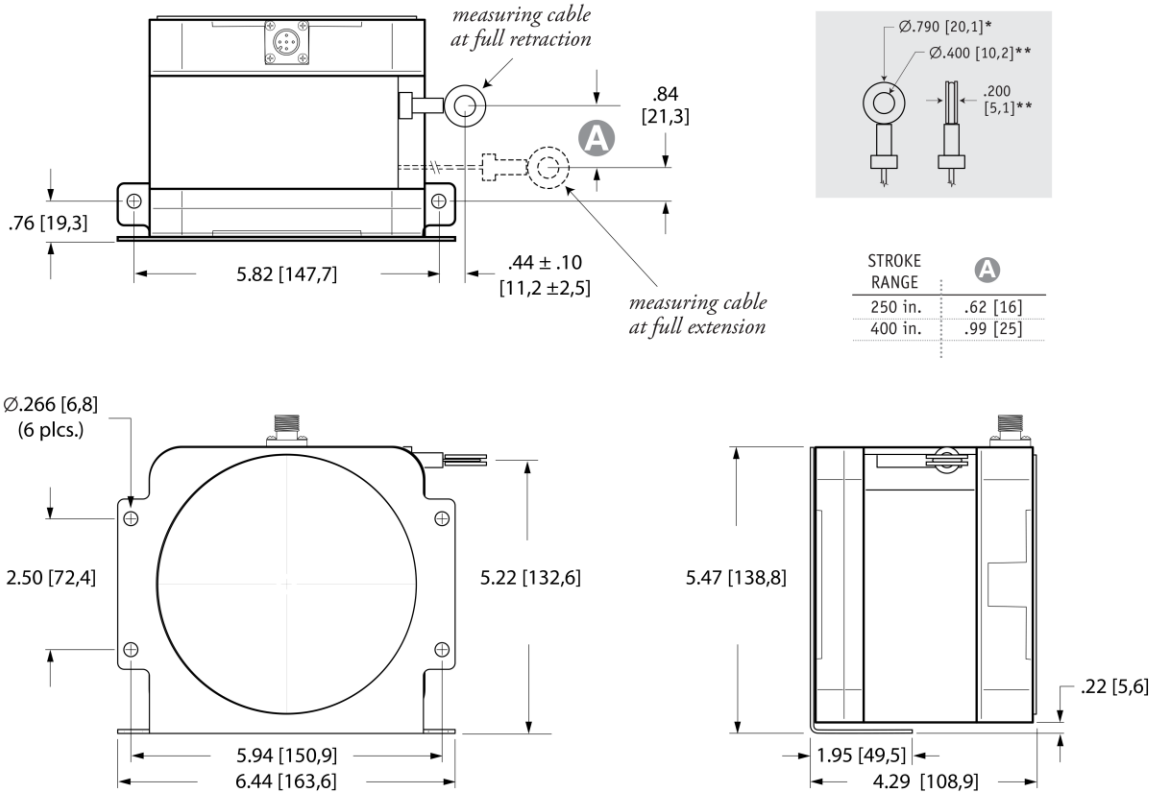
Specifications

Stroke Range Options	250 inches (6.4 m), 400 inches (10.2 m)
Accuracy	.35% FS.
Repeatability	.05% FS.
Resolution	12-bit
Input Voltage	10-36 VDC
Input Current	100 mA, max.
Measuring Cable	.031-inch dia. bare stainless steel
Maximum Cable Velocity	60 inches per second
Maximum Cable Acceleration	5 g
Measuring Cable Tension	23 oz. (6,4 N) ±40%
Sensor	plastic-hybrid precision potentiometer
Cycle Life	≥ 250,000
Electrical Connection	M12 connector, mating plug included
Enclosure	glass-filled polycarbonate
Environmental	IP67
Operating Temperature	-40˚ to 185˚ F (-40˚ to 85˚ C)

CANopen Specifications

Communication Profile	CiA 301 V 4.0.2, CANopen Slave
Device Type	CiA 406 V3.2, Encoder
Vendor ID	0x0002E0,Node ID
1-127 (Adjustable via dipswitch or LSS, default set to 1)	
Baud Rate Options	125K (default), 250K, 500K, 1M
Data Rate	50ms (default)
Error Control	Heartbeat, Emergency Message
PDO	2 TxPDO, 0 RxPDO, no linking, static mapping
PDO Modes	Event / Time triggered, Synch / Asynch
SDO	1 server, 0 client
Position Data	Object Dictionary 6004
Cam Switches	Not Supported

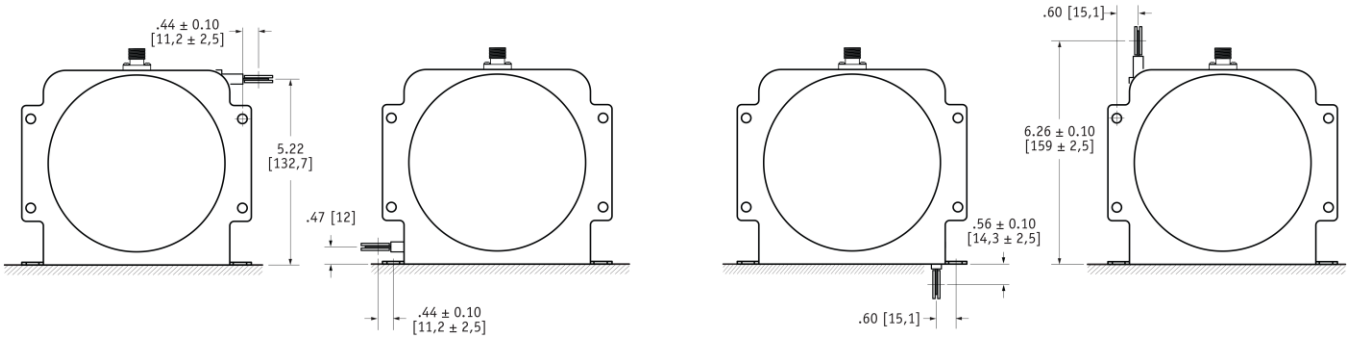
Outline Drawing



DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.04 IN. [1,0 MM] unless otherwise noted.

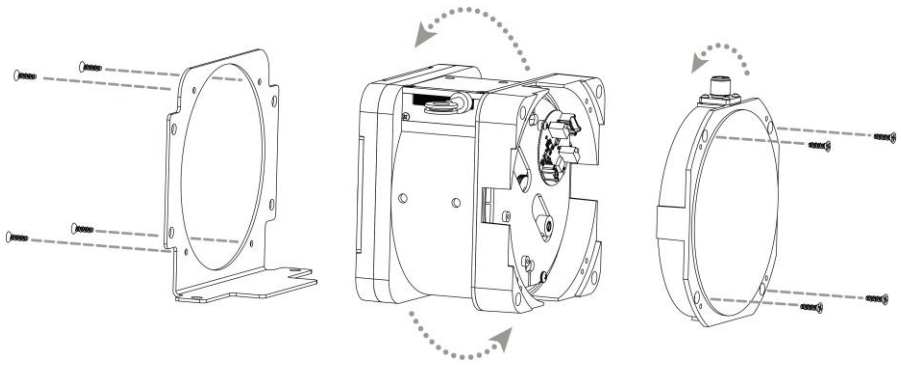
* tolerance = +.005 –.001 [+0,1 –0,0]
** tolerance = +.005 –.005 [+0,1 –0,1]

Mounting Options

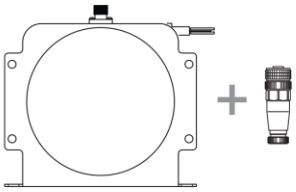


To change cable exit direction: simply remove the 4 bracket mounting screws and rotate sensor body to desired direction.

To change electrical connector orientation: remove the 4 rear screws and carefully remove the rear cover and rotate cover.

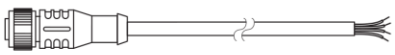
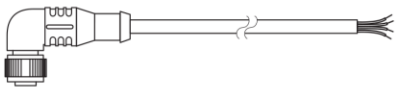


Ordering Information



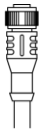
Part Number	full stroke range	accuracy	max. acceleration	measuring cable tension (± 40%)
SKH-250-4	250 in (6.4 m)	.35%	5 g	23 oz. (6,4 N)
SKH-400-4	400 in (10.2 m)	.35%	5 g	23 oz. (6,4N)

includes mounting bracket & mating connector.

Optional Cordsets	Part Number	length	wire size	connector
	**9036810-0030**	13 ft (4 m)	22 AWG (.34mm²)	straight 5-pin M12
	**9036810-0031**	13 ft (4 m)	22 AWG (.34mm²)	90° 5-pin M12

Electrical Connection

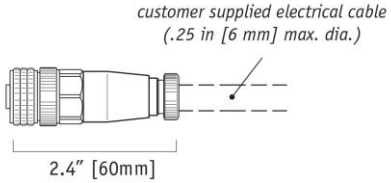

field installable connector


optional cordset

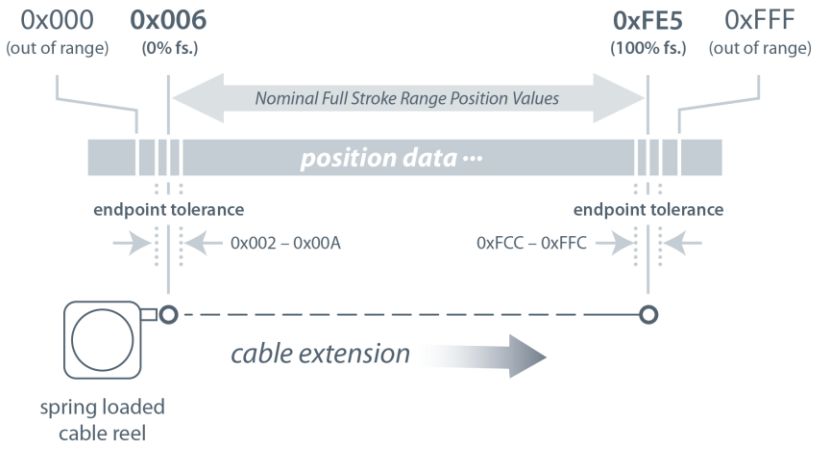
Output Signal	pin	pin - color
n/c	1	1 - brown
10..36 Vdc	2	2 - white
common	3	3 - blue
CAN - High	4	4 - black
CAN - Low	5	5 - green/yellow

Field Installable Connector

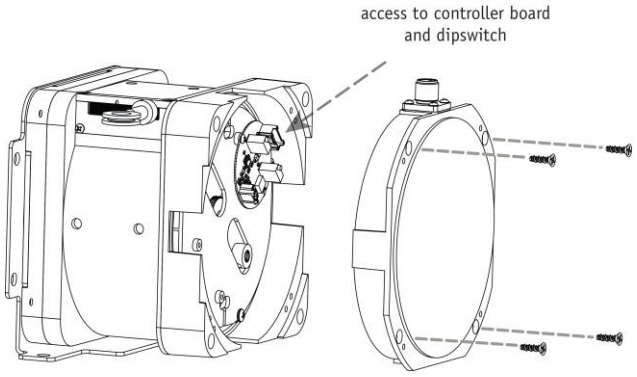
contact view



Position Data Overview



Internal Controller Board



Status LED - Indicates Operating Condition of the Potentiometer

green	red	
on	flash	emergency message (high)
off	flash	buffer (high)
on	off	normal operating range
flash	off	buffer (low)
flash	on	emergency message (low)

LSS, Baud Rate and Node ID settings:

LSS, Baud Rate and Node ID settings are set via dip switch found on the internal controller board. To gain access to the controller board, remove the 4 cover attaching screws and carefully separate the sensor cover from the main body. Be careful not to damage the small gage wires that connect the potentiometer to the controller board mounted directly to the rear cover.

Follow the instructions below for desired settings and reinstall sensor cover.

LSS options

LSS settings	SW1
disabled	off
enabled	on

LSS Settings:

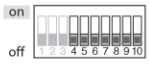
IF DIP Switch 1 is set to “on” position, then LSS will be functional and uses the contents of EEPROM including Node ID and Baud Rate. If DIP Switch 1 is set to “off” position, then DIP switches will override information in EEPROM including the Node ID and Baud Rate.

BAUD Rate:

If DIP Switch 1 is set to “off” then BAUD rate is set via DIP switch 2 and 3 as shown:

transmission rate options

baud rate	SW2	SW3
125 kbps	off	off
250 kbps	on	off
500 kbps	off	on
1 Mbps	on	on



node ID options 1–127 (0x01–0x7F)

node ID Dec.	node ID Hex	SW4 (2^0)	SW5 (2^1)	SW6 (2^2)	SW7 (2^3)	SW8 (2^4)	SW9 (2^5)	SW10 (2^6)
1	0x01	on	off	off	off	off	off	off
2	0x02	off	on	off	off	off	off	off
3	0x03	on	on	off	off	off	off	off
...	...	...	...	...	...	...	...	...
126	0x7E	off	on	on	on	on	on	on
127	0x7F	on	on	on	on	on	on	on

Node ID:

If DIP Switch 1 is set to “off” then the Node ID is set via DIP switches 4 – 10 as shown below. The DIP switch settings are binary starting with switch number 4 (=20) and ending with switch number 10 (=26).

The Node ID is equal to the binary setting.

Manufacturer Objects

Index	Sub-Index	Name	Default	Comment
2000		Raw Position Value		This is the averaged, non-scaled value from the encoder.
2001		Emergency Buffer Distance	0.1	Emergency Message is sent when the output of the sensing potentiometer is outside its calibrated range by more than .1% of the sensors full measurement range (Emergency Buffer). This allows for non-repeatability of sensor and customers application. This object allows user ability to change buffer size along with transmission of Emergency Message, Manufacturer specific bit in error register set, and error added to error list.

Device Profile Area

Index	Sub-Index	Name	Default	Comment
6000		Operating Parameters	0X0000	
6004		Position Value	0	Counts proportional to measuring cable extension. Nominal values are 0x006 with cable fully retracted and 0xFE5 with cable fully extended. Format of data in CAN message is little endian – least significant byte pair first. Therefore 0x008 would be shown as “08 00” and 0xFE5 would be shown as “E5 0F”
6400		Area State Register		SubNumber= 2 (indicates underflow or overflow per CiA406)
	0	Highest Subindex	0x01	
	1	Work Area State Channel 1	0	
6401		Work Area Low Limit		The averaged, non-scaled (raw) encoder data below which the encoder is out of range.
	0	Highest Subindex	0x01	
	1	Work Area Low Limit Channel1	0x024	
6402		Work Area High Limit		The averaged, non-scaled (raw) encoder data above which the encoder is out of range.
	0	Highest Subindex	0x01	
	1	Work Area High Limit Channel 1	0xF4E	
6500		Operating Status	0x0000	
6501		Measuring Step	1	Position Measuring Step. Can be set by user to convert Position Value (Object 6004) to measurement units (inches, mm). Default is set to 1.

Communication Area Profile

Index	Sub-Index	Name	Default	Comment
1000		Device Type	0X00080196	Device Profile 406
1001		Error Register	0	Manufacturer Specific Error bit 7 is set when sensor is outside of calibrated range and cleared when back in range.
1003		Pre-Defined Error Field		SubNumber= 9 (lists last eight Emergency Messages)
	0	Number of Errors	0	
	1	Standard Error Field 1		
	2	Standard Error Field 2		
	3	Standard Error Field 3		
	4	Standard Error Field 4		
	5	Standard Error Field 5		
	6	Standard Error Field 6		
	7	Standard Error Field 7		
	8	Standard Error Field 8		
1005		SYNC COB-ID	0x80	
1010		Store Parameters		SubNumber=2
1010	0	Highest Subindex	0x01	Only “Save All Parameters” feature supported
	1	Save All Parameters		Write “save” or “evsa” to save parameters to EEPROM. They are automatically loaded on power up/reset. Saves the value of all R/W object dictionary entries.
1014		Emergency COB-ID	$NodeID + 0x80	COB-ID Emergency Message
1015		Emergency Inhibit Time	0	Multiple of 100us. Minimum time between transmissions of emergency messages.
1017		Producer Heartbeat Time	0	Multiples of 1ms. Time between transmission of heartbeat messages. 0 = disabled
1018		Identity Object		
	0	Number of Entries	4	
	1	Vendor Id	0x2E0	
	2	Product Code	0x10D	Celesco Reference # 604269
	3	Revision Number	0x1	
	4	Serial Number	0xFFFFFFFF	
1800		Tx PDO Comm. Parameter		PDO1
	0	Number of Entries	5	
	1	COB-ID	$NodeID + 0x108	COB-ID used by PDO1
	2	Transmission Type	254	PDO1 Tx Type: 0 = on Sync Message. 254 = Asynchronous Tx

Communication Area Profile (cont.)

	3	Inhibit Time	0	Multiple of 100us. Minimum time between transmissions of the PDO
	5	Event Timer	0x32	If non-zero then transmits the PDO periodically. This value is a multiple of 1ms.
1801		Tx PDO Comm. Parameter		PDO2
	0	Number of Entries	5	
	1	COB-ID	$NodeID + 0x280	COB-ID used by PDO2
	2	Transmission Type	0	PDO2 Tx Type: 0 = on Sync Message. 254 = Asynchronous Tx
	3	Inhibit Time	0	Multiple of 100us. Minimum time between transmissions of the PDO
	5	Event Timer	0	If non-zero then transmits the PDO periodically. This value is a multiple of 1ms.
1A00		Tx PDO Mapping Parameter		Subnumber = 2
	0	Number of Entries	1	
	1	PDO Mapping Entry	0x60040020	Mapping Parameter
1A01		Tx PDO Mapping Parameter		Subnumber = 2
	0	Number of Entries	1	
	1	PDO Mapping Entry	0x60040020	Mapping Parameter

NORTH AMERICA

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Tel +1 818 701 2750
Fax +1 818 701 2799
Customercare.chtw@te.com

TE.com/sensorsolutions

SKH 12/01/2015

SKJ

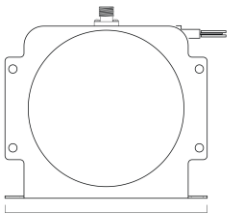
Cable Actuated Sensor
J1939 CANBus Output Signal

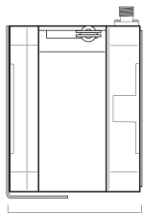
Linear Position to 400 inches (10 m)

Compact Design • Simple To Install

User Adjustable Measuring Cable Orientation

IN STOCK for Quick Delivery!

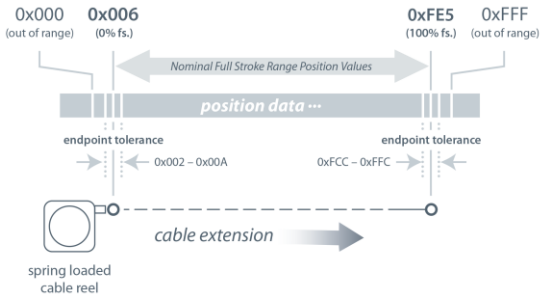




The SKJ is the perfect off-the-shelf linear position sensor for applications ranging from outrigger position on a mobile crane to tracking the height of a hydraulic lift table in a factory and anything else in between. Available in both 250 and 400-inch stroke ranges, this model offers the ultimate ease-of-use, compact design and user flexibility. Need to mount it upside down? Simply rotate its stainless mounting bracket to where you want it. Need the electrical connector to point in a different direction? Just rotate the rear cover to point the connector to the desired direction.

It's compact design, ease of use and the utmost in flexibility makes this model the perfect economically priced solution for both the single piece user to the higher volume OEM.

Output Signal



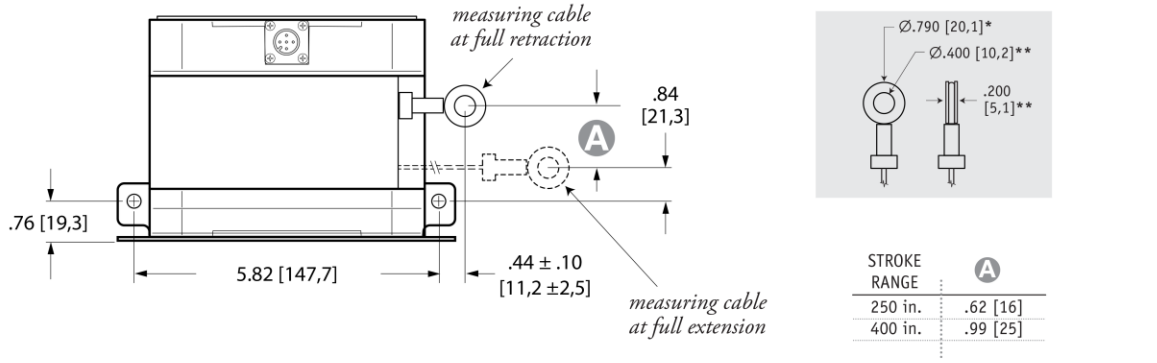
Specifications

Stroke Range Options	250 inches (6.4 m), 400 inches (10.2 m)
Accuracy	.35% FS.
Repeatability	.05% FS.
Resolution	12-bit
Input Voltage	10-36 VDC
Input Current	100 mA, max.
Measuring Cable	.031-inch dia. bare stainless steel
Maximum Cable Velocity	60 inches per second
Maximum Cable Acceleration	5 g
Measuring Cable Tension	23 oz. (6,4 N) ±40%
Sensor	plastic-hybrid precision potentiometer
Cycle Life	≥ 250,000
Electrical Connection	M12 connector, mating plug included
Enclosure	glass-filled polycarbonate
Environmental	IP67
Operating Temperature	-40˚ to 185˚ F (-40˚ to 85˚ C)

CANopen Specifications

Communication Profile	CANbus SAE J1939
Protocol	Proprietary B
Node ID	Adjustable via dipswitch (0-63), default set to 0
Baud Rate Options	125K (default), 250K, 500K
Data Rate	5ms (default), 20ms, 50ms, 100ms

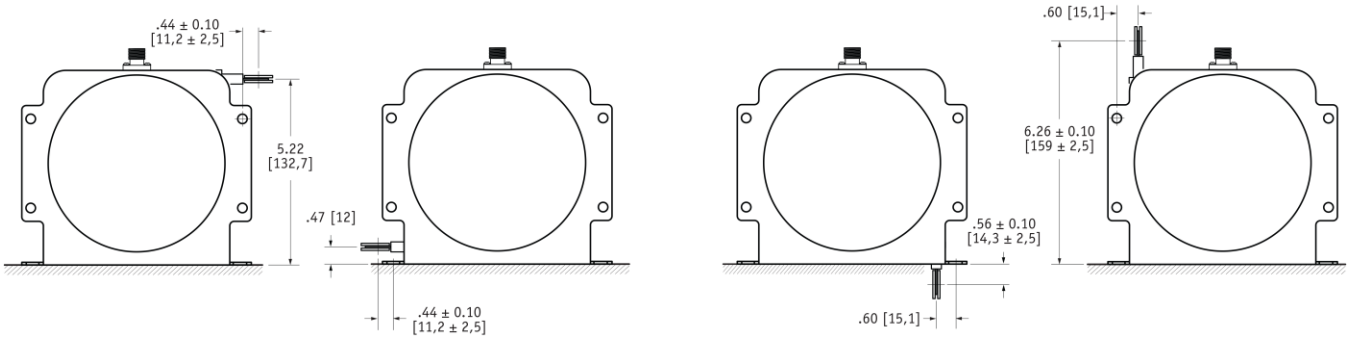
Outline Drawing



DIMENSIONS ARE IN INCHES [MM]
tolerances are 0.04 IN. [1,0 MM] unless otherwise noted.

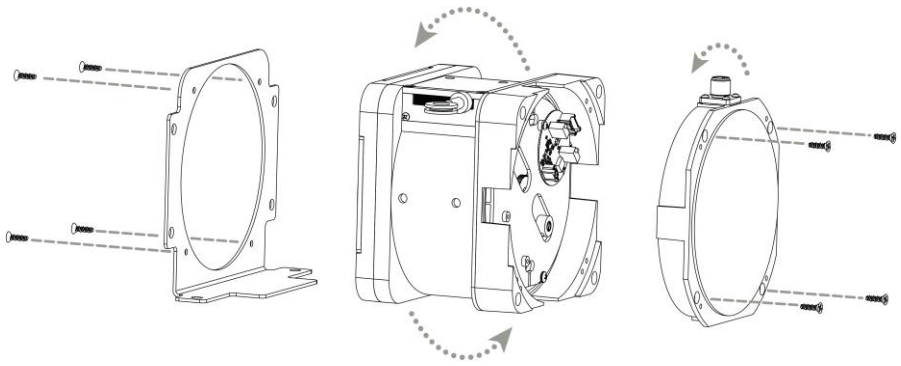
* tolerance = +.005 –.001 [+0,1 –0,0]
** tolerance = +.005 –.005 [+0,1 –0,1]

Mounting Options

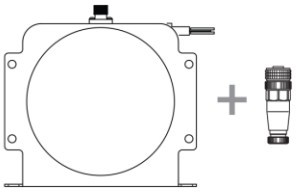


To change cable exit direction: simply remove the 4 bracket mounting screws and rotate sensor body to desired direction.

To change electrical connector orientation: remove the 4 rear screws and carefully remove the rear cover and rotate cover.

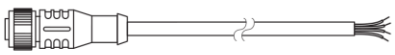
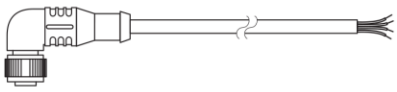


Ordering Information



Part Number	full stroke range	accuracy	max. acceleration	measuring cable tension (± 40%)
SKJ-250-4	250 in (6.4 m)	.35%	5 g	23 oz. (6,4 N)
SKJ-400-4	400 in (10.2 m)	.35%	5 g	23 oz. (6,4N)

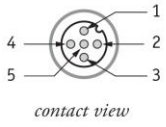
includes mounting bracket & mating connector.

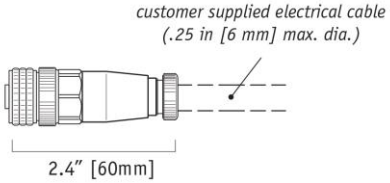
Optional Cordsets	Part Number	length	wire size	connector
	**9036810-0030**	13 ft (4 m)	22 AWG (.34mm²)	straight 5-pin M12
	**9036810-0031**	13 ft (4 m)	22 AWG (.34mm²)	90° 5-pin M12

Electrical Connection

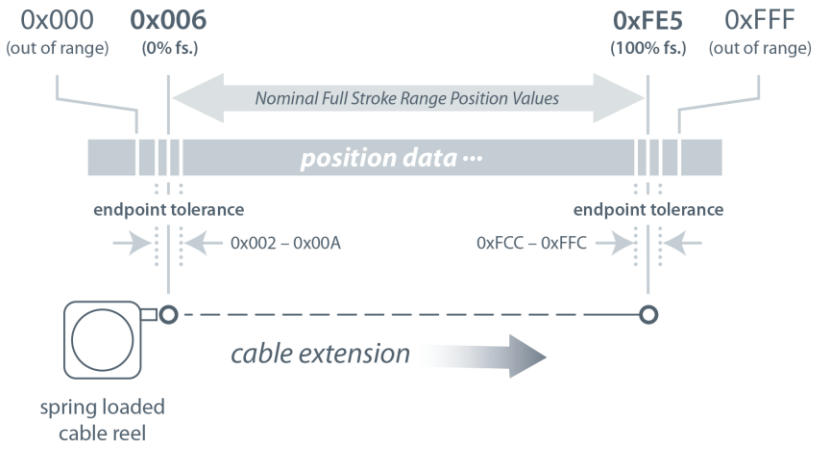
Output Signal	pin	pin	color
n/c	1	1	brown
10..36 Vdc	2	2	white
common	3	3	blue
CAN - High	4	4	black
CAN - Low	5	5	green/yellow

Field Installable Connector

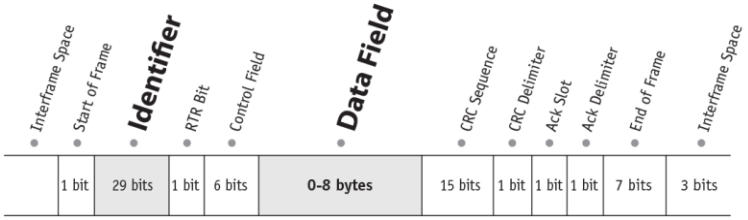




Position Data Overview



I/O Format

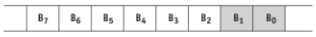


Identifier

	Message Priority			Future Use		J1939 Reference Proprietary B								Data Field Type*								Not Used		Node ID**							
Example –	1	0	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	0	0	1	1	0	0	1	1	1	1	1	1		
Identifier Bit No. –	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
Hex Value –		0				F				F				5				3				3		F							

*Sensor field data can be factory set to customer specific value. **Customer defined, set via Dips 1-6. Bit values shown for example only, see **Address Setting** below.

Data Field



Current Measurement Count

The **C**urrent **M**easurement **C**ount (**CMC**) is the output data that indicates the present position of the measuring cable. The CMC is a 12-bit value that occupies bytes B_0 and B_1 of the data field. B_0 is the **LSB** (least significant byte) and B_1 is the **MSB** (most significant byte).

The **CMC** starts at **0x006** with the measuring cable fully retracted and continues upward to the end of the stroke range stopping at **0xFE5**. This holds true for all ranges.

Converting CMC to Linear Measurement

To convert the current measurment count to inches or millimeters, simply divide the count by 4061 (total counts over the range) and then multiply that value by the full stroke range:

$$\left(\frac{\textbf{CMC} - 6}{4063}\right) \times \text{full stroke range}$$

Sample Conversion:

If the full stroke range is **250 inches** and the current position is **0x4FF** (1279 Decimal) then,

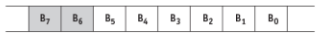
$$\left(\frac{1279 - 6}{4061}\right) \times 250 = 78.8 \text{ inches}$$

Error Flags

RED and GREEN Indicator LEDS (controller board)

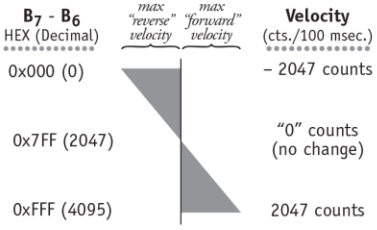
0x00 (GREEN - ON, RED - OFF) indicates the sensor is operating within normal calibrated limits.

0x33, 0x55, 0xAA, 0xCC (RED or GREEN - FLASHING) indicates sensor is at or beyond it's calibrated measurment range. Should any of these conditions occur within calibrated range, return unit to factory for evaluation or service.



Velocity

Data in bytes B_7 - B_6 is the change in the **CMC** (current measurement count) over a 100 msec time period. This data can then be used to calculate velocity in a post processing operation.



Velocity Calculation

$$\left(\frac{\text{count change} - 2047}{.1 \text{ sec. time period}}\right) \times \left(\frac{\text{full stroke range}}{4063}\right)$$

Sample Calculations

Cable Extension (positive direction):

$B_7..B_6$ = **0x8D3** (2259Dec), **full stroke = 250 in.**

$$\left(\frac{2259 - 2047}{.1 \text{ sec}}\right) \times \left(\frac{250 \text{ in.}}{4063}\right) = 130.45 \text{ in./sec.}$$

Cable Retraction (negative direction):

$B_7..B_6$ = **0x7D0** (2000Dec), **full stroke = 250 in.**

$$\left(\frac{2000 - 2047}{.1 \text{ sec}}\right) \times \left(\frac{250 \text{ in.}}{4063}\right) = -28.92 \text{ in./sec.}$$

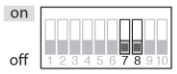
Baud, Node ID and Data Rate

Baud Rate, Node ID and Data Rate settings are set via dip switch found on the internal controller board. To gain access to the controller board, remove the 4 cover attaching screws and carefully separate the sensor cover from the main body. Be careful not to damage the small gage wires that connect the controller board to the connector mounted directly to the rear cover.

Follow the instructions below for desired settings and reinstall sensor cover.

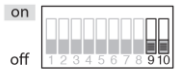
node ID options 0–63 (0x00–0x3F)

node ID Dec.	node ID Hex	SW1 (2^0)	SW2 (2^1)	SW3 (2^2)	SW4 (2^3)	SW5 (2^4)	SW6 (2^5)
0	0x00	off	off	off	off	off	off
1	0x01	on	off	off	off	off	off
2	0x02	off	on	off	off	off	off
3	0x03	on	on	off	off	off	off
...	...	...	...	...	...	...	...
62	0x3E	off	on	on	on	on	on
63	0x3F	on	on	on	on	on	on



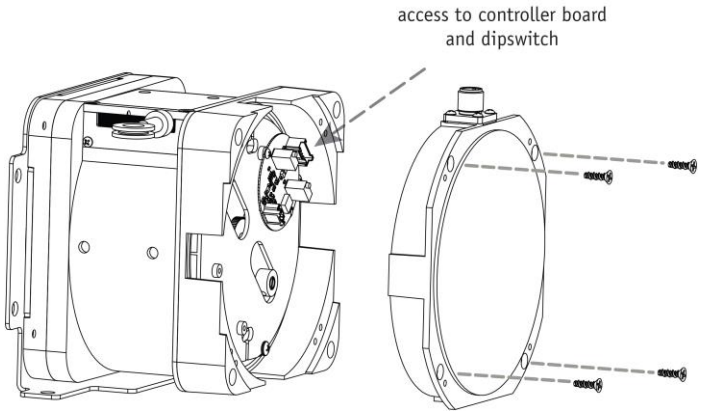
BAUD rate options

baud rate	SW7	SW8
125 kbps	off	off
250 kbps	on	off
500 kbps	off	on



Data Rate options

Data Rate	SW9	SW10
5 ms	off	off
20 ms	on	off
50 ms	off	on
100 ms	on	on



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