

## CD120 SERIES

### INCREMENTAL DRAW WIRE

### Introduction

Draw wire sensor assemblies combine a rotary sensor such as an encoder with a spring-loaded retractable cable on a drum. This provides a means to translate the precision of a rotary encoder into a linear measurement.



### Features

- A full 120 inches (10 feet) of measurement capability.
- Wire drum is scaled so that one revolution = 1 foot of measurement.
- Mounting bracket and encoder position can be rotated in 90° increments to accommodate a variety of installation requirements.

### Applications

- Concrete, wood, steel sawing
- Mast height measurement for fork truck AGV's
- Extension measurement for small cranes
- Flood Control gates
- Hydraulic Cylinder Position



## SPECIFICATIONS

### Mechanical

<b>Output Signal type</b>	Optical Incremental Encoder in Quadrature with Index
<b>Linearity</b>	+/- 0.05% of full scale
<b>Resolution</b>	Range of Pulses per inch (Ref ordering block)
<b>Cable Type</b>	0.024" (0.60 mm) diameter stainless steel
<b>Cable Tension</b>	2.9 - 4.0 pounds (13 - 18 N)
<b>Enclosure material</b>	Aluminum
<b>Weight</b>	4.4 pounds, (2 Kg)

### Electrical

<b>Input Current</b>	100mA (no load), up to 160 mA full load
<b>Input Voltage</b>	5-28 Vdc; Vout=Vin
<b>Connector</b>	M16, 7 pin Connector M18, 10 pin Connector SCS, cable Gland Seal
<b>Mating Connector/Cable</b>	31186-18XX, XX = cable length in feet
<b>Drum Circumference</b>	12 inches (304.8 mm)

## Enviromental

<b>Enclosure Protection Rating</b>	IP66 with M16 or M18 connector IP65 with cable Gland Seal
<b>Operating Temperature</b>	-20°C to + 85°C
<b>Storage Temperature</b>	-20°C to + 85°C

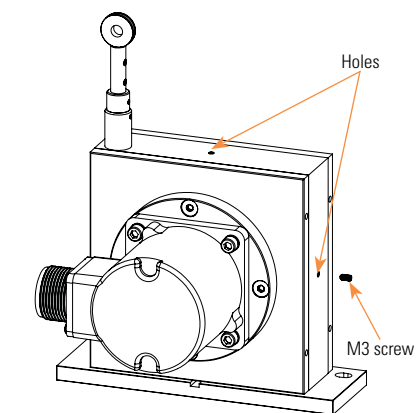
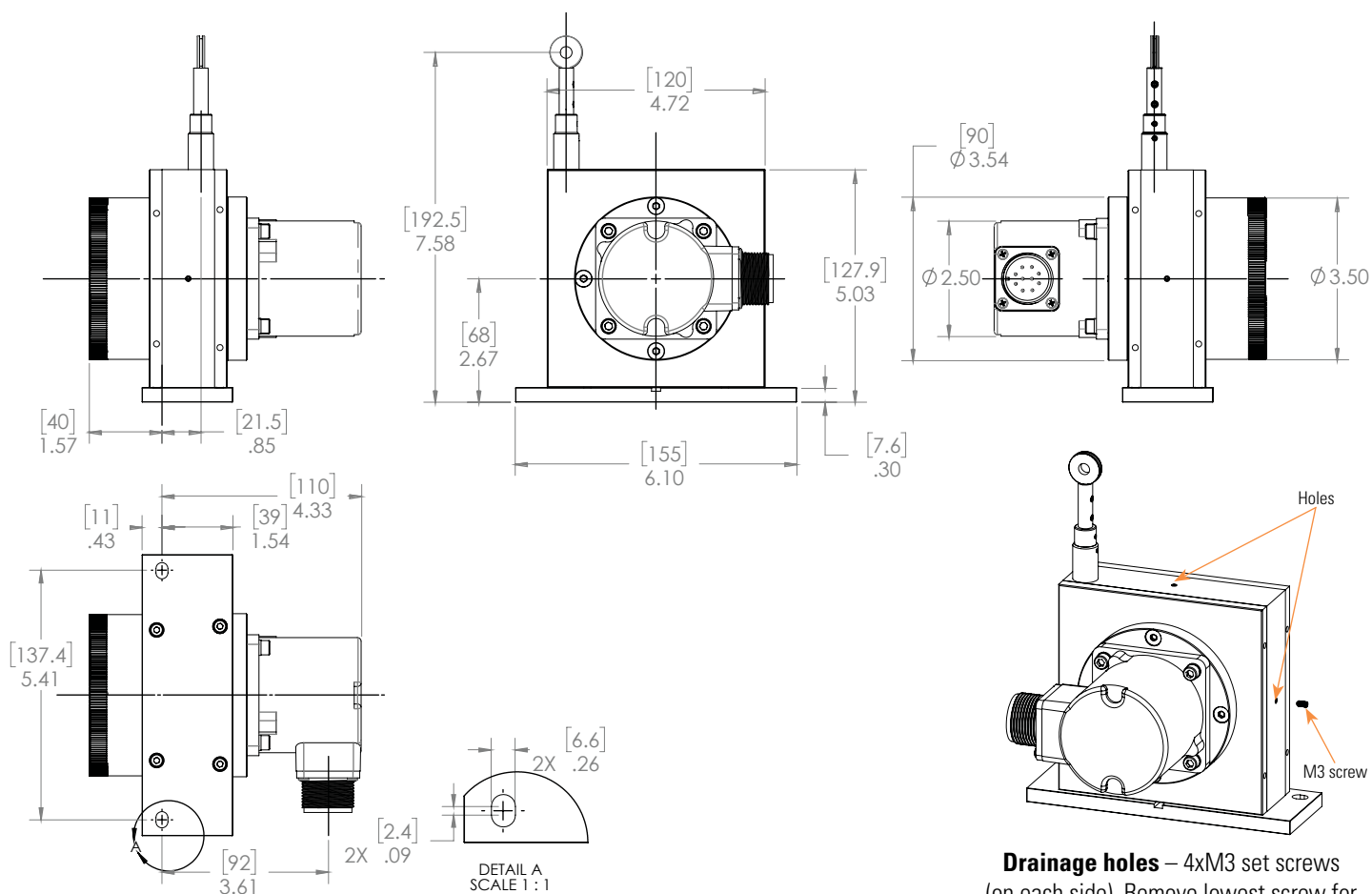
## Other Specifications

<b>Maximum Velocity of cable</b>	10 m/s
<b>Maximum Acceleration of Cable</b>	7 m/s <sup>2</sup>



### DIMENSIONS

Tolerance, unless otherwise noted:  
All dimensions are in inches [mm]

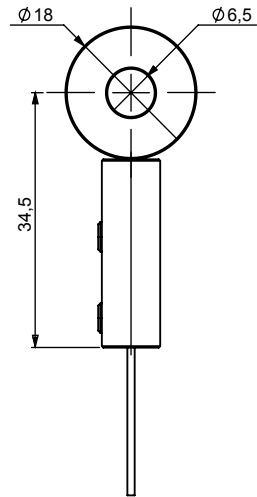


**Drainage holes** – 4xM3 set screws (on each side). Remove lowest screw for drainage of trapped moisture

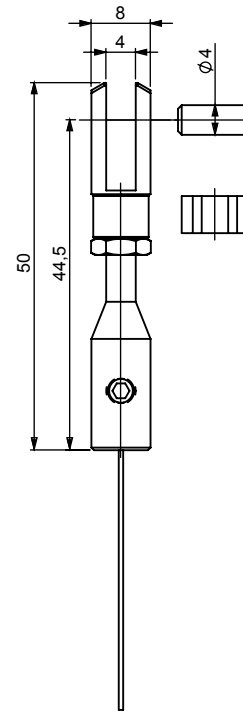


## CD120 DRAW-WIRE, AVAILABLE FEATURES

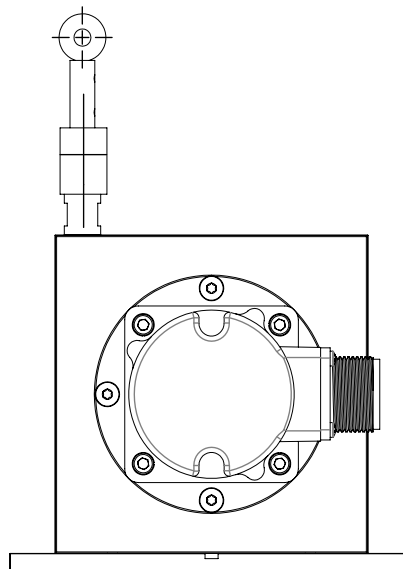
All dimensions are in mm



Standard termination with a captive washer which accepts a 6 mm (1/4") screw



**CP** termination: Threaded cable termination is attached to a clevis. The 4 mm diameter clevis pin is provided.



**B2:** A cleaning brush is factory installed to wipe away dust and moisture as the cable retracts



## ORDERING OPTIONS

Example : CD120-500-ABZC-28V/V-M18-B2

	CD120	-	500	-	ABZC	-	28V/V	-	M18	-	B2
<b>Family</b>	Draw-Wire Assembly 120 inches maximum travel Aluminum Housing										
<b>Resolution</b>	<b>Note: programmable resolution, OMNI , must use an M18 termination</b> 10 counts per inch to 500 counts per inch (See Table, Below)										
<b>Output Type</b>	<b>ABZC</b> = Two Channels in Quadrature + Index and complements = Std <b>ABZ</b> = Two Channels in Quadrature + Index <b>ABC</b> = Two Channels in Quadrature plus complements Check with factory for other output types.										
<b>Electrical Options</b>	<b>28V/V</b> = 5 – 28 V in. Vout = Vin <b>28V/5</b> = 5 – 28 V in. Vout = 5V regulated <b>28V/OC</b> = 5 – 28 V in. Vout = Open Collector										
<b>Termination</b>	<b>M18</b> = M18, 10 Pin Connector (used with ABZC) <b>M18 – 10</b> = M18 Connector with Mating Cable/Connector Assembly, -10 = 10 foot length. Available lengths are 10, 20, 30, and 50 feet. <b>M16</b> = M16, 7 Pin Connector (used with ABC or ABZ) <b>M16 – 10</b> = M16 Connector with Mating Cable/Connector Assembly, as above. <b>SCS-XX</b> = Cable Gland Seal with XX feet of cable. Available lengths (XX) = 10, 20, 30 and 50 feet.										
<b>Available Features</b>	<b>BLANK</b> = Standard Termination <b>B2</b> = Built-in Cleaning Brush for cable <b>CP</b> = Clevis Termination										



## RESOLUTIONS TABLE

Resolution	Distance/ Count
10	0.100 "
25	0.040 "
50	0.020 "
100	0.010"
250	0.004"
500	0.002"
OMNI*	Programmable

\*Available with M18 termination only

## PINOUT AND CONNECTION TABLES

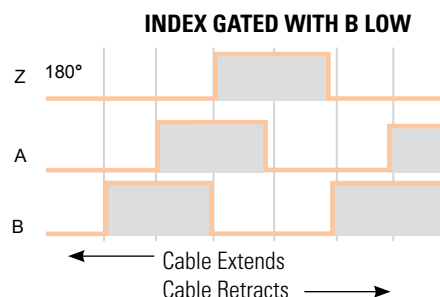
The connector style will determine pinouts. For example, an encoder with ABC channels and an M18 connector uses the table to the right.

M16 Connector	Channels Designated in Model Number	
Pin	ABZ	ABC
A	A	A
B	B	B
C	Z	$\bar{A}$
D	+V (Supply Voltage)	
E	—	$\bar{B}$
F	0V (Circuit Common)	
G	Case Ground (CG)	

Wire Color (22AWG)	Channels Designated in Model Number		
	ABZ	ABC	ABZC
YEL	A	A	A
BLUE	B	B	B
ORN	Z	—	Z
W-Yel	—	$\bar{A}$	$\bar{A}$
W-Blu	—	$\bar{B}$	$\bar{B}$
W-Orn	—	—	$\bar{Z}$
RED	+V (Supply Voltage)		
BLK	0V (Circuit Common)		
GRN	Case Ground (CG0)		
WHITE	Shield Drain (Shielded Cable Only)		

M18 Connector	
Pin	Channel
A	A
B	B
C	Z
D	+V
E	—
F	0V
G	CG
H	$\bar{A}$
I	$\bar{B}$
J	$\bar{Z}$

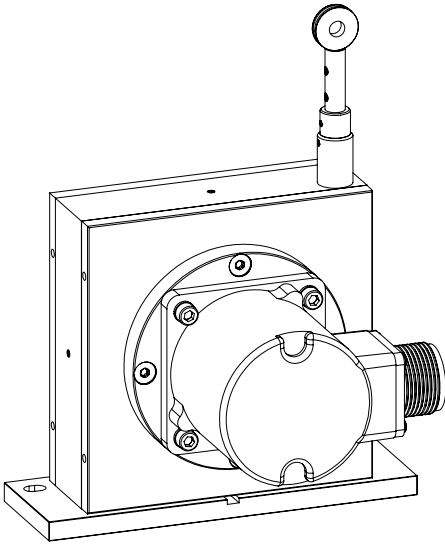
## WAVEFORM DIAGRAM



## AGENCY APPROVALS & CERTIFICATIONS



EN 61000-6-4 and EN 61000-6-2



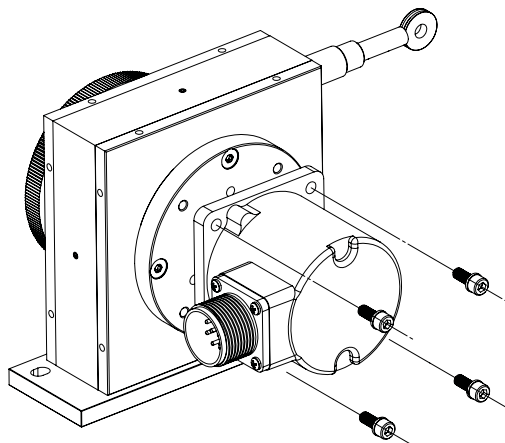
## CD120 Mounting Instructions

1. Mount the CD120 mounting plate securely to a stable flat surface using M6 or 1/4" bolts and washers.
2. Attach the draw wire to your moving equipment using the eyelet provided with an M4, #8 screw or a 3/16" pin. If you have purchased a special termination, then use the mounting instructions for that wire termination.

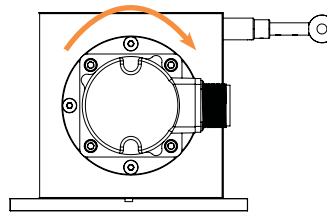


### WARNING:

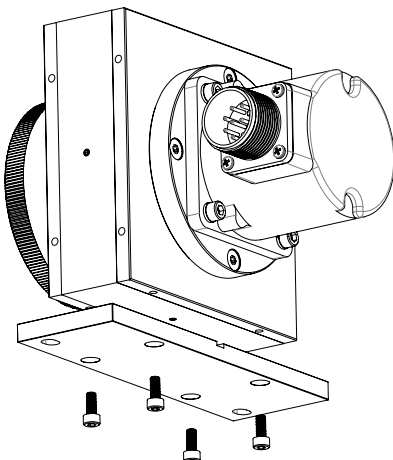
- Damage may occur if draw wire is released and allowed to freely retract without tension.
- Make certain the draw wire path is clear of objects or sharp edges to prevent cable damage.
- Draw wire should exit as straight as possible. A pulley may be used to redirect it



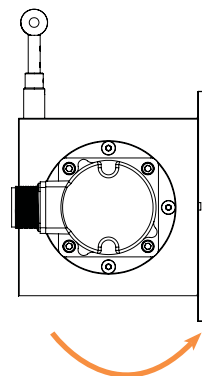
## How to Change Encoder Positioning



1. Remove the four #10-32 hex socket cap screws and washers from the encoder flange. (5/32 in. hex driver).
2. Rotate the encoder flange in 90° increments. You may need to pull it out a little to get it loose enough to turn.
3. If the encoder is completely removed, you can rotate the encoder shaft a little to align the driving gear with the draw wire hub. It should insert with little or no resistance. Do Not Force the gear into place.
4. Replace the screws and lock washers and tighten to 13 in-lb [1.4 N-m].




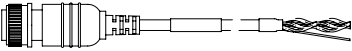
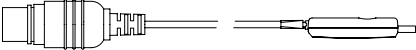
## How to Change the Mounting Plate Position



1. Remove the four M4 hex socket cap screws from the mounting plate (3 mm hex driver)
2. Align the mounting plate on the side you wish to attach it.
3. Replace the screws and tighten to 13 in-lb [1.4 N-m].



## ACCESSORIES

Description	Part Number
<b>M16 Cable Connector Assembly</b> When ordered separately. Cable Assembly may be ordered directly as part of the model number 	MS31186-1610 = 10' MS31186-1620 = 20' MS31186-1630 = 30' MS31186-1650 = 50'
<b>M18 Cable Connector Assembly</b> When ordered separately. Cable Assembly may be ordered directly as part of the model number 	MS31186-1810 = 10' MS31186-1820 = 20' MS31186-1830 = 30' MS31186-1850 = 50'
<b>Omniconder® Programming Cable</b> Ordered Separately 	60031-101

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