Logicbus

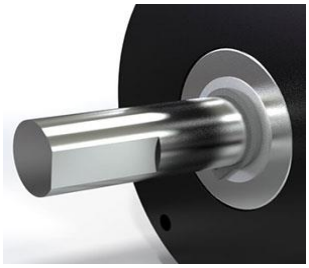
Your Automation Site !

Catalogo - Encoders

Contenido

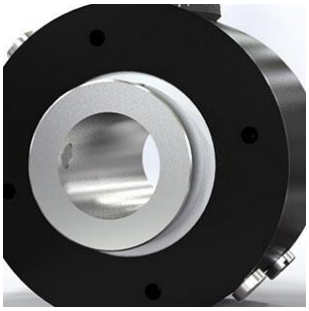
ENCODERS

Digital position and motion information is needed for a wide range of applications. Optical position technology offers the highest resolution of all the technologies. Accuracy and reliability are key. Photocraft optical rotary encoders have stood the test of time with proven service in harsh applications for more than 40 years. Encoders with precision measuring wheels designed for conveyor and web applications solve a host of linear measuring needs. Our shaft, hollow-shaft incremental and absolute rotary encoders are used in a variety of industries. Our encoders can be user configured to deliver a number of CPR settings and custom features to meet the needs of different applications. With our large selection of accessories and custom cables we are a one stop shop for all your encoder needs. Check out our selection of encoder products.



Shaft Encoders

Provides excelent speed and distance feedback for a rotating shaft.



Hollow Shaft Encoders

Mounts directly on a shaft, eliminating the need for couplings and brackets.

Wheel Encoders

Uses precision measuring wheels to track and measure the movement of a conveyor belt or a moving web.

Absolute Encoders

Single-turn resolutions up to 10-bits in low cost miniature, modular, and industrial configurations.

Accessories

Measuring wheels, shaft couplings, mounting brackets, mounting adapters, cables assemblies, and more.

Shaft Encoders

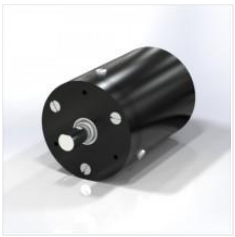
Shaft encoders direct couple to a device shaft and generate a specific pulse output for each revolution. Select from a wide offering of body sizes and styles. Once you have decided on a style, you can configure your encoder to your specific needs with our configuration center.

RB20
BlueCoder size 20 up to 10,000 CPR. Servo ring, face mount options.

R20
Size 20 up to 1200 CPR. Servo ring, face mount and IP66 seal options

R20-P
Size 20 w/user selectable CPR. Servo ring and face mount options

RG
Size 22.5 up to 2400 CPR. General purpose and economical



RJ
Size 22.5 up to 2400 CPR. General purpose and environmentally sealed

RBL
BlueCoder size 30 up to 1344 CPR

RL
Size 30 up to 1344 CPR

RL-P
Size 30 w/user selectable CPR

RBS
BlueCoder Cube style up to 10000 CPR

RS
Cube style up to 1200 CPR

RS-P
Cube style w/user selectable CPR

RBX
3" square face mount configuration

RC
Rugged base mount configuration

Hollow Shaft

Hollow shaft encoders are designed with either a through-bore or blind-bored shaft which mounts to a rotating shaft. They "float" on the shaft eliminating the need for a shaft-to-shaft coupling and mounting adapter saving space and cost. A tether or flexible mounting bracket prevents the encoder from turning and absorbs shaft-to-shaft misalignment increasing bearing life. Select from a wide offering of body sizes and styles. Once you have decided on a style you can configure your encoder to your needs using our configuration center.

HSB20
BlueCoder Size 20 up to 10,000 CPR & 16mm bore

HS20
Size 20 up to 720 CPR & 16mm bore

HS20-P
Size 20 w/user selectable CPR & up to 16mm bore

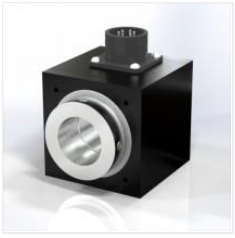
HS25
Size 25 up to 1200 CPR & 10mm bore

HS25-P
Size 25 w/user selectable CPR & up to 10mm bore

HS30
Size 30 up to 1200 CPR & 30mm bore

HRL
Size 30 up to 1344 CPR & 25mm bore

HRL-P
Size 30 w/user selectable CPR & up to 25mm bore



HRS
Cube style up to 1024 CPR & 25mm bore

HRS-P
Cube style w/user selectable CPR & up to 25mm bor

Wheel

Wheel encoders ride directly on the moving material, use a wheel tread having a high coefficient of friction, and have a very low starting torque resulting in virtually no slippage of the wheels on the belt. In addition, the wheels are precision ground with exacting tolerances, versus a roller which has a much larger tolerance and its circumference seldom translates into an integral number of encoder pulses per unit of linear movement.

Our single and dual wheel encoders offer additional advantages:

- Integrated mounting arm for easy installation
- Accessories for mounting above or below a conveyor or moving web
- Rugged construction for continuous duty in industrial applications
- "Anti-Jitter" feature eliminated measuring and tracking problems and the resulting miss-sorts often encountered when a conveyor or web stop or restarts
- Circuit protection that eliminates failure caused by the significant levels of static electricity often associated with conveyors
- "Programmable" versions that enables selection of various features at installation time, such as the pulses per revolution and the output circuit type, resulting in maximum flexibility with minimum inventory

Select the body size and wheel configuration. You can then configure your encoder to your needs using our configuration center.

RB21
BlueCoder Size 20 8" or 20cm wheel design w/integral mounting arm

R21
Size 20 8" or 20cm wheel design w/integral mounting arm

R21-P
Size 20 8" or 20cm wheel design w/user selectable parameters

RB22
BlueCoder Size 20 8" or 20cm dual wheel design w/integral mounting arm

R22
Size 20 8" or 20cm dual wheel design w/integral mounting arm

R22-P
Size 20 8" or 20cm dual wheel design w/user selectable parameters

RBH
BlueCoder Size 30 dual 12" or 30cm wheel design w/integral mounting arm

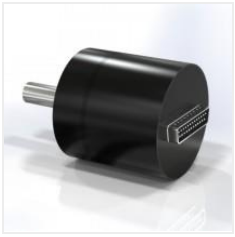
RH
Size 30 dual 12" or 30cm wheel design w/integral mounting arm

RH-P
Size 30 dual 12" or 30cm wheels w/user selectable parameters

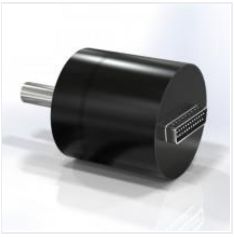
Absolute

Absolute encoders generate a digital code indicating the angular position of the shaft. Each increment of one shaft rotation is given a unique digital code for a single-turn encoder. When power is first applied, shaft position is immediately known without having to home the encoder. Even if the shaft is moved when power is off, shaft position is not lost. Select from a wide offering of body sizes and styles. Once you have decided on a style you can configure your encoder to your needs using our configuration center.

MR
Modular w/up to 11 bits of resolution



R30
Size 30 w/up to 10 bits of resolution



SR30
Size 30 w/up to 11 bits of resolution

SR12
Size 12 w/up to 10 bits of resolution

Accessories

We offer a wide variety of accessories to help you solve your application. Precision ground Measuring Wheels, Shaft Couplings, Shaft Stubs, Mounting Options, and Cable Assemblies can be fitted to most any of our encoders.

M12.4-3-10 RC
12mm, 4-pin, 3 wire, 10ft cable assembly

MB-ST.375A
Shaft stub, 3/8" diameter, 1-3/4" stub length, #10-24 thread

MB-ST.375B
Shaft stub, 3/8" diameter, 1-3/4" stub length, 3/8-16 thread

M12.4-3-20 RC
12mm, 4-pin, 3 wire, 20ft cable assembly

M12.4-3-3M RC
12mm, 4-pin, 3 wire, 3M cable assembly

M12.4-3-6M RC
12mm, 4-pin, 3 wire, 6M cable assembly

M12.4-4-10 RC
12mm, 4-pin, 4 wire, 10ft cable assembly

M12.4-4-20 RC
12mm, 4-pin, 4 wire, 20ft cable assembly

M12.4-4-3M RC
12mm, 4-pin, 4 wire, 3M cable assembly

M12.4-4-6M RC
12mm, 4-pin, 4 wire, 6M cable assembly

D6-3-10
16mm, 6-pin, 3 wire, 10ft cable assembly

D6-3-20
16mm, 6-pin, 3 wire, 20ft cable assembly

D6-3-3M
16mm, 6-pin, 3 wire, 3M cable assembly

D6-3-6M
16mm, 6-pin, 3 wire, 6M cable assembly

D6-4-10
16mm, 6-pin, 4 wire, 10ft cable assembly

D6-4-20
16mm, 6-pin, 4 wire, 20ft cable assembly

D6-4-3M
16mm, 6-pin, 4 wire, 3M cable assembly

D6-4-6M
16mm, 6-pin, 4 wire, 6M cable assembly

D6-5-10
16mm, 6-pin, 5 wire, 10ft cable assembly

D6-5-20
16mm, 6-pin, 5 wire, 20ft cable assembly

D6-5-3M
16mm, 6-pin, 5 wire, 3M cable assembly

D6-5-6M
16mm, 6-pin, 5 wire, 6M cable assembly

D8-4-10
16mm, 8-pin, 4 wire, 10ft cable assembly

D8-4-20
16mm, 8-pin, 4 wire, 20ft cable assembly

D8-4-3M
16mm, 8-pin, 4 wire, 3M cable assembly

D8-4-6M
16mm, 8-pin, 4 wire, 6M cable assembly

D8-6-10
16mm, 8-pin, 6 wire, 10ft cable assembly

D8-6-20
16mm, 8-pin, 6 wire, 20ft cable assembly

D8-6-3M
16mm, 8-pin, 6 wire, 3M cable assembly

D8-6-6M
16mm, 8-pin, 6 wire, 6M cable assembly

D8-8-10
16mm, 8-pin, 8 wire, 10ft cable assembly

D8-8-20
16mm, 8-pin, 8 wire, 20ft cable assembly

D8-8-3M
16mm, 8-pin, 8 wire, 3M cable assembly

D8-8-6M
16mm, 8-pin, 8 wire, 6M cable assembly

C3-3-10 RC
MS, 3-pin, 3 conductor, 10ft cable assembly

C3-3-20 RC
MS, 3-pin, 3 conductor, 20ft cable assembly

C3-3-3M RC
MS, 3-pin, 3 conductor, 3M cable assembly

C3-3-6M RC
MS, 3-pin, 3 conductor, 6M cable assembly

C3-2P-10 RC M148
MS, 3-pin, 2 pair braided, 10ft cable assembly

C3-2P-20 RC M148
MS, 3-pin, 2 pair braided, 20ft cable assembly

C3-2P-3M RC M148
MS, 3-pin, 2 pair braided, 3M cable assembly

C3-2P-6M RC M148
MS, 3-pin, 2 pair braided, 6M cable assembly

C5-3-10 RC
MS, 5-pin, 3 wire, 10ft cable assembly

C5-3-20 RC
MS, 5-pin, 3 wire, 20ft cable assembly

C5-3-3M RC
MS, 5-pin, 3 wire, 3M cable assembly

C5-3-6M RC
MS, 5-pin, 3 wire, 6M cable assembly

C5-4-10 RC
MS, 5-pin, 4 wire, 10ft cable assembly

C5-4-20 RC
MS, 5-pin, 4 wire, 20ft cable assembly

C5-4-3M RC
MS, 5-pin, 4 wire, 3M cable assembly

C5-4-6M RC
MS, 5-pin, 4 wire, 6M cable assembly

C5-4Z-10 RC
MS, 5-pin, 4 wire, pulse/index outputs, 10ft cable assembly

C5-4Z-20 RC
MS, 5-pin, 4 wire, pulse/index outputs, 20ft cable assembly

C5-4Z-3M RC
MS, 5-pin, 4 wire, pulse/index outputs, 3M cable assembly

C5-4Z-6M RC
MS, 5-pin, 4 wire, pulse/index outputs, 6M cable assembly

C5-5-10 RC
MS, 5-pin, 5 wire, 10ft cable assembly

C5-5-20 RC
MS, 5-pin, 5 wire, 20ft cable assembly

C5-5-3M RC
MS, 5-pin, 5 wire, 3M cable assembly

C5-5-6M RC
MS, 5-pin, 5 wire, 6M cable assembly

C6-3-10 RC
MS, 6-pin, 3 conductor, 10ft cable assembly

C6-3-20 RC
MS, 6-pin, 3 wire, 20ft cable assembly

C6-3-3M RC
MS, 6-pin, 3 wire, 3M cable assembly

C6-3-6M RC
MS, 6-pin, 3 wire, 6M cable assembly

C6-4-10 RC
MS, 6-pin, 4 wire, 10ft cable assembly

C6-4-20 RC
MS, 6-pin, 4 wire, 20ft cable assembly

C6-4-3M RC
MS, 6-pin, 4 wire, 3M cable assembly

C6-4-6M RC
MS, 6-pin, 4 wire, 6M cable assembly

C6-4-10 RCLD
MS, 6-pin, 4 wire, 10ft, line driver cable assembly

C6-4-20 RCLD
MS, 6-pin, 4 wire, 20ft, line driver cable assembly

C6-4-3M RCLD
MS, 6-pin, 4 wire, 3M, line driver cable assembly

C6-4-6M RCLD
MS, 6-pin, 4 wire, 6M, line driver cable assembly

C6-4Z-10 RC
MS, 6-pin, 4 wire, pulse/index outputs, 10ft cable assembly

C6-4Z-20 RC
MS, 6-pin, 4 wire, pulse/index outputs, 20ft cable assembly

C6-4Z-3M RC
MS, 6-pin, 4 wire, pulse/index outputs, 3M cable assembly

C6-4Z-6M RC
MS, 6-pin, 4 wire, pulse/index outputs, 6M cable assembly

C6-5-10 RC
MS, 6-pin, 5 wire, 10ft cable assembly

C6-5-20 RC
MS, 6-pin, 5 wire, 20ft cable assembly

C6-5-3M RC
MS, 6-pin, 5 wire, 3M cable assembly

C6-5-6M RC
MS, 6-pin, 5 wire, 6M cable assembly

C6-6-10 RC
MS, 6-pin, 6 wire, 10ft cable assembly

C6-6-20 RC
MS, 6-pin, 6 wire, 20ft cable assembly

C6-6-3M RC
MS, 6-pin, 6 wire, 3M cable assembly

C6-6-6M RC
MS, 6-pin, 6 wire, 6M cable assembly

C6-6-10 RCLD
MS, 6-pin, 6 wire, 10ft, line driver cable assembly

C6-6-20 RCLD
MS, 6-pin, 6 wire, 20ft, line driver cable assembly

C6-6-3M RCLD
MS, 6-pin, 6 wire, 3M, line driver cable assembly

C6-6-6M RCLD
MS, 6-pin, 6 wire, 6M, line driver cable assembly

C10-4-10 RCLD
MS, 10 pin, 4 wire, 10ft, line driver cable assembly

C10-4-20 RCLD
MS, 10 pin, 4 wire, 20ft, line driver cable assembly

C10-4-3M RCLD
MS, 10 pin, 4 wire, 3M, line driver cable assembly

C10-4-6M RCLD
MS, 10 pin, 4 wire, 6M, line driver cable assembly

C10-6-10 RC M226
MS, 10 pin, 6 wire, 10ft Cable Assembly

C10-6-20 RC M226
MS, 10 pin, 6 wire, 20ft Cable Assembly

C10-6-3M RC M226
MS, 10 pin, 6 wire, 3M Cable Assembly

C10-6-6M RC M226
MS, 10 pin, 6 wire, 6M Cable Assembly

C10-8-10 RCLD
MS, 10-pin, 8 wire, 10ft, line driver cable assembly

C10-8-20 RCLD
MS, 10-pin, 8 wire, 20ft, line driver cable assembly

C10-8-3M RCLD
MS, 10-pin, 8 wire, 3M, line driver cable assembly

C10-8-6M RCLD
MS, 10-pin, 8 wire, 6M, line driver cable assembly

C10-9-10 LD
MS, 10 pin, 9 wire, 10ft, line driver cable assembly

C10-9-20 LD
MS, 10 pin, 9 wire, 20ft, line driver cable assembly

C10-9-3M LD
MS, 10 pin, 9 wire, 3M, line driver cable assembly

C10-9-6M LD
MS, 10 pin, 9 wire, 6M, line driver cable assembly

DB9-3-10
DB9-pin, 3 wire, 10ft cable assembly

DB9-3-20
DB9-pin, 3 wire, 20ft cable assembly

DB9-3-3M
DB9-pin, 3 wire, 3M cable assembly

DB9-3-6M
DB9-pin, 3 wire, 6M cable assembly

DB9-4-10
DB9-pin, 4 wire, 10ft cable assembly

DB9-4-20
DB9-pin, 4 wire, 20ft cable assembly

DB9-4-3M
DB9-pin, 4 wire, 3M cable assembly

DB9-4-6M
DB9-pin, 4 wire, 6M cable assembly

DB9-4Z-10
DB9-pin, 4 wire, (pulse/index output), 10ft cable assembly

DB9-4Z-20
DB9-pin, 4 wire, (pulse/index output), 20ft cable assembly

DB9-4Z-3M
DB9-pin, 4 wire, (pulse/index output), 3M cable assembly

DB9-4Z-6M
DB9-pin, 4 wire, (pulse/index output), 6M cable assembly

DB9-5-10
DB9-pin, 5 wire, 10ft cable assembly

DB9-5-20
DB9-pin, 5 wire, 20ft cable assembly

DB9-5-3M
DB9-pin, 5 wire, 3M cable assembly

DB9-5-6M
DB9-pin, 5 wire, 6M cable assembly

DB9-6-10 LD
DB9-pin, 6 wire, 10ft, line driver, cable assembly

DB9-6-20 LD
DB9-pin, 6 wire, 20ft, line driver, cable assembly

DB9-6-3M LD
DB9-pin, 6 wire, 3M, line driver, cable assembly

DB9-6-6M LD
DB9-pin, 6 wire, 6M, line driver, cable assembly

DB9-8-10 LD
DB9-pin, 8 wire, 10ft, line driver, cable assembly

DB9-8-20 LD
DB9-pin, 8 wire, 20ft, line driver, cable assembly

DB9-8-3M LD
DB9-pin, 8 wire, 3M, line driver, cable assembly

DB9-8-6M LD
DB9-pin, 8 wire, 3M, line driver, cable assembly

MW-8-B
8" circumference measuring wheel, 3/8" bore

MW-10-B
10" circumference measuring wheel, 3/8" bore

MW-1-6MM
12" circumference measuring wheel, 6mm bore

MW-1-8MM
12" circumference measuring wheel, 8mm bore

MW-1-.5
12" circumference measuring wheel, 1/2" bore

MW-1-A
12" circumference measuring wheel, 5/16" bore

MW-1-B
12" circumference measuring wheel, 3/8" bore

MW-1-C
12" circumference measuring wheel, 1/4" bore

MW-1R-A
12" circumference measuring wheel, 5/16" bore, replaceable O-ring

MW-1R-B
12" circumference measuring wheel, 3/8" bore, replaceable O-ring

MW-1R-C
12" circumference measuring wheel, 1/4" bore, replaceable O-ring

MW-1W-6MM
12" circumference measuring wheel, 1" wide, 6mm bore

MW-1W-8MM
12" circumference measuring wheel, 1" wide, 8mm bore

MW-1W-.5
12" circumference measuring wheel, 1" wide, .5" bore

MW-1W-A
12" circumference measuring wheel, 1" wide, 5/16" bore

MW-1W-B
12" circumference measuring wheel, 1" wide, 3/8" bore

MW-1W-C
12" circumference measuring wheel, 1" wide, 1/4" bore

MW-20-B
20cm. circumference measuring wheel, 3/8" bore

MW-30-6MM
30cm. circumference measuring wheel, 6mm bore

MW-30-8MM
30cm. circumference measuring wheel, 8mm bore

MW-30-10MM
30cm. circumference measuring wheel, 10mm bore

MW-30-A
30cm. circumference measuring wheel, 5/16" bore

MW-30-B
30cm. circumference measuring wheel, 3/8" bore

MW-30-C
30cm. circumference measuring wheel, 1/4" bore

MW-30R-10MM
30cm. circumference measuring wheel, 10mm bore, replaceable O-ring

MW-30R-A
30cm. circumference measuring wheel, 5/16" bore, replaceable O-ring

MW-30R-B
30cm. circumference measuring wheel, 3/8" bore, replaceable O-ring

MW-30R-C
30cm. circumference measuring wheel, 1/4" bore, replaceable O-ring

MW-30W-6MM
30cm. circumference measuring wheel, 25mm wide, 6mm bore

MW-30W-8MM
30cm. circumference measuring wheel, 25mm wide, 8mm bore

MW-30W-10MM
30cm. circumference measuring wheel, 25mm wide, 10mm bore

MW-30W-A
30cm. circumference measuring wheel, 25mm wide, 5/16" bore

MW-30W-B
30cm. circumference measuring wheel, 25mm wide, 3/8" bore

MW-30W-C
30cm. circumference measuring wheel, 25mm wide, 1/4" bore

550-SCR808
Anti-rotation pin

MB-56C
56C Protective Cover

MB-FB1
Flexible mounting bracket

MB-FB2
Flexible mounting tether for C-face motor mount, 3.4" to 5.9" bolt circle

MB-FB2A
Flexible mounting tether for C-face motor mount, 3.4" to 5.9" bolt circle, flattened

MB-FL5
L-shaped mounting bracket

MB-FB2B
Rigid mounting tether

MB-FB3
Flexible mounting bracket, .015" (.38mm) thick

MB-FB5
Flexible mounting tether for C-face motor mount, 5" to 8" bolt circle

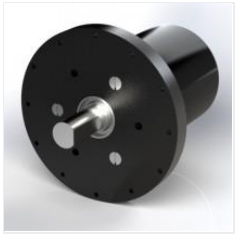
MB-FB5C
Flexible Tether, Conveyor bearing kit

MB-UB6
Rigid under-belt wheeled encoder mounting "L" bracket

MB-5PY
5PY adapter

MB-75
Face mounting adapter, servo

MB-76
Face mounting adapter, 1.46" bolt circle



MB-78
Face mounting adapter

MB-FL
Flange adapter, 2.5 inch square

MB-FL2
Flange adapter, 2.5" square; 10mm, 1/2 shaft

MB-FL3
Flange adapter, 2.25" x 3.25"

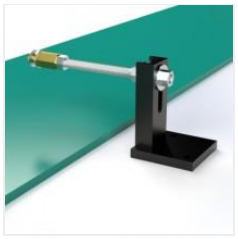
MB-FL4
Flange adapter, 2.25" x 2.25"

MB-FL6
Flange adapter, 2.5" square with 1.25" male pilot

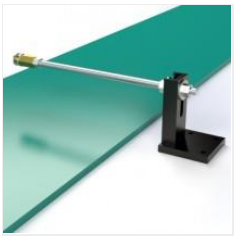
MB-KOYO
Face mounting adapter for Koyo, 40mm BC

MB-RD
Measuring wheel arm

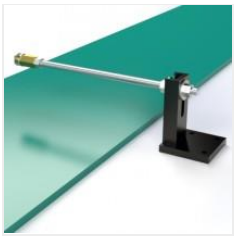
MB-RD2
Measuring wheel arm for Y-1G, Y-2G, Y-3G or MB-UB2



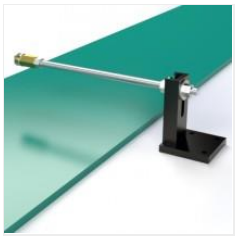
MB-UB2
Offset mounting bracket - 7" arm, for R21, R22 and RH Encoders



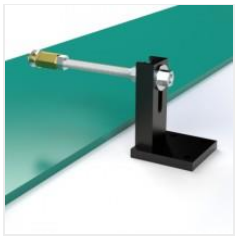
MB-UB2A
Offset mounting bracket - 11.25" arm, for R21, R22 and RH encoders



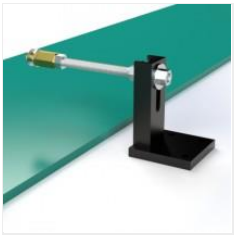
MB-UB2AG
Offset mounting bracket - 11.25" arm, for R20, RJ and RG encoders



MB-UB2AS
Offset mounting bracket - 11-1/4" arm, for RS



MB-UB2G
Offset mounting bracket - 7" arm, for R20, RJ and RG encoders



MB-UB2S
Offset mounting bracket - 7" arm, for RS

MB-UB3
Spring loaded, under-belt mounting assembly

MB-UB3G
Under-belt mounting bracket, spring loaded

MB-UB4
Spring loaded, under-belt mounting assembly

MB-UB4W
Spring loaded, under-belt mounting assembly, with shims

Y-1
Yoke assembly with 1/4"-28 bolt

Y-1G
Wheeled encoder mounting yoke, ¼-28 cap screw

Y-2
Yoke assembly for MB-UB1 mounting bracket

Y-2A
Yoke assembly, 3.25" length, 3/8"-16 bolt

Y-2G
Wheeled encoder mounting yoke, under belt

Y-3
Yoke assembly 3/8"-16 bolt

Y-3G
Wheeled encoder mounting yoke, 3/8-16 cap screw

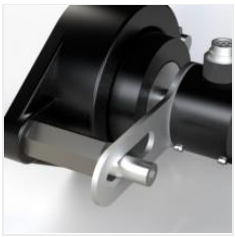
Torsion Spring Mounting Bracket
Torsion spring wheeled encoder mounting assembly.

MB-T
Torsion Spring Mounting Bracket, Universal Kit

MB-FB2C
Conveyor bearing mounting kit for a flange bearing with 1/2-13 bolts

MB-FB2C-1
Conveyor bearing mounting kit for a flange bearing with 3/8-16 bolts

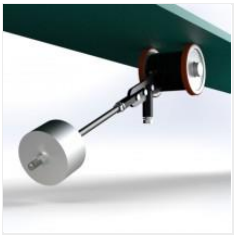
MB-FB2D
Conveyor bearing mounting kit with 1/2-13 coupling nut



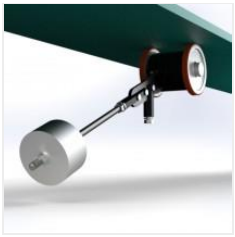
MB-FB2D-1
Conveyor bearing mounting kit with 3/8-16 coupling nut

MB-FL8
Mounting adapter kit for conveyor roller bearing

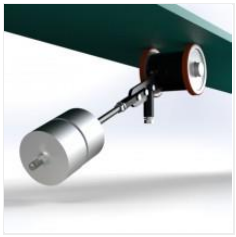
MB-FL8A
Mounting adapter kit for conveyor roller bearing with shaft guards



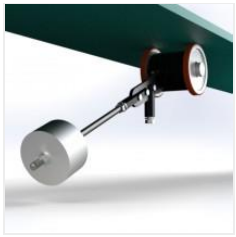
MB-UB1
Under-belt counter-weight mounting assembly



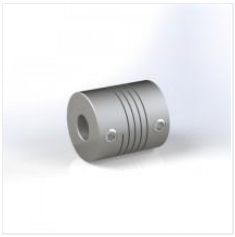
MB-UB1 M185
Under-belt counter-weight mounting assembly with 2 weights, no rod



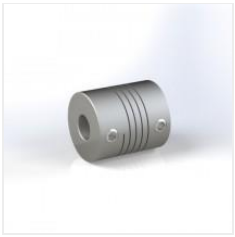
MB-UB1A
Under-belt counter-weight mounting assembly, 2 weights



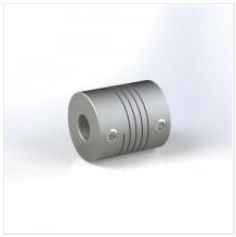
MB-UB1M
Under-belt counter-weight mounting assembly for wheeled encoders (metric)



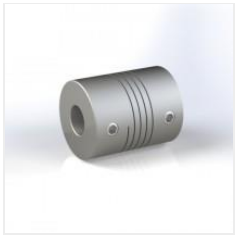
AE087-10-10
Flexible shaft coupling, 3/4"D x 1"L, 5/16" bore



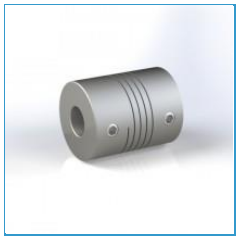
AE087-12-10
Flexible shaft coupling, 3/4"D x 1"L, 3/8" bore and 5/16" bore



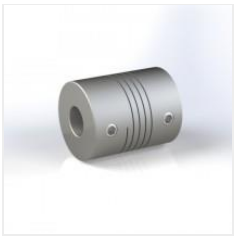
AE087-8MM-8MM
Flexible shaft coupling, 3/4"D x 1"L, 8mm bore



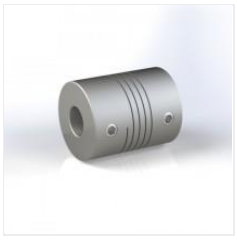
AE100-12-12
Flexible shaft coupling, 1"D x 1.25"L, 3/8" bore



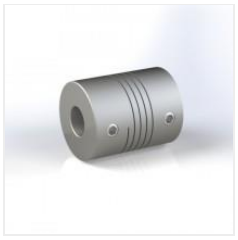
AE100-12-10MM
Flexible shaft coupling, 1"D x 1.25"L, 3/8" and 10mm bore



AE100-10MM-10MM
Flexible shaft coupling, 1"D x 1.25"L, 10mm bore

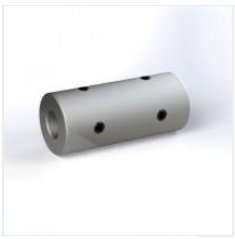


AE100-12MM-10MM
Flexible shaft coupling, 1"D x 1.25"L, 12mm and 10mm bore

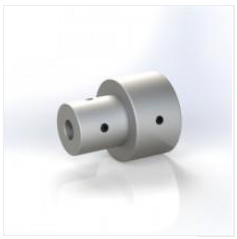


AE100-12MM-12MM
Flexible shaft coupling, 1"D x 1.25"L, 12mm bore

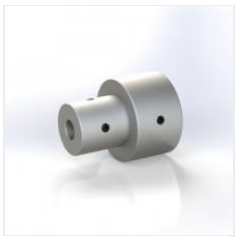
MB-085
Rigid shaft coupling, 3/8"D to 1"D



MB-085-.375
Rigid shaft coupling, 3/8"D to 3/8"D



MB-085-.75
Rigid shaft coupling, 3/8"D to 3/4"D



MB-085-M30
Rigid shaft coupling, 3/8"D to 30mm

MB-SR.375
Roll pin shaft stub, 3/8" diameter x 2.25"

MB-ST-M10
Shaft stub, 10mm diameter, 27mm stub length, M8 x 1.25 thread

MB-ST-M12
Shaft stub, 12mm diameter, 44mm stub length, M10 x 1.5 thread

MB-ST-M12A
Shaft stub, 12mm diameter, 25mm length, M10 x 1.5 thread

MB-ST.250
Shaft stub, 1/4" diameter, 1.7" stub length, 10-24 thread

MB-ST.250A
Shaft stub, 1/4" diameter, .94" stub length, 10-24 thread

MB-ST.312
Shaft stub, 5/16" diameter, 1.72" stub length, 1/4-20 thread

MB-ST.375
Shaft stub, 3/8" diameter, 1-3/4" stub length, 5/16-18 thread

MB-ST.5

Shaft stub, 1/2" diameter, 1.8" stub length, 3/8-16 thread

MB-ST.5A

Shaft stub, 1/2" diameter, 1.1" stub length, 3/8-16 thread

MODEL RB20 BlueCoder High Resolution Encoder

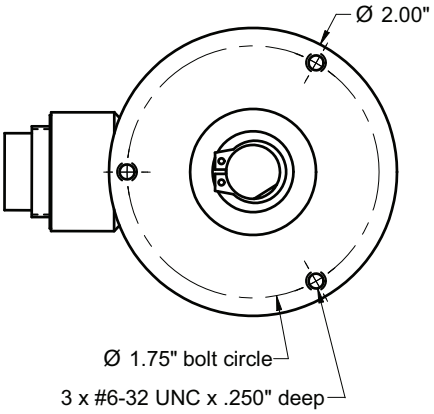
BLUE CODER

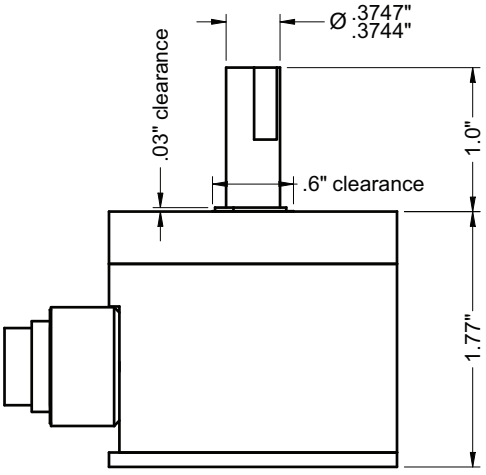
The BlueCoder model RB20 is an optical incremental encoder that use the benefits of blue LED light. It is housed in a 2" diameter x 1-3/4" long enclosure that can be face mounted using three 6-32 x .25" deep mounting holes on a 1.75" diameter bolt circle. Electrical connection is through a 16mm circular connector or an attached cable.

- High-Definition blue-light phased array technology
- Compensated blue-light source
- Wide operating voltage 4.5Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk
- Low-Lag Time. Excellent for motor regulation
- Shaft size from 0.250" to 0.375" & 4mm to 8mm
- Servo ring and face mount options
- IP65 environmental seal

DIMENSIONS

(Shown with 16mm Din connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:
Radial - 50 lbs. for life of 4.1 x 109 revolutions
Axial - 50 lbs. for life of 4.1 x 109 revolutions
Note: A flexible shaft coupling is recommended to increase bearing life.
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 10 oz. (285 grams)
Sealing: P65

Electrical Connections

Single Ended Outputs:

16mm Din 6-pin	M12 4-pin	Function	Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

16mm Din 8-Pin	Function	Color
1	Output A	White
2	Output B	Green
3	Output Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output $\overline{A}$	Blue or Green
7	Output $\overline{B}$	Brown
8	Output $\overline{Z}$	Orange

8-pin connector is Amphenol T3506000 or equivalent

Electrical

Supply Voltages: 4.5 Vdc to 30 Vdc
(6.0 Vdc to 30 Vdc for RS422 differential line driver)
Current: 65 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 70° C
Pulse Symmetry: 180°±36° @ maxRPM
Quadrature Phase Error: 90°±36° @ maxRPM
Phase jitter: 27°
Maximum Frequency: up to 1.4 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
Two channel quadrature square waves (A,B)
• optional index (Z).
• optional complimentary outputs (-A,-B,-Z).
Note: Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Counts per Revolution: (specify when ordering)
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000
Output Circuit: (specify when ordering)
Single Ended:
• 7273 open collector
(30 VDC max, 50 mA max)
• 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
• 7272 differential line driver
(output level same as supply voltage)
• RS422 differential line driver
(with regulated 5vdc output level)
Connections: (specify when ordering)
• Attached 10ft cable
• 16mm 6/8-pin Din connector
• M12 4-pin connector

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

Build Encoder

RB20	Shaft	Output Type	—	CPR	Output Circuit	Connector
RB20			—			

Shaft Diameter:
blank = 3/8"
A = 5/16"
C = 1/4"
.187 = .187"
M4 = 4mm
M6 = 6mm
M8 = 8mm

Output Type:
blank = single output on A,
Q = quadrature outputs on A & B
QZ = quadrature outputs on A & B with Z outputs

Counts Per Revolution:
Choose one number:
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
DH = Differential line driver - output level same as input level
DL = RS422 line driver with 5vdc output level

Cable/Connector:
blank = attached 10ft. shielded cable
S = 16mm 6/8-pin Din connector
S3 = 4-pin M12 connector

Example: **RB20Q-10240DHS** - 3/8" shaft, quadrature outputs, 1024 ppr, differential line driver output, 16mm connector (8-pin)

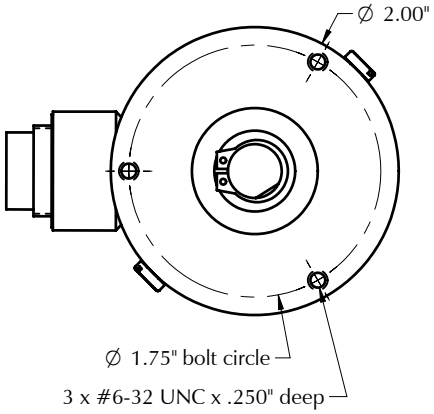
MODEL R20 — Series 20 Heavy Duty Encoder

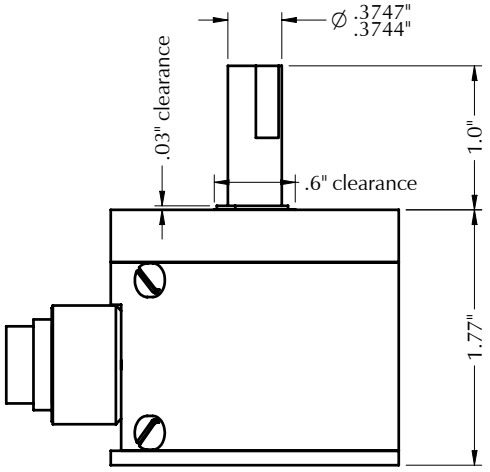
FEATURES

- **Heavy Duty bearings**
- **Size 20 housing**
- **Short circuit and ESD protected**
- **Up to 1200 pulses per revolution**
- **Attached cable, or 16mm or M12 connector**
- **Hollow shaft model available - see Model HS20**
- **Wheeled version available - see Models R21 and R22**
- **Programmable model available - see Model R20-P**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading: Radial - 40 lbs. / 18.1 kg
Axial - 30 lbs. / 13.6 kg
Note: a flexible shaft coupling is recommended
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 10 oz. (285 grams)
Enclosure: IP50 standard, IP64 available

Electrical Connections

Single Ended Outputs:

Optional 6-pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin Connector	Function	Wire Color
1	Output +A	White
2	Output +B	Green
3	Output +Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output -A	Blue or Green
7	Output -B	Brown
8	Output -Z	Orange

8-pin connector is Amphenol T3506000 or equivalent

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: (specify when ordering)
1 to 1200
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver
(output level same as supply voltage)
— RS422 differential line driver
(with regulated 5vdc output level)
Output Format: Two channel quadrature square waves (A,B) with optional index (Z). Optional complimentary outputs (-A,-B,-Z). Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Symmetry: 180°±30%
Pulse interval jitter: 30% max
Quadrature: 90°±30% max
Phase jitter: 30% max
Anti-jitter: (single output models only)
Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and possible false output pulses. For example a 10 pulse per revolution output has 18° hysteresis (i.e. 360° ÷ 10 × ½).
Enhanced Anti-jitter: see our website or contact us for more information.

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

R20				—			/					
Model Number	**Shaft Diameter:** blank for 3/8", **A** = 5/16", **C** = 1/4", **M4** = 4mm, **M6** = 6mm, **M8** = 8mm	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 1200	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage:** **5** or **8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver with 5vdc output level	**Cable/Connector:** leave blank for attached cable, **S** = 16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

INDUSTRIAL ENCODERS FOR OVER 35 YEARS
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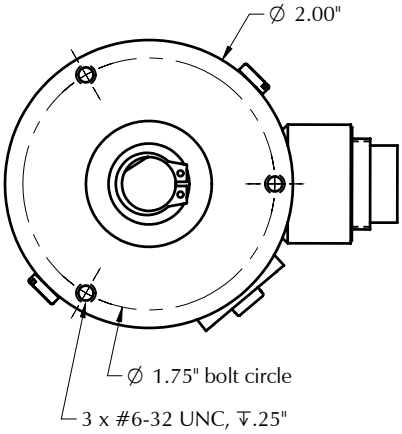
MODEL R20-P — Series 20 Programmable Shaft Encoder

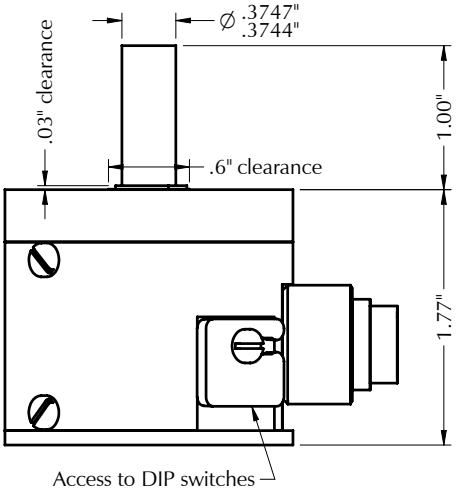
FEATURES

- **DIP switch selectable features (see our website)**
- **Up to 1200 pulses per revolution**
- **Heavy Duty bearings**
- **Size 20 housing**
- **Attached cable, or 16mm or M12 connector**
- **Short circuit and ESD protected**
- **Hollow shaft model available - see Model HS20**
- **Wheeled version available - see Models R21 and R22**

DIMENSIONS

(shown with 16mm connector, 3/8" diameter shaft)





SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm

Shaft Loading:

— Radial: 40 lbs. / 18.1 kg

— Axial: 30 lbs. / 13.6 kg

A flexible coupling is recommended.

Bearing Life: 32 x 1,000,000/rpm = hours

Materials:

— Case: Aluminum, anodized

— Shaft: 303 Stainless steel

Weight: 10 oz. (285 grams)

Electrical Connections

Single Ended Outputs:

Optional 6-pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin Connector	Function	Wire Color
1	Output +A	White
2	Output +B	Green
3	Output +Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output -A	Blue or Green
7	Output -B	Brown
8	Output -Z	Orange

8-pin connector is Amphenol T3506000 or equivalent

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Programmable Features: The encoder is factory configured with a program that offers one or more of the following features. DIP switches are used to set program parameters.

(for more details, call or see our website)

— Selectable Pulses per revolution

— Quadrature (A/B) outputs

— Direction outputs

— Anti-Jitter feature

— Other enhanced features

Supply Voltages: (specify when ordering)

5 VDC, or 8-30 VDC

Current: 50 mA max (no load)

100 mA max (line driver)

Operating Temperature: 0° to 70° C

Output Circuit: (specify when ordering)

Single Ended:

— 7273 open collector
(30 VDC max, 50 mA max)

— 7272 Push-Pull
(50 mA max source or sink)

Differential Line Driver:

— 7272 differential line driver
(output level same as supply voltage)

— RS422 differential line driver
(with regulated 5vdc output level)

Output Waveshape:

Square wave outputs are 50/50 duty cycle nominal. Type and number of outputs depends on the programmable features provided with the encoder. Call or see the model specific datasheet for more information.

Accessories

Call or see our website about the following:
Adapters, Cables, Flexible Couplings, Measuring Wheels, Mounting Brackets

MODEL NUMBER

R20		—	P		/					
Model Number	**Shaft Diameter:** leave blank for 3/8", **A** = 5/16", **C** = 1/4", **M4** = 4mm, **m6** = 6mm, **M8** = 8mm		**P** = programmable encoder	**Program:** name of factory configured program. See program specific datasheet for feature descriptions and DIP switch settings.		**Supply Voltage:** **5** or **8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver with 5vdc output level	**Cable/Connector:** leave blank for attached cable, **S** = 16mm connector , **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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SPECIFICATIONS

Mechanical

Shaft dia.: (specify when ordering)
5/16″ – .3120″ diameter with flat
3/8″ – .3745″ diameter with flat
1/4″ – .2495″ diameter with flat

Weight (without connector): 7 oz. (198 grams)

Maximum speed: 6,000 rpm

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 10 lb. (4.5 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours
Note: *to allow for axial and angular misalignment, a flexible shaft coupling is recommended.*

Materials: Case: Aluminum, anodized
Shaft: 303 Stainless steel

Cable: Pre-wired 10′ (3m) shielded cable, or optional connector with cable.
(other lengths are available)

Optional Connector[1] (Specify when ordering):

No. of Pins	Encoder Connector	Mating Connector
6	MS3102E-14S-6P	MS3106A-14S-6S
10[2]	MS3102E-18-1P	MS3106A-18-1P

1. Only available with 3/8″ shaft, and must be purchased separately.
2. Not available as a side connector.

Electrical

Power Input (specify voltage when ordering):

Supply[1] (Vdc)	R Values[2,3] (Kohms)
5	1
12 or 15	2.2
24	3.3
7 to 20 (″5R″ supply voltage)	2.2
12 to 27 (″12R″ supply voltage)	3.3
8 to 30 (″8-30″ supply voltage)	3.3

(1) Others available on special order
(2) See output circuit figure 1 below
(3) R is removed for open collector
— **Current:** 50 ma max (no load)
100 ma max (line driver)
— **Ripple:** 2% max
— **Regulation:** ±5%
— Reverse polarity protected

Operating temperature: 0° to 70°C

Pulse rate: 0 to 30 kHz

Pulses per Revolution: 1 to 1200
(Specify when ordering)

Output Circuit (Figure 1; specify when ordering):
— Current sinking NPN transistor with pull-up resistor (50 ma max)
— Current sinking NPN open collector (50 ma, 30 vdc max)
— Current sourcing PNP with pull-down resistor (50 ma max)
— RS422 differential line driver (MC3487 device; must be ordered with 5, 5R or 8-30 Supply Voltage)

Output Waveshape: (See Figure 2)
Square wave; outputs A and B are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on outputs A or B
— Pulse symmetry(A): 180°±30%
— Pulse interval jitter(B): 30% max
— Quadrature(C): 90°±30% max
— Phase jitter (D): 30% max
— Index pulse (E)

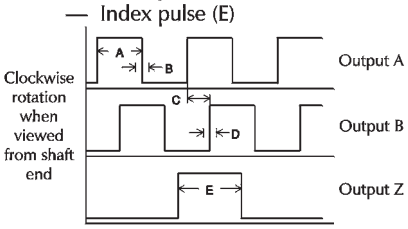


Figure 2

Electrical Connections

NPN or PNP transistor outputs:

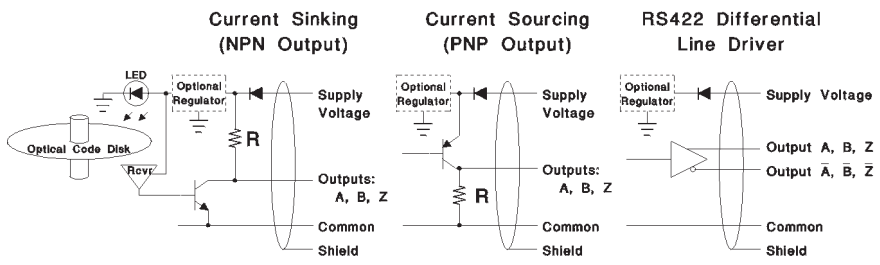
6-Pin	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output Z	Brown*
D	Output A	White
E	Output B	Green

** Output Z is green if Output B is not used.*

Line Driver outputs:

6-Pin	10-Pin[1]	Function	Wire Color
A	F	Common	Black
B	D	+vdc	Red
C	A	Output A	White
D	H	Output $\bar{A}$	Blue[2]
E	B	Output B[4]	Green
F	I	Output $\bar{B}$[4]	Brown
–	C	Output Z	Yellow[3]
–	J	Output $\bar{Z}$	Orange[3]

[1] Only used if A, B, and Z are required.
[2] Output $\bar{A}$ is green if Output B is not used.
[3] Output Z is green and $\bar{Z}$ is brown if outputs B and $\bar{B}$ are not used.
[4] These are Outputs Z/$\bar{Z}$ if B/$\bar{B}$ are not used.



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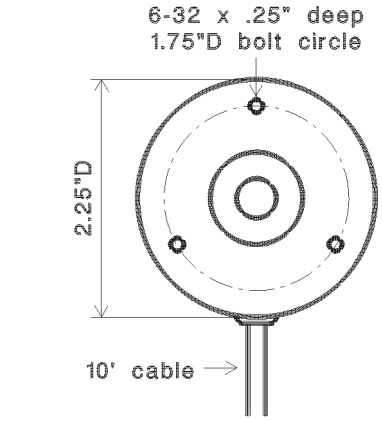
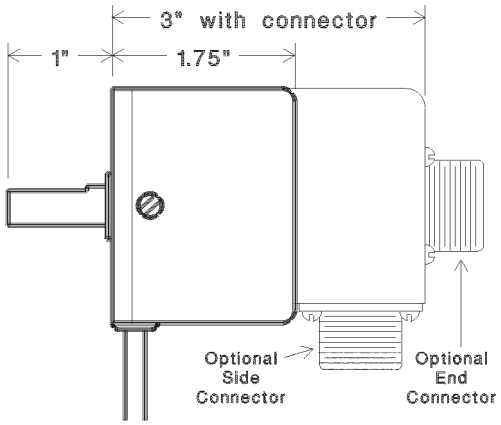




ORDERING INFORMATION

RG ___ ___ ___ - ___ / ___ ___ ___

Model

Shaft Diameter:
A=5/16″
B=3/8″
C=1/4″

Single output on A is standard;
Q = Quadrature outputs on A and B

No index is standard:
Z = Index output
NZ = inverted index

Pulses per revolution

DC supply voltage:
5, 12, 15, or 24;
or 5R (7-20);
or 12R (12-27);
or 8-30

Output circuit:
NPN is standard
C = NPN open collector
P = PNP
D = Differential line driver

No connector is standard;
E=End connector*, S=Side connector*
**Only available with 3/8″ shaft dia.*

TRI-TRONICS®
MATERIAL HANDLING AND INDUSTRIAL EXPERIENCE SINCE 1974
PHOTOCRAFT Encoders
P.O. BOX 25135, TAMPA, FL 33622-5135

SPECIFICATIONS

Mechanical

Shaft dia.: .3745" dia. with flat

Weight: 10 oz. (284 grams)

Maximum speed: 6,000 rpm

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 10 lb. (4.5 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours
Note: *to allow for axial and angular misalignment, a flexible shaft coupling is recommended.*

Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel

Connectors:

No. of Pins	Encoder[2] Connector	Mating[1] Connector
6	97-3102E14S-6P	97-3106A14S-6S
10[3]	97-3102E18-1P	97-3106A18-1P

1. A mating connector with cable must be purchased separately.
2. Other connectors are available.
3. Not available as side connector.

Electrical

Power Input:(specify voltage when ordering)

Supply[1] (Vdc)	R Values[2,3] (Kohms)
5	1
12 or 15	2.2
24	3.3
7 to 20 ("5R" supply voltage)	2.2
12 to 27 ("12R" supply voltage)	3.3
8 to 30 ("8-30" supply voltage)	3.3

(1) Others available on special order
(2) See output circuit figure 1 below
(3) R is removed for open collector
— **Current:** 50 ma max (no load)
100 ma max (line driver)
— **Ripple:** 2% max
— **Regulation:** ±5%
— Reverse polarity protected (except for 5 vdc)

Operating temperature: 0° to 70°C

Pulse rate: 0 to 30 kHz

Pulses per Revolution: 1 to 1200.
(Specify when ordering)

Output Circuit (Figure 1, specify when ordering):
— Current sinking NPN transistor with pull-up resistor (50 ma max)
— Current sinking NPN open collector (50 ma, 30 vdc max)
— Current sourcing PNP with pull-down resistor (50 ma max)
— RS422 differential line driver (MC3487 device; must be ordered with 5, 5R or 8-30 Supply Voltage)

Output Waveshape: (See Figure 2)
Square wave; outputs A and B are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on outputs A or B
— Pulse symmetry(A): 180°±30%
— Pulse interval jitter(B): 30% max
— Quadrature(C): 90°±30% max
— Phase jitter (D): 30% max
— Index pulse (E)

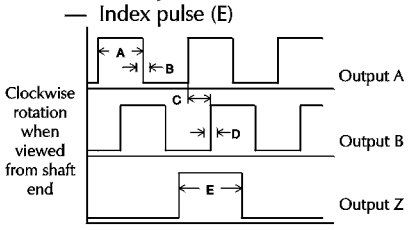


Figure 2

Electrical Connections

NPN or PNP transistor outputs:

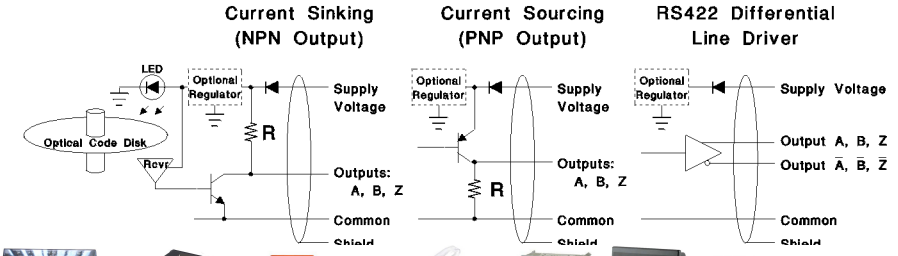
6-Pin	Function	WireColor
A	Common	Black
B	+vdc	Red
C	Output Z	Brown*
D	Output A	White
E	Output B	Green

** Output Z is green if Output B is not used.*

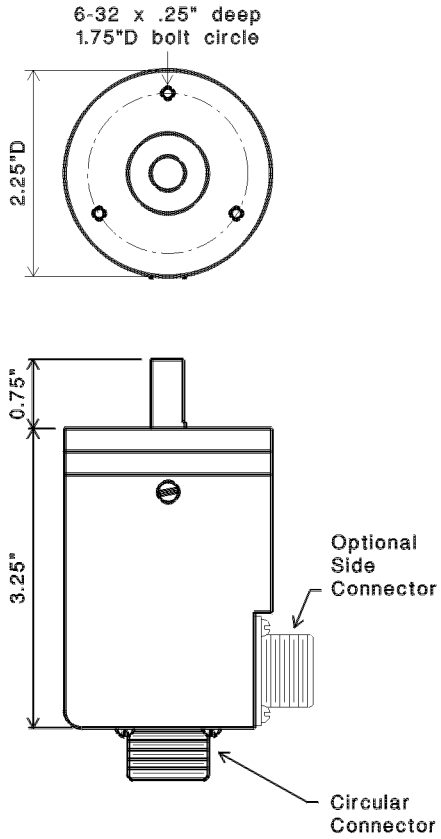
Line Driver outputs:

6-Pin	10-Pin[1]	Function	Wire Color
A	F	Common	Black
B	D	+vdc	Red
C	A	Output A	White
D	H	Output $\bar{A}$	Blue[2]
E	B	Output B[4]	Green
F	I	Output $\bar{B}$[4]	Brown
–	C	Output Z	Yellow[3]
–	J	Output $\bar{Z}$	Orange[3]

[1] Only used if A, B, and Z are required.
[2] Output A is green if Output B is not used.
[3] Output Z is green and $\bar{Z}$ is brown if outputs B and $\bar{B}$ are not used.
[4] These are Outputs Z/$\bar{Z}$ if B/$\bar{B}$ are not used.



DIMENSIONS



ORDERING INFORMATION

RJ ___ ___ - ____ / ___ ___ ___ - ___

- RJ: Model
- ___: Single output on A is standard; Q= Quadrature outputs on A and B
- ___: No index is standard: Z = Index output; NZ = inverted index
- ____: Pulses per revolution
- ___: DC Supply voltage: 5, 12, 15, or 24; or 5R (7-20); or 12R (12-27); or 8-30
- ___: Output circuit: NPN is standard; C = NPN open collector; P = PNP; D = Differential line driver
- ___: S = Side Connector
- ___: ModificationNumber: refers to special order features (consult factory)

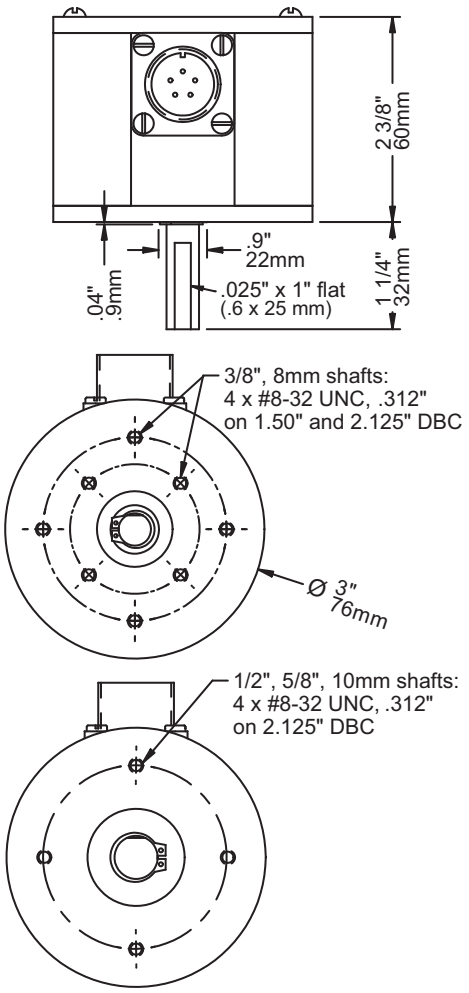
MODEL RBL BlueCoder High Resolution Encoder

BLUE CODER

The BlueCoder model RBL is an optical incremental encoder that use the benefits of blue LED light. It is housed in a 3" diameter x 2-3/8 long ultra rugged enclosure. Multiple face mounting options are available. The MS circular electrical connector is either 5-pin, 6-pin or 10-pin depending on model.

- Heavy duty bearings
- High-Definition blue-light phased array technology
- Compensated blue-light source
- Wide operating voltage 4.5Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk
- IP50 environmental seal

DIMENSIONS



SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm

Shaft Loading:

Shaft Diameter	Radial Lbs (kg)	Axial Lbs(kg)	Factor (BL)
3/8" / 8mm	40 (18.1)	30 (13.6)	32
1/2" / 10mm	45 (20.4)	35 (15.9)	37
5/8"	50 (22.7)	40 (18.1)	41

Note: A flexible shaft coupling is recommended to increase bearing life.

Bearing Life: BL x 1,000,000/rpm = hours
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 10 oz. (285 grams)
Sealing: IP50

Electrical Connections

Single Ended Outputs:

5-Pin Connector	Function	Wire Color
A	+Vdc	Red
B	Common	Black
C	Output A	White
D	Output B	Green
E	Output Z	Brown

Differential Line Driver Outputs:

6-Pin Connector	10-pin	Function	Color
A	F	Common	Black
B	D	+Vdc	Red
C	A	Output A	White
D	H	Output $\overline{A}$	Blue
E	B	Output B	Green
F	I	Output $\overline{B}$	Brown
-	C	Output Z	Yellow
-	J	Output $\overline{Z}$	Orange

Electrical

Supply Voltages: 4.5 Vdc to 30 Vdc
(6.0 Vdc to 30 Vdc for RS422 differential line driver)
Current: 65 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 70° C
Pulse Symmetry: 180°±36° @ maxRPM
Quadrature Phase Error: 90°±36° @ maxRPM
Phase jitter: 27°
Maximum Frequency: up to 1.4 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
Two channel quadrature square waves (A,B)
- optional index (Z).
- optional complimentary outputs (-A,-B,-Z).

Note: Output A leads B by 90° for clockwise rotation when viewed from shaft end.

Counts per Revolution: (specify when ordering)
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

Output Circuit: (specify when ordering)
Single Ended:
- 7273 open collector
(30 Vdc max, 50 mA max)
- 7272 Push-Pull
(50 mA max source or sink)

Differential Line Driver:
- 7272 differential line driver
(output level same as supply voltage)
- RS422 differential line driver
(5 Vdc output level)

Connection:
- 5-pin,6-pin, 10-pin MS

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

Build Encoder

RBL	Shaft	Output Type	—	CPR	Output Circuit
RBL			—		

Shaft Diameter:
blank = 3/8"
.5 = 1/2"
.625 = 5/8"
M8 = 8mm
M10 = 10mm

Output Type:
blank = single output on A,
Q = quadrature outputs on A & B
QZ = quadrature outputs on A & B with Z outputs

Counts Per Revolution:
Choose one number:
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
DH = Differential line driver - output level same as input level
DL = RS422 line driver with 5vdc output level

Example: **RBLQ-10240DH** - 3/8" shaft, quadrature outputs, 1024 ppr, differential line driver output

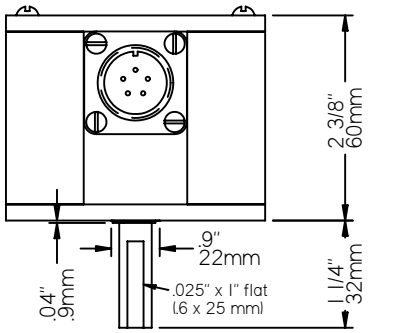
MODEL RL — Heavy Duty Shaft Encoder

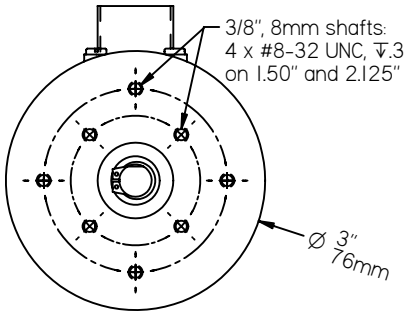
FEATURES

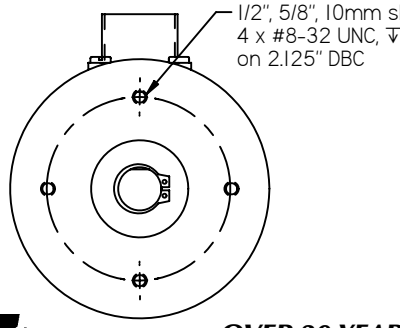
- 3/8", 1/2", 5/8", or Metric Shaft Diameters
- Double ended 3/8" Shaft Option
- Hollow Shaft Available - see Model HRL
- Programmable Model Available - see Model RL-P
- Exclusive "Anti-Jitter" Circuit for Conveyor Applications
- DC or AC Supply Voltages Available
- Single (A), Quadrature (A, B), and Index (Z) Outputs
- Dual or Triple output Models with different pulses per revolution on each output
- Short Circuit / ESD Protection on Most Models
- Custom Models Available

* CE marking requires Photocraft cable, and surge protection option if cable exceeds 100' (30m) or leaves the building.

DIMENSIONS







SPECIFICATIONS

Mechanical

Maximum speed: 6,000 rpm

Shaft Loading:

Shaft Diameter	Radial Lbs (kg)	Axial Lbs (kg)	Factor (BL)
3/8" / 8mm	40 (18.1)	30 (13.6)	32
1/2" / 10mm	45 (20.4)	35 (15.9)	37
5/8"	50 (22.7)	40 (18.1)	41

Note: 120AC power requires 3/8" shaft, and shaft loading is reduced to 25 radial, 10 axial, BL=36.

Bearing Life: BL x 1,000,000/rpm = hours

Materials:

— Case: ¼" Aluminum, anodized

— Shaft: 303 Stainless steel

Electrical Connections

NPN or PNP Transistor Outputs:

5-Pin Connector	Function	Wire Color
A	+vdc	Red
B	Common	Black
C	Output A	White
D	Output B	Green
E	Output Z	Brown*

* Output Z is green if Output B is not used.

Line Driver Outputs:

Connector 6-pin	Connector 10-pin[3]	Function	Wire Color
A	F	Common	Black
B	D	+vdc	Red
C	A	Output $\overline{A}$	White
D	H	Output $\overline{A}$	Blue[1]
E	B	Output $\overline{B}$[2]	Green
F	I	Output $\overline{B}$[2]	Brown
-	C	Output $\overline{Z}$	Yellow
-	J	Output $\overline{Z}$	Orange

[1] Output $\overline{A}$ is green if Output B is not used.

[2] These are Outputs Z / $\overline{Z}$ if B / $\overline{B}$ are not used.

[3] 10-pin only applies when all outputs (A / $\overline{A}$, B / $\overline{B}$, Z / $\overline{Z}$) are required.

Electrical

Supply Voltages: (specify when ordering)

DC Supply Voltages	Load Resistor
5	1K
12 or 15	2.2K
24	3.3K
7 to 12 ("5R")	1K
12 to 27 ("12R")	2.2K
8 to 30 ("8-30")	3.3K

AC Voltage: 120vac (see 120ACT datasheet)

Current: 50 ma max (no load)
100 ma max (line driver)

Pulse Rate: 0 - 30 kHz

Pulses per Revolution: 1 to 1200
(specify when ordering)

Operating Temperature: 0° to 70° C

Output Circuit: (specify when ordering)

— Current sinking NPN transistor with pull-up resistor* (50 ma max)

— Current sinking NPN open collector (50 max, 30 vdc max)

— Current sourcing PNP with pull-down resistor* (50 ma max)

— RS422 differential line driver (requires 5, 5R, or 8-30 supply)

— Triac (see 120ACT datasheet)

* see Load Resistor value in DC Supply Voltage table

Output Waveshape:

Square wave; outputs A and B are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on outputs A or B.

— Pulse symmetry: 180°±30%

— Pulse interval jitter: 30% max

— Quadrature: 90°±30% max

— Phase jitter: 30% max

Anti-jitter: Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and the possible dither that results in false output pulses. For example a 10 pulse per revolution output would have 18° hysteresis (i.e. 360° ÷ 10 × ½).

MODEL NUMBER

RL				–			/				
Model Number	**Shaft Diameter:** blank for 3/8", **.5**=1/2", **.625**=5/8", **M8**=8mm, **M10**=10mm, **D**=3/8" double ended	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output, **NZ**=inverted index		**Pulses Per Revolution:** a number from 1 to 1200, enter dual and triple output values separated by "/"	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage:** 5, 12, 15, 24, 5R, 12R, 8-30, or 120AC (see the supply voltage table above)	**Output Circuit:** leave blank for NPN, **P**=PNP, **C**=NPN open collector, **D**=line driver, **T**=Triac	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

OVER 30 YEARS OF MATERIAL HANDLING AND INDUSTRIAL EXPERIENCE

PHOTOCRAFT INC

602 E. North Street
Elburn, IL 60119, USA

630-365-7148
Fax: 630-365-7149

www.photocraftencoders.com

MODEL RL-P — Programmable Heavy Duty Shaft Encoder

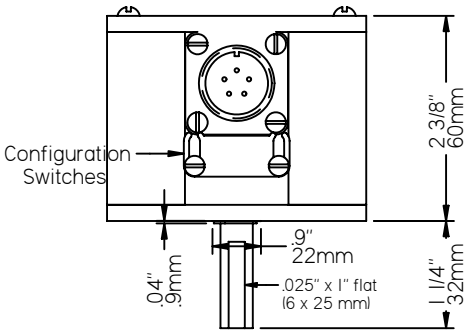
FEATURES

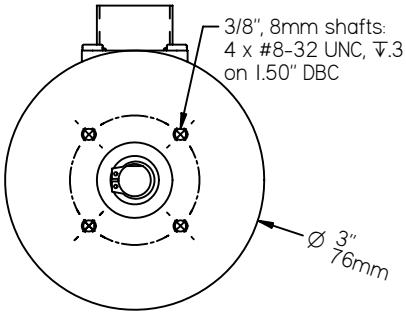
- **3/8", 1/2", 5/8", or Metric Shaft Diameters**
- **Double ended 3/8" Shaft Option**
- **Hollow Shaft Available - see Model HRL**
- **Programmable via DIP switches at installation time**
- **User selectable pulses per revolution**
- **Exclusive "Anti-Jitter" Circuit for Conveyor Applications**
- **5 vdc or 8-30 vdc supply voltages**
- **Single (A), Quadrature (A, B), and Index (Z) Outputs**
- **Short Circuit / ESD Protection on Most Models**
- **Custom Models Available**

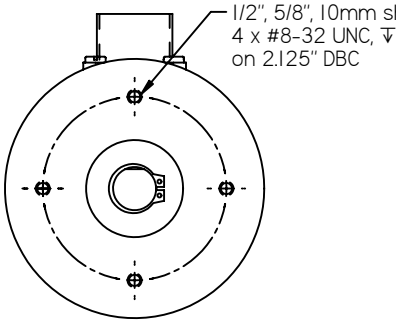
CE *

* CE marking requires Photocraft cable, and surge protection option if cable exceeds 100' (30m) or leaves the building.

DIMENSIONS







SPECIFICATIONS

Mechanical

Maximum speed: 6,000 rpm

Shaft Loading:

Shaft Diameter	Radial Lbs (kg)	Axial Lbs (kg)	Factor (BL)
3/8" / 8mm	40 (18.1)	30 (13.6)	32
1/2" / 10mm	45 (20.4)	35 (15.9)	37
5/8"	50 (22.7)	40 (18.1)	41

Bearing Life: BL x 1,000,000/rpm = hours

Materials:

- Case: ¼" Aluminum, anodized
- Shaft: 303 Stainless steel
- Switch cover: ABS plastic

Weight: 16.8 oz. (475 grams)

Programs

The RL-P is preconfigured at the factory with one of many predefined programs. Program options are selected at installation time by setting configuration switches. Call or see our website for details about available programs.

Typical Program Features

Selectable Pulses per Revolution: pulses per revolution on one, two, or three outputs can be selected from a predefined set.

Anti-jitter: Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and the possible dither that results in false output pulses. For example a 10 pulse per revolution output would have 18° hysteresis (i.e. 360° ÷ 10 × ½).

Direction Indicator: Indicates direction of shaft rotation.

Fractional Pulses per Revolution: for example 2.5 pulses per revolution.

Speed Indicator: Sets the output when a predefined rotational speed is attained.

Electrical

Supply Voltages (Vin): (specify when ordering)

- 5 ± 5% vdc
- 8 to 30 vdc

Supply Current: 50 ma maximum (no load)

Output Current (Io): 50 ma max source/sink

Output Circuits:

- Push/Pull (combined sourcing/sinking)
- Current sinking NPN transistor with pull-up resistor* (50 ma max)
- Current sinking NPN open collector (50 max, 30 vdc max)
- Current sourcing PNP with pull-down resistor* (50 ma max)

* Load Resistor value is 3.3K ohms

Note: all are switch selectable for single output models; factory configured for 2 or 3 outputs

Output Waveshape: 50/50 squarewave

- Pulse On-Off Ratio: 50% ± 10%
- Pulse interval jitter: ±10%
- Quadrature Deviation: 30° (max)
- Pulse rise time: 2 μsec (max)
- Pulse fall time: 5 μsec (max)
- Voltage (high): Vin - 2.5 vdc (min)
- Voltage (low): 1.5 vdc (max)
- Index Pulse: approximately the width of 1 pulse on output A or B

(600 rpm, Vin=24vdc, 10ma < Io < 50ma, 25°C)

Operating Temperature: 0° to 70° C

Pulse Rate: 0 - 30 kHz

Output Protection:

- Short Circuit
- ESD to 8KV direct and 25KV air

Electrical Connections

Connector	Function	Wire Color
A	+vdc	Red
B	Common	Black
C	Output A	White
D	Output B	Green
E	Output C or Z	Brown

MODEL NUMBER

RL — [ ] / [ ] [ ] [ ] [ ]

Model Number

Shaft Diameter: blank for 3/8", **.5**=1/2", **.625**=5/8", **M8**=8mm, **M10**=10mm, **D**=3/8" double ended

Program Name: the name of a predefined program. For example: P144AJ or P270AJB. Call or see our website for program information.

Supply Voltage: **5**=5vdc, **8-30**=8-30vdc

Output Circuit:
— single output models: leave blank
— 2 or 3 output models: leave blank for push/pull
C=NPN open collector

Modification Number: optional modification or special feature ID. Call or see our website.

Accessories: leave blank for no accessories. Call or see our website for more information.

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www.photocraftencoders.com

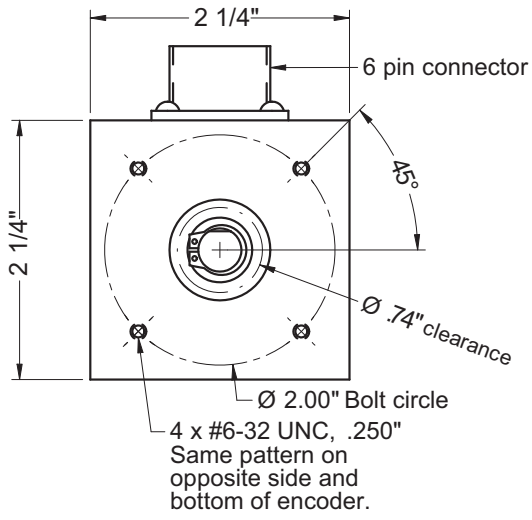
MODEL RBS BlueCoder High Resolution Encoder

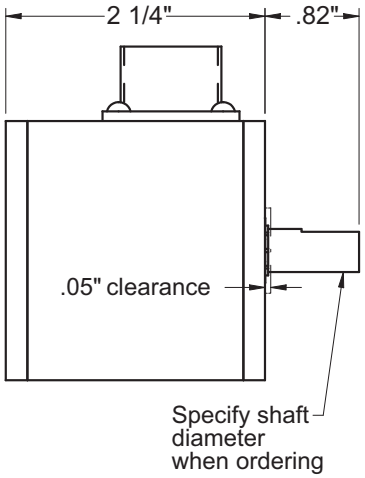
BLUE CODER

The BlueCoder model RBS is an optical incremental encoder that use the benefits of blue LED light. It is housed in a 2.25" cubed ultra rugged enclosure. Available shaft diameters: 1/4", 5/16", 3/8", and 1/2".
Multiple face mounting options are available. The MS circular electrical connector is either 6-pin or 10-pin depending on model.

- Heavy duty bearings
- High-Definition blue-light phased array technology
- Compensated blue-light source
- Wide operating voltage 4.5Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk
- IP50 environmental seal

DIMENSIONS





SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:

Shaft Diameter	Radial Lbs (kg)	Axial Lbs(kg)	Factor (BL)
1/4,5/16,3/8"	25 (11.3)	15 (6.8)	36
1/2"	45 (20.4)	35 (15.9)	37

Note: A flexible shaft coupling is recommended to increase bearing life.

Bearing Life: BL x 1,000,000/rpm = hours
Materials: Case - 1/4" Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 13 oz. (370 grams)
Sealing: IP50

Electrical Connections

Single Ended Outputs:

6-Pin Connector	Function	Wire Color
A	Common	Black
B	+Vdc	Red
C	Output Z	Brown
D	Output A	White
E	Output B	Green
F	not used	-

Differential Line Driver Outputs:

6-Pin Connector	10-pin	Function	Color
A	F	Common	Black
B	D	+Vdc	Red
C	A	Output A	White
D	H	Output $\overline{A}$	Blue
E	B	Output B	Green
F	I	Output $\overline{B}$	Brown
-	C	Output Z	Yellow
-	J	Output $\overline{Z}$	Orange

Electrical

Supply Voltages: 4.5 Vdc to 30 Vdc
(6.0 Vdc to 30 Vdc for RS422 differential line driver)
Current: 65 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 70° C
Pulse Symmetry: 180°±36° @ maxRPM
Quadrature Phase Error: 90°±36° @ maxRPM
Phase jitter: 27°
Maximum Frequency: up to 1.4 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
Two channel quadrature square waves (A,B)
• optional index (Z).
• optional complimentary outputs (-A,-B,-Z).
Note: Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Counts per Revolution: (specify when ordering)
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000
Output Circuit: (specify when ordering)
Single Ended:
• 7273 open collector
(30 Vdc max, 50 mA max)
• 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
• 7272 differential line driver
(output level same as supply voltage)
• RS422 differential line driver
(5 Vdc output level)
Connection:
• 6-pin, 10-pin MS

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

Build Encoder

RBS	Shaft	Output Type	—	CPR	Output Circuit
RBS			—		

Shaft Diameter:
A = 5/16"
B = 3/8"
C = 1/4"
.5 = 1/2"
Call for others

Output Type:
blank = single output on A,
Q = quadrature outputs on A & B
QZ = quadrature outputs on A & B with Z outputs

Counts Per Revolution:
Choose one number:
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
DH = Differential line driver - output level same as input level
DL = RS422 line driver with 5vdc output level

Example: **RBLQ-10240DH** - 3/8" shaft, quadrature outputs, 1024 ppr, differential line driver output

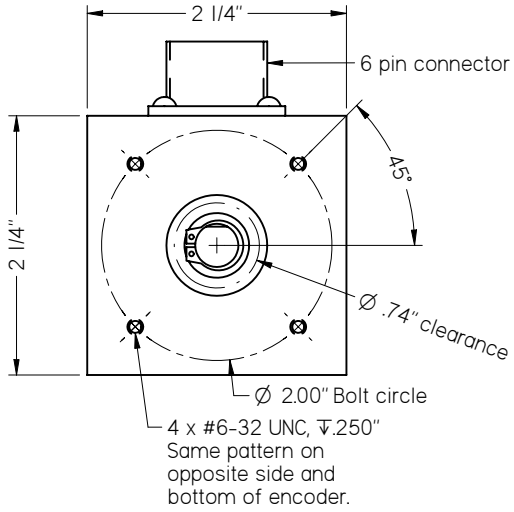
MODEL RS — Standard Cube Style Shaft Encoder

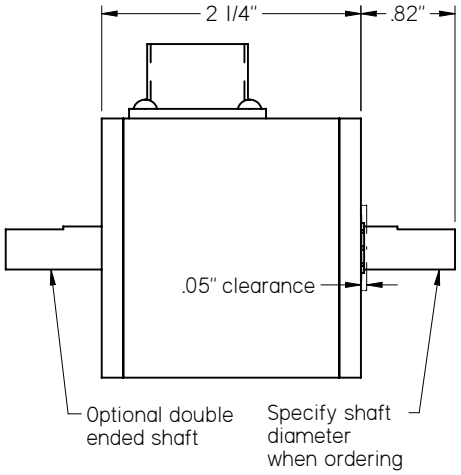
FEATURES

- **1/4", 5/16", 3/8", and 1/2" Shaft Diameters**
- **Double ended Shaft Option**
- **Hollow Shaft Available - see Model HRS**
- **Programmable Model Available - see Model RS-P**
- **Exclusive "Anti-Jitter" Circuit for Conveyor Applications**
- **Single (A), Quadrature (A, B), and Index (Z) Outputs**
- **Dual or Triple output Models with different pulses per revolution on each output (A, B, C)**
- **Short Circuit / ESD Protection on Most Models**
- **Custom Models Available**

* CE marking requires Photocraft cable, and surge protection option if cable exceeds 100' (30m) or leaves the building.

DIMENSIONS





SPECIFICATIONS

Mechanical

Maximum speed: 6,000 rpm

Shaft Loading:

Shaft Diameter	Radial Lbs (kg)	Axial Lbs (kg)	Factor (BL)
1/4,5/16,3/8"	25 (11.3)	15 (6.8)	36
M182 option*	40 (18.1)	30 (13.6)	32
1/2"	45 (20.4)	35 (15.9)	37

** Call for details*

Note: a flexible shaft coupling is recommended

Bearing Life: BL x 1,000,000/rpm = hours

Materials:

— Case: ¼" Aluminum, anodized

— Shaft: 303 Stainless steel

Weight: 13 oz. (370 grams)

Electrical Connections

NPN or PNP transistor outputs:

6-Pin Connector	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output C or Z	Brown*
D	Output A	White
E	Output B	Green
F	not used	-

* Output Z is green if Output B is not used.

Line Driver Outputs:

6-Pin Connector	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output A	White
D	Output $\overline{A}$	Blue[1]
E	Output B[2]	Green
F	Output $\overline{B}$[2]	Brown

[1] Output $\overline{A}$ is green if Output B is not used.

[2] These are Outputs Z / $\overline{Z}$ if B / $\overline{B}$ are not used.

Electrical

Supply Voltages: (specify when ordering)

DC Supply Voltages	Load Resistor
5	1K
12 or 15	2.2K
24	3.3K
7 to 12 ("5R")	2.2K
12 to 27 ("12R")	3.3K
8 to 30 ("8-30")	3.3K

Current: 50 ma max (no load)
100 ma max (line driver)

Pulse Rate: 0 - 30 kHz

Pulses per Revolution: 1 to 1200
1 to 600 for RS.5D
(specify when ordering)

Operating Temperature: 0° to 70° C

Output Circuit: (specify when ordering)

— Current sinking NPN transistor with pull-up resistor* (50 ma max)

— Current sinking NPN open collector (50 max, 30 vdc max)

— Current sourcing PNP with pull-down resistor* (50 ma max)

— RS422 differential line driver (requires 5, 5R, or 8-30 supply)

* see Load Resistor value in DC Supply Voltage table

Output Waveshape:

Square wave; outputs A, B, and C are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on outputs A or B.

— Pulse symmetry: 180°±30%

— Pulse interval jitter: 30% max

— Quadrature: 90°±30% max

— Phase jitter: 30% max

Anti-jitter: Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and the possible dither that results in false output pulses. For example a 10 pulse per revolution output would have 18° hysteresis (i.e. 360° ÷ 10 × ½).

MODEL NUMBER

RS					–			/				
Model Number	**Shaft Diameter:** **A**=5/16", **B**=3/8", **C**=1/4", **.5**=1/2" (call for others)	**Shaft Type:** leave blank for single ended, **D**=double ended	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output, **NZ**=inverted index		**Pulses Per Revolution:** a number from 1 to 1200, enter dual and triple output values separated by "/"	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage:** 5, 12, 15, 24, 5R, 12R, or 8-30 (see the Supply Voltages table above)	**Output Circuit:** leave blank for NPN, **P**=PNP, **C**=NPN open collector, **D**=line driver	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

OVER 30 YEARS OF MATERIAL HANDLING AND INDUSTRIAL EXPERIENCE

PHOTOCRAFT INC

602 E. North Street
Elburn, IL 60119, USA

630-365-7148
Fax: 630-365-7149

www.photocraftencoders.com

SPECIFICATIONS

Mechanical

Shaft: 1/4", 5/16", or 3/8" diameter, single or double ended. (Specify when ordering)

Weight: 11 oz. (312 grams)

Shaft Loading: Radial: 25 lb. (11.3 kg.) max. Axial: 10 lb. (4.5 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours
Note: *to allow for axial and angular misalignment, a flexible shaft coupling is recommended.*

Materials:
- Case: Aluminum, anodized
- Shaft: 303 Stainless steel
- Switch access door: Plastic

Connector: 6-pin, 97-3102A14S-6P

Mating Connector: 97-3106A14S-6S

Electrical

Supply Voltage (V_{IN}): (specify when ordering)
5 ± 5% vdc or 8-30 vdc

Supply Current: 50ma maximum (no load)

Output Current (I_O): 50ma max source/sink

Output Circuits: (specify when ordering)
- Push/Pull
  Combined sourcing/sinking output
- NPN open collector
  (V_{cc}=30 vdc maximum)

Output Waveform: 50/50 squarewave
- **Pulse On-Off Ratio:** 50% ± 10%
- **Pulse Interval Jitter:** ±10%
- **Pulse rise time:** 2 µsec (max)
- **Pulse fall time:** 5 µsec (max)
- **Voltage (high):** V_{in}-2.5 vdc (min)
- **Voltage (low):** 1.5 vdc (max)

(600 rpm, V_{IN}=24vdc, 10ma<I_O<50ma, 25°C)

Operating Temperature: 0° to 70°C

Maximum Operating Speed: 2,500 rpm
(Program dependent)

Programs

Please call for detailed information about

P64AJ - Pulse output on connector Pin D. Switches 1-6 are used to select the pulses per revolution which could be any value from 1 through 64.

Please inquire about others.

Electrical Connections

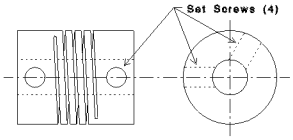
Pin No.	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output C or Z	Brown*
D	Output A	White
E	Output B	Green
F	—	—

** Output C/Z is green if B is not used.*

Accessories

Cable Assembly (C6-x-10): 10 ft. (3m), shielded cable with 97-3106A14S-6S connector (x is number of conductors) Other lengths are available.
CE *mark requires Photocraft cable, and surge protection if cable exceeds 100' (30m) or leaves the building.*

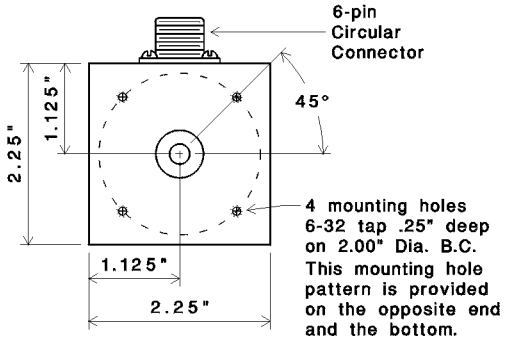
Flexible Coupling: aluminum helical coil style coupling for shaft to shaft connections.
- AE087-10-10: 5/16" shaft size .875" diameter X 1" length
- AE100-12-12: 3/8" shaft size 1" diameter X 1.25" length

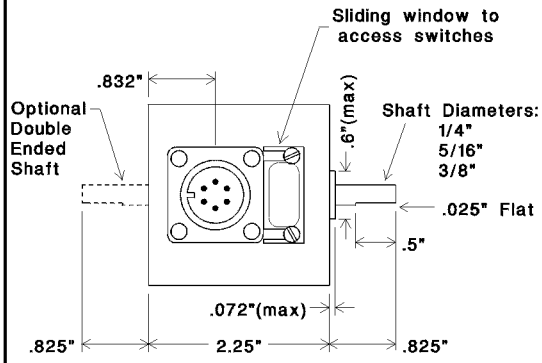


Installation Instructions

1. Mechanically mount the encoder.
   Use a flexible shaft coupling to compensate for axial and angular misalignment.
2. Attach the cable leads to the control device (e.g. PLC) ensuring that the power supply meets specifications.
3. Set the configuration switches.
   Switches can be changed at any time.
4. Attach the cable to the encoder.

DIMENSIONS





ORDERING INFORMATION

RS ___ ___ - P ___ / ___ ___

Model

Shaft Diameter:
A=5/16"
B=3/8"
C=1/4"

Leave blank for Single ended shaft
D=Double ended shaft

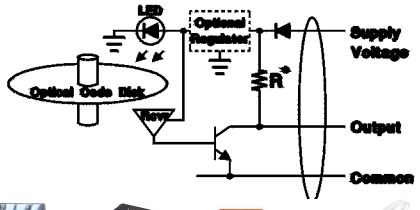
Program Name

Supply voltage:
5 or 8-30

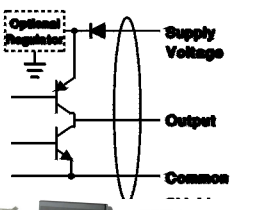
Output circuit:
Leave blank for Push/Pull
C = NPN open collector

Short lead time options are underlined.

NPN Open Collector (Current Sinking)



Push/Pull (Combined Sourcing/Sinking)



SPECIFICATIONS

Mechanical

Weight: 1lb. 2 oz. (510 grams)

Maximum speed: 6,000 rpm

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 15 lb. (6.8 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours

Materials:
- Case: 1/4" Aluminum, anodized
- Shaft: 303 Stainless steel

Connector:
- Single output (3 pin connector): MS3102A-10SL-3P
- Multi output (6 pin connector): MS3102A-14S-6P

Mating Connector:
- Single output: MS3106A-10SL-3S
- Multi output: MS3106A-14S-6S
- Case Ground: The cable shield is connected via the connector shell to the encoder housing.

Note: *10' (3m) cable supplied at no extra charge.* **CE** *marking requires the surge protection option if the cable exceeds 100' (30m) or leaves the building.*

Electrical

Power Input (specify voltage when ordering)**:**

Supply[1] (Vdc)	R Values[2,3] (Kohms)
5	1
12 or 15	2.2
24	3.3
7 to 20 ("5R" supply voltage)	2.2
12 to 27 ("12R" supply voltage)	3.3
8 to 30 ("8-30" supply voltage)	3.3

(1) Others available on special order
(2) See output circuit figure 1 below
(3) R is removed for open collector

- **Current:** 50 ma max (no load) 100 ma max (line driver)
- **Ripple:** 2% max
- **Regulation:** ±5%
- Reverse polarity protected (except for 5vdc)

Operating temperature: 0° to 70° C

Pulse Rate: 0 - 30 kHz

Pulses per Revolution: 1 to 600 (specify when ordering)

Output Circuit (Figure 1, specify when ordering)**:**
- Current sinking NPN transistor with pull-up resistor (50 ma. max.)
- Current sinking NPN open collector (50 ma., 30 vdc max.)
- Current sourcing PNP with pull-down resistor (50 ma. max.)
- RS422 differential line driver (MC3487 device; must be ordered with 5, 5R or 8-30 Supply Voltage)

Output Waveshape: (See Figure 2; does not apply to dual/triple output models)
Square wave; outputs A and B are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on outputs A or B.
- Pulse symmetry(A): 180°±30%
- Pulse interval jitter(B): 30% max
- Quadrature(C): 90°±30% max
- Phase jitter (D): 30% max
- Index pulse (E)

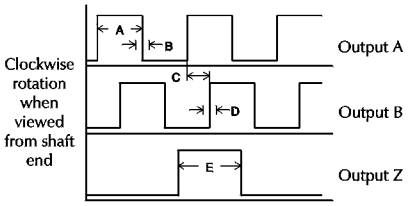


Figure 2

Electrical Connections

NPN or PNP Transistor Outputs:

Connector 3-Pin	Connector 6-Pin	Function	Wire Color
C	A	Common	Black
A	B	+vdc	Red
—	C	Output Z or C	Brown*
B	D	Output A	White
—	E	Output B	Green
—	F	no connection	

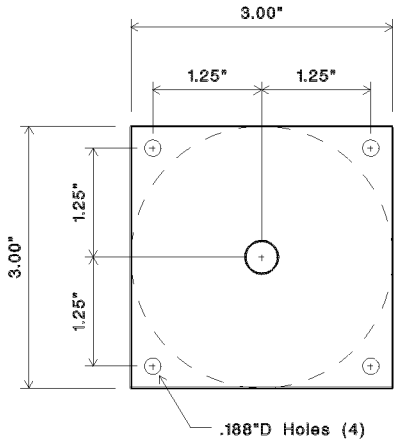
** Output Z is green if Output B is not used.*

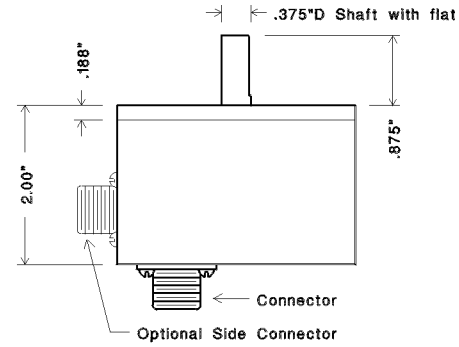
Line Driver Outputs (not CE certified)**:**

Connector 6-Pin	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output A	White
D	Output $\overline{A}$	Blue[1]
E	Output B[2]	Green
F	Output $\overline{B}$[2]	Brown

[1] Output $\overline{A}$ is green if Output B is not used.
[2] These are Outputs Z/$\overline{Z}$ if B/$\overline{B}$ are not used.

DIMENSIONS

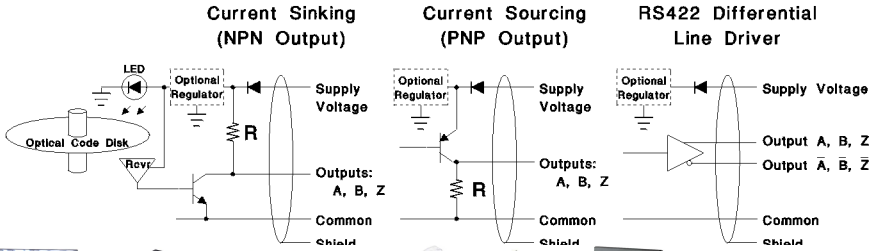




ORDERING INFORMATION

RBX ___ ___ - ____ / ___ ___ ___

- Model
- Pulses per revolution. *Enter dual and triple output values separated by a "/".*
- Unidirectional output on A is standard; Q= Bidirectional with Quadrature outputs on A and B
- DC Supply voltage: 5, 12, 15, or 24; or 5R (7-20); or 12R (12-27); or 8-30
- No index is standard: Z = Index output; NZ = inverted index
- Output circuit: NPN is standard; C = NPN open collector; P = PNP; D = Differential line driver
- S = Side Connector



SPECIFICATIONS

Mechanical

Weight: 1lb. 7 oz. (663 grams)

Maximum speed: 6,000 rpm

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 15 lb. (6.8 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours

Materials:
- Case: 1/4" Aluminum, anodized
- Shaft: 303 Stainless steel

Connector:
- Single output (3 pin connector): MS3102A-10SL-3P
- Multi output (6 pin connector): MS3102A-14S-6P

Mating Connector:
- Single output: MS3106A-10SL-3S
- Multi output: MS3106A-14S-6S
- Case Ground: Silver foil at the mating connector provides a ground path via the cable shield and the connector shell to the encoder housing.

Note: A mating connector with 10-foot shielded cable is supplied at no extra charge.

Electrical

Power Input (specify voltage when ordering):

Supply[1] (Vdc)	R Values[2,3] (Kohms)
5	1
12 or 15	2.2
24	3.3
7 to 20 ("5R" supply voltage)	2.2
12 to 27 ("12R" supply voltage)	3.3
8 to 30 ("8-30" supply voltage)	3.3

(1) Others available on special order
(2) See output circuit figure 1 below
(3) R is removed for open collector

- **Current:** 50 ma max (no load) 100 ma max (line driver)
- **Ripple:** 2% max
- **Regulation:** ±5%
- Reverse polarity protected (except for 5vdc)

Operating temperature: 0° to 70° C

Pulse Rate: 0 - 30 kHz

Pulses per Revolution: 1 to 600 (specify when ordering)

Output Circuit (Figure 1, specify when ordering):
- Current sinking NPN transistor with pull-up resistor (50 ma max)
- Current sinking NPN open collector (50 ma, 30 vdc max)
- Current sourcing PNP with pull-down resistor (50 ma max)
- RS422 differential line driver (MC3487 device; must be ordered with 5, 5R or 8-30 Supply Voltage)

Output Waveshape: (See Figure 2; does not apply to dual/triple output models)
Square wave; outputs A and B are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on outputs A or B.
- Pulse symmetry (A): 180°±30%
- Pulse interval jitter (B): 30% max
- Quadrature (C): 90°±30% max
- Phase jitter (D): 30% max
- Index pulse (E)

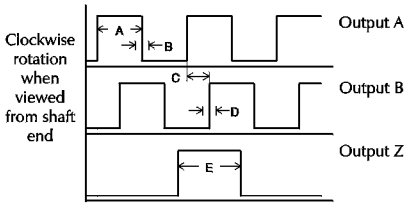


Figure 2

Electrical Connections

NPN or PNP Transistor Outputs:

Connector 3-Pin	Connector 6-Pin	Function	Wire Color
C	A	Common	Black
A	B	+vdc	Red
—	C	Output Z or C	Brown*
B	D	Output A	White
—	E	Output B	Green
—	F	no connection	

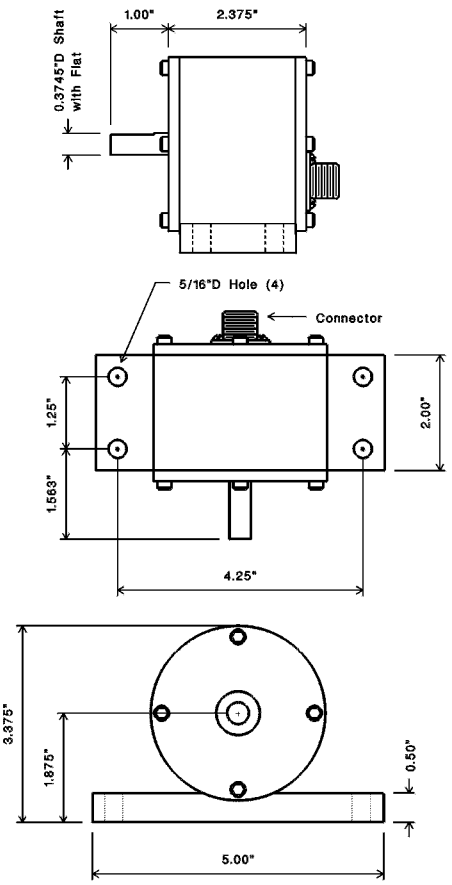
** Output Z is green if Output B is not used.*

Line Driver Outputs (not CE certified):

Connector 6-Pin	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output A	White
D	Output $\bar{A}$	Blue[1]
E	Output B[2]	Green
F	Output $\bar{B}$[2]	Brown

1 Output $\bar{A}$ is green if Output B is not used.
2 These are Outputs Z/$\bar{Z}$ if B/$\bar{B}$ are not used.

DIMENSIONS



ORDERING INFORMATION

RC ___ ___ - ___ / ___ ___

Model

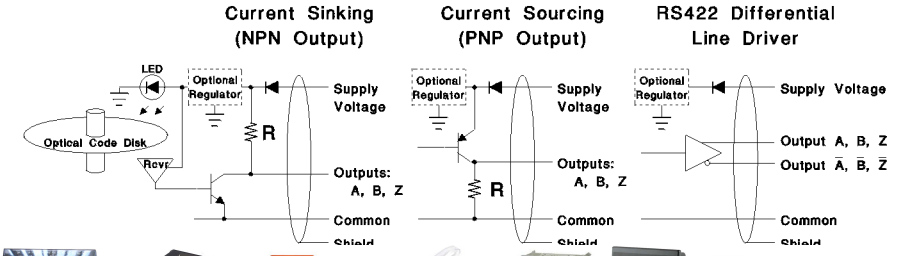
Unidirectional output on A is standard;
Q= Bidirectional with Quadrature outputs on A and B

Pulses per revolution. *Enter dual and triple output values separated by a "/".*

DC Supply voltage:
5, 12, 15, or 24;
or 5R (7-20);
or 12R (12-27);
or 8-30

No index is standard:
Z = Index output
NZ = inverted index

Output circuit:
NPN is standard
C = NPN open collector
P = PNP
D = Differential line driver



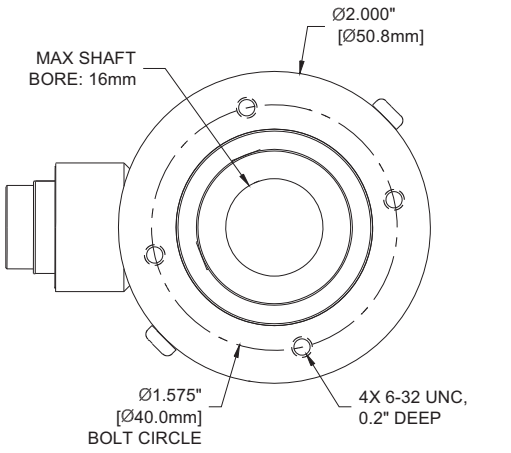
MODEL HSB20 — BlueCoder High Count Encoder

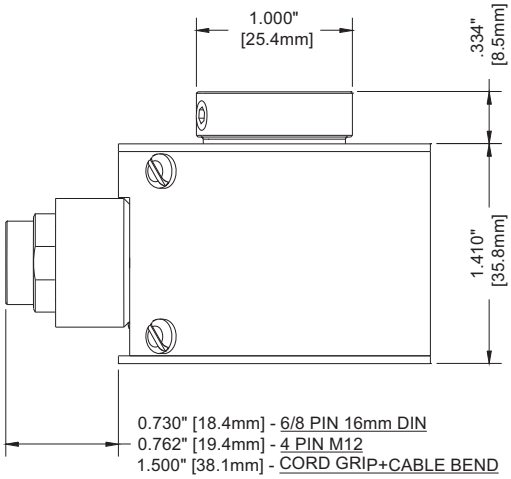
BLUE CODER

The BlueCoder model HSB20 is an optical incremental encoder that use the benefits of blue LED light. Housed in a size 20 2.00in diameter x 1.41in long ultra rugged enclosure. Four face-mounting holes allow for multiple tether mounting orientations and options. Electrical connection is through a circular connector or an attached cable.

- Three bearing system for longer bearing life
- High-Definition reflective blue-light phased array technology for increased accuracy over life-time.
- Compensated blue-light source for ultra stable operation over wide temperature variance range.
- Low-Lag Time. Excellent for motor regulation
- Wide operating voltage 4.75Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk

DIMENSIONS





CE
RoHS Compliant

SPECIFICATIONS

Mechanical

Shaft Bore: Up to 16mm.
Maximum Speed: 6,000 rpm
Shaft Loading:
Radial - 50lbs. / 22.7kg
Axial - 30lbs. / 13.6kg
Note: A flexible mounting bracket is recommended.
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 7 - 9 oz. (198 - 255 grams)
Sealing: IP50

Electrical Connections

Single Ended Outputs:

16mm Din 6-pin	M12 4-pin	Function	Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

16mm Din 8-Pin	Function	Color
1	Output A	White
2	Output B	Green
3	Output Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output $\overline{A}$	Blue or Green
7	Output $\overline{B}$	Brown
8	Output $\overline{Z}$	Orange

8-pin connector is Amphenol T3506000 or equivalent

Electrical

Supply Voltages: 4.75 Vdc to 30 Vdc
Current: 40 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 85°C (32° to 185°F)
Quadrature Phase Error:
Below 4800 CPR 90°±18° @ 100khz output,
Above 4800 CPR 90°±28° @ 100khz output.
Minimum Edge Separation:
Below 4800 CPR 72° @ 100khz output,
Above 4800 CPR 62° @ 100khz output.
Maximum Frequency: up to 1 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
- Single channel (A).
- Quadrature (A,B).
- Quadrature with index (A,B,Z).

Note: Output A leads B by 90° for clockwise rotation when viewed from shaft clamp face.
Counts per Revolution (CPR): (specify when ordering) 500, 512, 540, 600, 625, 1000, 1024, 1080, 1200, 1250, 2000, 2048, 2160, 2400, 2500, 4000, 4096, 4320, 4800, 5000, 8000, 8192, 8640, 9600, 10000 (consult factory for other CPR's).
Output Circuit: (specify when ordering)
Single Ended:
- 7273 open collector (30 Vdc max, 50 mA max)
- 7272 Push-Pull (50 mA max source or sink)

Differential Line Driver:
- 7272 differential line driver (output level same as supply voltage)
- RS422 differential line driver (when input voltage is 5Vdc)

Connections: (specify when ordering)
- Attached 10ft cable (consult factory for other cable lengths).
- 16mm 6/8-pin Din connector
- M12 4-pin connector

Accessories

See our website or contact us for more information about cables, flexible mounting brackets, and shaft stubs.

MODEL NUMBER

Build Encoder

HSB20	Shaft Bore	Output Type	–	CPR	Output Circuit	Connections
HSB20			–			

Shaft Bore:
B = 3/8"
.5 = 1/2"
.625 = 5/8"
M10 = 10mm
M12 = 12mm
M16 = 16mm
(Consult factory for other bore sizes).

Output Type:
blank = single output on A,
Q = quadrature outputs on A & B
QZ = quadrature outputs on A & B with Z outputs

Counts Per Revolution (CPR):
Choose one number:
500, 512, 540, 600, 625, 1000, 1024, 1080, 1200, 1250, 2000, 2048, 2160, 2400, 2500, 4000, 4096, 4320, 4800, 5000, 8000, 8192, 8640, 9600, 10000 (consult factory for other CPR's).

Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
D = Differential line driver

Connections:
blank = attached 10ft. shielded cable
S = 16mm 6/8-pin Din connector
S3 = 4-pin M12 connector

Example: **HSB20BQ-1024D**- 3/8" shaft bore, quadrature outputs, 1024 cpr, differential line driver output

MODEL HS20 — Series 20 Hollow Shaft Encoder

FEATURES

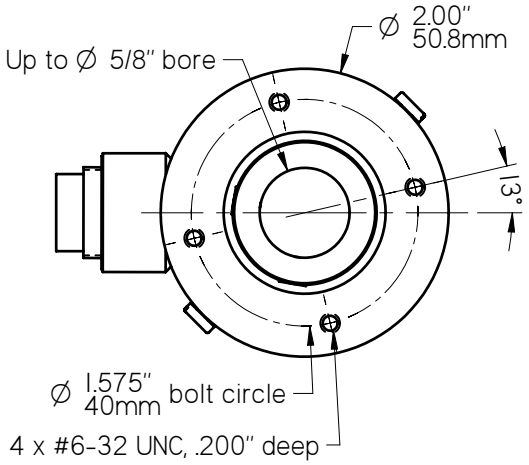
- **Up to 5/8" or 16mm shaft bore diameter**
- **Heavy Duty bearings**
- **Unbreakable code disk**
- **Size 20 housing**
- **Short circuit and ESD protected**
- **Shaft model available - see Model R20**
- **Up to 720 pulses per revolution**
- **Attached cable or optional connector**
- **CE compliant and RoHS available**
- **Programmable model available - see Model HS20-P**

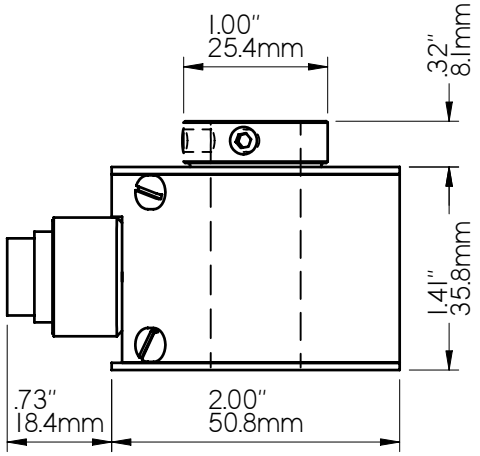
CE *

** requires the use of a Photocraft or CE compliant cable*

DIMENSIONS

(shown with optional connector, 5/8" shaft bore)





SPECIFICATIONS

Mechanical

Shaft Bore: Any up to 5/8", 16mm diameter
Maximum Speed: 6,000 rpm
Shaft Loading:
— Radial: 30 lbs. / 13.6 kg
— Axial: 20 lbs. / 9.1 kg
A flexible mounting bracket is recommended.
Bearing Life: 44 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 6.5 - 8.5 oz. (185 - 240 grams)
Protection: IP51 (IP66 available)

Electrical Connections

Single Ended Outputs:

Optional 6-Pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3		Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6		not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin Connector*	Function	Wire Color
1	Output +A	White
2	Output +B	Green
3	Output +Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output -A	Blue or Green
7	Output -B	Brown
8	Output -Z	Orange

* connector is Amphenol T3506000 or equivalent

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Supply Voltages: (specify when ordering)
— 5 ± 5% VDC
— 5-26 VDC
— 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: 1 to 720
(specify when ordering)
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver
(output level same as supply voltage)
— RS422 differential line driver
(with regulated 5vdc output level)
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. Output Z (index output) is approximately the width of one cycle on outputs A or B.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Anti-jitter: (single output models only)
Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and the possible dither that results in false output pulses. For example a 10 pulse per revolution output would have 18° hysteresis (i.e. 360° ÷ 10 × ½).

Accessories

See our website or contact us for more information about accessories.

MODEL NUMBER

HS20				–			/					
Model Number	**Shaft Bore:** **B** - 3/8", **.5** = 1/2", **.625** = 5/8", **M10** = 10mm, **M12** = 12mm, **M16** = 16mm *others available*	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 720	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (*single output models only*)		**Supply Voltage:** **5** = 5vdc, **5-26** = 5-26vdc **8-30** = 8-30vdc	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached 10' (3meter) cable, **S**=6 or 8 pin connector, **S3**=M12 4-pin connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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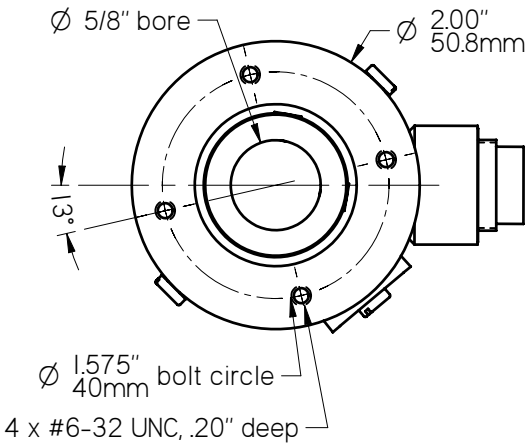
MODEL HS20-P Series 20 Programmable Hollow Shaft Encoder

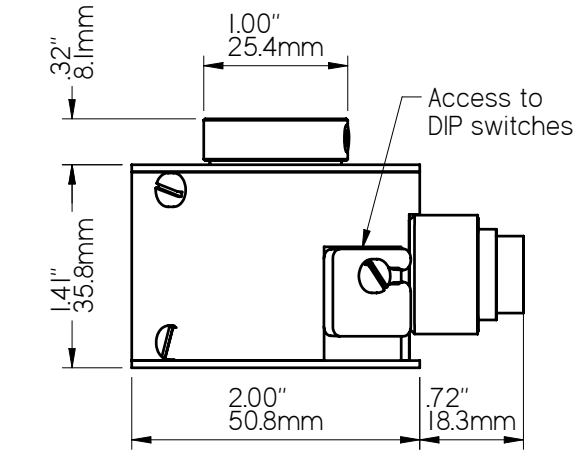
FEATURES

- **DIP switch selectable features (see our website)**
- **Up to 5/8" or 16mm shaft bore diameter**
- **Heavy Duty bearings**
- **Unbreakable code disk**
- **Size 20 housing**
- **Short circuit and ESD protected**
- **Shaft model available - see Model R20**
- **Up to 1200 pulses per revolution**
- **Attached cable or optional connector**

DIMENSIONS

(shown with optional connector, 5/8" shaft bore)





SPECIFICATIONS

Mechanical

Shaft Bore: Any up to 5/8", 16mm diameter
Maximum Speed: 6,000 rpm
Shaft Loading:
— Radial: 30 lbs. / 13.6 kg
— Axial: 20 lbs. / 9.1 kg
A flexible mounting bracket is recommended.
Bearing Life: 44 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 6.5 - 8.5 oz. (185 - 240 grams)

Electrical Connections

Single Ended Outputs:

Optional 6-Pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3		Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6		not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin Connector*	Function	Wire Color
1	Output +A	White
2	Output +B	Green
3	Output +Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output -A	Blue or Green
7	Output -B	Brown
8	Output -Z	Orange

* connector is Amphenol T3506000 or equivalent

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Programmable Features: The encoder is factory configured with a program that offers one or more of the following features. DIP switches are used to set program parameters.
(for more details, call or see our website)
— Selectable Pulses per revolution
— Quadrature (A/B) outputs
— Direction outputs
— Anti-Jitter feature
— Enhanced anti-jitter feature
— Other enhanced features
Supply Voltages: (specify when ordering)
— 5 VDC, or
— 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage level.
Single Ended:
— 7273 open collector (30 VDC max, 50 mA max)
— 7272 Push-Pull (50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver (also with optional 5vdc output level)
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. Output Z (index output) is approximately the width of one cycle on outputs A or B. A leads B by 90° for clockwise rotation when viewed from shaft collar end.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max

Accessories

See our website.

MODEL NUMBER

HS20		—	P		/					
Model Number	**Shaft Bore:** **B** = 3/8", **.5** = 1/2", **.625** = 5/8", **M10** = 10mm, **M12** = 12mm, **M16** = 16mm		**P** = programmable encoder	**Program:** name of factory configured program. See program specific datasheet for feature descriptions and DIP switch settings.		**Supply Voltage:** **5** or **8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **D**=7272 line driver, **DL**=7272 line driver with 5vdc output level	**Cable/Connector:** leave blank for attached 10' (3meter) cable, **S**=6 or 8 pin connector, **S3**=M12 4-pin connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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PHOTOCRAFT INC

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Elburn, IL 60119, USA Fax: 630-365-7149
www.photocraftencoders.com

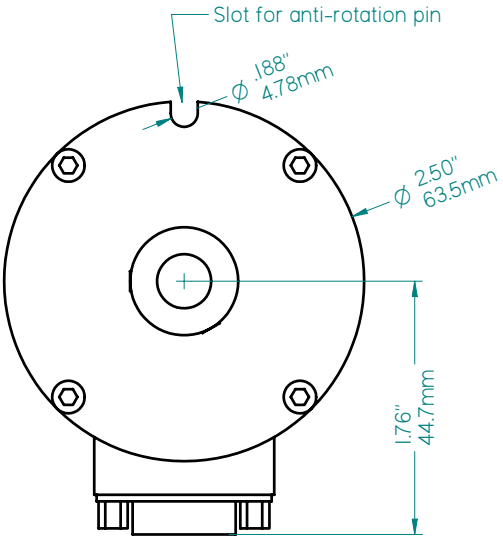
MODEL HS25 — Hollow Shaft Encoder

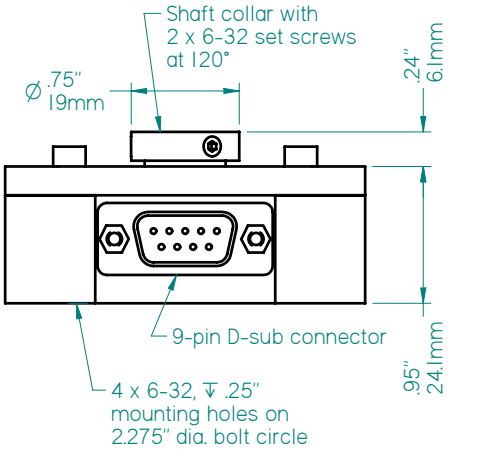
FEATURES

- **Up to 3/8" or 10mm shaft bore diameter**
- **Up to 600 pulses per revolution**
- **Single, quadrature, and index outputs**
- **Direction indicator output option**
- **Anti-jitter feature option**
- **ESD and short circuit protection on most models**
- **5 vdc, 8 to 30 vdc, and other supply voltages**
- **9-pin D-Sub or 4-pin M12 connector**
- **Programmable model available - see Model HS25-P**

DIMENSIONS

(shown with 3/8" shaft bore and 9-pin D-sub connector)





SPECIFICATIONS

Mechanical

Shaft Bore: Any up to 3/8", 10mm diameter
Maximum Speed: 3,000 rpm
Shaft Loading:
— Radial: 5.5 lbs. / 2.5 kg max.
— Axial: 2.2 lbs. / 1 kg max.
A flexible mounting bracket is recommended.
Bearing Life: 42 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 5.5 oz. (156 grams)

Electrical Connections

9-pin D-sub Pin No.	4-pin M12 Pin No.	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3	4	Output A	White
4	2	Output B	Green
5	-	Output Z	Brown*
6-9		not used	-

* Output Z is green if Output B is not used.

Installation Notes

1. Slide the HS25 onto the shaft and tighten set screws. Be sure to maintain clearance around the entire encoder body.
2. Use the anti-rotation screw, flexible mounting bracket, or other means to prevent the encoder from rotating.
3. Attach the cable leads to the control device (e.g. PLC) ensuring that the power supply meets specifications.
4. Attach the cable to the encoder.

Accessories

See our website or contact us for more information about Cables, Flexible Mounting Brackets, and the Anti-Rotation Pin

Electrical

Supply Voltages: (specify when ordering)
— 5 ± 5% VDC
— 12, 15, or 24 ± 10% VDC
— 8-30 VDC
Current: 50 mA max (no load)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: 1 to 600
(specify when ordering)
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
— Push/Pull (combined sourcing/sinking)
— Current sinking NPN transistsor with built in pull-up resistor
— NPN open collector (Vcc=30 vdc max)
— Current sourcing PNP transistor
Output Current: 50ma max source/sink
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. Output Z (index output) is approximately the width of one cycle on outputs A or B. A leads B by 90° for clockwise rotation when viewed from shaft collar end.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Anti-jitter option: (single output models only)
Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and the possible dither that results in false output pulses.
Direction Output option: (single output models)
Indicates direction of rotation: "high" for clockwise rotation; "low" for counter clockwise. Initially "low" when powered on.

MODEL NUMBER

HS25				—				/						
Model Number	**Shaft Bore:** **A**=5/16", **B**=3/8", **C**=1/4", **.188**=3/16", **M6**=6mm, **M8**=8mm, **M10**=10mm	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 600	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)	**Direction option:** leave blank for no direction, **B**=direction output (single output models only)		**Supply Voltage:** **5**=5vdc, **8-30**=8 to 30 vdc, **12**=12vdc, **15**=15vdc, **24**=24vdc	**Output Circuit:** leave blank for current sinking, **P**=sourcing, **C**=open collector, **NP**=push/pull	**Connector:** leave blank for 9-pin D-Sub, **S3**=4-pin M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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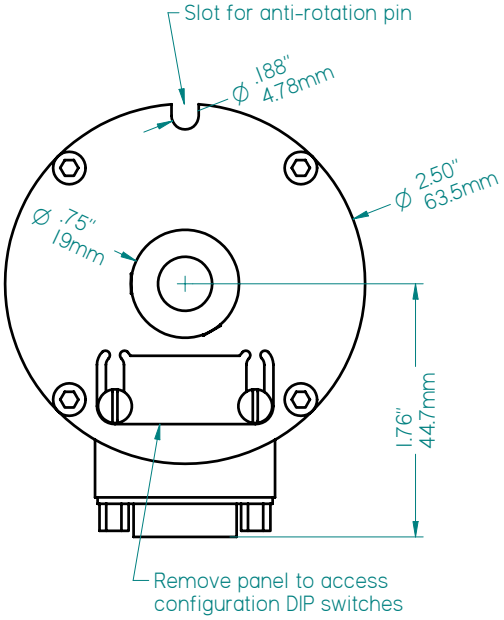
MODEL HS25-P — Programmable Hollow Shaft Encoder

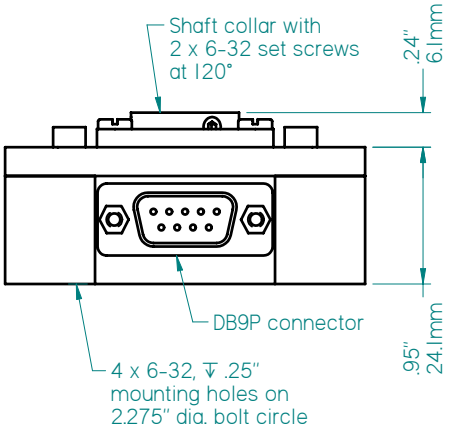
FEATURES

- **Up to 3/8" or 10mm shaft bore diameter**
- **DIP switch selectable pulses per revolution**
- **Single and quadrature pulse outputs**
- **Direction indicator output option**
- **Anti-jitter feature option**
- **ESD and short circuit protection on most models**
- **5 vdc and 8 to 30 vdc supply voltages**
- **Fixed output model available - see Model HS25**

DIMENSIONS

(shown with 3/8" shaft bore)





SPECIFICATIONS

Mechanical

Shaft Bore: Any up to 3/8", 10mm diameter
Maximum Speed: 3,000 rpm
Shaft Loading:
— Radial: 5.5 lbs. / 2.5 kg max.
— Axial: 2.2 lbs. / 1 kg max.
A flexible mounting bracket is recommended.
Bearing Life: 42 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
— Switch cover: ABS plastic
Weight: 5.5 oz. (156 grams)

Electrical Connections

Pin No.	Function	Wire Color
1	Common	Black
2	+vdc	Red
3	Output A	White
4	Output B	Green
5	Output Z	Brown*
6-9	not used	-

* Output Z is green if Output B is not used.

Installation Notes

1. Slide the HS25 onto the shaft and tighten set screws. Be sure to maintain clearance around the entire encoder body.
2. Use the anti-rotation screw, flexible mounting bracket, or other means to prevent the encoder from rotating.
3. Attach the cable leads to the control device (e.g. PLC) ensuring that the power supply meets specifications.
4. Attach the cable to the encoder.

Accessories

See our website or contact us for more information about Cables, Flexible Mounting Brackets, and the Anti-Rotation Pin.

Electrical

Supply Voltages: (specify when ordering)
— 5 ± 5% VDC
— 8-30 VDC
Current: 50 mA max (no load)
Pulse Rate: 0 - 30 kHz
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
— Push/Pull (combined sourcing/sinking)
— NPN open collector (Vcc=30 vdc max)
Output Current: 50ma max source/sink
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. A leads B by 90° for clockwise rotation when viewed from shaft collar end.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Programmable Features: Factory configured program that offers one or more advanced features. DIP switches set program options.
(for more details, call or see our website)
— Selectable Pulses per revolution
— Quadrature (A/B) outputs
— Direction outputs
— Anti-Jitter feature
— Enhanced anti-jitter feature
Program: (specify when ordering)
Following are examples of available programs
64AJ - Single pulse output on A with selectable ppr from 1 through 64, and the anti-jitter feature.
64Q - Quadrature pulse outputs (A and B) with selectable ppr from 1 through 64
270AJB - Single pulse output on A with selectable ppr (2,3,4,5,6,7,8,9,10,12, 15,16,18,20,24,30,54,60) and the anti-jitter feature. Direction output on B with selectable direction logic.

MODEL NUMBER

HS25		—	P		/				
Model Number	**Shaft Bore:** **A**=5/16", **B**=3/8", **C**=1/4", **.188**=3/16", **M6**=6mm, **M8**=8mm, **M10**=10mm		**P**=Programmable model	**Program:** name of factory configured program. See the program specific datasheet for feature descriptions and DIP switch settings.		**Supply Voltage:** **5**=5vdc, **8-30**=8 to 30 vdc	**Output Circuit:** leave blank for push/pull **C**=NPN open collector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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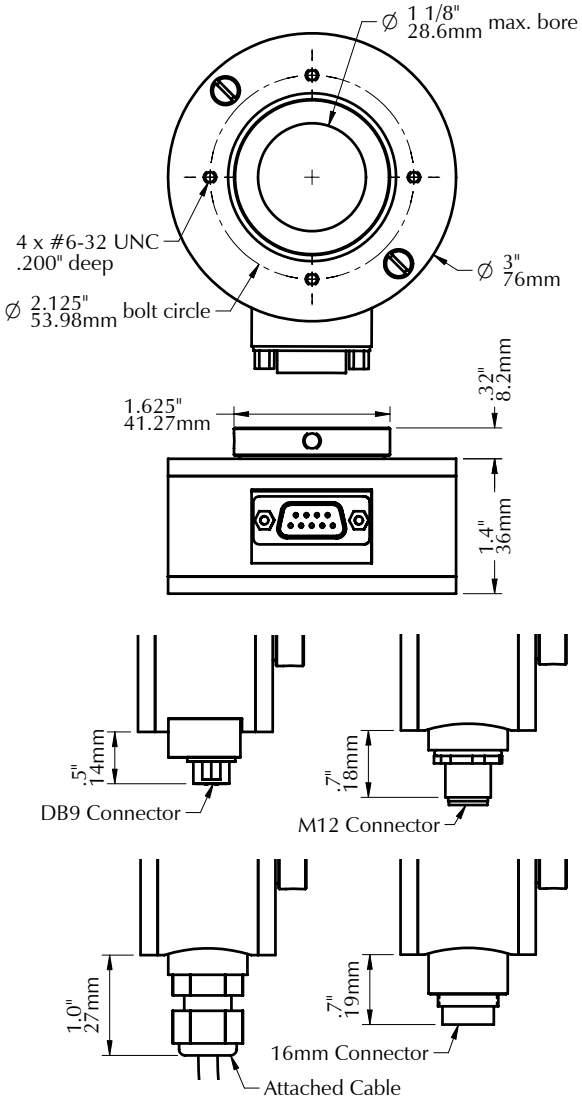
MODEL HS30 — Series 30 Hollow Shaft Encoder

FEATURES

- **Up to 1-1/8" or 28.6mm shaft bore diameter**
- **Heavy Duty bearings**
- **Unbreakable code disk**
- **Size 30 housing**
- **Short circuit and ESD protected**
- **Up to 1200 pulses per revolution**
- **Attached cable, or DB9, 16mm or M12 connector**
- **IP65 protection available - see Model HS31**
- **Programmable model available - see Model HS30-P**

DIMENSIONS

(shown with DB9 connector, 1-1/8" / 28.6mm shaft bore)



SPECIFICATIONS

Mechanical

Shaft Bore: Any up to 1-1/8" / 28.6mm
Maximum Speed: 6,000 rpm
Shaft Loading:
— Radial: 30 lbs. / 13.6 kg
— Axial: 20 lbs. / 9.1 kg
A flexible mounting bracket is recommended.
Bearing Life: 44 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: Aluminum
Weight: 10.5 - 12.5 oz. (298 - 355 grams)
Enclosure rating: IP50

Electrical Connections

Single Ended Outputs:

Function	Wire Color	Optional Connector DB9	16mm	M12
Common	Black	1	1	3
Supply voltage	Red	2	2	1
Output A	White	3	4	4
Output B	Green	4	5	2
Output Z	Brown	5	3	-
not used	-	6-9	6	-

Differential Line Driver Outputs:

Function	Wire Color	Optional Connector DB9	16mm
Common	Black	1	5
Supply voltage	Red	2	4
Output +A	White	3	1
Output +B	Green	4	2
Output +Z	Yellow	5	3
Output -A	Blue or Green	6	6
Output -B	Brown	7	7
Output -Z	Orange	8	8
not used	-	9	-

Connectors:
DB9: D-Sub 9-pin.
16mm: Amphenol T3402000 (6-pin) or T3506000 (8-pin) or equivalent.
M12: 4-pin Turck FS4.4/18.25 or equivalent.

Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: (specify when ordering)
1 to 1200
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage level.
Single Ended:
— 7273 open collector (30 VDC max, 50 mA max)
— 7272 Push-Pull (50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver (also with optional 5vdc output level)
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. Output Z (index output) is approximately the width of one cycle on outputs A or B. Output A leads B by 90° for clockwise rotation viewed from shaft collar end.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Anti-jitter: (single output models only)
Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and possible false output pulses. For example a 10 pulse per revolution output has 18° hysteresis (i.e. 360° ÷ 10 × ½).

Accessories

See our website or contact us for more information about Cables, Mounting Brackets and other accessories.

MODEL NUMBER

HS30				—			/					
Model Number	**Shaft Bore:** **1.0** = 1", **.75** = 3/4", **.875** = 7/8", **M25** = 25mm, others are available	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 1200 *A one-time charge may apply for non-stock values.*	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage:** **5** or **8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=7272 line driver with 5vdc output level	**Cable/Connector:** leave blank for attached 10-ft. / 3-meter cable (other lengths are available) **S** = 16mm, **S1**=DB9, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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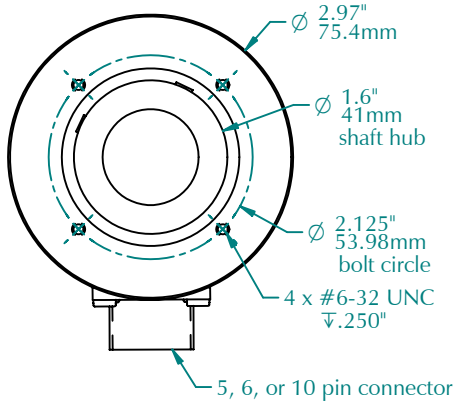
MODEL HRL — Hollow Shaft Encoder

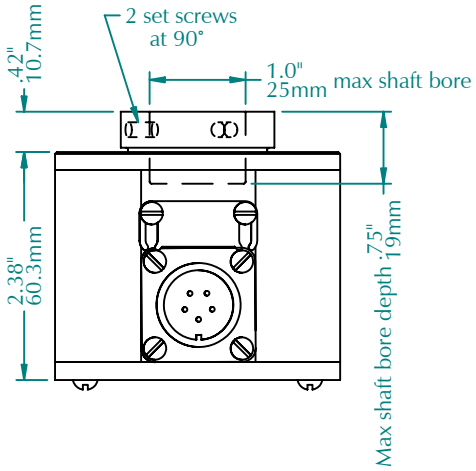
FEATURES

- **3/8" to 1", or 9mm to 25mm Shaft Bore**
- **3/4" or 19mm blind bore depth (not through bore)**
- **Shaft Version Available - see Model RL**
- **Programmable Model Available - see Model HRL-P**
- **Exclusive "Anti-Jitter" Circuit for Conveyor Applications**
- **Single (A), Quadrature (A, B), and Index (Z) Outputs**
- **Dual or Triple output Models with different pulses per revolution on each output**
- **Short Circuit / ESD Protection on Most Models**
- **Custom Models Available**

DIMENSIONS

* CE marking requires Photocraft cable, and surge protection option if cable exceeds 100' (30m) or leaves the building.





SPECIFICATIONS

Mechanical

Maximum speed: 6,000 rpm
Shaft Loading: Radial: 25 lb. (11.3 kg) max.
Axial: 15 lb. (6.8 kg) max.
Bearing Life: 36 x 1,000,000/rpm = hours
Materials:
— Case: ¼" Aluminum, anodized
— Shaft: Aluminum

Electrical Connections

Push/Pull Outputs:

5-Pin Connector	Function	Wire Color
A	+vdc	Red
B	Common	Black
C	Output A	White
D	Output B	Green
E	Output Z	Brown*

* Output Z is green if Output B is not used.

Line Driver Outputs:

Connector 6-pin	Connector 10-pin[3]	Function	Wire Color
A	F	Common	Black
B	D	+vdc	Red
C	A	Output A	White
D	H	Output $\overline{A}$	Blue[1]
E	B	Output B[2]	Green
F	I	Output $\overline{B}$[2]	Brown
-	C	Output Z	Yellow
-	J	Output $\overline{Z}$	Orange

[1] Output $\overline{A}$ is green if Output B is not used.
[2] These are Outputs Z / $\overline{Z}$ if B / $\overline{B}$ are not used.
[3] 10-pin only applies when all outputs (A / $\overline{A}$, B / $\overline{B}$, Z / $\overline{Z}$) are required.

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: (specify when ordering)
1 to 1200
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver
(output level same as supply voltage)
— RS422 differential line driver
(with regulated 5vdc output level)
Output Format: Two channel quadrature square waves (A,B) with optional index (Z). Optional complimentary outputs (-A,-B,-Z). Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Symmetry: 180°±30%
Pulse interval jitter: 30% max
Quadrature: 90°±30% max
Phase jitter: 30% max
Anti-jitter: (single output models only) Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and possible false output pulses. For example a 10 pulse per revolution output has 18° hysteresis (i.e. 360° ÷ 10 × ½).
Enhanced Anti-jitter: see our website or contact us for more information.

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

HRL				—			/				
Model Type	**Shaft Bore:** **1** = 1", **.75** = 3/4", **.875** = 7/8", **M25** = 25mm, others are available	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 1200, enter dual and triple output values separated by "/"	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage:** **5** or **8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver with 5vdc output level	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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SPECIFICATIONS

Electrical

Power Input (specify voltage when ordering):

Supply Voltage	R Values (see fig. 1)
5 ± 5% vdc	1K ohms
8 to 30 vdc	3.3K ohms

Supply Current: 50ma maximum (no load)

Output Current (I_O): 50ma max source/sink

Output Circuits: (see figure 1)
- — Push/Pull (Combined sourcing/sinking)
- — Current sinking NPN transistor
- — Open collector (V_{CC}=30 vdc max)
- — Curent sourcing PNP transistor

All are switch selectable for single output model; factory configured for 2 or 3 outputs

Output Waveform: 50/50 squarewave
- — **Pulse On-Off Ratio:** 50% ± 10%
- — **Pulse Interval Jitter:** ±10%
- — **Quadrature Deviation:** 30° (max)
- — **Pulse rise time:** 2 µsec (max)
- — **Pulse fall time:** 5 µsec (max)
- — **Voltage (high):** V_{in}-2.5 vdc (min)
- — **Voltage (low):** 1.5 vdc (max)
- — **Index Pulse:** approximately the width of 1 pulse on output A

(600 rpm, V_{IN}=24vdc, 10ma<I_O<50ma, 25°C)

Operating temperature: 0° to 70° C

Pulse Rate: 0 - 30 kHz

Output Protection:
- — **Short Circuit**
- — **ESD** to 8KV direct and 25KV air

Electrical Connections

Pin No.	Function	Wire Color
A	Supply Voltage	Red
B	Common	Black
C	Output A	White
D	Output B	Green
E	Output C or Z	Brown
—	Case Ground	Shield

Connector: 97-3102A-14S-5P (5-pin)

Mechanical

Weight: 16.8 oz. (477 grams)

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 15 lb. (6.8 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours

Materials:
- — Case: 1/4" Aluminum, anodized
- — Shaft: Aluminum
- — Window: Plastic

Programs

The HRL-P is preconfigured with one of the following programs. Others are available.

144AJ - Single pulse output on A with selectable ppr (1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 144) and the anti-jitter feature.

240AJ - Single pulse output on A with selectable ppr (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 18, 20, 24, 30, 36, 40, 48, 60, 80, 120, 240) and the anti-jitter feature.

270AJ - Single pulse output on A with selectable ppr (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 18, 20, 24, 30, 54, 60) and the anti-jitter feature.

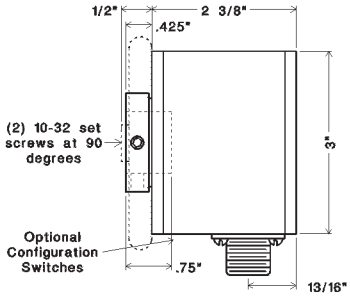
270AJB - Single pulse output on A with selectable ppr (2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 18, 20, 24, 30, 54, 60) and the anti-jitter feature. Direction output on B with selectable direction.

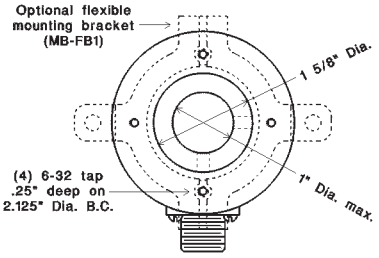
Accessories

Flexible Mounting Bracket (MB-FB1): allows for axial and angular shaft misalignment.

Cable Assembly (C5-x-10): 10 ft. (3m) shielded cable with 97-3106A14S-5S mating connector is included at no extra cost (x is number of conductors) Other lengths are available.
***CE** marking requires Photocraft cable, and surge protection option if the cable exceeds 100' (30m) or leaves the building.*

DIMENSIONS





ORDERING INFORMATION

HRL ___ - P ___ / ___ ___

Model

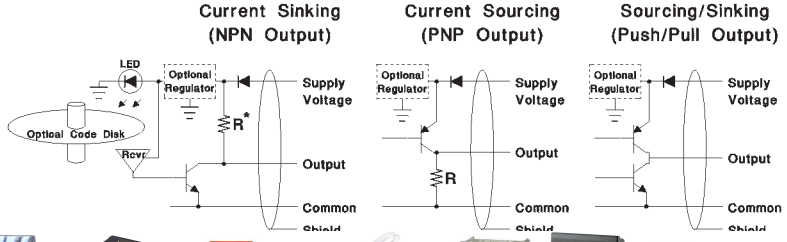
Shaft diameter:
1 = 1"
M25=25mm
(Others values available up to 1" maximum)

Program name

Supply voltage:
5 or 8-30

Output Circuit:
Push/Pull is standard
C = NPN open collector

Short lead time options are underlined



SPECIFICATIONS

Mechanical

Weight: 11 oz. (312 grams)

Maximum speed: 3,000 rpm

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 15 lb. (6.8 kg.) max.

Bearing Life (L_{10}): 36 x 10^6/RPM = hours

Materials:
- Case and Shaft: Aluminum
- Switch Access Door: Plastic

Connector: 6-pin, MS3102A-14S-6P

Electrical

Power Input (specify voltage when ordering)**:**

Supply Voltage	R Values (see fig. 1)
5 ± 5% vdc	1K ohms
12 or 15 ± 5% vdc	2.2K ohms
24 ± 5% vdc	3.3K ohms
8 to 30 vdc	3.3K ohms

Supply Current: 50ma maximum (no load)

Output Current (I_O): 50ma max source/sink

Output Circuits: (specify when ordering)
- Push/Pull (Combined sourcing/sinking)
- Current sinking NPN transistor
- NPN open collector (V_{CC}=30 vdc maximum)
- Current sourcing PNP transistor
- RS422 differential line driver (MC3487 device; must be ordered with 5, 5R or 8-30 supply voltage)

Output Protection:
- **Short Circuit** (all Programmable and AJ models; inquire for others)
- **ESD** to 8KV direct and 25KV air

Output Waveform: 50/50 squarewave
- **Pulse On-Off Ratio:** 50% ± 10%
- **Pulse Interval Jitter:** ±10%
- **Quadrature Deviation:** 30° (max)
- **Pulse rise time:** 2 µsec (max)
- **Pulse fall time:** 5 µsec (max)
- **Voltage (high):** V_{in}-2.5 vdc (min)
- **Voltage (low):** 1.5 vdc (max)
- **Index Pulse:** approximately the width of 1 pulse on output A

(600 rpm, V_{IN}=24vdc, 10ma<I_O<50ma, 25°C)

Operating temperature: 0° to 70° C

Pulse Rate: 0 - 30 kHz

Pulses per Revolution: (specify when ordering) 1 to 1200.

Programs (for programmable versions)

The HRS-P is preconfigured with one of the following programs. Others are available.

64AJ - Single pulse output on A with selectable ppr from 1 through 64, and the anti-jitter feature.

Electrical Connections

NPN or PNP transistor outputs:

6-Pin Connector	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output Z or C	Brown*
D	Output A	White
E	Output B	Green

** Output Z is green if Output B is not used.*

Line Driver outputs:

6-Pin Connector	Function	Wire Color
A	Common	Black
B	+vdc	Red
C	Output A	White
D	Output $\overline{A}$	Blue[1]
E	Output B[2]	Green
F	Output $\overline{B}$[2]	Brown

[1] Output $\overline{A}$ is green if Output B is not used.
[2] These are Outputs Z/ $\overline{Z}$ if B/ $\overline{B}$ are not used.

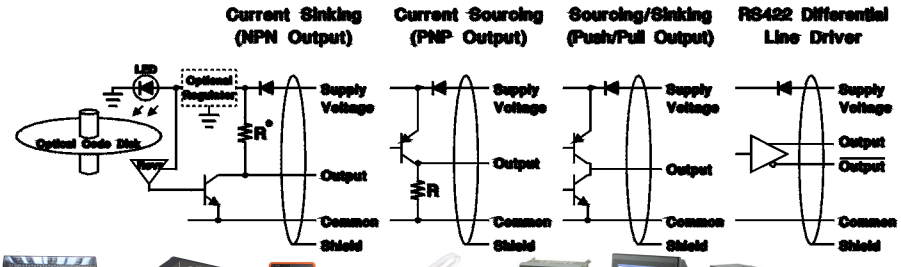
Accessories

Cable Assembly (C6-x-10): 10 ft. (3m), *x* conductor shielded cable & connector
Other lengths are available.
***CE** mark requires Photocraft cable, and surge protection if cable exceeds 100' (30m) or leaves the building.*

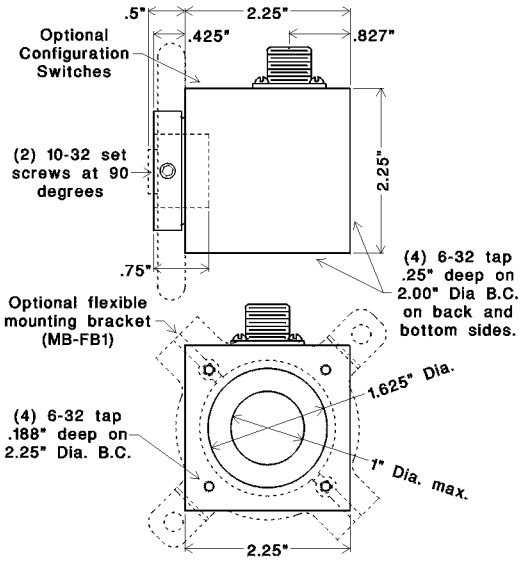
Flexible Mounting Bracket (MB-FB1): flexible stainless steel that allows for axial and angular shaft misalignment.

Mounting Instructions

1. Slide HRS onto shaft, fasten flexible mounting bracket or tether to frame, and then tighten shaft set screws.
2. Attach the cable leads to the control device (e.g. PLC) ensuring that the power supply meets specifications.
3. If programmable then set the switches. *Switches can be changed at any time.*
4. Attach the cable to the encoder.



DIMENSIONS



ORDERING INFORMATION

HRS ___ ___ ___ - ___ ___ / ___ ___

Model

Shaft diameter:
1 = 1″
M25=25mm
(Others values available up to 1″ maximum)

Single output on A is standard;
Q= quadrature with outputs A and B

No index is standard:
Z = Index output
NZ = inverted index

Pulses per revolution.
Enter dual and triple ppr separated by "/"

AJ = Anti-jitter option

Supply voltage: 5, 12, 15, or 24; or 8-30

Output circuit:
NPN is standard
C = Open collector
P = PNP
D = Differential Line Driver

Programmable Version

HRS ___ - P ___ / ___ ___

Model

Shaft diameter:
1 = 1″
M25=25mm
(Others values available up to 1″ maximum)

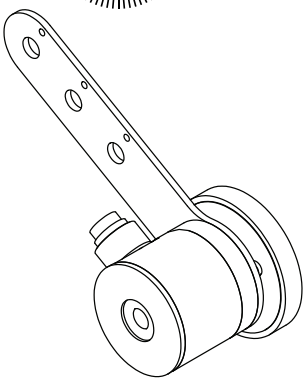
Output Circuit:
Push/Pull is standard
C = NPN open collector

Supply voltage:
5 or 8-30

Program name

Short lead time options are underlined

MODEL RB21 BlueCoder High Resolution Encoder

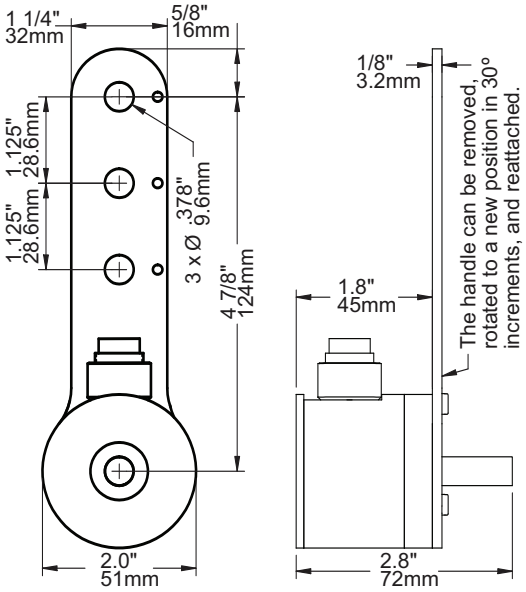


The BlueCoder model RB21 is an optical incremental encoder that use the benefits of blue LED light. It is a size 20 encoder that is a compact 2" diameter x 1-7/8" (Ø51mm x 48mm) long optical shaft encoder with an integral mounting arm, compatible with a variety of mounting accessories for installation either above or below a moving web or conveyor. When used with the MW-8 (8.00" circumference) or MW-20 (20.00cm circumference) measuring wheel it can accurately track the web or conveyor to within ±.007" or ±.016cm per revolution. Solid construction and heavy duty bearings make this encoder a great choice for long-term operation in continuous duty applications.

- High-Definition blue-light phased array technology
- Compensated blue-light source
- Wide operating voltage 4.5Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk
- IP65 environmental seal
- Integrated mounting arm
- Precision measuring wheel

DIMENSIONS

(Shown with 16mm Din connector)



SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:
Radial - 50 lbs. for life of 4.1 x 109 revolutions
Axial - 50 lbs. for life of 4.1 x 109 revolutions
Note: A flexible shaft coupling is recommended to increase bearing life.
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 10 oz. (285 grams)
Sealing: P65

Electrical Connections

Single Ended Outputs:

16mm Din 6-pin	M12 4-pin	Function	Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

16mm Din 8-Pin	Function	Color
1	Output A	White
2	Output B	Green
3	Output Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output $\overline{A}$	Blue or Green
7	Output $\overline{B}$	Brown
8	Output $\overline{Z}$	Orange

8-pin connector is Amphenol T3506000 or equivalent

Electrical

Supply Voltages: 4.5 Vdc to 30 Vdc
(6.0 Vdc to 30 Vdc for RS422 differential line driver)
Current: 65 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 70° C
Pulse Symmetry: 180°±36° @ maxRPM
Quadrature Phase Error: 90°±36° @ maxRPM
Phase jitter: 27°
Maximum Frequency: up to 1.4 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
Two channel quadrature square waves (A,B)
• optional index (Z).
• optional complimentary outputs (-A,-B,-Z).
Note: Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Counts per Revolution: (specify when ordering)
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000
Output Circuit: (specify when ordering)
Single Ended:
• 7273 open collector
(30 Vdc max, 50 mA max)
• 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
• 7272 differential line driver
(output level same as supply voltage)
• RS422 differential line driver
(5 Vdc output level)
Connections: (specify when ordering)
• Attached 10ft cable
• 16mm 6/8-pin Din connector
• M12 4-pin connector

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

Build Encoder

RB21	Output Type	–	CPR	Output Circuit	Connector	Measuring Wheel

RB21 –

Output Type:
blank = single pulse A output,
Q = quad. outputs on A & B
QZ = quad. outputs on A & B with Z outputs

Counts Per Revolution:
Choose one number:
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

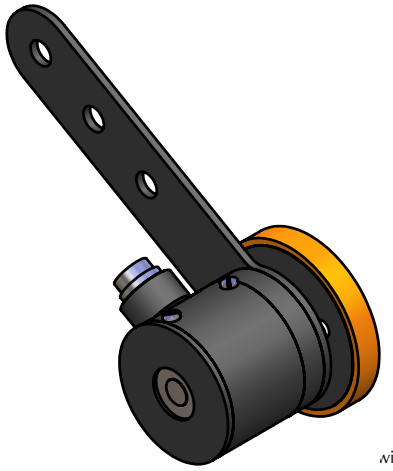
Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
DH = Differential line driver - output level same as input level
DL = RS422 line driver with 5vdc output level

Cable/Connector:
blank = attached 10ft. shielded cable
S = 16mm 6/8-pin Din connector
S3 = 4-pin M12 connector

Measuring Wheel:
MW8 = 8" circumference
MW10 = 10" circumference
MW1 = 12" circumference
MW1R = 12" circumference with replaceable o-ring
MW1W = 12" circumference
MW20 = 20cm circumference
MW30 = 30cm circumference
MW30R = 30cm circumference with replaceable o-ring
MW30W = 30cm circumference 25mm wide

Example: **RB21Q-10240DHS MW10** - quadrature outputs, 1024 cpr, differential line driver output, 16mm connector (8-pin), 10" measuring wheel

MODEL R21 — Series 20 Wheeled Encoder



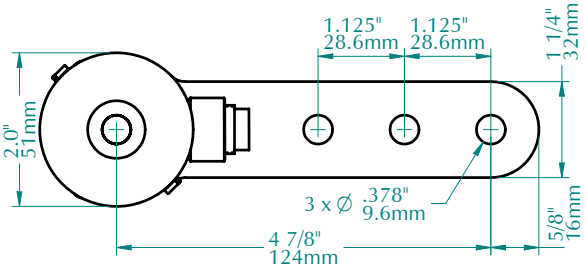
with optional MW-8 measuring wheel and 16mm connector

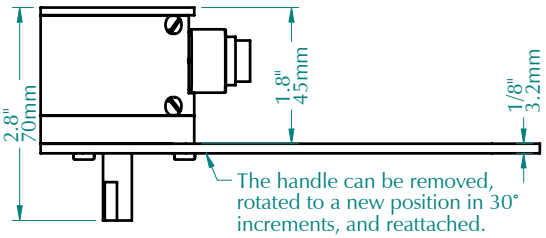
FEATURES

- **Generates pulses for accurate linear measurement**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" or 20cm circumference measuring wheel**
- **16mm or M12 connector, or attached cable**
- **"Anti-Jitter" and other material handling features**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**
- **Programmable model available - see Model R21-P**
- **Dual measuring wheels - see Model R22**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. (340 grams)
Protection: IP50 (IP64 is available)

Electrical Connections

Single Ended Outputs:

Optional 6-pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin Connector	Function	Wire Color
1	Output +A	White
2	Output +B	Green
3	Output +Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output -A	Blue or Green
7	Output -B	Brown
8	Output -Z	Orange

8-pin connector is Amphenol T3506000 or equivalent

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: (specify when ordering)
1 to 1200 *(call for values up to 4800)*
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage level.
Single Ended:
— 7273 open collector (30 VDC max, 50 mA max)
— 7272 Push-Pull (50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver (also with optional 5vdc output level)
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. Output Z (index output) is approximately the width of one cycle on outputs A or B. Output A leads B by 90° for clockwise rotation viewed from end by handle.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Anti-jitter: (single output models only)
Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and possible false output pulses. For example a 10 pulse per revolution output has 18° hysteresis (i.e. 360° ÷ 10 × ½).

Accessories

See our website or contact us for more information about cables, measuring wheels, and mounting hardware.

MODEL NUMBER

R21			—			/					
Model Number	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 1200 *(call for information about higher values)*	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage: 5 or 8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **D**=7272 line driver, **DL**=7272 line driver with 5vdc output level	**Cable/Connector:** leave blank for attached cable, **S** =16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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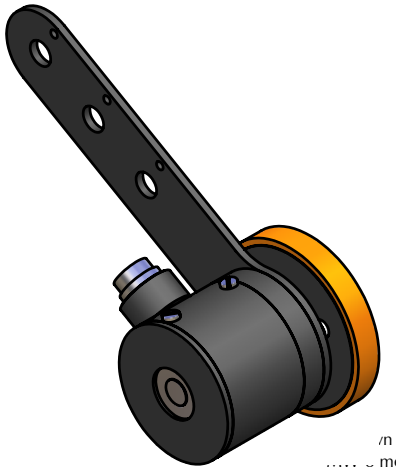
MODEL R21-P8EAJ — Programmable Wheeled Encoder



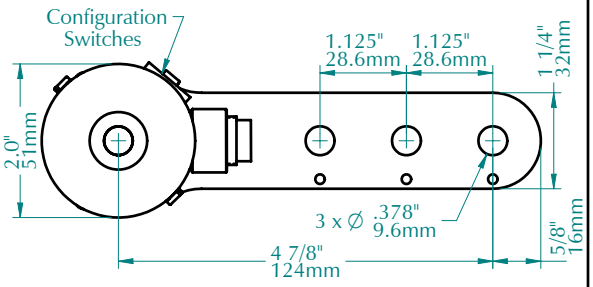
/n with optional
..... measuring wheels
and 16mm connector

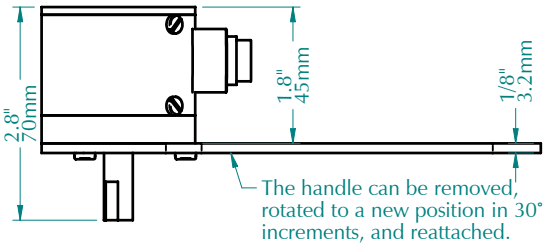
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable resolution: Pulses/Foot and Pulses/Inch**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" circumference measuring wheel**
- **16mm or M12 connector, or attached cable**
- **Enhanced "Anti-Jitter" feature for web applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**
- **Metric version available**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 3,000 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Switch cover: ABS
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. / 340 grams (without accessories)
Protection: IP50 is standard, IP66 available

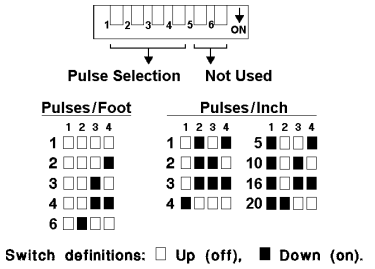
Electrical Connections

	Connectors			
Function	16mm 6-Pin	16mm 8-Pin	M12 4-Pin	Wire Color
Common	1	5	3	Black
+vdc	2	4	1	Red
Output A	4	1	4	White
Output -A	-	6	2	Green

Unlisted pins are not used.
16mm 6-pin is Amphenol T3402000 or equivalent, for Single Ended outputs.
16mm 8-pin is Amphenol T3506000 or equivalent, for Differential Line Driver.
M12 4-pin is Turck FS4.4/.. or equivalent for either Single or Differential Outputs.
Attached cable is 10-ft / 3-meters. Other lengths are available.

Configuration Switches

Selects the pulses per linear movement of the 8" circumference measuring wheel (MW-8).



Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: 2/3, 1-1/3, 2, 2-2/3, 4, 8, 16, 24, 32, 40, 80, 128, 160
Operating Temperature: -25° to +85° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector (30 VDC max, 50 mA max)
— 7272 Push-Pull (50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver (output level same as supply voltage)
— RS422 differential line driver (with regulated 5vdc output level)
Output Waveshape:
Square wave output A is 50/50 duty cycle nominal. Output -A is the compliment of A.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
Enhanced Anti-jitter: Developed for conveyor applications that typically operate in one direction, and do not want pulses generated if the conveyor stops or reverses for a short distance. Pulses are generated as long as rotation continues in one direction. If the direction reverses then pulse output ceases until it returns to its original direction and position it was at before reversing. If the reverse rotation exceeds 10 rotations then the encoder resets assuming the current direction is forward and begins pulsing.

Accessories

See our website or contact us for more information about cables, measuring wheels, and mounting hardware.

MODEL NUMBER

R21	—	P8EAJ	/					
Model Number		**Program Name:** Call or see our website for information about other programs.		**Supply Voltage:** 5 or 8-30	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S** =16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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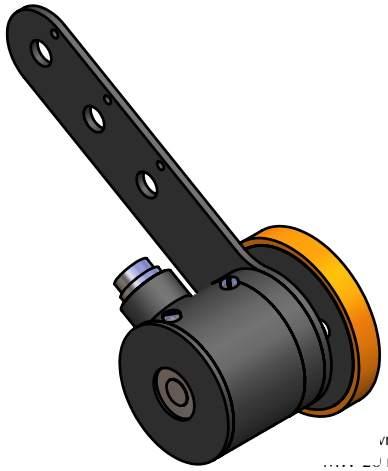
MODEL R21-P20EAJ Programmable Wheeled Encoder



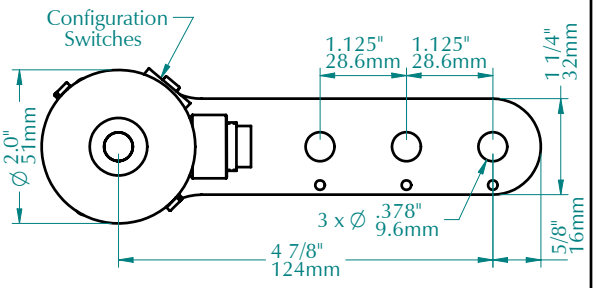
...n with optional
... measuring wheels
and 16mm connector

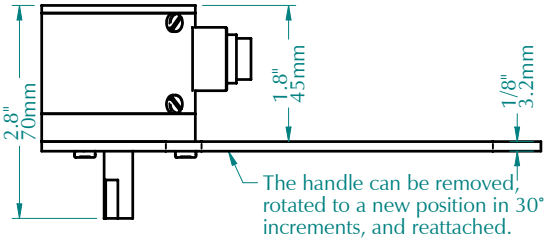
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable resolution: Millimeters per Pulse**
- **Heavy Duty construction**
- **Compact size**
- **Precision 20cm circumference measuring wheel**
- **16mm or M12 connector, or attached cable**
- **Enhanced "Anti-Jitter" feature for web applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**
- **Other programmable models are available**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 3,000 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Switch cover: ABS
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. / 340 grams (without accessories)
Protection: IP50 is standard, IP66 available

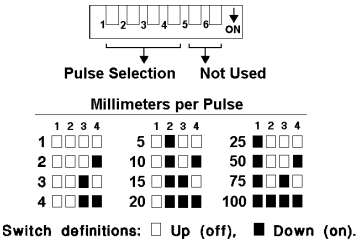
Electrical Connections

	Connectors			
Function	16mm 6-Pin	16mm 8-Pin	M12 4-Pin	Wire Color
Common	1	5	3	Black
+vdc	2	4	1	Red
Output A	4	1	4	White
Output -A	-	6	2	Green

Unlisted pins are not used.
16mm 6-pin is Amphenol T3402000 or equivalent, for Single Ended outputs.
16mm 8-pin is Amphenol T3506000 or equivalent, for Differential Line Driver.
M12 4-pin is Turck FS4.4/.. or equivalent for either Single or Differential Outputs.
Attached cable is 10-ft / 3-meters. Other lengths are available.

Configuration Switches

Determines the linear movement per output pulse when used with the 20 centimeter circumference measuring wheel (MW-20).



Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: 2, 2-2/3, 4, 8, 10
13-1/3, 20, 40, 50, 66-2/3, 100, 200
Operating Temperature: -25° to +85° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver
(output level same as supply voltage)
— RS422 differential line driver
(with regulated 5vdc output level)
Output Waveshape:
Square wave output A is 50/50 duty cycle nominal. Output -A is the compliment of A.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
Enhanced Anti-jitter: Developed for conveyor applications that typically operate in one direction, and do not want pulses generated if the conveyor stops or reverses for a short distance. Pulses are generated as long as rotation continues in one direction. If the direction reverses then pulse output ceases until it returns to its original direction and position it was at before reversing. If the reverse rotation exceeds 10 rotations then the encoder resets assuming the current direction is forward and begins pulsing.

Accessories

See our website or contact us for more information about cables, measuring wheels, and mounting hardware.

MODEL NUMBER

R21	—	P20EAJ	/					
Model Number		**Program Name:** Call or see our website for information about other programs.		**Supply Voltage:** 5 or 8-30	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S**=16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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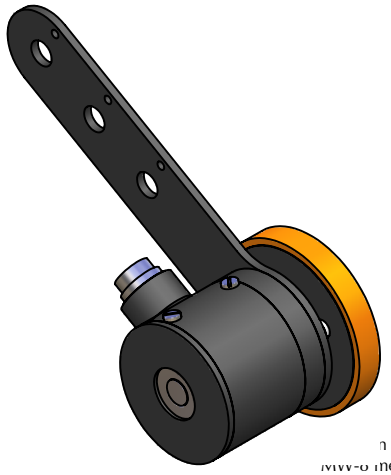
R21-P64AJ Programmable Wheeled Encoder



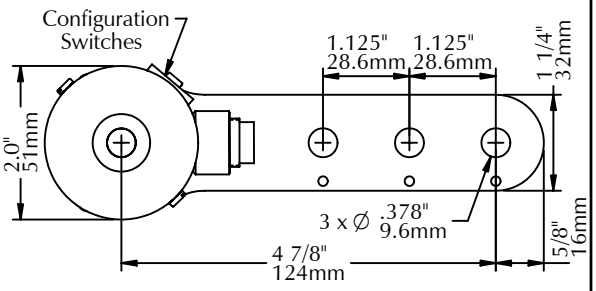
n with optional
MW-8 measuring wheels
and 16mm connector

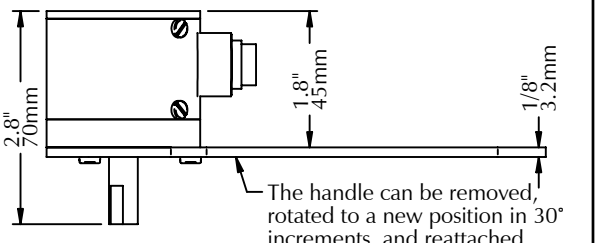
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable pulses per revolution**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" or 20cm circumference measuring wheel**
- **16mm or M12 connector, or attached cable**
- **"Anti-Jitter" feature for conveyor applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**

DIMENSIONS

(shown with optional 16mm connector)



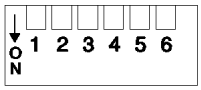


SPECIFICATIONS

Mechanical

Maximum Speed: 2,500 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Switch cover: ABS
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. / 340 grams (without accessories)
Protection: IP50 is standard, IP66 availabl

Configuration Switches



Switch definitions:
□ Up (off)
■ Down (on)

Pulses per Revolution Selection

	1 2 3 4 5 6		1 2 3 4 5 6		1 2 3 4 5 6
1	□□□□□□	22	□■□■■□	43	■□■□■■
2	□□□□□■	23	□■□■■■	44	■□■□■■
3	□□□□■□	24	□■□■■■	45	■□■■□□
4	□□□□■■	25	□■■□□□	46	■□■■□■
5	□□□■□□	26	□■■□□■	47	■□■■■□
6	□□□■□■	27	□■■□■□	48	■□■■■■
7	□□□■■□	28	□■■□■■	49	■■□□□□
8	□□□■■■	29	□■■■□□	50	■■□□□■
9	□□■□□□	30	□■■■□■	51	■■□□■□
10	□□■□□■	31	□■■■■□	52	■■□□■■
11	□□■□■□	32	□■■■■■	53	■■□■□□
12	□□■□■■	33	■□□□□□	54	■■□■□■
13	□□■■□□	34	■□□□□■	55	■■□■■□
14	□□■■□■	35	■□□□■□	56	■■□■■■
15	□□■■■□	36	■□□□■■	57	■■■□□□
16	□□■■■■	37	■□□■□□	58	■■■□□■
17	□■□□□□	38	■□□■□■	59	■■■□■□
18	□■□□□■	39	■□□■■□	60	■■■□■■
19	□■□□■□	40	■□□■■■	61	■■■■□□
20	□■□□■■	41	■□■□□□	62	■■■■□■
21	□■□■□□	42	■□■□□■	63	■■■■■□
				64	■■■■■■

Electrical

Supply Voltages (+vdc): (specify when ordering)
5 ± 5% vdc or 8 to 30 vdc
Supply Current: 50 ma max (no load)
100 ma max (line driver)
Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage level
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 line driver, unregulated output
— RS422 line driver with 5vdc output
Operating Temperature: -25° to +85° C

Outputs

Pulses per Revolution Output: Selectable by setting configuration switches 1 to 6. Output is "low" when initially powered.
Anti-Jitter feature: details on our website

Electrical Connections

Single Ended Outputs:

Optional Connectors 6-Pin	M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
4	4	Output A	White
3, 5, 6	2	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional Connectors 8-Pin	M12 4-pin	Function	Wire Color
1	4	Output +A	White
4	1	+vdc	Red
5	3	Common	Black
6	2	Output -A	Green
2, 3, 7, 8	-	not used	-

8-pin connector is Amphenol T3506000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

MODEL NUMBER

R21	—	P64AJ	/					
Model Number		**Program Name** Call or see our website for information about other available programs for this encoder model.		**Supply Voltage:** **5**=5vdc, **8-30**=8-30vdc	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S**=6 or 8 pin 16mm, **S3**=M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** optional accessories (call or see our website).

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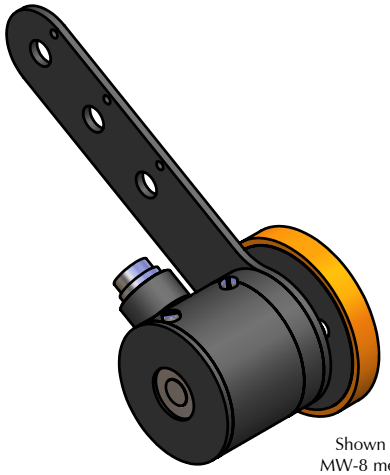
MODEL R21-P144AJ Programmable Wheeled Encoder



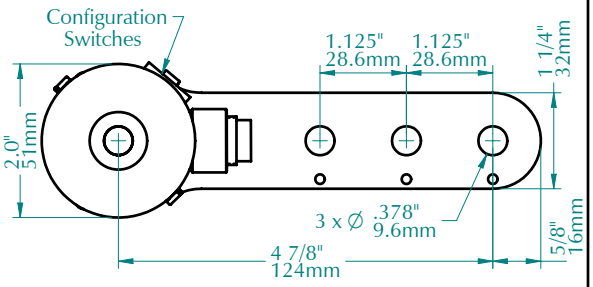
Shown with optional MW-8 measuring wheels and 16mm connector

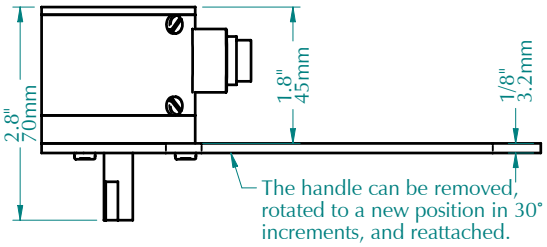
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable pulses per revolution**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" or 12" circumference measuring wheel**
- **16mm or M12 connector, or attached cable**
- **"Anti-Jitter" feature for web applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Shaft Loading:
- — Radial: 40 lbs. / 18.1 kg
- — Axial: 30 lbs. / 13.6 kg

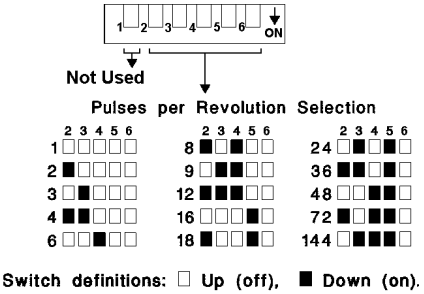
Bearing Life: 32 x 1,000,000/rpm = hours

Materials:
- — Case: Aluminum, anodized
- — Shaft: 303 Stainless steel
- — Switch access door: plastic

Weight: 12 oz. / 340 grams (without accessories)

Protection: IP50 is standard
IP66 is available

Configuration Switches



Outputs

Pulses per Revolution Output: Selectable by setting configuration switches 2 to 6. Output is "low" when initially powered.

Anti-Jitter feature: Increases pulse output hysteresis to ½ of a pulse width eliminating the effects of mechanical vibration and the possible dither that results in false output pulses.

Electrical

Supply Voltages (+vdc): (specify when ordering)
5 ± 5% vdc or 8 to 30 vdc

Supply Current: 50 ma max (no load)
100 ma max (line driver)

Output Circuit: (specify when ordering)

Single Ended:
- — 7273 open collector (30 VDC max, 50 mA max)
- — 7272 Push-Pull (50 mA max source or sink)

Differential Line Driver:
- — 7272 differential line driver (output level same as supply voltage)
- — RS422 differential line driver (with regulated 5vdc output level)

Operating Temperature: 0° to 70° C

Maximum Operating Speed: 2,500 rpm

Electrical Connections

Single Ended Outputs:

Optional 6-Pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
4	4	Output A	White
3, 5, 6	2	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin	Optional M12 4-pin	Function	Wire Color
1	4	Output +A	White
4	1	+vdc	Red
5	3	Common	Black
6	2	Output -A	Green
2, 3, 7, 8		not used	-

8-pin connector is Amphenol T3506000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Accessories (call or see our website)

Adapters, Cables, Flexible Couplings, Measuring Wheels, Mounting Brackets

MODEL NUMBER

R21	—	P144AJ	/						
Model Number		**Program Name:** Call or see our website for information about other programs.		**Supply Voltage:** 5 or 8-30	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S** =16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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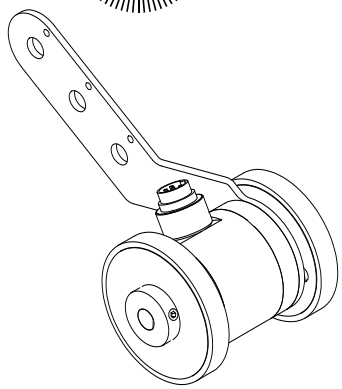
MODEL RB22 BlueCoder High Resolution Encoder

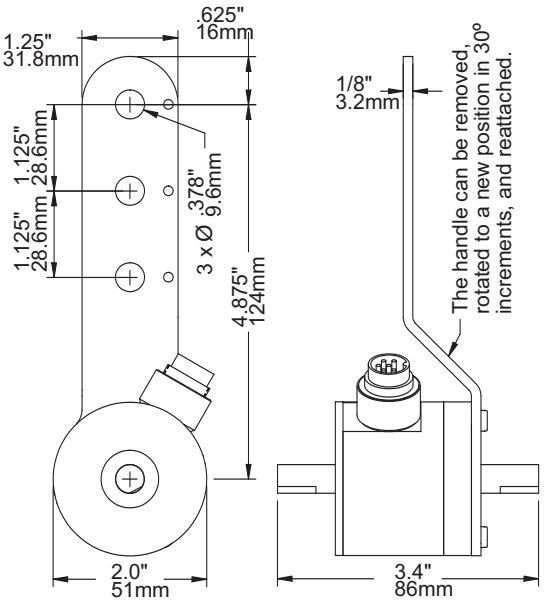


The BlueCoder model RB22 is an optical incremental encoder that use the benefits of blue LED light. It is a size 20 encoder that is a compact 2" diameter x 1-7/8" (Ø51mm x 48mm) long optical shaft encoder with an integral mounting arm, compatible with a variety of mounting accessories for installation either above or below a moving web or conveyor. When used with the MW-8 (8.00" circumference) or MW-20 (20.00cm circumference) measuring wheel it can accurately track the web or conveyor to within ±.007" or ±.016cm per revolution. Solid construction and heavy duty bearings make this encoder a great choice for long-term operation in continuous duty applications.

- High-Definition blue-light phased array technology
- Compensated blue-light source
- Wide operating voltage 4.5Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk
- IP65 environmental seal
- Integrated mounting arm
- Precision measuring wheel

DIMENSIONS

(Shown with 16mm Din connector)



SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:
Radial - 50 lbs. for life of 4.1 x 109 revolutions
Axial - 50 lbs. for life of 4.1 x 109 revolutions
Note: A flexible shaft coupling is recommended to increase bearing life.
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 10 oz. (285 grams)
Sealing: P65

Electrical Connections

Single Ended Outputs:

16mm Din 6-pin	M12 4-pin	Function	Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

16mm Din 8-Pin	Function	Color
1	Output A	White
2	Output B	Green
3	Output Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output $\overline{A}$	Blue or Green
7	Output $\overline{B}$	Brown
8	Output $\overline{Z}$	Orange

8-pin connector is Amphenol T3506000 or equivalent

Electrical

Supply Voltages: 4.5 Vdc to 30 Vdc
(6.0 Vdc to 30 Vdc for RS422 differential line driver)
Current: 65 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 70° C
Pulse Symmetry: 180°±36° @ maxRPM
Quadrature Phase Error: 90°±36° @ maxRPM
Phase jitter: 27°
Maximum Frequency: up to 1.4 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
Two channel quadrature square waves (A,B)
• optional index (Z).
• optional complimentary outputs (-A,-B,-Z).
Note: Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Counts per Revolution: (specify when ordering)
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000
Output Circuit: (specify when ordering)
Single Ended:
• 7273 open collector
(30 Vdc max, 50 mA max)
• 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
• 7272 differential line driver
(output level same as supply voltage)
• RS422 differential line driver
(5 Vdc output level)
Connections: (specify when ordering)
• Attached 10ft cable
• 16mm 6/8-pin Din connector
• M12 4-pin connector

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

Build Encoder

RB22	Output Type	–	CPR	Output Circuit	Connector	Measuring Wheel

RB22 ____ – ____ ____ ____ ____

Output Type:
blank = single pulse A output,
Q = quad. outputs on A & B
QZ = quad. outputs on A & B with Z outputs

Counts Per Revolution:
Choose one number:
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

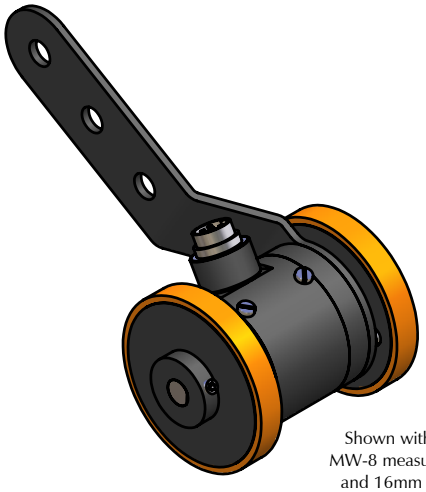
Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
DH = Differential line driver - output level same as input level
DL = RS422 line driver with 5vdc output level

Cable/Connector:
blank = attached 10ft. shielded cable
S = 16mm 6/8-pin Din connector
S3 = 4-pin M12 connector

Measuring Wheel:
MW8 = 8" circumference
MW10 = 10" circumference
MW1 = 12" circumference
MW1R = 12" circumference with replaceable o-ring
MW1W = 12" circumference
MW20 = 20cm circumference
MW30 = 30cm circumference
MW30R = 30cm circumference with replaceable o-ring
MW30W = 30cm circumference 25mm wide

Example: **RB22Q-10240DHS MW10** - quadrature outputs, 1024 cpr, differential line driver output, 16mm connector (8-pin), 10" measuring wheel

MODEL R22 — Series 20 Wheeled Encoder



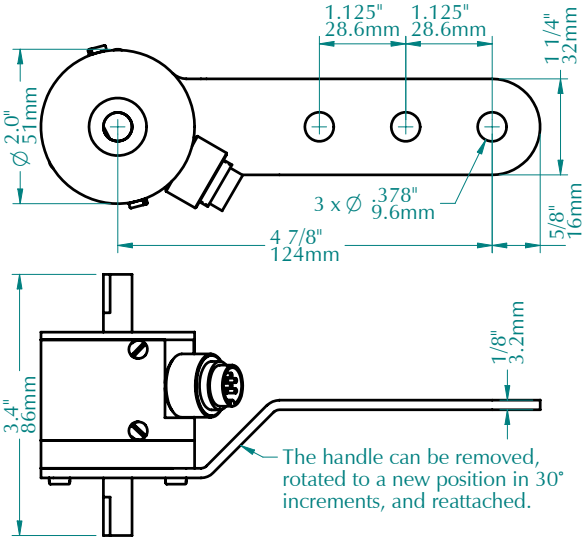
Shown with optional MW-8 measuring wheels and 16mm connector

FEATURES

- **Generates pulses for accurate linear measurement**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" or 20cm circumference measuring wheels**
- **16mm or M12 connector, or attached cable**
- **"Anti-Jitter" and other material handling features**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**
- **Programmable model available - see Model R22-P**
- **Single wheel version - see Model R21**

DIMENSIONS

(shown with optional 16mm connector)



SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials:
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. (340 grams)
Protection: IP50 (IP64 is available)

Electrical Connections

Single Ended Outputs:

Optional 6-pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
3	-	Output Z	Brown
4	4	Output A	White
5	2	Output B	Green
6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin Connector	Function	Wire Color
1	Output +A	White
2	Output +B	Green
3	Output +Z	Yellow
4	Supply voltage	Red
5	Common	Black
6	Output -A	Blue or Green
7	Output -B	Brown
8	Output -Z	Orange

8-pin connector is Amphenol T3506000 or equivalent

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: (specify when ordering)
1 to 1200 *(call for values up to 4800)*
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage level.
Single Ended:
— 7273 open collector (30 VDC max, 50 mA max)
— 7272 Push-Pull (50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver (also with optional 5vdc output level)
Output Waveshape:
Square wave outputs A and B are 50/50 duty cycle nominal. Output Z (index output) is approximately the width of one cycle on outputs A or B. Output A leads B by 90° for clockwise rotation viewed from end by handle.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Anti-jitter: (single output models only)
Increases the pulse hysteresis to ½ of a pulse width, eliminating the effects of mechanical vibration and possible false output pulses. For example a 10 pulse per revolution output has 18° hysteresis (i.e. 360° ÷ 10 × ½).

Accessories

See our website or contact us for more information about cables, measuring wheels, and mounting hardware.

MODEL NUMBER

R22			–			/					
Model Number	**Output Type:** leave blank for single output on A, **Q**=quadrature outputs on A and B	**Index Output:** leave blank for no index, **Z**=index output		**Pulses Per Revolution:** a number from 1 to 1200 *(call for information about higher values)*	**Anti-jitter option:** leave blank for no anti-jitter, **AJ**=anti-jitter option (single output models only)		**Supply Voltage:** **5** or **8-30**	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **D**=7272 line driver, **DL**=7272 line driver with 5vdc output level	**Cable/Connector:** leave blank for attached cable, **S** =16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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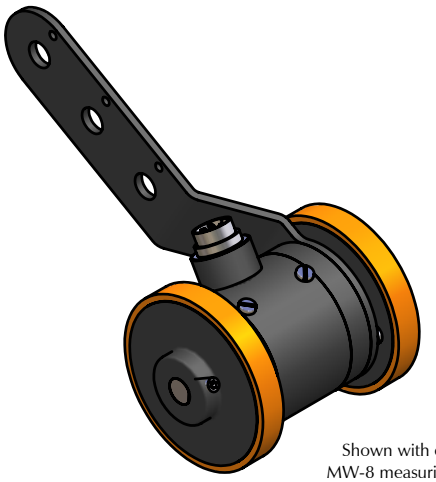
MODEL R22-P8EAJ — Programmable Wheeled Encoder



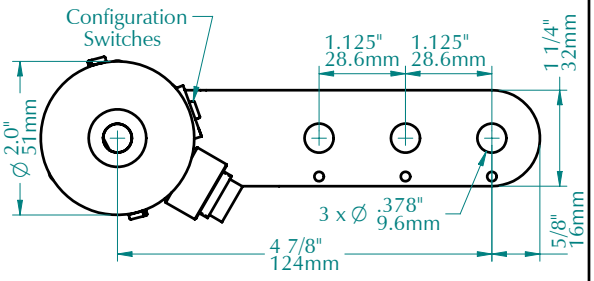
Shown with optional MW-8 measuring wheels and 16mm connector

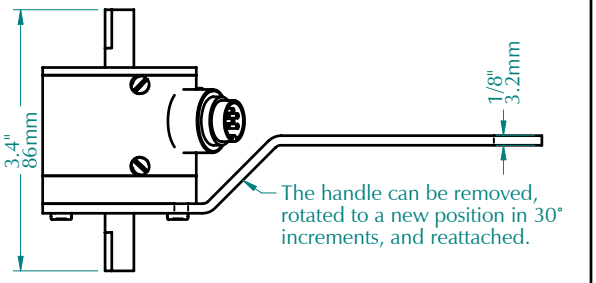
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable resolution: Pulses/Foot and Pulses/Inch**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" circumference measuring wheels**
- **16mm or M12 connector, or attached cable**
- **Enhanced "Anti-Jitter" feature for web applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**
- **Metric version available**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 3,000 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Switch cover: ABS
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. / 340 grams (without accessories)
Protection: IP50 is standard, IP66 available

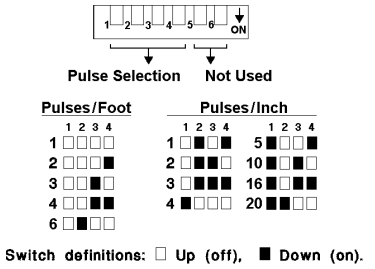
Electrical Connections

	Connectors			
Function	16mm 6-Pin	16mm 8-Pin	M12 4-Pin	Wire Color
Common	1	5	3	Black
+vdc	2	4	1	Red
Output A	4	1	4	White
Output -A	-	6	2	Green

Unlisted pins are not used.
16mm 6-pin is Amphenol T3402000 or equivalent, for Single Ended outputs.
16mm 8-pin is Amphenol T3506000 or equivalent, for Differential Line Driver.
M12 4-pin is Turck FS4.4/.. or equivalent for either Single or Differential Outputs.
Attached cable is 10-ft / 3-meters. Other lengths are available.

Configuration Switches

Selects the pulses per linear movement of the 8" circumference measuring wheel (MW-8).



Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: 2/3, 1-1/3, 2, 2-2/3, 4, 8, 16, 24, 32, 40, 80, 128, 160
Operating Temperature: -25° to +85° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector (30 VDC max, 50 mA max)
— 7272 Push-Pull (50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver (output level same as supply voltage)
— RS422 differential line driver (with regulated 5vdc output level)
Output Waveshape:
Square wave output A is 50/50 duty cycle nominal. Output -A is the compliment of A.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
Enhanced Anti-jitter: Developed for conveyor applications that typically operate in one direction, and do not want pulses generated if the conveyor stops or reverses for a short distance. Pulses are generated as long as rotation continues in one direction. If the direction reverses then pulse output ceases until it returns to its original direction and position it was at before reversing. If the reverse rotation exceeds 10 rotations then the encoder resets assuming the current direction is forward and begins pulsing.

Accessories

See our website or contact us for more information about cables, measuring wheels, and mounting hardware.

MODEL NUMBER

R22	—	P8EAJ	/					
Model Number		**Program Name:** Call or see our website for information about other programs.		**Supply Voltage:** 5 or 8-30	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S** =16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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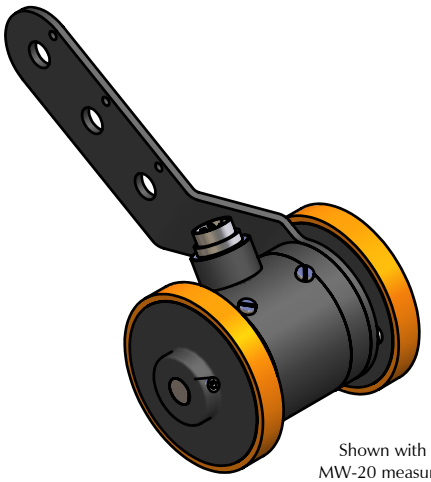
MODEL R22-P20EAJ — Programmable Wheeled Encoder



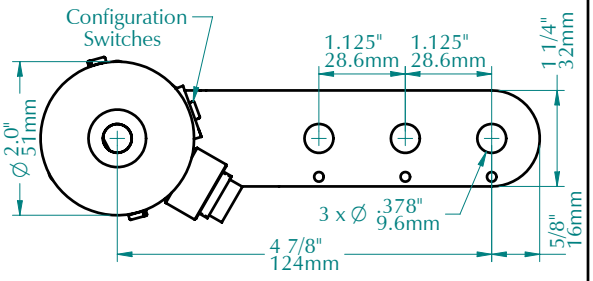
Shown with optional MW-20 measuring wheels and 16mm connector

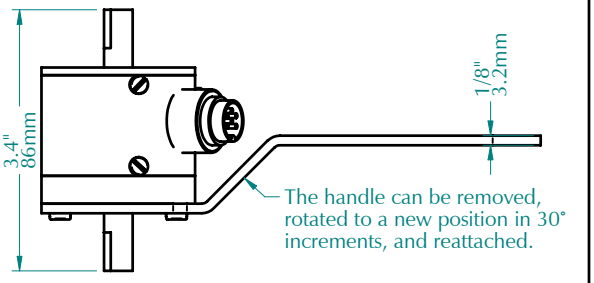
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable resolution: Millimeters per Pulse**
- **Heavy Duty construction**
- **Compact size**
- **Precision 20cm circumference measuring wheels**
- **16mm or M12 connector, or attached cable**
- **Enhanced "Anti-Jitter" feature for web applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**
- **Other programmable models are available**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Maximum Speed: 3,000 rpm
Shaft Loading:
— Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 32 x 1,000,000/rpm = hours
Materials: Switch cover: ABS
— Case: Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 12 oz. / 340 grams (without accessories)
Protection: IP50 is standard, IP66 available

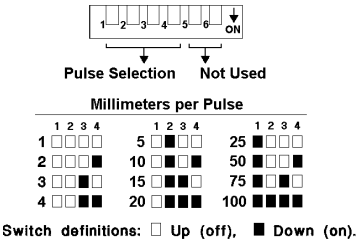
Electrical Connections

	Connectors			
Function	16mm 6-Pin	16mm 8-Pin	M12 4-Pin	Wire Color
Common	1	5	3	Black
+vdc	2	4	1	Red
Output A	4	1	4	White
Output -A	-	6	2	Green

Unlisted pins are not used.
16mm 6-pin is Amphenol T3402000 or equivalent, for Single Ended outputs.
16mm 8-pin is Amphenol T3506000 or equivalent, for Differential Line Driver.
M12 4-pin is Turck FS4.4/.. or equivalent for either Single or Differential Outputs.
Attached cable is 10-ft / 3-meters. Other lengths are available.

Configuration Switches

Determines the linear movement per output pulse when used with the 20 centimeter circumference measuring wheel (MW-20).



Electrical

Supply Voltages: (specify when ordering)
5 VDC or 8-30 VDC
Current: 50 mA max (no load)
100 mA max (line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: 2, 2-2/3, 4, 8, 10
13-1/3, 20, 40, 50, 66-2/3, 100, 200
Operating Temperature: -25° to +85° C
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver
(output level same as supply voltage)
— RS422 differential line driver
(with regulated 5vdc output level)
Output Waveshape:
Square wave output A is 50/50 duty cycle nominal. Output -A is the compliment of A.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
Enhanced Anti-jitter: Developed for conveyor applications that typically operate in one direction, and do not want pulses generated if the conveyor stops or reverses for a short distance. Pulses are generated as long as rotation continues in one direction. If the direction reverses then pulse output ceases until it returns to its original direction and position it was at before reversing. If the reverse rotation exceeds 10 rotations then the encoder resets assuming the current direction is forward and begins pulsing.

Accessories

See our website or contact us for more information about cables, measuring wheels, and mounting hardware.

MODEL NUMBER

R22	— P20EAJ	/					
Model Number	**Program Name:** Call or see our website for information about other programs.	**Supply Voltage:** 5 or 8-30	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S**=16mm connector, **S3** = M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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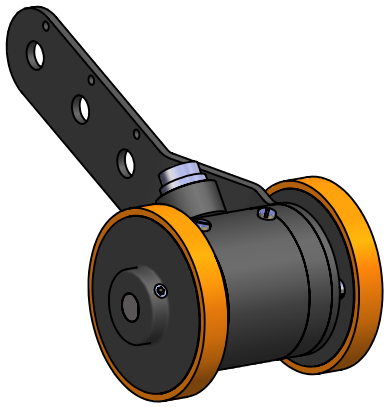
R22-P64AJ Programmable Wheeled Encoder



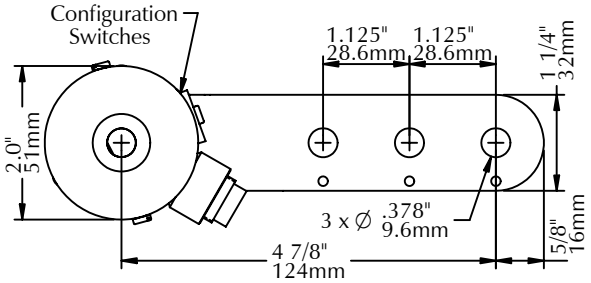
Shown with optional MW-8 measuring wheels and 16mm connector

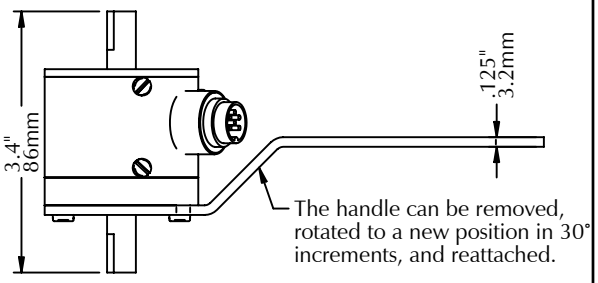
FEATURES

- **Generates pulses for accurate linear measurement**
- **Selectable pulses per revolution**
- **Heavy Duty construction**
- **Compact size**
- **Precision 8" or 20cm circumference measuring wheels**
- **16mm or M12 connector, or attached cable**
- **"Anti-Jitter" feature for conveyor applications**
- **ESD, Short Circuit, Reverse Voltage protection**
- **Various mounting hardware kits are available**

DIMENSIONS

(shown with optional 16mm connector)





SPECIFICATIONS

Mechanical

Shaft Loading:
- — Radial: 40 lbs. / 18.1 kg
- — Axial: 30 lbs. / 13.6 kg

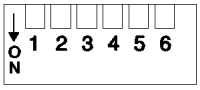
Bearing Life: 32 x 1,000,000/rpm = hours

Materials:
- — Case: Aluminum, anodized
- — Shaft: 303 Stainless steel
- — Switch access door: plastic

Weight: 10 oz. (285 grams)

Protection: IP50 is standard, IP66 available

Configuration Switches



Switch definitions:
- ☐ Up (off)
- ■ Down (on)

Pulses per Revolution Selection

	1 2 3 4 5 6		1 2 3 4 5 6		1 2 3 4 5 6
1	☐☐☐☐☐☐	22	☐■☐■■■	43	■☐■☐☐☐
2	☐☐☐☐☐■	23	☐■☐■■■	44	■☐■☐☐■
3	☐☐☐☐■☐	24	☐■☐■■■	45	■☐■☐■☐
4	☐☐☐☐■■	25	☐■■☐☐☐	46	■☐■☐■■
5	☐☐☐■☐☐	26	☐■■☐☐■	47	■☐■■☐☐
6	☐☐☐■☐■	27	☐■■☐■☐	48	■☐■■☐■
7	☐☐☐■■☐	28	☐■■☐■■	49	■☐■■■☐
8	☐☐☐■■■	29	☐■■■☐☐	50	■☐■■■■
9	☐☐■☐☐☐	30	☐■■■☐■	51	■■☐☐☐☐
10	☐☐■☐☐■	31	☐■■■■☐	52	■■☐☐☐■
11	☐☐■☐■☐	32	☐■■■■■	53	■■☐☐■☐
12	☐☐■☐■■	33	■☐☐☐☐☐	54	■■☐☐■■
13	☐☐■■☐☐	34	■☐☐☐☐■	55	■■☐■☐☐
14	☐☐■■☐■	35	■☐☐☐■☐	56	■■☐■☐■
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16	☐☐■■■■	37	■☐☐■☐☐	58	■■☐■■■
17	☐■☐☐☐☐	38	■☐☐■☐■	59	■■■☐☐☐
18	☐■☐☐☐■	39	■☐☐■■☐	60	■■■☐☐■
19	☐■☐☐■☐	40	■☐☐■■■	61	■■■☐■☐
20	☐■☐☐■■	41	■☐■☐☐☐	62	■■■☐■■
21	☐■☐■☐☐	42	■☐■☐☐■	63	■■■■☐☐
				64	■■■■■■

Electrical

Supply Voltages (+vdc): (specify when ordering)
5 ± 5% vdc or 8 to 30 vdc

Supply Current: 50 ma max (no load)
100 ma max (line driver)

Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage level

Single Ended:
- — 7273 open collector (30 VDC max, 50 mA max)
- — 7272 Push-Pull (50 mA max source or sink)

Differential Line Driver:
- — 7272 line driver, unregulated output
- — RS422 line driver with 5vdc output

Operating Temperature: -25° to +85° C

Maximum Operating Speed: 2,500 rpm

Outputs

Pulses per Revolution Output: Selectable by setting configuration switches 1 to 6. Output is "low" when initially powered.

Anti-Jitter feature: details on our website

Electrical Connections

Single Ended Outputs:

Optional Connectors 6-Pin	M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
4	4	Output A	White
3, 5, 6	2	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional Connectors 8-Pin	M12 4-pin	Function	Wire Color
1	4	Output +A	White
4	1	+vdc	Red
5	3	Common	Black
6	2	Output -A	Green
2, 3, 7, 8	-	not used	-

8-pin connector is Amphenol T3506000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

MODEL NUMBER

R22	—	P64AJ	/					
Model Number		**Program Name** Call or see our website for information about other available programs for this encoder model.		**Supply Voltage:** **5**=5vdc, **8-30**=8-30vdc	**Output Circuit:** leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver	**Cable/Connector:** leave blank for attached cable, **S**=6 or 8 pin 16mm, **S3**=M12 connector	**Modification Number:** optional modification or special feature ID. Call or see our website.	**Accessories:** optional accessories (call or see our website).

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PHOTOCRAFT Encoders
PO Box 25135 813-886-4000
Tampa FL 33622-5135, USA 800-237-0946

R22-P240AJB Programmable Wheeled Encoder

DESCRIPTION

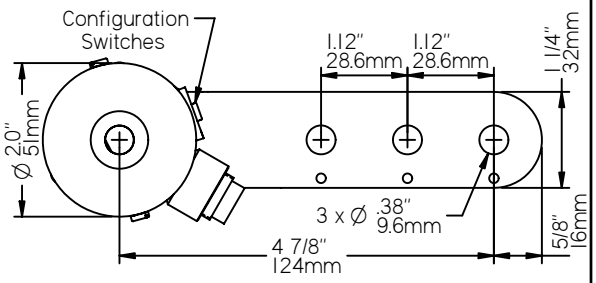
The R22-P240AJB wheeled encoder converts shaft rotation into square wave output pulses to provide an accurate and reliable means of digitizing position, rate, or length of travel. Pulses per each revolution of the shaft, determined by setting configuration switches, are on Output A. Output B is a direction output indicating the shaft rotation direction, clockwise (CW) or counter-clockwise (CCW), as viewed from the shaft end where the handle is attached. Various measuring wheels are available for converting shaft rotation into linear measurement of inches or centimeters of travel. For conveyor applications, accessories are available for mounting either above or below the conveyor belt or roller.

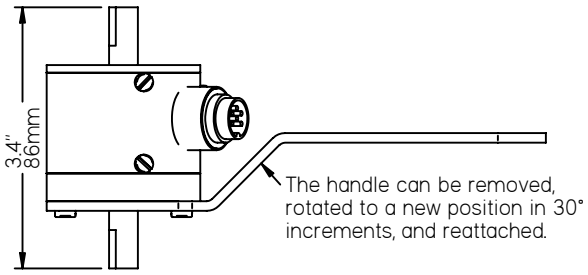
FEATURES

- **Selectable Pulses/Revolution (up to 240 ppr)**
- **Programmable Direction Output**
- **Precision 8", 12", 20cm, or 30cm circumference measuring wheels**
- **16mm or M12 connector, or attached cable**
- **Double ended shaft for well balanced operation**
- **ESD / Short Circuit / Reverse Voltage Protected**
- **Exclusive "Anti-Jitter" Circuit for Conveyor Applications**
- **CE marked and RoHS compliant**

DIMENSIONS

(shown with optional 16mm connector)



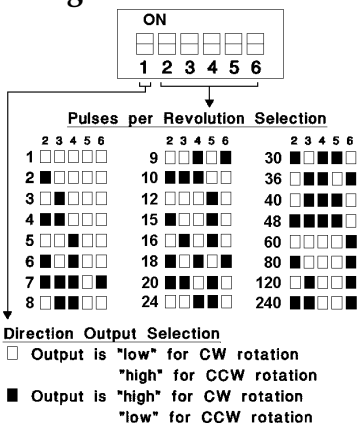


SPECIFICATIONS

Mechanical

Shaft Loading: — Radial: 40 lbs. / 18.1 kg
— Axial: 30 lbs. / 13.6 kg
Bearing Life: 44 x 1,000,000/rpm = hours
Materials: — Case: Aluminum, anodized
— Shaft: 303 Stainless steel
— Switch access door: plastic
Weight: 12 oz. (340 grams)
Protection: IP50 is standard, IP66 available

Configuration Switches



Outputs

Pulses per Revolution Output(A): Selectable by setting configuration switches 2 to 6. Output is "low" when initially powered.
Anti-Jitter feature: Increases pulse output hysteresis to ½ of a pulse width eliminating the effects of mechanical vibration and the possible dither that results in false output pulses.
Direction Output(B): Indicates direction of rotation updated each 1/240th/revolution. Switch 1 setting determines polarity.

Electrical

Supply Voltages (+vdc): (specify when ordering)
5 ± 5% vdc or 8 to 30 vdc
Supply Current: 50 ma max (no load)
100 ma max (line driver)
Output Circuit: (specify when ordering)
Single Ended:
— 7273 open collector
(30 VDC max, 50 mA max)
— 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
— 7272 differential line driver
(output level same as supply voltage)
— RS422 differential line driver
(with regulated 5vdc output level)
Operating Temperature: 0° to 70° C
Maximum Operating Speed: 2,500 rpm

Electrical Connections

Single Ended Outputs:

Optional 6-Pin	Optional M12 4-pin	Function	Wire Color
1	3	Common	Black
2	1	+vdc	Red
4	4	Output A	White
5	2	Output B	Green
3, 6	-	not used	-

6-pin connector is Amphenol T3402000 or equivalent
M12 4-pin is Turck FS4.4/18.25 or equivalent

Differential Line Driver Outputs:

Optional 8-Pin*	Function	Wire Color
1	Output +A	White
2	Output +B	Green
4	+vdc	Red
5	Common	Black
6	Output -A	Blue
7	Output -B	Brown
3, 8	not used	-

* connector is Amphenol T3506000 or equivalent

MODEL NUMBER

R22 — **P240AJB** /

Model Number

Program Name
Call or see our website for information about other available programs for this encoder model.

Supply Voltage: **5**=5vdc, **8-30**=8-30vdc

Output Circuit: leave blank for 7272 Push/Pull, **C**=7273 open collector, **DH**=7272 line driver, **DL**=RS422 line driver

Cable/Connector: leave blank for attached 10' (3meter) cable, **S**=6 or 8 pin connector, **S3**=M12 4-pin connector

Modification Number: optional modification or special feature ID. Call or see our website.

Accessories: leave blank for no accessories. Call or see our website for more information.

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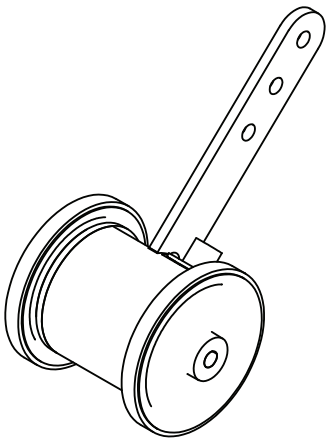
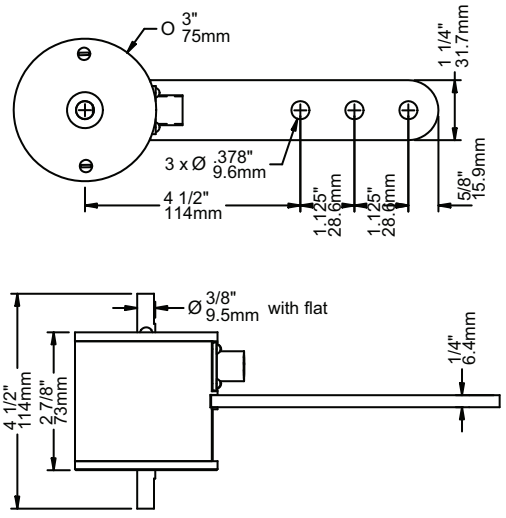
MODEL RBH BlueCoder High Resolution Encoder



The BlueCoder model RBH is an optical incremental encoder that use the benefits of blue LED light. It is housed in a 3" diameter x 2-3/8 long ultra rugged enclosure with an integral mounting arm, compatible with a variety of mounting accessories for installation either above or below a moving web or conveyor. When used with the MW-1 (12.00" circumference) or MW-30 (30.00cm circumference) measuring wheel it can accurately track the web or conveyor to within ±.007" or ±.016cm per revolution. Solid construction and heavy duty bearings make this encoder a great choice for long-term operation in continuous duty applications.

- Heavy duty bearings
- High-Definition blue-light phased array technology
- Compensated blue-light source
- Wide operating voltage 4.5Vdc - 30Vdc
- High resolution up 10,000 CPR
- Unbreakable code disk
- IP50 environmental seal

DIMENSIONS



SPECIFICATIONS

Mechanical

Maximum Speed: 6,000 rpm
Shaft Loading:
Radial - 25 lbs. / 11.3 kg
Axial - : 10 lbs. / 4.5 kg
Note: A flexible shaft coupling is recommended to increase bearing life.
Bearing Life: 70 x 1,000,000/rpm = hours
Materials: Case - Aluminum, anodized
Shaft - 303 Stainless steel
Weight: 1.34 lbs. / .6 kg
Sealing: IP50

Electrical Connections

Single Ended Outputs:

Connector 3-pin	6-pin	4-pin	Function	Wire Color
C	A/1	3	Common	Black
A	B/2	1	+vdc	Red
--	C/3	--	Output Z	Brown/Green
B	D/4	4	Output A	White
--	E/5	2	Output B	Green
--	F/6	--	no connection	

3-pin is C-5015 style 97-3102A-10SL-3P or equivalent
6-pin is C-5015 style 97-3102A-14S-6P or equivalent; or
16mm Amphenol T3402000 or equivalent
4-pin is 12mm Turck FS4.4/14.5 or equivalent

Differential Line Driver Outputs:

Connector 6-pin	8-pin	10-pin	Function	Wire Color
A	5	F	Common	Black
B	4	D	+vdc	Red
C	1	A	Output A	White
D	6	H	Output $\overline{A}$	Blue/Green
E	2	B	Output B	Green
F	7	I	Output $\overline{B}$	Brown
--	3	C	Output Z	Yellow/Green
--	8	J	Output $\overline{Z}$	Orange/Brown
--	--	G	Case Gnd	Purple

6-pin is C-5015 style 97-3102A-14S-6P or equivalent
8-pin is 16mm Amphenol T3506000 or equivalent
10-pin is C-5015 style 97-3102E-18-1P or equivalent
see M226 modification drawing for additional details

Electrical

Supply Voltages: 4.5 Vdc to 30 Vdc
(6.0 Vdc to 30 Vdc for RS422 differential line driver)
Current: 65 mA max exclusive of load
Short circuit and ESD protected
Operating Temperature: 0° to 70° C
Pulse Symmetry: 180°±36° @ maxRPM
Quadrature Phase Error: 90°±36° @ maxRPM
Phase jitter: 27°
Maximum Frequency: up to 1.4 Mhz
Noise Immunity: Tested to EN61000-6-2
Output Type: (specify when ordering)
Two channel quadrature square waves (A,B)
• optional index (Z).
• optional complimentary outputs (-A,-B,-Z).
Note: Output A leads B by 90° for clockwise rotation when viewed from shaft end.
Counts per Revolution: (specify when ordering)
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000
Output Circuit: (specify when ordering)
Single Ended:
• 7273 open collector
(30 Vdc max, 50 mA max)
• 7272 Push-Pull
(50 mA max source or sink)
Differential Line Driver:
• 7272 differential line driver
(output level same as supply voltage)
• RS422 differential line driver
(5 Vdc output level)
Connection:
Standard - MS style 3-pin or 6-pin connector
M131 Modification - 12mm 4-pin connector
M198 Modification - 16mm 6-pin or 8-pin connector
M226 Modification - MS style 10-pin connector

Accessories

See our website or contact us for more information about cables, flexible couplings, and measuring wheels.

MODEL NUMBER

Build Encoder

RBH	Output Type	–	CPR	Output Circuit		Modifcation Number		Measuring Wheel

RBH –

Output Type:
blank = single pulse A output,
Q = quad. outputs on A & B
QZ = quad. outputs on A & B with Z outputs

Counts Per Revolution:
Choose one number:
360, 720, 1000, 1024, 1200, 1250, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 4800, 5000, 6000, 7200, 8000, 8192, 10000

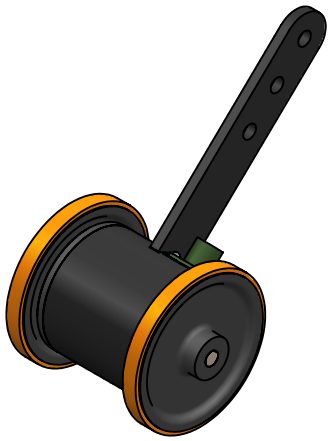
Output Circuit:
blank = 7272 push/pull
C = NPN open collector open circuit
DH = Differential line driver - output level same as input level
DL = RS422 line driver with 5vdc output level

Modification Number:
Standard = MS style 3-pin or 6-pin connector
M131 = 12mm 4-pin connector
M198 = 16mm 6-pin or 8-pin connector
M226 = MS style 10-pin connector

Measuring Wheel:
MW1 = 12" circumference
MW1R = 12" circumference with replaceable o-ring
MW1W = 12" circumference
MW30 = 30cm circumference
MW30R = 30cm circumference with replaceable o-ring
MW30W= 30cm circumference 25mm wide

Example: **RBHQ-10240DH MW10** - quadrature outputs, 1024 cpr, differential line driver output, 10" measuring wheel

MODEL RH — Series 30 Wheeled Encoder



Shown with optional MW-1 measuring wheels

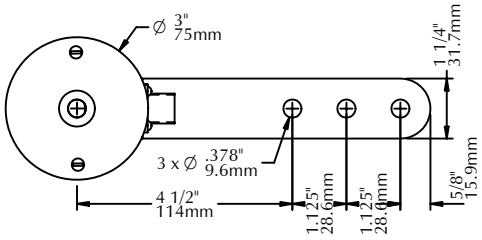
CE*

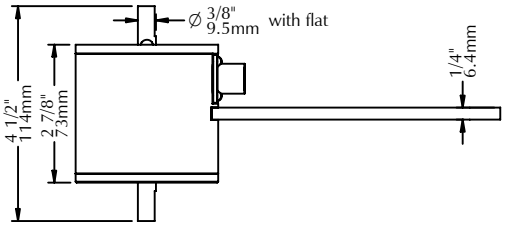
* CE requires Photocraft cable, and enhanced surge protection option if cable exceeds 100' (30m) or leaves the building.

FEATURES

- **Generates pulses for accurate linear measurement**
- **Tracks conveyor movement independent of conveyor roller diameters**
- **Heavy duty construction**
- **Precision 12" or 30cm circumference measuring wheels**
- **Programmable model available - see Model RH-P**
- **Exclusive "Anti-Jitter" circuit for conveyor applications**
- **Single (A), quadrature (A, B), and index (Z) outputs**
- **Short circuit, ESD, reverse voltage protection**
- **Various mounting hardware kits are available**
- **See the model R22 for a smaller wheeled encoder**

DIMENSIONS





SPECIFICATIONS

Mechanical

Maximum speed: 6,000 rpm
Shaft Loading:
— Radial: 25 lbs. / 11.3 kg
— Axial: 10 lbs. / 4.5 kg
Bearing Life: 70 x 1,000,000/rpm = hours
Materials:
— Case: ¼" Aluminum, anodized
— Shaft: 303 Stainless steel
Weight: 1.34 lbs. / .6 kg

Electrical Connections

Single Ended Outputs:

--- Connectors --- 3-pin	6-pin	4-pin	Function	Wire Color
C	A/1	3	Common	Black
A	B/2	1	+vdc	Red
--	C/3	--	Output Z	Brown or Green
B	D/4	4	Output A	White
--	E/5	2	Output B	Green
--	F/6	--	no connection	

3-pin is C-5015 style 97-3102A-10SL-3P or equivalent
6-pin is C-5015 style 97-3102A-14S-6P or equivalent; or 16mm Amphenol T3402000 or equivalent
4-pin is 12mm Turck FS4.4/14.5 or equivalent

Differential Line Driver Outputs:

--- Connectors --- 6-pin	8-pin	10-pin	Function	Wire Color
A	5	F	Common	Black
B	4	D	+vdc	Red
C	1	A	Output +A	White
D	6	H	Output -A	Blue or Green
E	2	B	Output +B	Green
F	7	I	Output -B	Brown
--	3	C	Output +Z	Yellow or Green
--	8	J	Output -Z	Orange or Brown
--	--	G	Case Gnd	Purple

6-pin is C-5015 style 97-3102A-14S-6P or equivalent
8-pin is 16mm Amphenol T3506000 or equivalent
10-pin is C-5015 style 97-3102E-18-1P or equivalent
see M226 modification drawing for additional details.

Standard cable length is 10 ft / 3 meters.
Other lengths are available.

Electrical

DC Supply Voltages: (specify when ordering)
— **5** ± 5%, **5-26** vdc, or **8-30** vdc
Other supported voltages:
— **12**, **15**, or **24** ± 10% vdc
— **5R** to indicate 7 to 12 vdc
— **12R** to indicate 12 to 27 vdc
Current: 50 ma max (no load)
100 ma max (differential line driver)
Pulse Rate: 0 - 30 kHz
Pulses per Revolution: (specify when ordering)
— 1 to 1200
— 1 to 2400 (single output only)
Operating Temperature: 0° to 70° C
Output Circuit: (specify when ordering)
Output voltage level is approximately the same as the input voltage (unless specified)
Single Ended: 50ma max current
— Current sinking NPN with pull-up
— NPN open collector (30 vdc max)
— Current sourcing PNP with pull-down
— Push/pull
Differential Line Driver:
— 7272 line driver
— RS422 - 5vdc output voltage level
(requires 5 or 8-30 supply voltage)
Output Waveshape: Square wave; outputs A and B are 50/50 duty cycle nominal; output Z (index output) is approximately the width of one cycle on output A or B. Output A leads B by 90° for clockwise rotation viewed from shaft end farthest from the connector.
— Pulse symmetry: 180°±30%
— Pulse interval jitter: 30% max
— Quadrature: 90°±30% max
— Phase jitter: 30% max
Anti-jitter: Increases pulse hysteresis to ½ of a pulse width, eliminating the dither caused by excess mechanical vibration and the resulting false output pulses. Call for details.

MODEL NUMBER

RH — /

Model Number

Output Type: leave blank for single output on A, **Q**=quadrature outputs on A and B

Index Output: leave blank for no index, **Z**=index output

Pulses Per Revolution: a number from 1 to 2400, enter dual and triple output values separated by "/"

Anti-jitter option: leave blank for no anti-jitter, **AJ**=anti-jitter option (A-only output models)

Supply Voltage: 5, **5-26**, or **8-30** also available: 12, 15, 24, 5R, 12R

Output Circuit: leave blank for NPN, **P**=PNP, **NP**=Push/Pull, **C**=NPN open collector, **DL**=RS422 line driver, **DH**=7272 line driver

Surge Protection: leave blank for standard protection, **G**=enhanced protection*

Modification Number: 3 or 6 pin C-5015 style connector is standard (3-pin for A-only output).
M131 = 4-pin 12mm connector
M198 = 6 or 8 pin 16mm connector
M226 = 10-pin C-5015 connector
Call or see our website for other modifications.

Accessories: leave blank for no accessories. Call or see our website for more information.

MATERIAL HANDLING AND INDUSTRIAL EXPERIENCE SINCE 1974

PHOTOCRAFT INC

602 E. North Street
Elburn, IL 60119, USA

630-365-7148
Fax: 630-365-7149

www.photocraftencoders.com

SPECIFICATIONS

Electrical

Power Input (specify voltage when ordering):

Supply Voltage	R Values (see fig. 1)
5 ± 5% vdc	1K ohms
8 to 30 vdc	3.3K ohms

Supply Current: 50ma maximum (no load)

Output Current (I_O): 50ma max source/sink

Output Circuits: (see figure 1)
- — Push/Pull (Combined sourcing/sinking)
- — Current sinking NPN transistor
- — Open collector (V_{CC}=30 vdc max)
- — Curent sourcing PNP transistor

All are switch selectable for single output model; factory configured for 2 or 3 outputs

Output Waveform: 50/50 squarewave
- — **Pulse On-Off Ratio:** 50% ± 10%
- — **Pulse Interval Jitter:** ±10%
- — **Quadrature Deviation:** 30° (max)
- — **Pulse rise time:** 2 µsec (max)
- — **Pulse fall time:** 5 µsec (max)
- — **Voltage (high):** V_{in}-2.5 vdc (min)
- — **Voltage (low):** 1.5 vdc (max)
- — **Index Pulse:** approximately the width of 1 pulse on output A

(600 rpm, V_{IN}=24vdc, 10ma<I_O<50ma, 25°C)

Operating temperature: 0° to 70° C

Pulse Rate: 0 - 30 kHz

Output Protection:
- — **Short Circuit**
- — **ESD** to 8KV direct and 25KV air

RoHS Compliance available on most models.

Electrical Connections

Connector Pin 1 output	Connector Pin 2 or 3	Function	Wire Color
C	A	Common	Black
A	B	+vdc	Red
—	C	Output C or Z	Brown*
B	D	Output A	White
—	E	Output B	Green
—	F	no connection	—
—	—	Case ground	Shield

** Green if output B is not used.*

Connector:
- — Single output (3 pin connector): 97-3102A10SL-3P
- — 2 or 3 outputs (6 pin connector): 97-3102A14S-6P

Mechanical

Weight: 1.4 lb. (635 grams)

Shaft Loading: Radial: 25 lb. (11.3 kg.) max.
Axial: 10 lb. (6.8 kg.) max.

Bearing Life (L_{10}): 70 x 10^6/RPM = hours

Materials:
- — Case: 1/4" Aluminum, anodized
- — Shaft: 303 Stainless steel

Programs

The RH-P is preconfigured with one of the following programs. Others are available.

144AJ - One anti-jitter pulse output on A with selectable ppr (1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 144).

240AJ - One anti-jitter pulse output on A with selectable ppr (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 18, 20, 24, 30, 36, 40, 48, 60, 80, 120, 240).

300AJQ - Quadrature anti-jitter pulse outputs on A and B with selectable ppr (60, 75, 100, 120, 150, 300).

Accessories

Measuring Wheels: Cast aluminum with 3/8" (10mm) wide urethane tire having a high coefficient of friction.

Part number	Circumference
MW-1-B	12.00 ± .01 inch
MW-30-B	30.00 ± .025 cm.

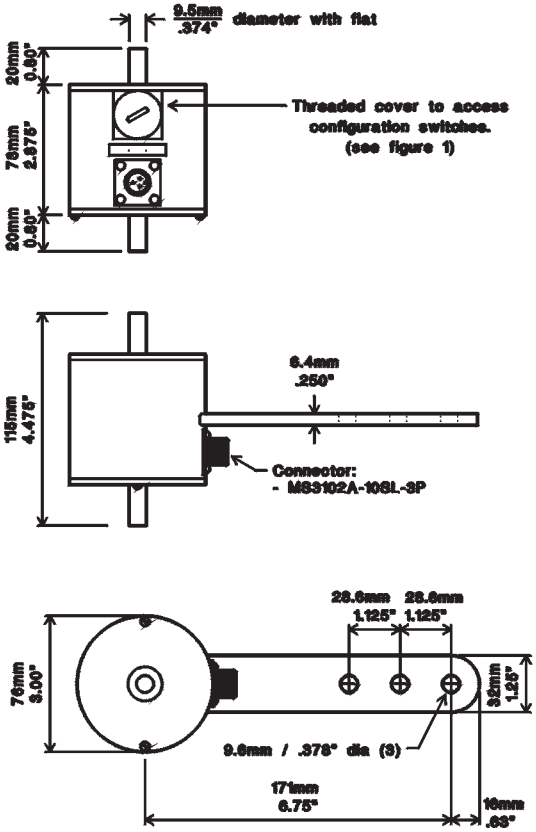
Yoke Assembly (Y-1): Yoke, clevis pin and 1/4-28 mounting screw. Allows the encoder to pivot freely when fastened to a rigid cross member for mounting above the moving material

Underbelt Mounting (MB-UB1): Call for information.

Cable Assemblies:
- — C3-3-10: (for 1 output) 10 ft. (3m) shielded cable with 97-3106A10SL-3S connector.
- — C6-x-10: (for 2 or 3 outputs) 10 ft. (3m) shielded cable with 97-3106A14S-6S connector (x is number of conductors).

1. Other lengths are available.
*2. **CE** marking requires Photocraft cable, and surge protection option if the cable exceeds 100' (30m) or leaves the building.*

DIMENSIONS



ORDERING INFORMATION

Single Output

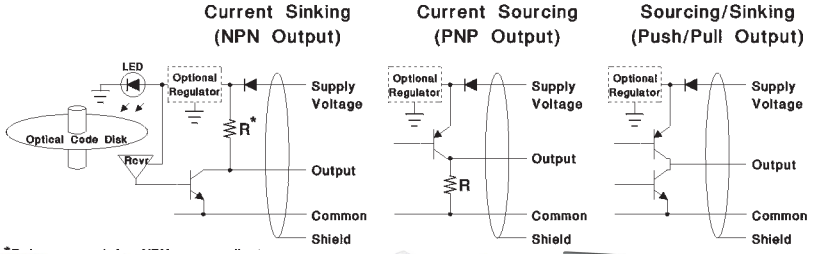
RH - P ___ / ___ ___

- RH - P: Model / Program name
- ___: Supply voltage: 5 or 8-30
- ___: RC = RoHS compliant

2 or 3 Outputs

RH - P ___ / ___ ___ ___

- RH - P: Model / Program name
- ___: Supply voltage: 5 or 8-30
- ___: Output Circuit: Push/Pull is standard; C = NPN open collector
- ___: RC = RoHS compliant

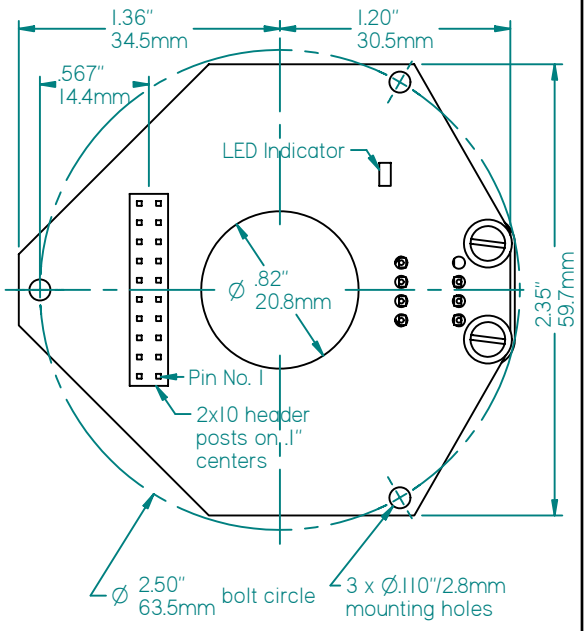


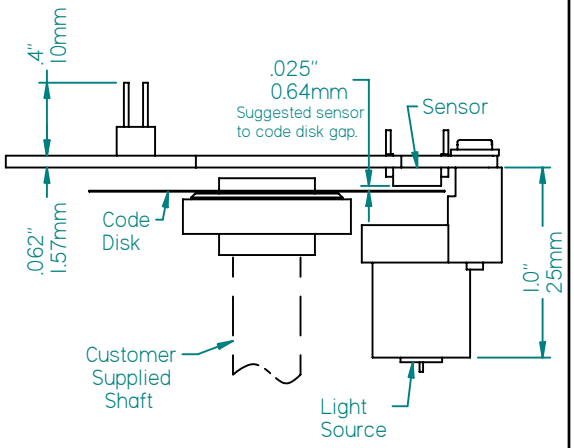
MODEL MR30 — Modular Absolute Encoder

FEATURES

- 8, 9, 10, or 11 bit resolution
- Up to 2048 positions/revolution, single turn
- Parallel Outputs
- Digital Output: Natural Binary or Gray Code
- Supply: 5 vdc
- Fits 1/4", 5/16", 3/8", 8mm, or 10mm Shaft Diameters
- ESD Protected
- Optional mounting base and cover
- Custom Models Available

DIMENSIONS





SPECIFICATIONS

Output Configuration

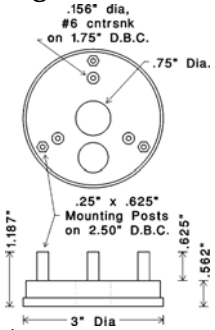
Circuit Bd. Pin No.‡	DB25P Pin No.‡	Function
1	1	2^9
3	2	2^8
5	3	2^7
7	4	2^6
9	5	2^5
11	6	2^4
13	7	2^3
15	8	2^2
17	9	2^1
19	10	2^0
2	14	2^{10}
4	15	†
6	16	†
8	17	†
10	18	†
12	19	DataReady
16	21	Common
18	22	Supply

‡ Unlisted pins have no connection.
† Unused pins have undefined outputs and are reserved for future use.

Optional Mounting Base

Materials: Aluminum, Brass posts.

Mounting: Circuit board attaches to the 3 mounting posts using the 4-40 machine screws supplied.

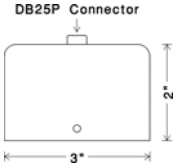


Optional Cover / Connector

Materials: Aluminum

Connector: DB25P

A circuit board to DB25P ribbon cable is supplied.



Electrical

Supply Voltages: 5 vdc ± 5%

Current: 15 ma max (no load)

Operating Temperature: -40° to 70° C

Output Codes: (specify when ordering)
- — Gray Code
- — Natural Binary

Interrogation Rate: The rate at which the code disk is sampled. Regardless of the rotational speed, this determines the maximum rate the outputs change.
- — Model MR30: 1KHz
- — Model MR31: 3KHz

Resolution: (specify when ordering)
- — 256, 512, 1024, or 2048

Accuracy: ± 1/2 bit

Rotation: Counts increase with clockwise rotation as viewed from sensor side of circuit board.

Digital Output Logic Levels:
- — Logic 0: low voltage (.6 volts max.)
- — Logic 1: high (Supply - .7 volts min.)

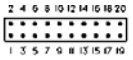
DataReady Output: Normally high, goes low momentarily (7 µsec minimum) while the outputs are changing. Stays low to indicate an error condition.

Output Circuits: Totem-pole output
- — 5 ma. max source and
- — 6 ma. max sink current

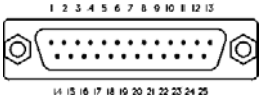
LED Indicator:
- — "Off" when in the zero position.
- — "On" in all other positions.
- — When slowly rotating the disk (<½ rev/sec), blinking indicates an alignment error.

Connectors:

Circuit Board: 2x10 header posts on .1" centers



Optional Cover: 25-pin D-subminiature (DB25P)



MODEL NUMBER

Model Number: **MR30**=1KHz update rate **MR31**=3KHz update rate	**Shaft Diameter:** **A**=5/16", **B**=3/8", **C**=1/4", **M8**=8mm, **M10**=10mm	—	**Resolution:** 256, 512, 1024, or 2048	**Output Code:** **G**=Gray Code, **N**=Natural Binary	/	**Supply Voltage:** 5vdc	**Special Features:** Call or see our website for more information.	**Accessories/Options:** leave blank for no accessories. **MB**=mounting base, **MBC**=mounting base and cover with DB25P connector, **CBO**=circuit board only, **DO**=disk only
						5		

MATERIAL HANDLING AND INDUSTRIAL EXPERIENCE SINCE 1974

PHOTOCRAFT INC

602 E. North Street
Elburn, IL 60119, USA

630-365-7148
Fax: 630-365-7149

www.photocraftencoders.com

SPECIFICATIONS

Mechanical

Shaft: 3/8" or 1/2" dia. with flat

Weight: 19 oz. max
22 oz. max (sealed housing)

Maximum speed: 6,000 rpm

Shaft Loading:

Shaft Diameter	Radial Lbs (kg)	Axial Lbs (kg)	Factor (BL)
3/8"	25 (11.3)	15 (6.8)	36
1/2"	45 (20.4)	35 (15.9)	37

Bearing Life: BL x 1,000,000/rpm = hours
A flexible shaft coupling is recommended

Materials: Case: Aluminum, anodized
— Shaft: 303 Stainless steel

Construction: Standard is fully enclosed, dust-tight. Environmentally sealed construction is available.

Connector: Standard: DB25P (25 pin)
Optional: MS3102E20-29P (17 pin)
(standard with sealed housing)

Electrical

Power Input: 5 VDC ± 5% or 8-28 VDC

Current: 100 ma. max

Operating temperature:
— R30: 0° to 70°C
— SR30/ SR31: -40° to 70°C

Output codes: GC = Gray Code
NB = Natural Binary
Others are available.

Interrogation rate: The rate at which the code disk is sampled. Regardless of rotational speed, this determines the maximum rate the outputs change.

Model	Rate
R30 with GC	Continuous
R30 with NB	40K Hz
SR30	1K Hz
SR31	3K Hz

Counts per Revolution:

Resolution	R30	SR30/SR31
8-bit	256	256
9-bit	360,512	512
10-bit	1000,1024	1024

Logic: Positive logic is standard

Logic	"0" value	"1" value
Positive	0 vdc	Supply vdc
Negative	Supply vdc	0 vdc

DataReady Signal: Normally high, goes low momentarily (7 µsec) while the outputs are changing. Available on all models except R30 with GC output. Optional low data ready is available, and is required for PNP output.

Rotation: Counts increase with clockwise rotation as viewed from shaft end. Decreasing counts are available. Selectable direction is available.

Accuracy: ±1/2 bit

Output Circuit Ratings:

5 vdc R30 with GC output:
— NPN with 10K pull-up resistor (5 ma max sink current)

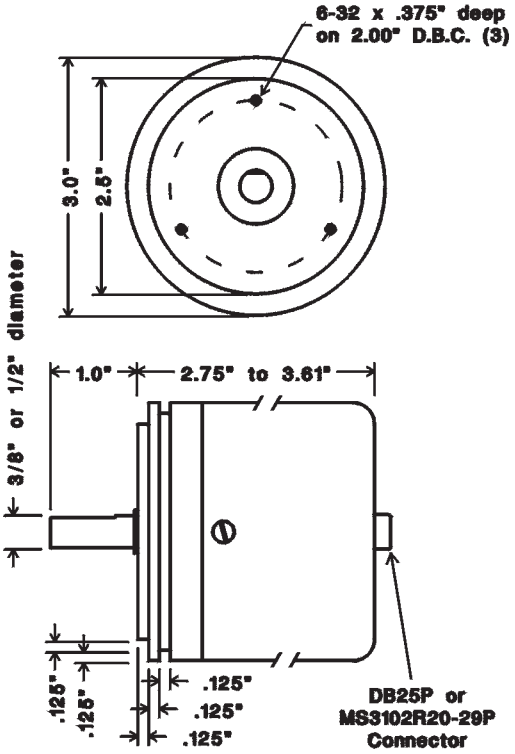
5 vdc R30 with NB, or any 5 vdc SR30:
— Totem-pole output (5 ma max source or sink current)

Any 8-28 vdc R30 or SR30 model, or optional with any 5 vdc model:
— NPN with 3.3K pull-up resistor (50 ma max sink current);
— NPN open collector (50 ma, 30 vdc max); or
— PNP with 3.3K pull-down resistor (50 ma max source current)

Electrical Connections

DB25 Pin No.	MS Pin No.	R30	SR30 SR31
1	M	2^9	2^9
2	L	2^8	2^8
3	K	2^7	2^7
4	J	2^6	2^6
5	H	2^5	2^5
6	G	2^4	2^4
7	F	2^3	2^3
8	E	2^2	2^2
9	D	2^1	2^1
10	C	2^0	2^0
14	N	–	–
15	S	–	–
16	P	–	–
19	R	DataReady	DataReady
21	A	Common	Common
22	B	Supply	Supply
–	T	Case Gnd	Case Gnd

DIMENSIONS



ORDERING INFORMATION

Model: R30, SR30, SR31

Shaft: 3/8" is standard .5 = 1/2"

Counts/Rev: 256, 360, 512, 1000, or 1024

G=Gray code
N=Natural binary

Counts increase with CW rotation.
D=Counts increase with CCW rotation.

Supply Voltage: 5 or 8-28 vdc

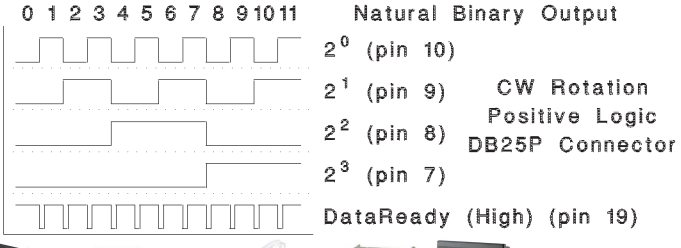
Positive Logic is standard
N=Negative Logic

High Data Ready is standard
L=Low Data Ready

Options:
MS=MS Connector
WP=Environmentally Sealed

Output:
5vdc supply:
5ma is standard
8-28vdc supply:
R is standard
R=50ma NPN
C=50ma NPN open collector
P=50ma PNP

Example Output:

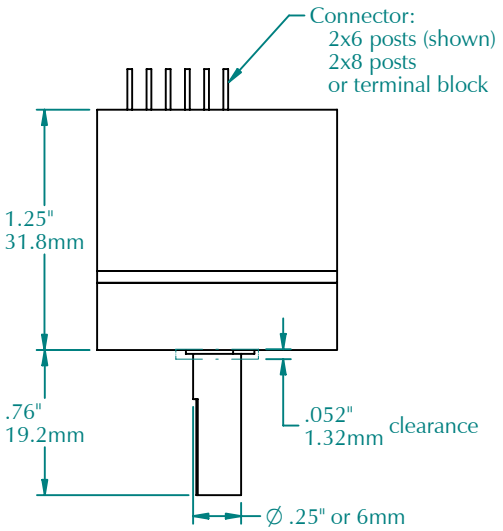


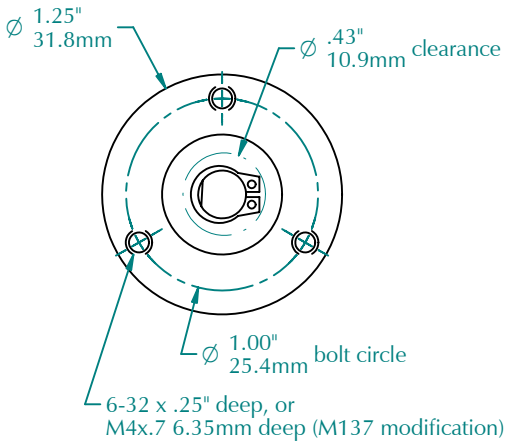
MODEL SR12 — Absolute Shaft Encoder

FEATURES

- 7, 8, 9, or 10 bit resolution
- Up to 1024 positions/revolution, single turn
- Parallel, Serial, or Analog Outputs
- Digital Output: Natural Binary or Gray Code
- Analog Output: 0-10 vdc or 4-20 ma
- Supply: 5 vdc (12-30 vdc for analog)
- 1/4" or 6mm Shaft Diameters
- ESD Protected
- Custom Models Available

DIMENSIONS

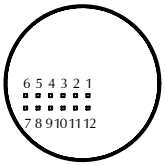




SPECIFICATIONS

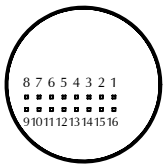
Output Configurations

Digital Parallel (7,8,9 bit): 2x6 posts with .1" spacing. 5vdc totem-pole outputs.



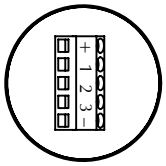
Pin	Function	Pin	Function
1	Supply	12	Common
2	2^3	11	2^4
3	2^2	10	2^5
4	2^1	9	2^6
5	2^0	8	2^7
6	DataReady	7	2^8

Digital Parallel (10 bit): 2x8 posts with .1" spacing. 5vdc totem-pole outputs.



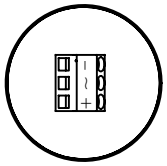
Pin	Function	Pin	Function
1	reserved	16	reserved
2	reserved	15	2^9
3	Supply	14	Common
4	2^3	13	2^4
5	2^2	12	2^5
6	2^1	11	2^6
7	2^0	10	2^7
8	DataReady	9	2^8

Digital Serial (SPI): 5 position terminal block. 5vdc totem-pole outputs.



Terminal	Function
+	5vdc supply
1	Slave Select
2	Clock Input
3	Data Output
–	Common

Analog: 3 position terminal block. 12-30vdc supply with 0-10vdc or 4-20ma output.



Terminal	Function
–	Common
~	analog output
+	12-30vdc supply

Electrical

Supply Voltages: (specify when ordering)
5 vdc ± 5%, or 12-30 vdc (analog only)
Current: 25 ma max (no load)
Operating Temperature: -40° to 70° C
Output Codes: Gray code, Natural binary, 0-10vdc analog, or 4-20ma analog
Interrogation Rate: 2KHz (minimum)
Note: The rate at which the code disk is sampled. Regardless of the rotational speed, this determines the maximum rate the outputs change. *Consult factory for details.*
Resolution: (specify when ordering)
128, 256, 512, 1024 positions/revolution
Accuracy: ± 1/2 bit digital, ±1 bit analog
Rotation: (specify when ordering)
Counts can increase with clockwise (CW) rotation as viewed from shaft end, or they can decrease clockwise.
Digital Output Logic Levels:
— Logic "0": low voltage (0.6 volts max.)
— Logic "1": high voltage (4.0 volts min.)
DataReady Output: Normally high, goes low while the outputs are changing (7 µsec). Stays low to indicate an error condition.
0-10vdc Analog Output Levels:
— Zero code error: 20mv
— Full-scale error: 125mv
— Relative accuracy: ± 10mv
Output Circuits:
— Totem-pole: 5 ma. max source and 6 ma. max sink current
— 0-10vdc voltage output
— 4-20ma current output

Mechanical

Bearings: ball bearings, shielded
Shaft Loading: 10 lb. (4.5 kg) axial and radial
Bearing Life: 52 x 1,000,000/rpm = hours
Weight: 1.75 oz. (50 gm)
Materials: Anodized aluminum housing, 303 stainless steel shaft, epoxy potting

MODEL NUMBER

SR12		–				/			
Model Number	**Shaft Diameter:** blank for 1/4", M6=6mm		**Resolution:** 128, 256, 512, or 1024	**Output Code:** A=0-10vdc, C=4-20ma, G=Gray Code, N=Natural Binary	**Rotation:** leave blank to increase CW, D=counts decrease for CW rotation.		**Supply Voltage:** 5 (digital output), or 12-30 (analog output)	**Special Features:** SPI=Serial Peripheral Interface M___=Modification Number Call or see our website for more information.	**Accessories:** leave blank for no accessories. Call or see our website for more information.

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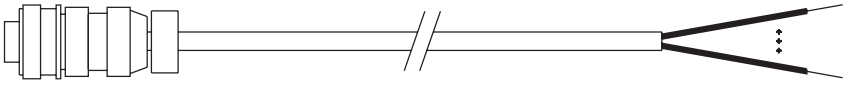
Cable Assemblies

Photocraft supplies standard and custom cable assemblies for all encoders. A standard cable consists of 10 feet (3 meters) of multiconductor, shielded cable, a connector that mates with the encoder on one end, and stripped and tinned leads on the other end. Cable specifications are shown below. For example, 3 conductor cable is Belden 8771 or equivalent. Standard cable assemblies use MIL-C-5015 style circular connectors, 16mm circular connectors, 12mm circular (M12) connectors, or D-subminiature connectors depending on the encoder model. Others connectors and cable lengths are available.

Cable specifications:

- Multi-conductor
- Overall foil shielded with drain wire
- PVC jacket
- Stranded conductors (7 x 30 typically)
- Wire gage: 22 (3 or 4 conductor)
  24 (5 or more conductor)



Encoders that are CE marked require specially constructed cables that include EMI foil shielding visible at the cable clamp. Use of other cables voids the CE mark. CE marked encoders also include cadmium-free connectors to meet European enviromental requirements.

Ordering information: ___ ___ - ___ - ___ ___

Connector:
C = MIL-C-5015style
D = 16mm circular
DB = D-subminiature style
M12. = 12mm circular

Number of connector pins

Number of cable conductors

Cable length in feet, or meters (use M suffix)

CF = Cadmium free connector
RC = RoHS compliant

Examples:

- **C3-3-10** is a 3-pin MIL-C-5015 style circular connector, with 10 feet of 3 conductor cable.
- **DB9-5-6M** is a 9-pin D-sub style connector, with 6 meters of 5 conductor cable.

Connectors

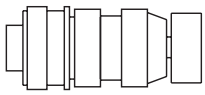
Connectors without cable are available. Connectors are supplied with all necessary hardware.

Note: use of a non-Photocraft cable assembly voids the CE mark.

Ordering information: ___ ___

Connector:
C = MIL-C-5015style
D = 16mm circular
DB = D-subminiature style
M12. = 12mm circular

Number of connector pins



Extension Cables

Extension cables consists of a cable assembly with the encoder mating connector (socket) on one end and a plug that will mate with another cable assembly on the other end.

Ordering information: ___ ___ - ___ - ___ - EXT ___

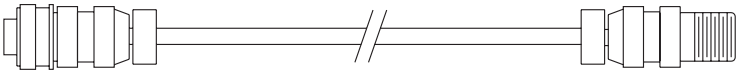
Connector:
C = MIL-C-5015style
D = 16mm circular
DB = D-subminiature style
M12. = 12mm circular

Number of connector pins

Number of cable conductors

Cable length in feet, or meters (use M suffix)

CF = Cadmium free
RC = RoHS compliant



MB-ST.375 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST.375 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HS25 encoders. The HS20 or HS25 should be ordered with a 3/8" shaft bore so it fits the MB-ST.375

INSTALLATION

1. Drill and tap either a 5/16-18, 10-24, or 3/8-16 hole, at least 1/2" deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST.375 shaft stub. Tighten with a 3/16" hex key or a screw driver.

3. Install the HS20 or HS25 hollow shaft encoder onto the shaft stub and tighten the set screws.

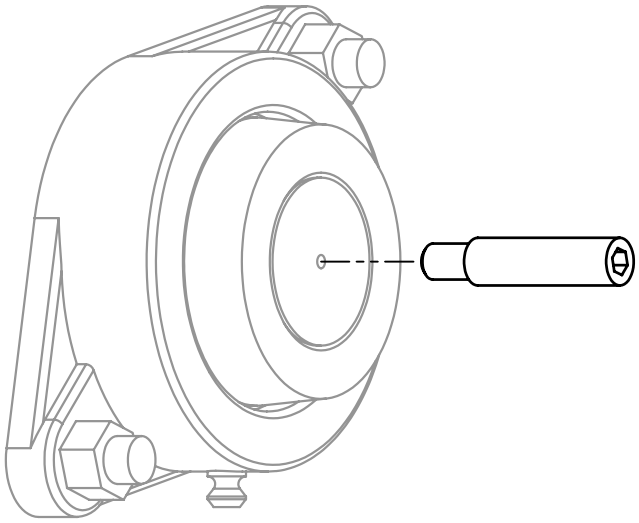


Figure 1: MB-ST.375 and conveyor roller bearing

DIMENSIONS

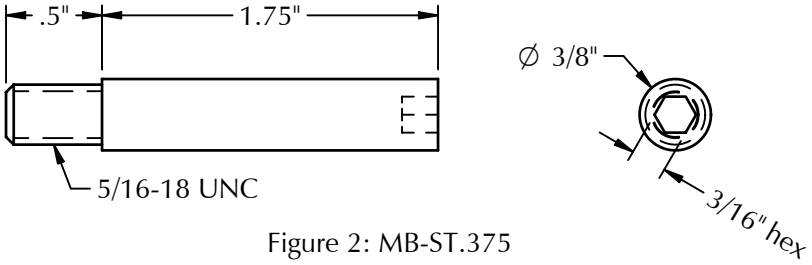


Figure 2: MB-ST.375

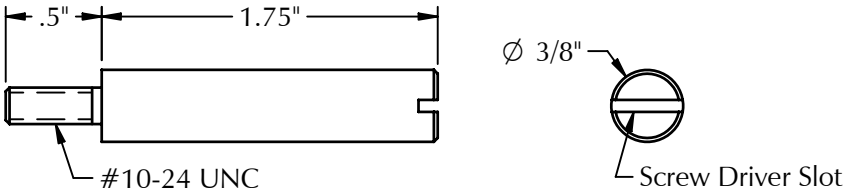


Figure 3: MB-ST.375A

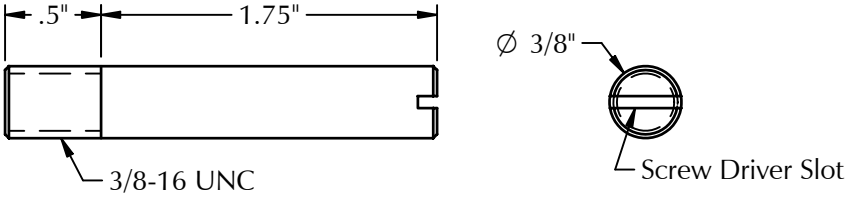


Figure 4: MB-ST.375B

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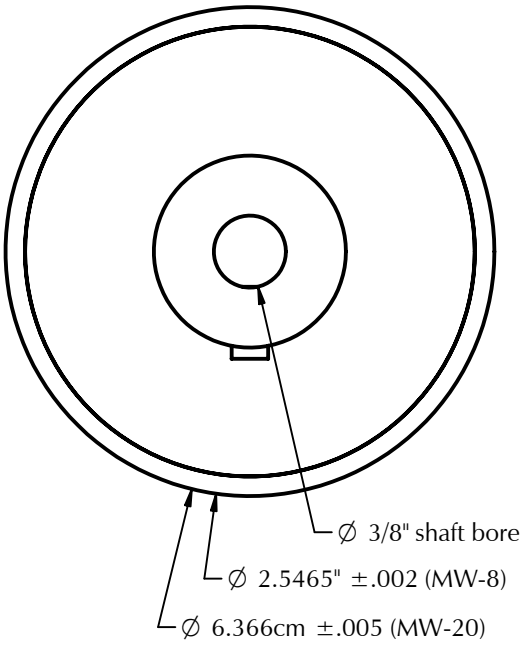
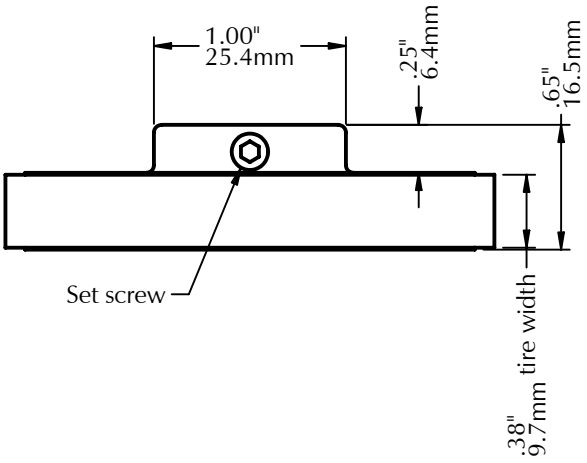
MW-8 and MW-20 Measuring Wheels

DIMENSIONS





DESCRIPTION

The **MW-8** and **MW-20** measuring wheels provide an accurate way to precisely measure linear movement of a conveyor or web when used with the R22 wheeled encoder. The wheels are aluminum with a urethane tire with a precisely ground tread, and having a high coefficient of friction that resists slipping. They attach to an encoder shaft using a 10-24 set screw.

SPECIFICATIONS

MW-8 dimensions: 8.00" ± .007" circumference
2.5465" ± .002" diameter
MW-20 dimensions: 20.00cm ± .016cm circumference
6.3662cm ± .005cm diameter
Shore Hardness of tire: 83A
Operating Temperature Range: -25° to 65°C, -20° to 150°F
Urethane is FDA compliant, food grade.

INSTALLATION and MAINTENANCE

Measuring wheels should be installed such that they are perpendicular to and their rotation is directly in line with the moving web or conveyor, or there could be premature wheel tread wear. For the double wheel R22 encoder, use of the Y-1, Y-3, MB-UB1, MB-UB2, MB-UB3, or MB-UB4 mounting adapters allow the R22 encoder to self-align with the moving web. The underbelt adapters apply an upward force that is directly along the centerline of the R22 encoder, minimizing wheel wear. On curved sections of conveyors, we recommend the use of the IW modification with the RH encoder, or use a single wheeled encoder. Special care must be used when installing a single wheel encoder to ensure it is properly aligned.

Maintenance consists of periodically cleaning the wheel tread. In dirty environments this is especially important since dirt accumulation on the wheel will increase its diameter.

MODEL NUMBERS

MW	–			–	
Measuring Wheel		**Circumference:** **8**=8" (2.5465" dia.), **20**=20 centimeters (6.3662cm dia.)	**Type:** leave blank for standard width *(there are no other options at this time)*		**Shaft Size:** **B**=3/8" *(there are no other options at this time)*

Examples: MW-8-B (8" circumference, 3/8" shaft)

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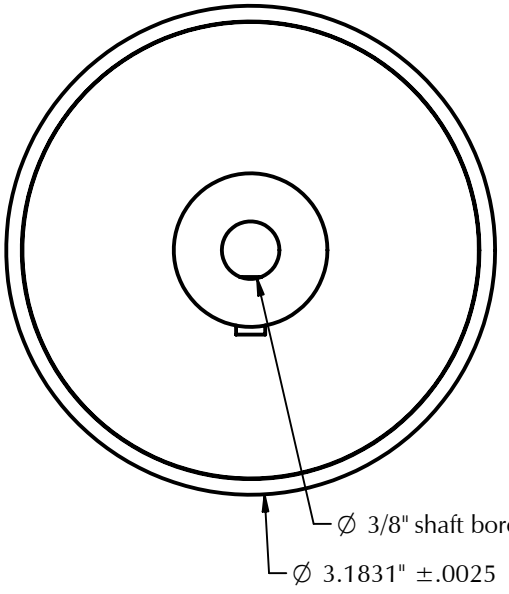
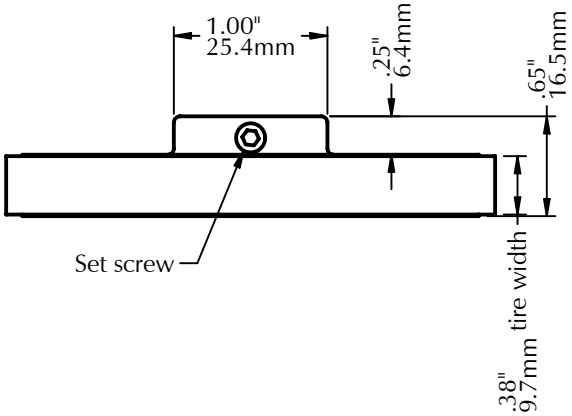
MW-10 Measuring Wheels

DIMENSIONS





DESCRIPTION

The **MW-10** measuring wheel provides an accurate way to precisely measure linear movement of a conveyor or web when used with the R21, R22 or RH wheeled encoders. The wheels are aluminum with a urethane tire with a precisely ground tread, and having a high coefficient of friction that resists slipping. They attach to an encoder shaft using a 10-24 set screw.

SPECIFICATIONS

MW-10 dimensions: 10.00" ± .008" circumference
3.1831" ± .0025" diameter
Shore Hardness of tire: 83A
Operating Temperature Range: -25° to 65°C, -20° to 150°F
Urethane is FDA compliant, food grade.

INSTALLATION and MAINTENANCE

Measuring wheels should be installed such that they are perpendicular to and their rotation is directly in line with the moving web or conveyor, or there could be premature wheel tread wear. For the double wheel R22 and RH encoders, use of the Y-1, Y-3, MB-T, MB-UB1, MB-UB2, MB-UB3, or MB-UB4 mounting adapters allow the encoder to self-align with the moving web. The underbelt and torsion spring adapters apply a force that is directly along the centerline of the R22 or RH encoder, minimizing wheel wear. On curved sections of conveyors, we recommend the use of the IW modification with the RH encoder, or use a single wheeled encoder. Special care must be used when installing the single wheel R21 encoder to ensure it is properly aligned.

Maintenance consists of periodically cleaning the wheel tread. In dirty environments this is especially important since dirt accumulation on the wheel will increase its diameter.

MODEL NUMBERS

MW –			–
Measuring Wheel	**Circumference:** **10**=10" (3.1831" dia.)	**Type:** leave blank for standard width *(there are no other options at this time)*	**Shaft Size:** **B**=3/8" *(there are no other options at this time)*

Examples: **MW-10-B** (10" circumference, 3/8" shaft)

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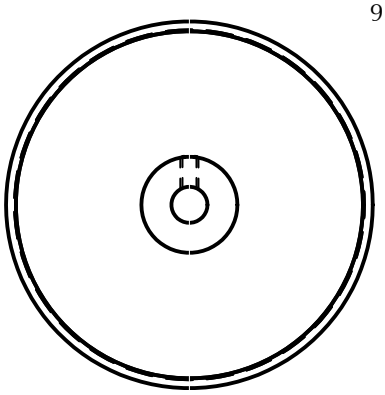
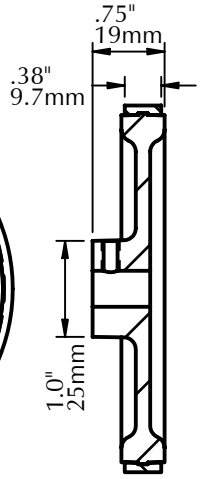
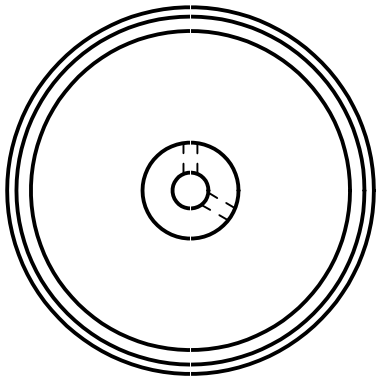
MW-1 and MW-30 Measuring Wheels

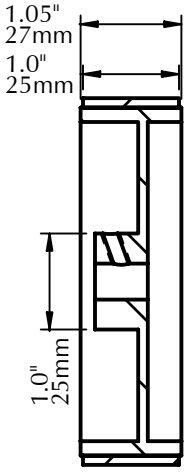
MW-1 and MW-30



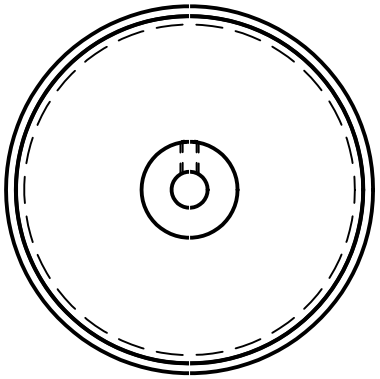


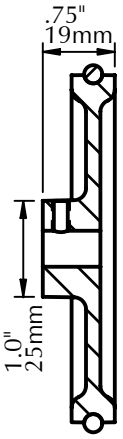
MW-1W and MW-30W





MW-1R and MW-30R





DESCRIPTION

The **MW-1** measuring wheels are precision ground to a 12.00" ± .01" circumference (3.82" ± .003" diameter), and the **MW-30** to 30.00cm ± .025cm (95.5mm ± .1mm diameter). The wheels are aluminum with a urethane tire having a high coefficient of friction. They attach to an encoder shaft using one or two 10-24 set screws, as shown in the drawings to the left.

The **MW-1W** and **MW-30W** are similar to the MW-1 and MW-30, but have a 1" (25mm) wide precision ground urethane tire.

The **MW-1R** and **MW-30R** are made using the same aluminum wheel as the MW-1 and MW-30, but have a replaceable 3/16" width urethane O-ring that can be ordered separately (part no. 450-PLA-MW1R). Because these wheels are not precision ground they have greater tolerances than the other wheels. The MW-1R is 12.00" ± .03" circumference (3.82" ± .01" diameter), and the MW-30R is 30.00cm ± .078cm (95.5mm ± .25mm diameter).

SPECIFICATIONS

Shore Hardness: 83A
Operating Temperature Range: -25° to 65°C, -20° to 150°F
Urethane is FDA compliant, food grade.

INSTALLATION and MAINTENANCE

Measuring wheels should be installed such that they are perpendicular to and their rotation is directly in line with the moving web or conveyor, or there could be premature wheel tread wear. For the double wheel RH encoder, use of the Y-1, Y-3, MB-UB1, MB-UB2, MB-UB3, or MB-UB4 mounting adapters allow the RH encoder to self-align with the moving web. The underbelt adapters apply an upward force that is directly along the centerline of the RH encoder, minimizing wheel wear. On curved sections of conveyors, we recommend the use of the IW modification with the RH encoder, or use a single wheeled encoder. Special care must be used when installing a single wheel encoder to ensure it is properly aligned.

Maintenance consists of periodically cleaning the wheel tread, or replacing the O-ring (part no. 450-PLA-MW1R). In dirty environments this is especially important since dirt accumulation on the wheel will increase its diameter.

MODEL NUMBERS

MW	–			–	
Measuring Wheel		**Circumference:** **1**=1 foot or 12" (3.82" dia.), **30**=30 centimeters (95.5mm dia.)	**Type:** leave blank for standard width **R**=standard width with replaceable O-ring **W**=1" (25mm) width		**Shaft Size:** **A**=5/16", **B**=3/8", **C**=1/4", **.5**=1/2", **6mm, 7mm, 8mm, 10mm**

Examples: **MW-1-R** (1-ft circumference, 3/8" shaft)

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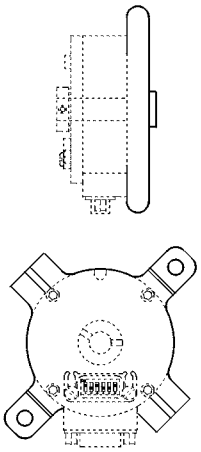
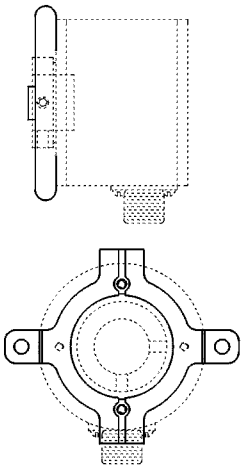
MB-FB1 Flexible Mounting Bracket

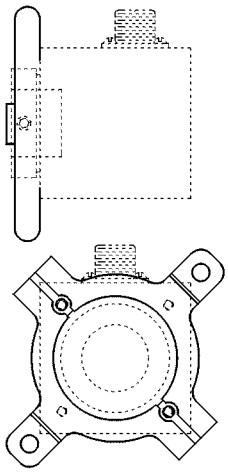
Shown with HS25 encoder



Shown with HRL encoder



Shown with HRS encoder



DESCRIPTION

Designed for the HRL, HRS, and HS25 hollow shaft encoders, the MB-FB1 flexible mounting bracket is made from .015″ (.38mm) thick stainless steel that flexes to accommodate the axial misalignment between the encoder's hollow shaft and the mounting shaft. Failure to use a flexible mounting such as this can significantly reduce the life of the encoder's bearings.

INSTALLATION

1. Fasten flexible bracket to face of encoder using two 6-32 screws (supplied) so that the bracket is approximately centered on the encoder shaft.
2. Slide encoder onto mounting shaft, but do not tighten set screws.
3. Securely fasten bracket to frame using two screws in the .260″ diameter bracket holes (screws are not provided).
4. Tighten set screws to fasten the encoder shaft to the mounting shaft.

ORDER INFORMATION

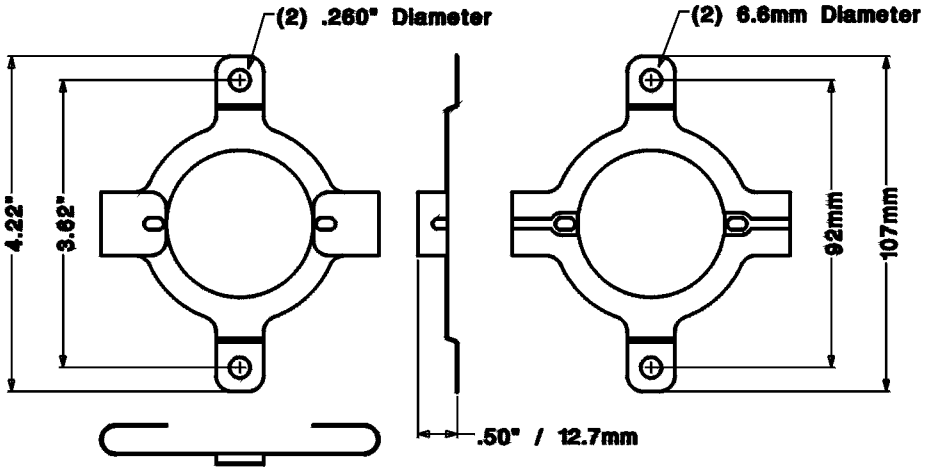
Part No.: MB-FB1

(Includes all parts shown in the parts list)

PARTS LIST

Qty	Description	Part No.
1	Flexible bracket	500-MSC006
2	6-32 x $^{3}/_{16}$″ RH screw	550-SCR202

DIMENSIONS



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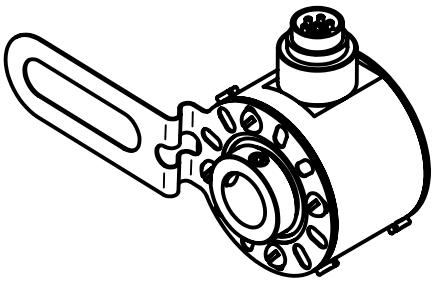
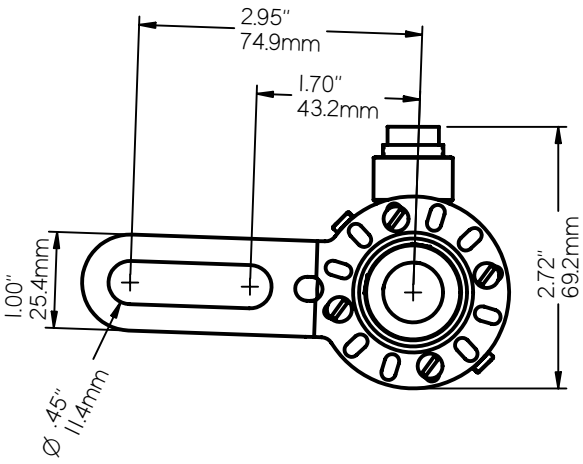
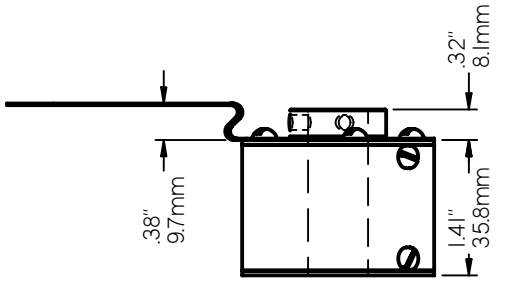
MB-FB2 Flexible Mounting Tether

DIMENSIONS

Shown with HS20 hollow shaft encoder. Also fits the R20, RG and RL shaft encoders.







DESCRIPTION

Designed to adapt the HS20 hollow shaft encoder to a C-face motor mount. It also fits the RG and RL shaft encoders, and provides a flexible tether for many diverse applications. The MB-FB2 is made of .015" (.38mm) thick stainless steel that flexes to accommodate the axial misalignment between the rigidly coupled encoder/motor shafts and the motor mount. Failure to use a flexible mounting such as this can significantly reduce the life of the encoder's bearings.

Also, see our other tethers:
- MB-FB2A - flattened version of the MB-FB2
- MB-FB2B - .125" thick rigid version of the MB-FB2

INSTALLATION

1. Fasten the MB-FB2 tether to the face of the encoder using three or four 6-32 screws (supplied). Note: the RL uses 8-32 screws. The MB-FB2 mounting holes allow for the positioning of the tether in 30° increments.

2. Position the encoder onto the motor shaft but do not tighten any shaft set screws.

3. Securely fasten the MB-FB2 to the motor frame.

4. Tighten the shaft set screws.

ORDERING INFORMATION

Part No.: MB-FB2
(includes all parts shown in the parts list)

PARTS LIST

Qty	Description	Part No.
1	MB-FB2 flexible tether	500-MSC010
4	6-32 x 3/16" RH screws	550-SCR202

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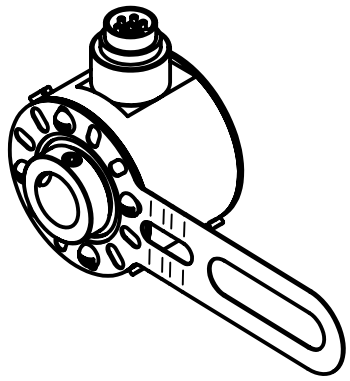
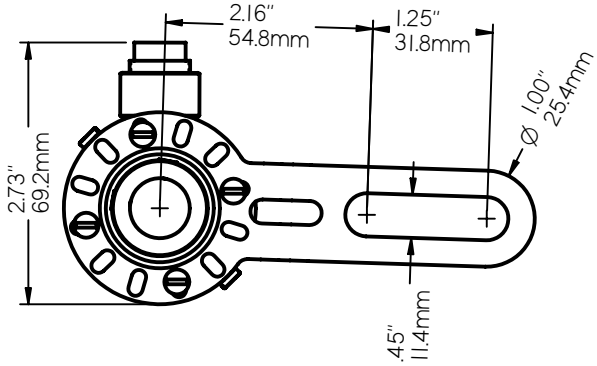
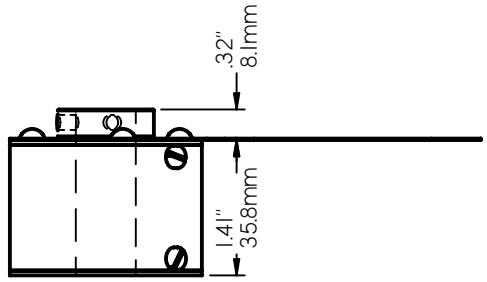
MB-FB2A Flexible Mounting Tether

DIMENSIONS

Shown with HS20 hollow shaft encoder. Also fits the R20, RG and RL shaft encoders.







DESCRIPTION

Designed to tether the HS20 hollow shaft encoder and prevent it from rotating without rigidly attaching it to the motor frame. It also fits the R20, RG and RL shaft encoders. Ideally the tether is held in position by placing a pin parallel to the motor shaft through the tether's slot and fastening the pin to the motor frame. The pin prevents the encoder from rotating, and allows it to float on the motor shaft.

The MB-FB2A is made of .015" (.38mm) thick stainless steel that flexes to accommodate the axial misalignment between the rigidly coupled encoder/motor shafts and the motor mount. Failure to use a flexible mounting such as this can significantly reduce the life of the encoder's bearings.

Also, see our other tethers:
— MB-FB2 - formed version of the MB-FB2A
— MB-FB2B - .125" thick rigid version of the MB-FB2A

INSTALLATION

1. Fasten the MB-FB2A tether to the face of the encoder using three or four 6-32 screws (supplied). Note: the RL uses 8-32 screws. The MB-FB2A mounting holes allow for the positioning of the tether in 30° increments.

2. Install a pin on the motor housing parallel to the motor shaft and 2.16" to 3.41" from the shaft center, such that it will engage the MB-FB2A slot when the encoder is installed.

3. Position the encoder onto the motor shaft placing the MB-FB2A slot over the pin previously installed.

ORDERING INFORMATION

Part No.: MB-FB2A
(includes all parts shown in the parts list)

PARTS LIST

Qty	Description	Part No.
1	MB-FB2A flexible tether	500-MSC010-F
4	6-32 x 3/16" RH screws	550-SCR202

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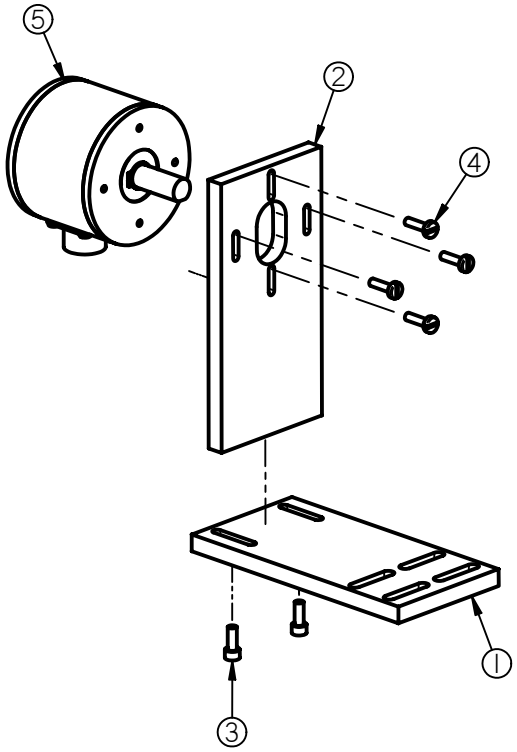
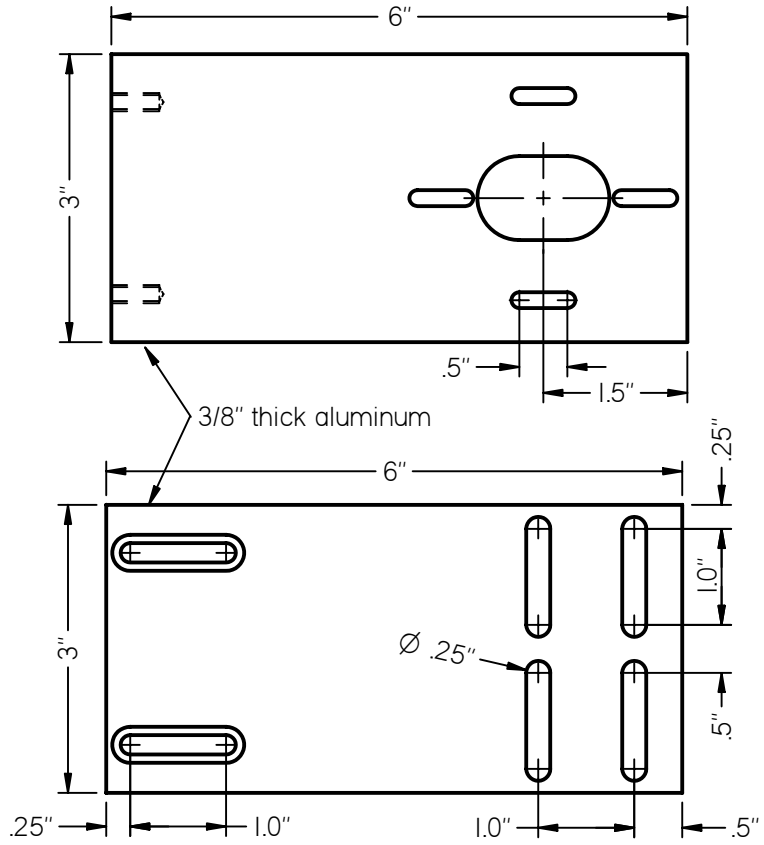
MB-FL5 Encoder mounting bracket





DESCRIPTION

The MB-FL5 provides a rigid mounting bracket for the RL encoder. During installation it can be adjusted in all three dimensions to optimize alignment with the mating shaft. Because it is a rigid mounting, we recommend the use of a flexible shaft coupling when directly coupling the encoder shaft to another shaft.

ORDER INFORMATION

Part No.: MB-FL5

(includes all parts in spare parts list except the RL encoder)

INSTALLATION

1. Assemble MB-FL5 mounting bracket as shown in the figure using the four .25" x 1" slots on the mounting base to attached the assembly to the machine frame. Do not tighten the screws.

2. Align the encoder shaft with the machine shaft. Use a flexible shaft coupling to couple the shafts.

3. After the two shafts are aligned, tighten all screws.

SPARE PARTS LIST

#	Description	Part No.	Qty
1	MB-FL5 mounting base	500-MCH100	1
2	MB-FL5 mounting plate	500-MCH099	1
3	Socket Head Cap Screw	550-SCR302	2
4	8-32 x .625" binder head screw	550-SCR307	4
5	RL.5 Encoder (1/2" shaft)		1

see circled reference numbers in figure above

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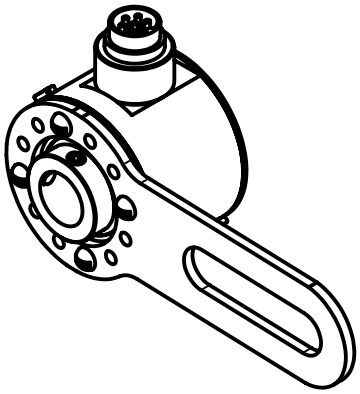
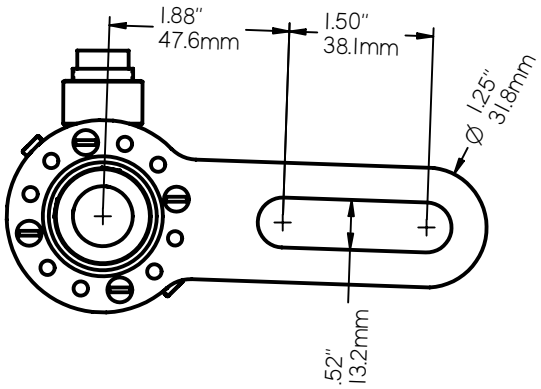
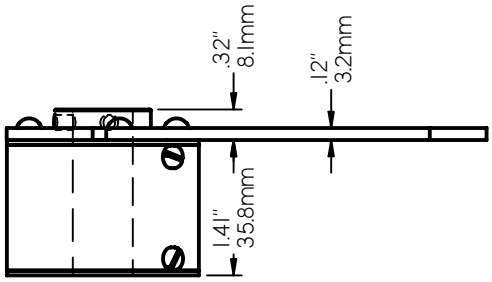
MB-FB2B Rigid Mounting Tether

DIMENSIONS

Shown with HS20 hollow shaft encoder.







DESCRIPTION

Designed to tether the HS20 hollow shaft encoder and prevent it from rotating without rigidly attaching it to the motor frame. Ideally the tether is held in position by placing a pin parallel to the motor shaft through the tether's slot and fastening the pin to the motor frame. The pin prevents the encoder from rotating, and allows it to float on the motor shaft.

The MB-FB2B is made of 1/8" (3.2mm) thick aluminum. The tether should not be rigidly attached to the motor frame. Doing so will significantly reduce the life of the encoder's bearings.

Also, see our other tethers:

— MB-FB2 - .015" thick formed, flexible, stainless steel version of the MB-FB2B.

— MB-FB2A - .015" thick flat, stainless steel version of the MB-FB2B.

INSTALLATION

1. Fasten the MB-FB2B tether to the face of the encoder using the four 6-32 screws (supplied). The MB-FB2B mounting holes allow for the positioning of the tether in 30° increments.

2. Install a pin on the motor housing parallel to the motor shaft and 1.88" to 3.38" from the shaft center, such that it will engage the MB-FB2B slot when the encoder is installed.

3. Position the encoder onto the motor shaft such that the previously installed pin is in the MB-FB2B slot.

ORDERING INFORMATION

Part No.: MB-FB2B
(includes all parts shown in the parts list)

PARTS LIST

Qty	Description	Part No.
1	MB-FB2B rigid tether	500-MCH110
4	6-32 x 1/4" RH screws	550-SCR200

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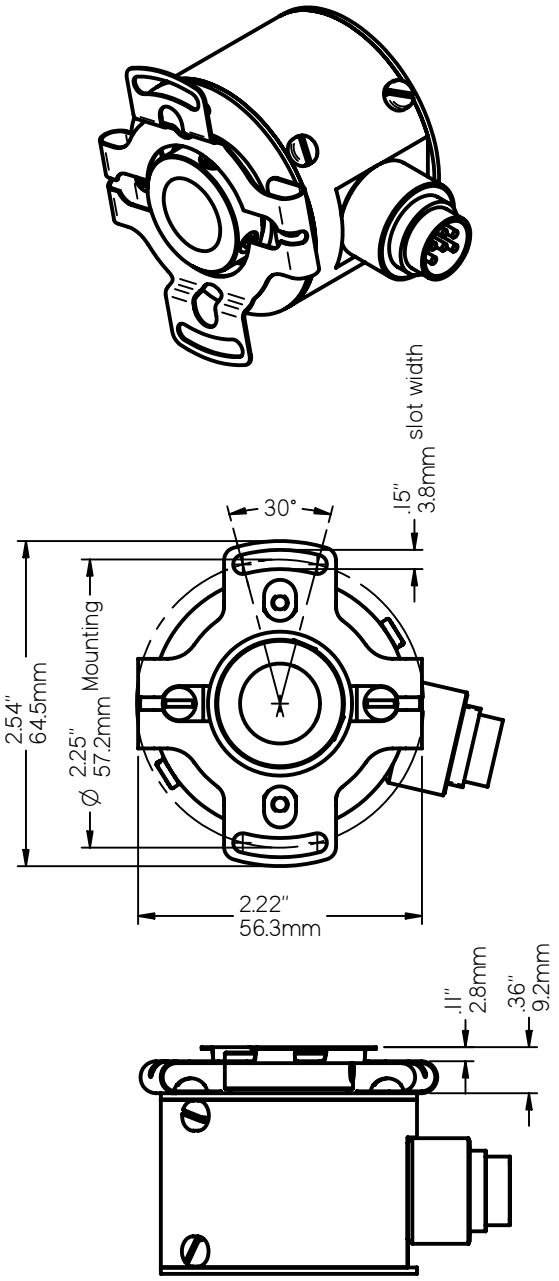
MB-FB3 Flexible Mounting Bracket

DIMENSIONS

Shown with HS20 hollow shaft encoder.



DESCRIPTION

Designed for the HS20 hollow shaft encoder, the MB-FB3 flexible mounting bracket is made of .015" (.38mm) thick stainless steel that flexes to accommodate the axial misalignment between the rigidly coupled encoder/motor shafts and the motor mount. Failure to use a flexible mounting such as this can significantly reduce the life of the encoder's bearings.

INSTALLATION

1. Fasten the MB-FB3 bracket to the face of the encoder using two 6-32 screws (supplied) so the bracket is appoximately centered on the encoder shaft.

2. Position the encoder onto the motor shaft but do not tighten any shaft set screws.

3. Securely fasten the MB-FB3 to the motor frame using two screws (screws are not provided).

4. Tighten the shaft set screws.

ORDERING INFORMATION

Part No.: MB-FB3
(includes all parts shown in the parts list)

PARTS LIST

Qty	Description	Part No.
1	MB-FB3 flexible bracket	500-MSC011
2	6-32 x 3/16" RH screws	550-SCR202

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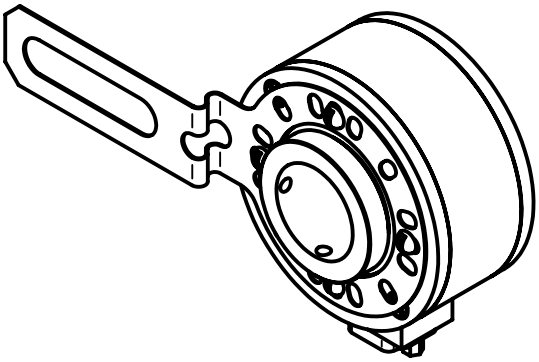
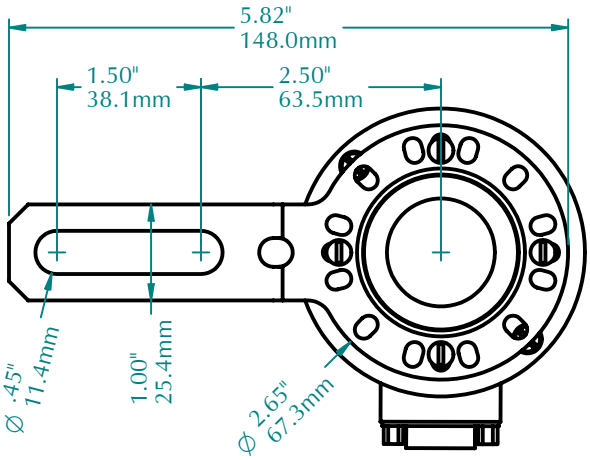
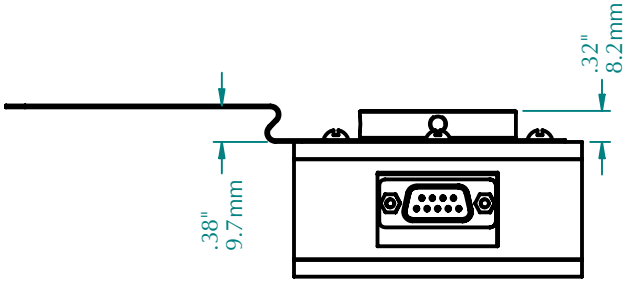
MB-FB5 Flexible Mounting Tether

DIMENSIONS

Shown with HS30 hollow shaft encoder. Also fits the HS25, HS31, HRL, HRS, and RL encoders.







DESCRIPTION

Designed to adapt the HS30 hollow shaft encoder to a C-face motor mount. It also fits the HS25, HS31, HRL, and HRS hollow shaft encoders, and RL shaft encoder, providing a flexible tether for many diverse applications. The MB-FB5 is made of .020" (.51mm) thick stainless steel that flexes to accommodate the axial misalignment between the rigidly coupled encoder/motor shafts and the motor housing. Failure to use a flexible mounting such as this can significantly reduce the life of the encoder's bearings.

INSTALLATION

1. Fasten the MB-FB5 tether to the face of the encoder using three or four 6-32 screws (supplied). Note: the RL uses 8-32 screws. The MB-FB5 mounting holes allow for flexible positioning of the tether onto the encoder.

2. Position the encoder onto the motor shaft but do not tighten any shaft set screws.

3. Securely fasten the MB-FB5 to the motor frame. Use the fiber washer and fiber shoulder washer to insulate the MB-FB5 arm from the motor housing (if necessary).

4. Tighten the shaft set screws.

ORDERING INFORMATION

Part No.: MB-FB5
(includes all parts shown in the parts list)

PARTS LIST

Qty	Description	Part No.
1	MB-FB5 flexible tether	500-MSC016
4	6-32 x 3/16" RH screws	550-SCR202
1	7/16" fiber washer	550-WSH016
1	3/8" shoulder washer	550-WSH017

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MB-FB5C Hollow shaft encoder mounting

DESCRIPTION

The MB-FB5C provides a means to mount the model HRL, HRS, HS30 and HS31 hollow shaft encoders to a conveyor roller that is supported by a 2-bolt flange mount bearing with a bolt spacing of 5" to 8". It is commonly used with the MB-ST.5A shaft stub that is attached to the end of the conveyor roller and supports the encoder. The MB-FB5C provides a tether that prevents the encoder from rotating yet is flexible, thus avoiding excess load on the encoder bearings. Mounting hardware anchors the tether to one of the 1/2" threaded mounting studs of the flange bearing.

INSTALLATION

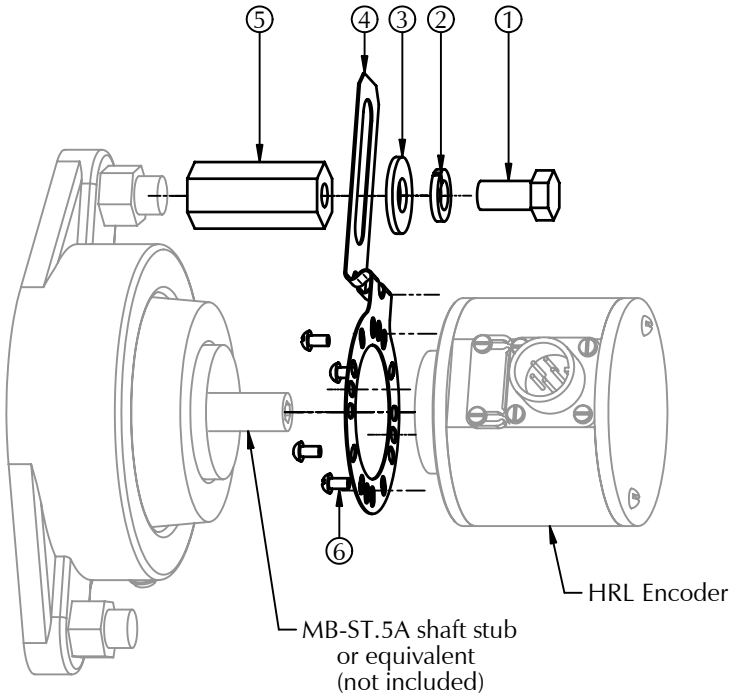
1. If using the MB-ST.5A shaft stub (puchased separately), drill and tap a 3/8-16 hole, at least 5/8" deep into the end of the conveyor shaft. Insert the MB-ST.5A shaft stub or equivalent. The shaft stub should be in-line with the shaft axis, so there is minimum wobble when the shaft is rotating.

2. Fasten the MB-FB5 flexible tether to the face of the encoder using the four 6-32 screws (supplied).

3. Attach the coupling nut to one of the 1/2" threaded mounting studs of the flange bearing. It may be necessary to remove the existing 1/2" nut.

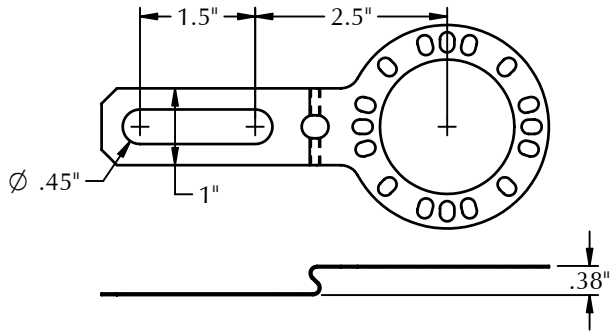
4. Install the encoder onto the shaft stub (MB-ST.5A or equivalent), such that the flexible tether rests on the coupling nut. Tighten the encoder set screws.

5. Secure the tether to the coupling nut using the 3/8-16 cap screw and washers as shown.

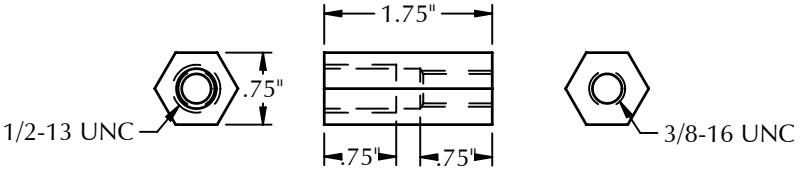


MB-FB5C includes the following parts			
#	Description	Part No.	Qty
1	3/8-16 x 3/4" cap screw	550-SCR303	1
2	3/8" split lock washer	550-WSH005	1
3	3/8" flat washer	550-WSH007	1
4	MB-FB5 flexible tether	500-MSC016	1
5	Coupling nut	500-MCH118	1
6	6-32 x 3/16" round head screw	550-SCR202	4

MB-FB5 Flexible Tether



Coupling Nut



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MB-UB6 Wheeled Encoder Mounting Bracket

DESCRIPTION

The MB-UB6 "L" bracket bolts to a cross beam above or below a conveyor belt, and provides an attachment point for a model R21, R22, or RH wheeled encoder. The bolts on the MB-UB6 allow the encoder to be adjusted so the measuring wheels contact the conveyor belt. Note: Because the encoder is rigidly fixed and cannot self-align with the conveyor belt, this bracket is not intended for continuous duty applications where rapid wear of the measuring wheel tread will occur if the wheels are not perfectly aligned with the belt movement.

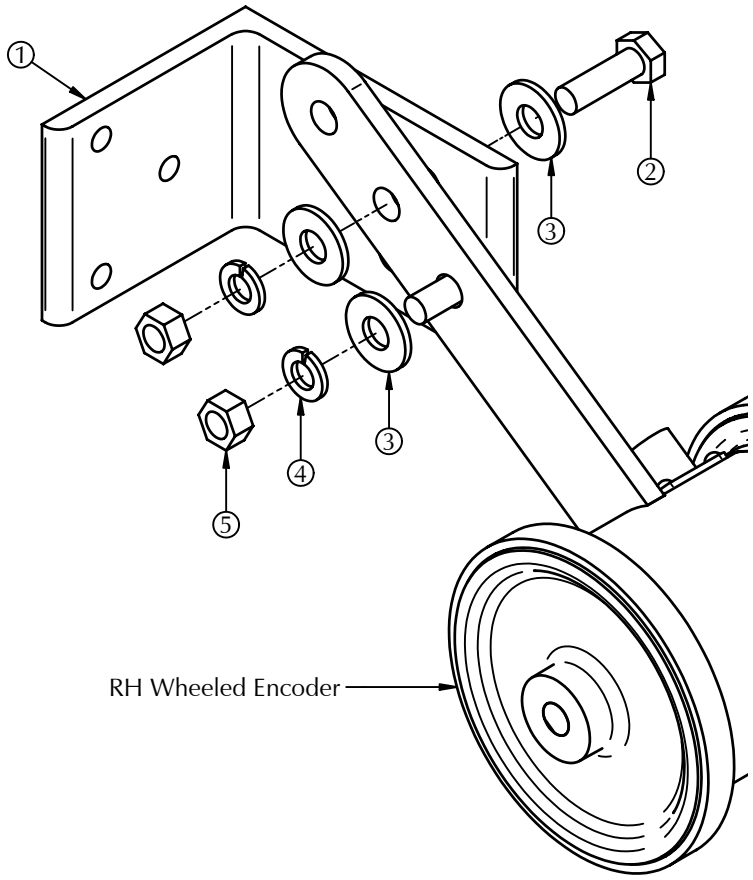
INSTALLATION

1. Attach the MB-UB6 "L" bracket to a cross beam that is several inches above or below the conveyor belt, ensuring that the correct bracket edge is nearest to the conveyor belt (see figure to the right). To minimize tread wear on the measuring wheel, the slotted flange of the "L" bracket must be exactly in-line with the conveyor belt movement, and its face must be perpendicular to the belt.

2. Connect the R21, R22 or RH encoder handle to the "L" bracket by inserting one of the three encoder mounting holes, either the middle hole or the hole nearest the encoder body, through the captive bolt on the "L" bracket. Loosely add washers and hex nut.

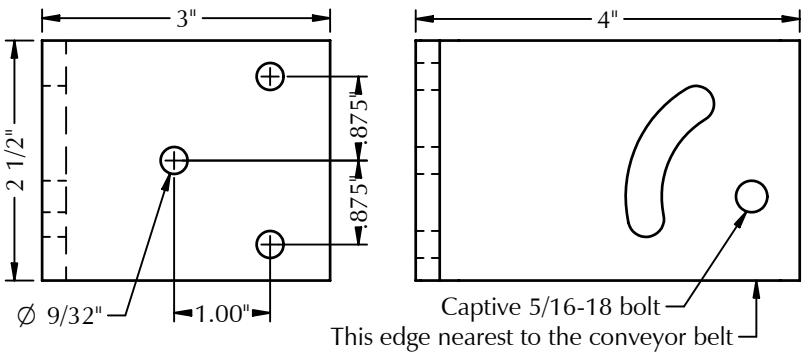
3. Insert the 5/16-18 x 1" hex bolt and washer through the curved "L" bracket slot and the encoder handle mounting hole. Loosely add washers and hex nut.

4. Adjust the encoder so the measuring wheel firmly contacts the encoder belt. Then tighten the hex nuts.



#	Description	Part No.	Qty
1	MB-UB6 "L" Bracket	500-MCH115	1
2	5/16-18 x 1" hex bolt	550-SCR306	1
3	5/16 flat washer	550-WSH008	3
4	5/16 split-lock washer	550-WSH009	2
5	5/16-18 hex nut	550-NUT009	2

MB-UB6 "L" Bracket



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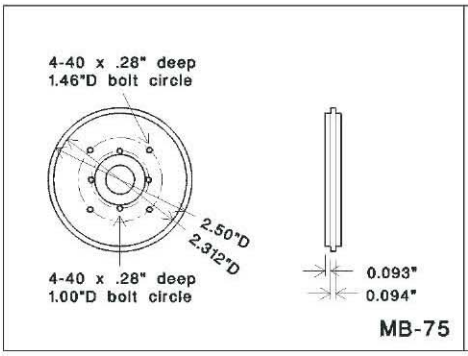
DESCRIPTION

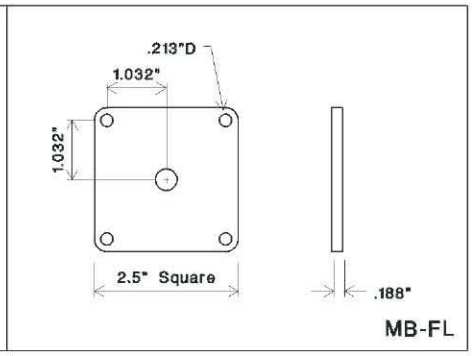
The adapters shown in the figures to the right can be attached to the model RG, RJ or RS encoders to provide alternate bolt hole patterns or methods of mounting the encoder. The adapters are shipped attached to the encoder if ordered at the same time. If ordered separately, the adapters are supplied with hardware for attaching to the encoder. Because environmental seals are an integral part of the adapter, they can not be field installed on the RJ encoder, and therefore must be ordered with the encoder.

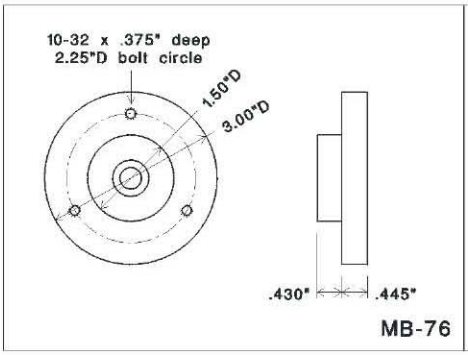
The table shows the adapters that can be used with each encoder model.

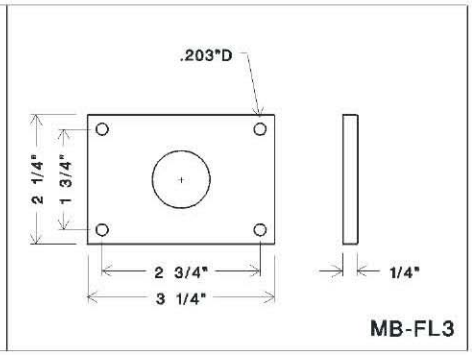
Adapter Model	Encoder Model RG	RJ	RS
MB-075	X	X	
MB-076	X	X	
MB-078	X	X	
MB-FL	X	X	
MB-FL3	X		X
MB-FL4	X		
MB-KOYO	X	X	
MB-FL6	X	X	X
MB-5PY	X	X	

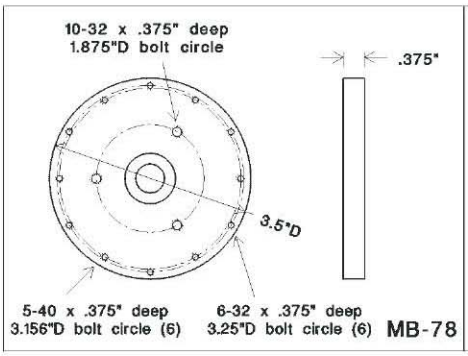
DIMENSIONS

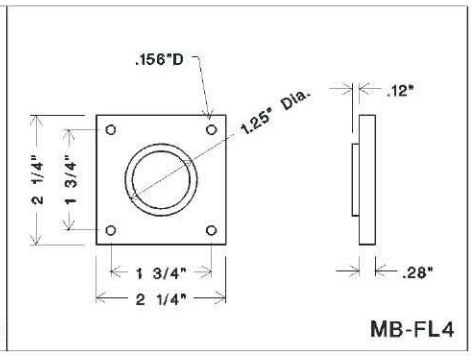


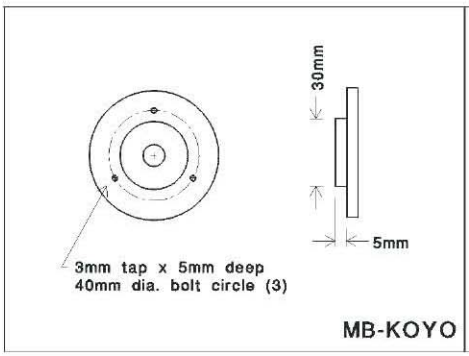


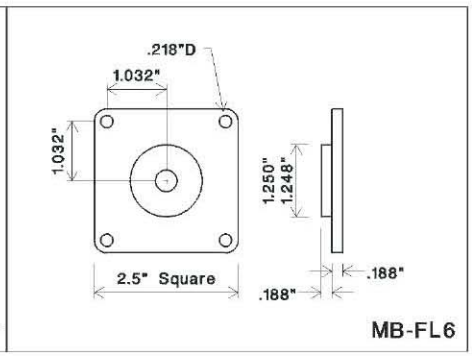


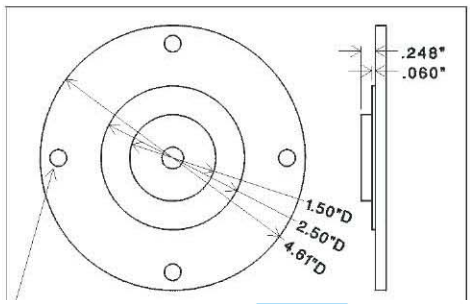












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MB-RD and Y-1G Measuring Wheel Adapter for RG/RJ

DESCRIPTION

MB-RD Adapter

The MB-RD adapts the model RG or RJ encoders for use with a measuring wheel. The MD-RD is a 2″ x 6″ x 1/8″ aluminum plate that bolts to the face of the encoder and includes a ¼″ diameter mounting hole, 4.5″ from the center of the encoder's shaft.

Part Number: MB-RD (includes all items in spare parts list)

Spare Parts List:

Qty	Description	Part No.
1	MB-RD adapter	605-0012-01
3	6-32 x ¼″ RH screws	541-6045

MB-RD2 Adapter

The MD-RD2 is similar to the MB-RD except it includes three 3/8″ diameter mounting holes that can be used with the Y-1G yoke assembly or the MB-UB2 offset mounting adapter (not shown here).

Part Number: MB-RD2 (includes all items in spare parts list)

Spare Parts List:

Qty	Description	Part No.
1	MB-RD2 adapter	605-0041-01
3	6-32 x ¼″ RH screws	541-6045

Y-1G Yoke Assembly

The Y-1G yoke assembly can be rigidly connected to a mounting beam (not provided) and attaches to the MB-RD2, as shown in figure 3, to provide a pivot point so the encoder measuring wheel can ride on the moving web and freely pivot up and down as the moving material moves under the wheel. The weight of the encoder is sufficient to maintain continuous contact with the web.

Part Number: Y-1G (includes all items in spare parts list)

Spare Parts List:

Qty	Description	Part No.
1	Y-1 Yoke	605-0022-01
1	1/4″D Clevis Pin	541-0001
1	Yoke Bushing (brass)	603-0276-01
1	1/16″x1/2″ Cotter Pin	541-0002
1	1/4-28 x ¾″ Cap Screw	541-1400
1	¼″ Split-Lock Washer	543-1201
2	Nylon washers	543-3806

DIMENSIONS

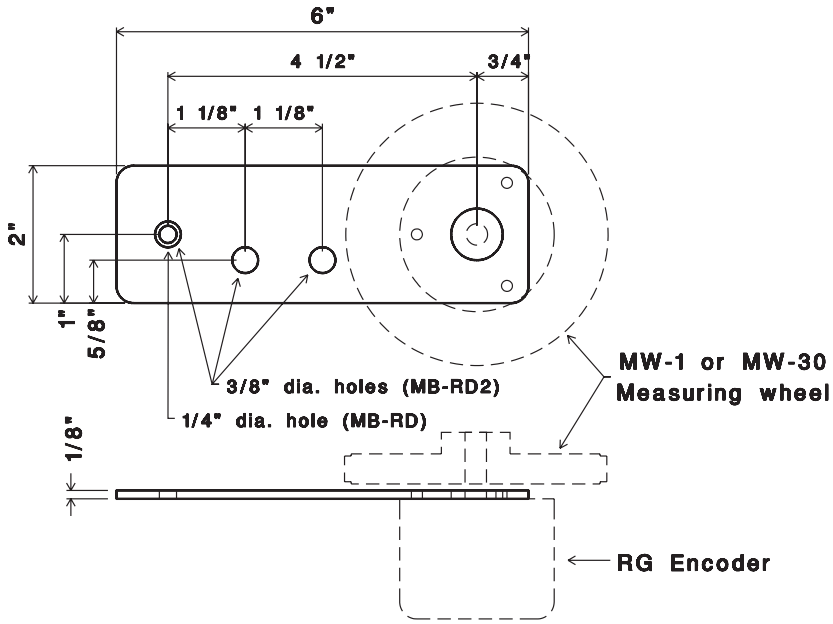

Figure 1: MB-RD and MB-RD2 Adapters

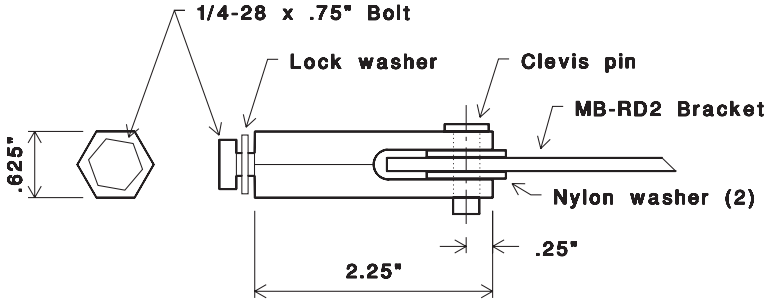

Figure 2: Y-1G Yoke Assembly

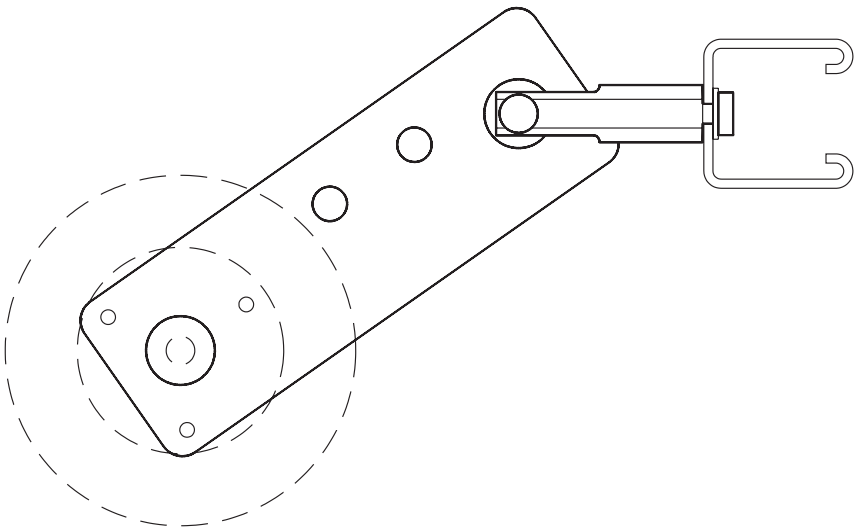

Figure 3: RG encoder with MB-RD2 and Y-1G

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MB-UB2 Wheeled Encoder Mounting Bracket

DESCRIPTION

The MB-UB2 attaches above and to the side of a moving web, providing a pivot point for the encoder with measuring wheels. It can be ordered with either a 7" or 11-1/4" arm. The extension and height of the arm is fully adjustable.

ORDER INFORMATION

Model	Description
MB-UB2	For R21, R22, RH encoder with 7" arm
MB-UB2A	For R21, R22, RH encoder with 11-1/4" arm
MB-UB2G	For R20, RG, or RJ encoder with 7" arm
MB-UB2AG	For R20, RG, or RJ encoder with 11-1/4" arm
MB-UB2S	For RS encoder with 7" arm
MB-UB2AS	For RS encoder with 11-1/4" arm

INSTALLATION

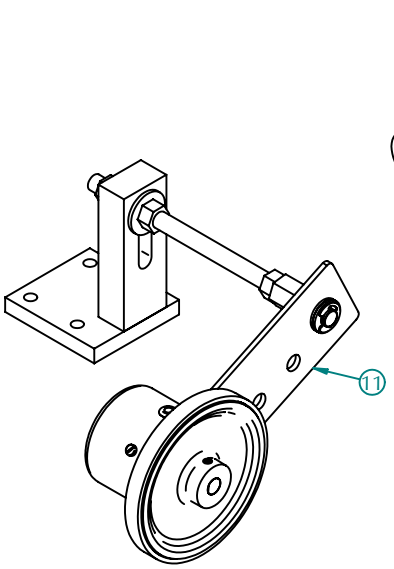
1. Fasten bracket to the side of the web such that the arm is perpendicular to the direction of the moving web.
2. Adjust the height and extension of the arm; tighten all bolts.
3. Attach the encoder to the pivot as shown in the diagrams. Use one nylon washer on either side of the RH encoder arm. Use two nylon washers on either side of the arm or MB-RD for the R20, R21, R22, RG, RJ, or RS encoders.
4. Insert retaining ring at end of pivot.
5. Adjust wheels if necessary to avoid rubbing against bracket or encoder body.
6. Ensure that the encoder cable has sufficient slack and is clear of any moving parts.

PARTS LIST

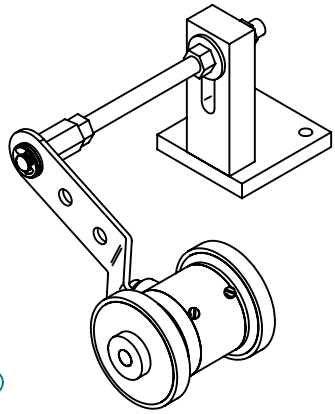
The MB-UB2 and MB-UB2A include the following parts			
#	Description	Part No.	Qty
1	MB-UB2 pivot	500-MCH087	1
2	MB-UB2 base	500-MCH088	1
3	MB-UB2 post	500-MCH089A	1
4	6" threaded rod	500-MCH087A	1*
5	10-1/4" threaded rod	500-MCH074A	1*
6	Retaining ring	500-RNG008	1
7	3/8" X 16 nut	550-NUT008	3
8	10-24 x 1/2" screw	550-SCR302	2
9	Nylon washers	550-WSH006	4
10	3/8" I.D. washers	550-WSH007	2
* Use #4 for 7" arm; #5 for 11-1/4" arm			

Additional parts for MB-UB2G / MB-UB2AG			
#	Description	Part No.	Qty
11	MB-RD2	500-MCH080	1
	6-32 x 1/4" screw	550-SCR200	3

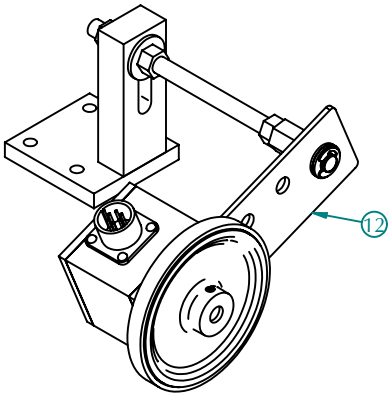
Additional parts for MB-UB2S / MB-UB2AS			
#	Description	Part No.	Qty
12	MB-RD3	500-MCH080A	1
	6-32 x 1/4" screw	550-SCR200	4



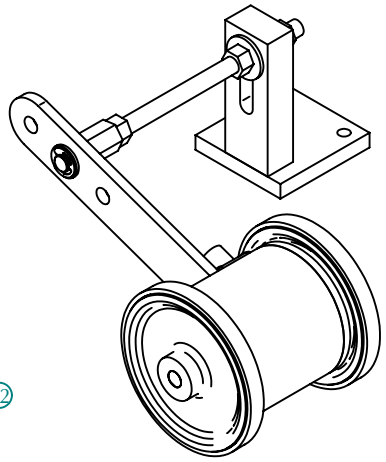
MB-UB2G with RG encoder



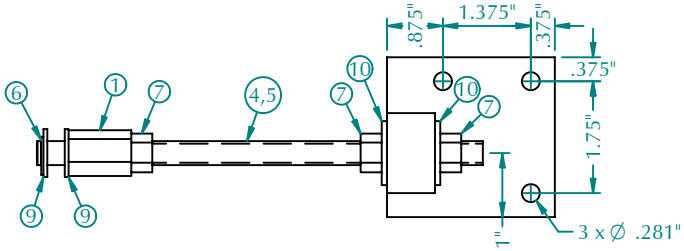
MB-UB2 with R22 encoder

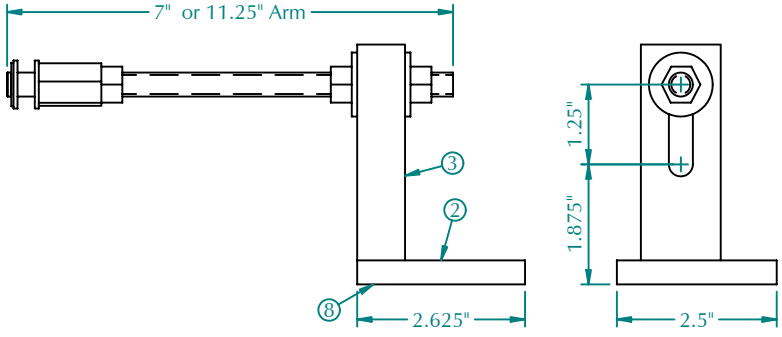


MB-UB2S with RS encoder (single or dual wheels)



MB-UB2 with RH encoder





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Model: MB-UB3 — Under-belt mounting

DESCRIPTION

The MB-UB3 underbelt mounting assembly facilitates installation of the model RH, R21 or R22 wheeled encoders under the convey belt (or roller). The pivot yoke rotates 360° relative to the mounting plate giving maximum flexibility in locating the plate. The pivot point allows for up and down movement of the encoder with the conveyor belt while the 2 springs assure constant contact of the measuring wheels to the conveyor. The pivot point and pivot yoke are centered on the encoder to automatically optimize for alignment with the conveyor and minimize wheel wear. An optional lock washer can be inserted to lock the pivot yoke into a fixed position, preventing it from rotating for conveyor applications that reverse direction. Nylon washers are included to accommodate the thinner handle on the R21 and R22 wheeled encoders.

INSTALLATION

1. Assemble the pivot yoke onto the encoder as shown in figure 3. Note: the yoke attaches to the hole at the center of the encoder arm, and the springs attach to the outermost hole of the encoder arm.

2. Attach the pivot yoke to the mounting plate and bearing arm assembly using the 1/2" x 3/4" shoulder bolt as shown in figure 1. After tightening the shoulder bolt, the pivot yoke should rotate freely.

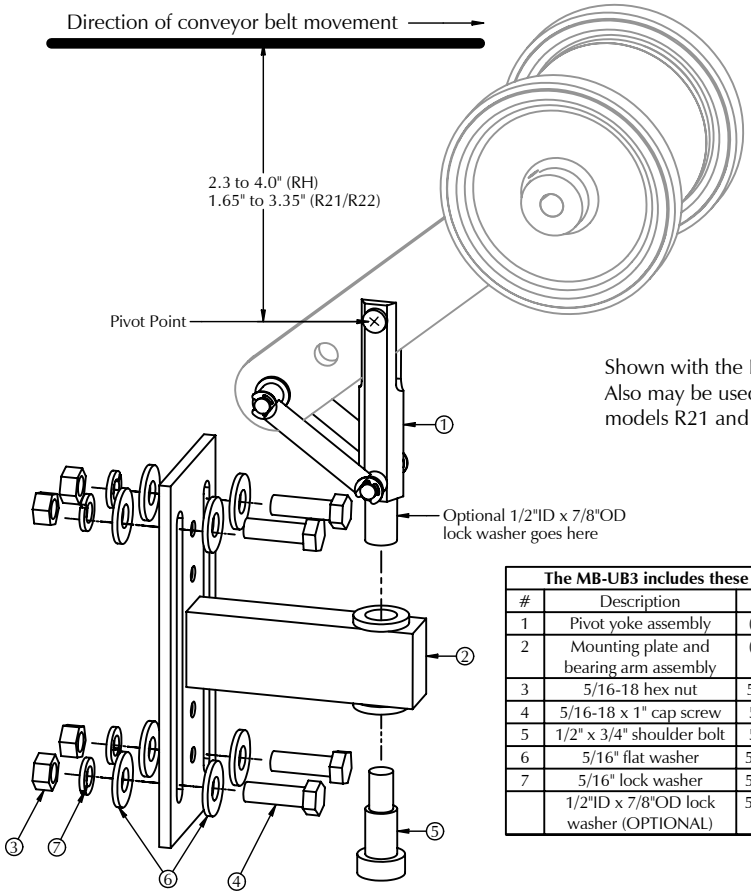
OPTIONAL: to prevent the pivot yoke from rotating, insert the 1/2"ID x 7/8"OD lock washer onto the pivot yoke before installing. If the conveyor operates in both directions then the lock washer should be installed to prevent the encoder from rotating 180° when the conveyor reverses direction. In this case, if the pivot yoke is not locked in a fixed position then there could be premature wheel tread wear for the measuring wheels, or the cable could become tangled.

3. Bolt the mounting plate to the conveyor frame using 5/16-18 cap screws and hardware supplied as shown in figure 1. The pivot yoke should be perpendicular to the conveyor belt with the pivot point below the belt as shown in figure 1, and be positioned so the encoder is aligned with the belt. The greatest pressure is applied when the pivot point is closest to the belt.

Note: The bearing arm can be attached to different locations on the mounting plate to facilitate installation.

4. Make sure the encoder has unobstructed rotation and up/down movement.

5. Attach the cable so the cord is clear of the pivot point and sharp edges, and with sufficient slack to allow for expected up/down and sideways movement.



Shown with the RH encoder. Also may be used with the models R21 and R22 encoders.

The MB-UB3 includes these parts (Figure 1)			
#	Description	Part No.	Qty
1	Pivot yoke assembly	(see figure 3)	1
2	Mounting plate and bearing arm assembly	(see figure 2)	1
3	5/16-18 hex nut	550-NUT009	4
4	5/16-18 x 1" cap screw	550-SCR306	4
5	1/2" x 3/4" shoulder bolt	550-SCR309	1
6	5/16" flat washer	550-WSH008	8
7	5/16" lock washer	550-WSH009	4
	1/2"ID x 7/8"OD lock washer (OPTIONAL)	550-WSH012	1

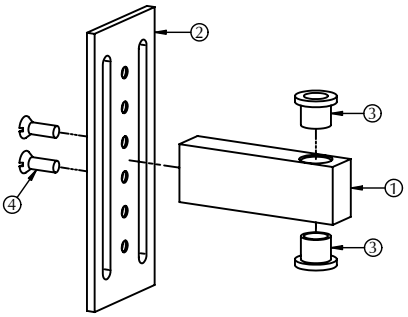


Fig. 2: Mounting Plate and Bearing Arm Assembly			
#	Description	Part No.	Qty
1	Bearing arm	500-MCH094A	1
2	Mounting plate	500-MCH095A	1
3	1/2" Bronze bearing	500-BRN006	2
4	1/4-20 x 3/4" Flat head screw	550-SCR308	2

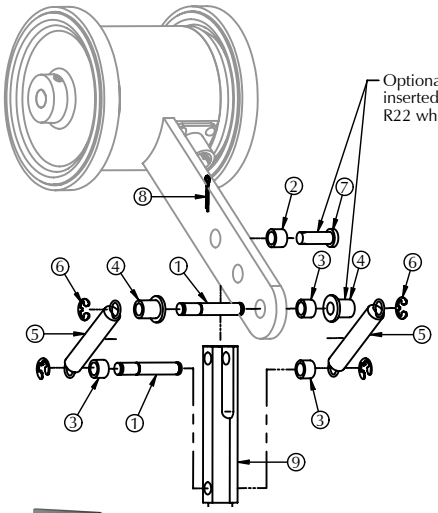


Figure 3: Pivot Yoke Assembly			
#	Description	Part No.	Qty
1	1.5" x 1/4" pins	500-MCH096A	2
2	Brass bushing	500-MCH041	1
3	Nylon bushing	550-MSC007	3
4	Nylon shoulder washer	550-MSC008	2
5	2.5" x 3/8" spring	500-MSC009	2
6	7/32" E-ring	550-RNG010	4
7	3/4" Clevis pin	550-MSC004	1
8	Cotter pin	550-MSC005	1
9	Pivot yoke	500-MCH093A	1
	Nylon washer	550-WSH006	4

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1002

Model: MB-UB4 Under-belt mounting

DESCRIPTION

The MB-UB4 underbelt mounting assembly facilitates installation of the model RH, R21 or R22 wheeled encoders under the convey belt (or roller) as shown in figure 1. The Y-4 yoke provides a pivot point that allows the up/down and some sideways movement of the encoder with the conveyor belt while the springs assure constant contact of the wheels to the conveyor. The pivot point and Y-4 yoke are centered on the encoder to automatically optimize alignment with the conveyor. Nylon washers are included to accommodate the thinner handle on the R21 and R22 wheeled encoders.

INSTALLATION

1. Assemble the MB-UB4 components onto the encoder as shown in figure 2. Note: when ordered with an encoder as an assembly, the MB-UB4 is preassembled onto the encoder to simplify installation.

2. Bolt the Y-4 yoke to the mounting beam (not supplied) using the 3/8-16 hex cap screw and lock washer supplied. The Y-4 should be perpendicular to the conveyor belt with the pivot point below the belt as shown in figure 1, and positioned so it is aligned with the belt. The greatest pressure is applied when the pivot point is closest to the belt. Caution: If the encoder is not well aligned with the belt, premature wheel wear will result.

3. Make sure the encoder has unobstructed up/down movement.

4. Attach the cable so the cord is clear of the pivot point and sharp edges, and with sufficient slack to allow for expected up/down and some sideways movement.

PARTS LIST

The MB-UB4 includes these parts (See figure 2)			
#	Description	Part No.	Qty
1	1.5" x 1/4" pins	500-MCH096A	2
2	Brass bushing	500-MCH041	1
3	Nylon bushing	550-MSC007	3
4	Nylon shoulder washer	550-MSC008	2
5	2.5" x 3/8" spring	500-MSC009	2
6	7/32" E-ring	550-RNG010	4
7	3/4" Clevis pin	550-MSC004	1
8	Cotter pin	550-MSC005	1
9	Y-4 Yoke	500-MCH097A	1
10	3/8" Lock Washer	550-WSH005	1
11	3/8"-16 Cap Screw	550-SCR303	1
	Nylon Washers	550-WSH006	4

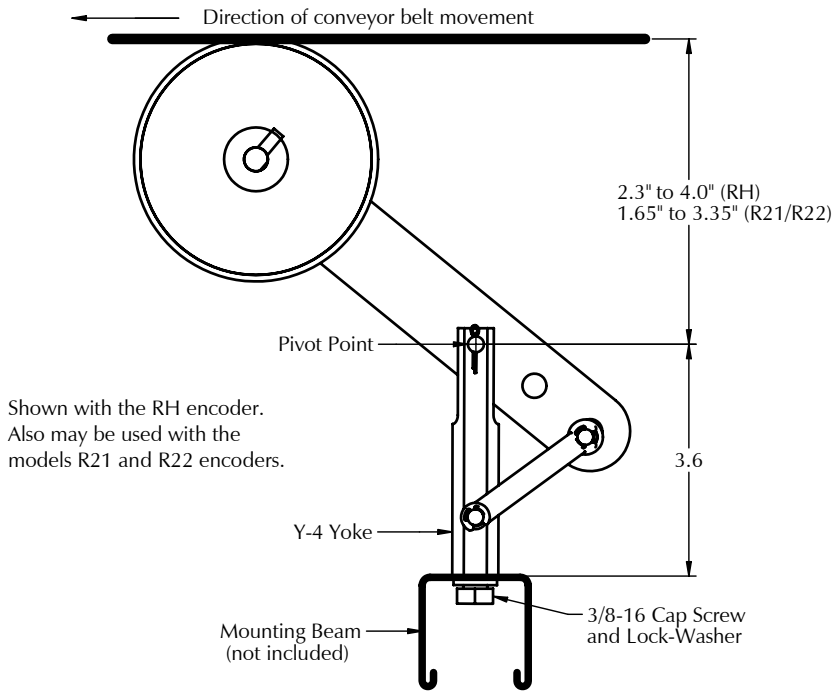

Figure 1: MB-UB4 Assembly (shown with RH wheeled encoder)

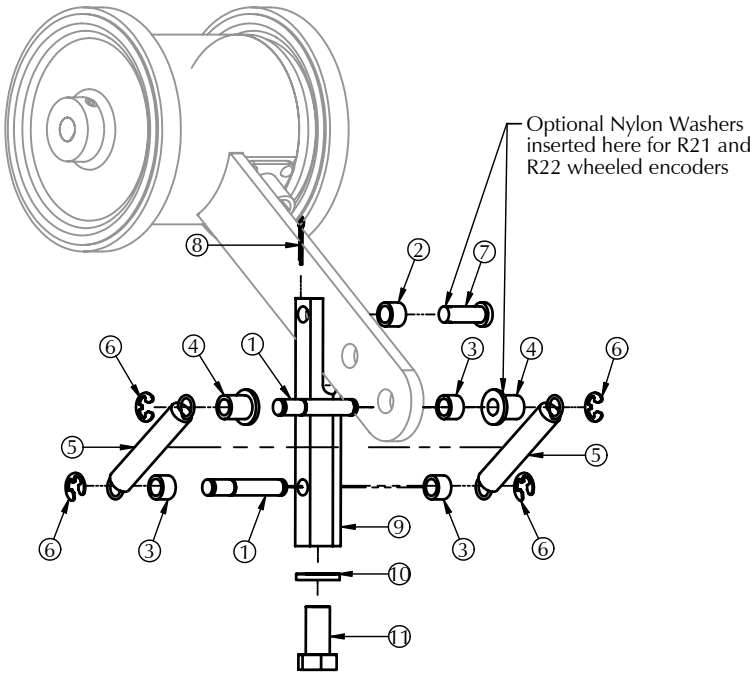

Figure 2: MB-UB4 Component Detail

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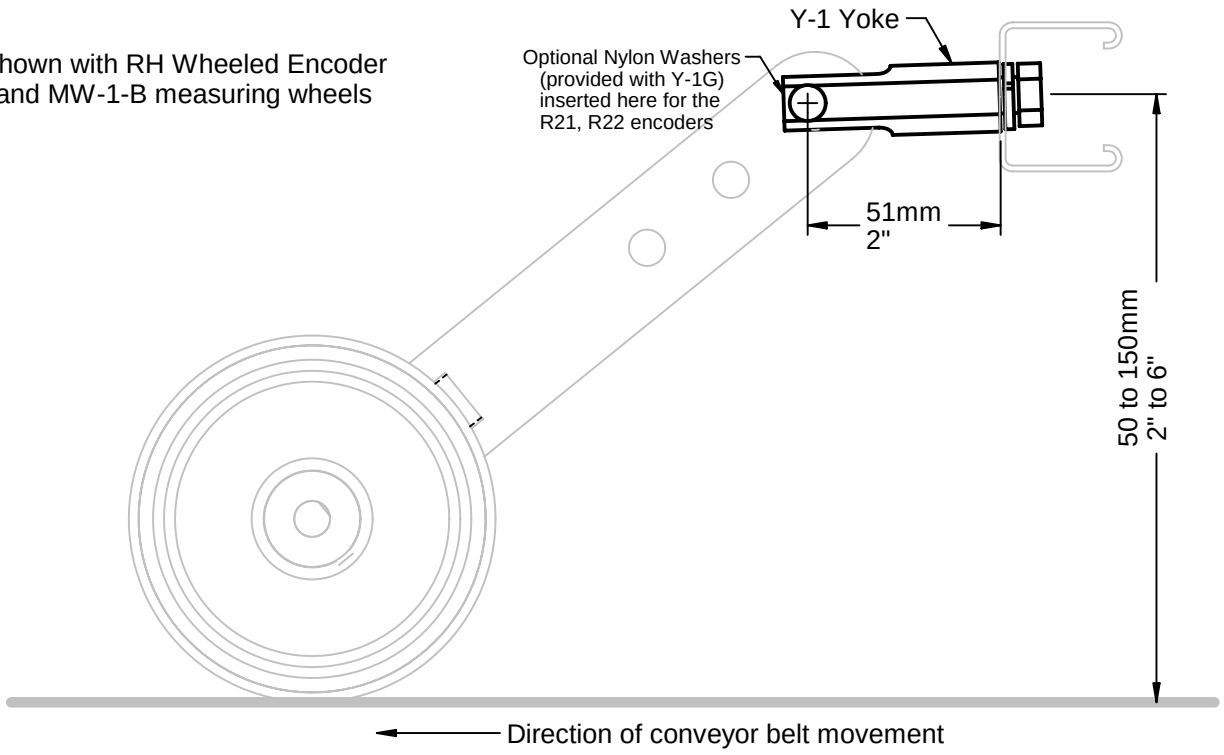
Y-1 Wheeled Encoder Mounting Yoke

Shown with RH Wheeled Encoder and MW-1-B measuring wheels



DESCRIPTION

The Y-1 facilitates mounting the model RH dual wheeled encoder above a conveyor belt or web as shown in the figure. For the R21 and R22 wheeled encoders, order the Y-1G.

The Y-1 yoke provides a pivot point along the center of gravity of the encoder equiped with a pair of measuring wheels, allowing for up/down and some sideways movement of the encoder so that it self-aligns with the conveyor belt movement, thus minimizing wheel wear.

It should be mounted as shown such that the movement of the conveyor pulls the encoder, and the Y-1 should be aligned as parallel as possible with the conveyor belt. If the encoder is mounted such that it is pushed towards the Y-1, it will not maintain proper alignment and will result in premature wheel wear.

INSTALLATION

1. Insert the brass bushing through the hole on the encoder handle.
2. Align the handle and brass bushing between the fork of the Y-1. Then insert the clevis pin into one hole of the Y-1, through the handle and brass bushing, and out the other hole of the Y-1. Secure the clevis pin with the cotter pin.
   Note: For the R21 and R22 encoders, place a nylon washer, included with the Y-1G, on each side of the handle to eliminate excess gap.
3. Bolt the Y-1 to a mounting beam (not supplied) using the 1/4-28 cap screw and lock washer. The Y-1 should be parallel to the conveyor belt with the pivot point 2" to 6" above the belt, and be aligned with the movement of the conveyor.
4. Attach the encoder cable so it is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways movement.

Y-1 Yoke Components		
Description	**Part No.**	**Quantity**
Y-1 Yoke	605-0022-01	1
1/4-28 Cap Screw	541-1400	1
Split-Lock Washer	543-1201	1
Brass Bushing	603-0276-01	1
Clevis Pin	541-0001	1
Cotter Pin	541-0002	1

Additional parts for Y-1G		
Description	**Part No.**	**Quantity**

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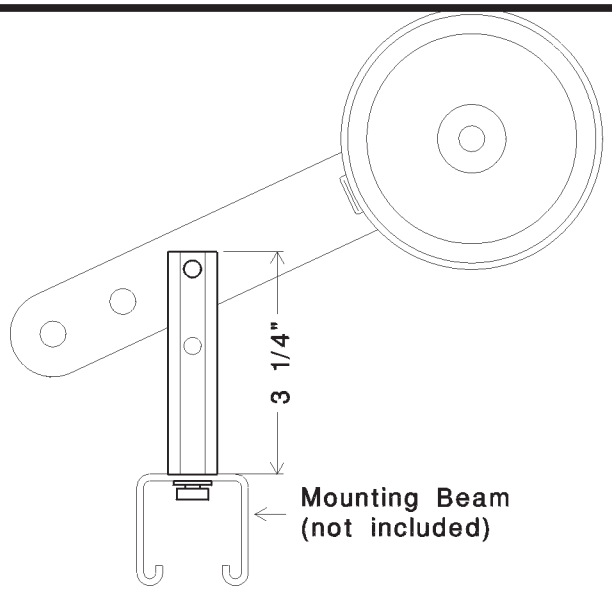


Figure 1: Y-2a Assembly (shown with PPI)

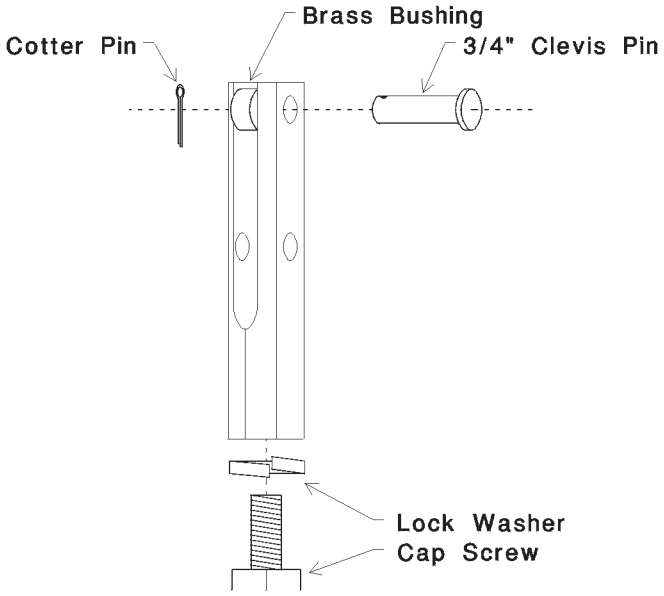


Figure 2: Y-2a Component Detail

DESCRIPTION

The Y-2a provides a single point of attachment that allows the model RH pulse position indicator (PPI) to maintain alignment with the conveyor belt or rollers, and therefore minimize wheel wear. With its double wheel construction, the PPI is self-aligning when allowed to pivot freely from the Y-2a.

The Y-2a is intended to be used with a customer supplied counter-weight or other mechanism to keep the PPI wheels firmly against the conveyor belt when mounted under the conveyor.

INSTALLATION

1. Assemble Y-2a components onto the PPI as shown in the figure.
2. Bolt Y-2a yoke to a mounting beam (not supplied) using the 3/8-16 Hex Cap Screw and lock washer supplied.
3. Assemble the customer supplied counter-weight onto the PPI.
4. Attach the PPI cable so the cable is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways PPI movement.

ORDER INFORMATION

Part No.: Y-2a

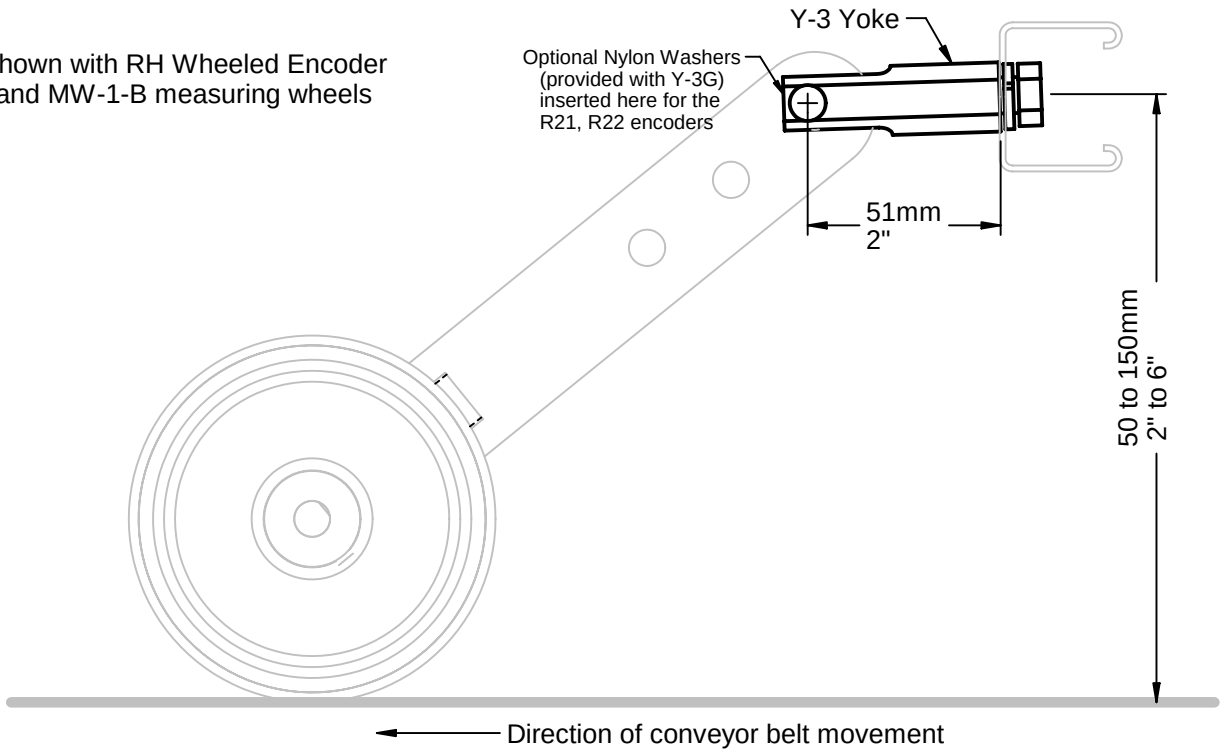
(Includes all parts shown in the spare parts list)

SPARE PARTS LIST

Qty	Description	Part #
1	Y-2 Yoke	500-MCH075
1	Clevis Pin	550-MSC004
1	Brass Bushing	500-MCH041
1	Cotter Pin	550-MSC005
1	3/8-16 x 3/4" Cap Screw	550-SCR303
1	3/8" Lock Washer	550-WSH005

Y-3 Wheeled Encoder Mounting Yoke

Shown with RH Wheeled Encoder and MW-1-B measuring wheels



DESCRIPTION

The Y-3 facilitates mounting the model RH dual wheeled encoder above a conveyor belt or web as shown in the figure. For the R21 and R22 wheeled encoders, order the Y-3G.

The Y-3 yoke provides a pivot point along the center of gravity of the encoder equiped with a pair of measuring wheels, allowing for up/down and some sideways movement of the encoder so that it self-aligns with the conveyor belt movement, thus minimizing wheel wear.

It should be mounted as shown such that the movement of the conveyor pulls the encoder, and the Y-3 should be aligned as parallel as possible with the conveyor belt. If the encoder is mounted such that it is pushed towards the Y-3, it will not maintain proper alignment and will result in premature wheel wear.

INSTALLATION

1. Insert the brass bushing through the hole on the encoder handle.
2. Align the handle and brass bushing between the fork of the Y-3. Then insert the clevis pin into one hole of the Y-3, through the handle and brass bushing, and out the other hole of the Y-3. Secure the clevis pin with the cotter pin.
   Note: For the R21 and R22 encoders, place a nylon washer, included with the Y-3G, on each side of the handle to eliminate excess gap.
3. Bolt the Y-3 to a mounting beam (not supplied) using the 3/8-16 cap screw and lock washer. The Y-3 should be parallel to the conveyor belt with the pivot point 2" to 6" above the belt, and be aligned with the movement of the conveyor.
4. Attach the encoder cable so it is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways movement.

Y-3 Yoke Components		
Description	**Part No.**	**Quantity**
Y-3 Yoke	605-0039-01	1
3/8-16 Cap Screw	541-3800	1
Split-Lock Washer	543-3805	1
Brass Bushing	603-0276-01	1
Clevis Pin	541-0001	1
Cotter Pin	541-0002	1

Additional parts for Y-3G		
Description	**Part No.**	**Quantity**

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MB-T_ Torsion Spring Mounting

DESCRIPTION

The MB-T torsion spring wheeled encoder mounting assembly facilitates installation of the R21 or R22, or RH (with M266 modification) encoders onto a conveyor belt or roller, or other moving web. The adjustable torsion spring is locked into place to provide constant pressure of the wheel against the web, even for uneven surfaces. Adapting to a variety of installations is made possible through various mounting kits.

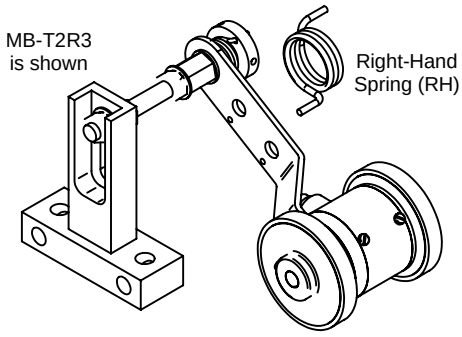


Figure 1: Typical Right-Hand Spring Configuration

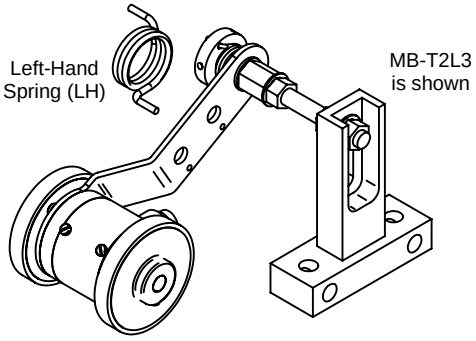


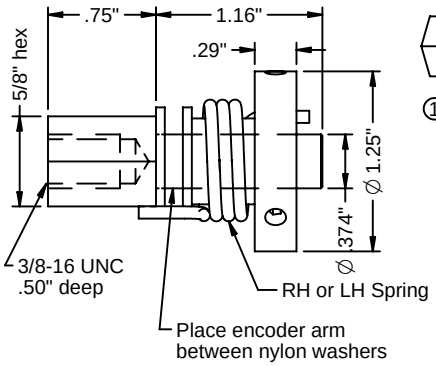
Figure 2: Typical Left-Hand Spring Configuration

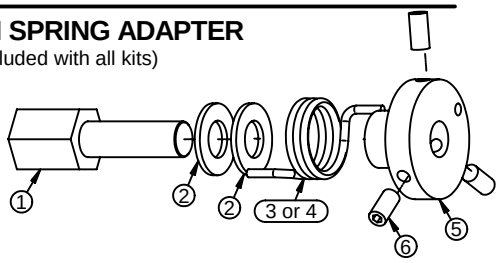
INSTALLATION

1. Put the mandrel through one of the 3 holes in the encoder arm, with a nylon washer on each side of the encoder arm.
2. Place the spring on the mandrel, inserting the spring end into the small hole on the encoder arm.
3. Place the spring support through the spring and onto the mandrel so the encoder arm and 2 nylon washers are sandwiched between the 5/8 hex part of the mandrel and the spring support. Leave just enough slack so the encoder arm pivots freely.
4. Gently tighten one of the spring support set-screws.
5. Using one of the mounting kits, mount the encoder on the machine or conveyor.
6. Once the encoder and torsion spring mounting are in place, loosen the spring support set-screw.
7. Using a 3/32 allen wrench as a lever in one of the set screws, rotate the spring support clockwise (for LH spring) or counter-clockwise (for RH spring). About 1/10th of a rotation (30 degrees) will provide sufficient tension. Do not exceed 90 degrees.
8. Tighten all 3 spring support set-screws.

TORSION SPRING ADAPTER

(included with all kits)



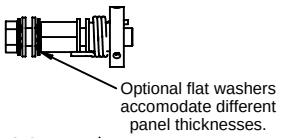


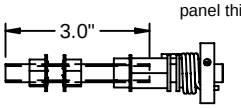
Torsion Spring Adapter Parts List			
#	Description	Part No.	Quantity
1	Mandrel	603-0555-01	1
2	Nylon washer	543-3806	2
3	RH Torsion spring	600-2188-01	optional
4	LH Torsion spring	600-2187-01	optional
5	Spring support	603-0554-01	1
6	Set screw	541-1017	3

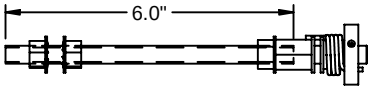
MOUNTING KITS

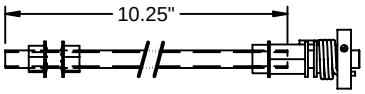
(Each kit also includes a Torsion Spring Adapter with RH or LH spring)

Extension Rod Style









MB-T0_0 Mounting Kit with 0" Rod		
Description	Part No.	Quantity
3/8-16 x .75" Cap Screw	541-3800	1
3/8" Lock Washer	543-3809	2
3/8" Flat Washer	543-3810	2

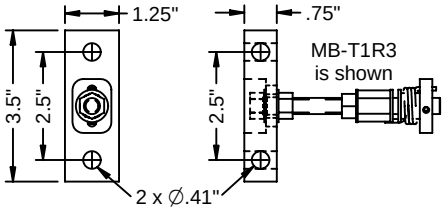
MB-T0_3 Mounting Kit with 3" Rod		
Description	Part No.	Quantity
3" Threaded Rod	603-0558-01	1
3/8" Lock Washer	543-3809	3
3/8-16 Hex Bolt	542-3804	3

MB-T0_6 Mounting Kit with 6" Rod		
Description	Part No.	Quantity
6" Threaded Rod	603-0287-01	1
3/8" Lock Washer	543-3809	3
3/8-16 Hex Bolt	542-3804	3

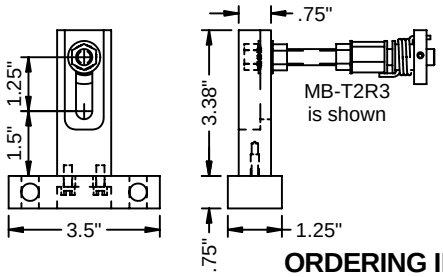
MB-T0_10 Mounting Kit with 10.25" Rod		
Description	Part No.	Quantity
10.25" Threaded Rod	603-0279-01	1
3/8" Lock Washer	543-3809	3
3/8-16 Hex Bolt	542-3804	3

Base and Post Styles

(all are supplied with some extension rod)



MB-T1__ Mounting Kit with Base		
Description	Part No.	Quantity
Base	603-0556-01	1
Extension Rod kit (shown above)	MB-T0__	1



MB-T2__ Mounting Kit with Base and Post		
Description	Part No.	Quantity
Base	603-0556-01	1
Post	603-0557-01	1
10-24 Cap Screw	541-1016	2
Extension Rod kit (shown above)	MB-T0__	1

ORDERING INFORMATION

MB-	T			
unting Bracket	**sion Spring**	**le:** Rod Only, Base and Rod, Base, Post, Rod	**ring:** Right Hand, Left Hand	**d Length:** 0"=3", 3=3", 6=6", =10.25"

Example Models:

MB-T0L6 - Extension rod style, LH spring, 6" threaded rod

MB-T1R0 - Base style, RH spring, 0" extension rod

MB-T2R10 - Base and Post style, RH spring, 10.25" rod

MB-T - Universal kit containing

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MB-FB2C Hollow shaft encoder mounting

DESCRIPTION

The MB-FB2C provides a means to mount the model HS20 hollow shaft encoder to a conveyor roller that is supported by a 2-bolt flange mount bearing with a bolt spacing of 3.4" to 5.9". It is commonly used with the MB-ST.5 shaft stub that is attached to the end of the conveyor roller and supports the HS20 encoder. The MB-FB2C provides a tether that prevents the HS20 from rotating yet is flexible, thus avoiding excess load on the encoder bearings. Mounting hardware anchors the tether to one of the 1/2" threaded mounting studs of the flange bearing.

INSTALLATION

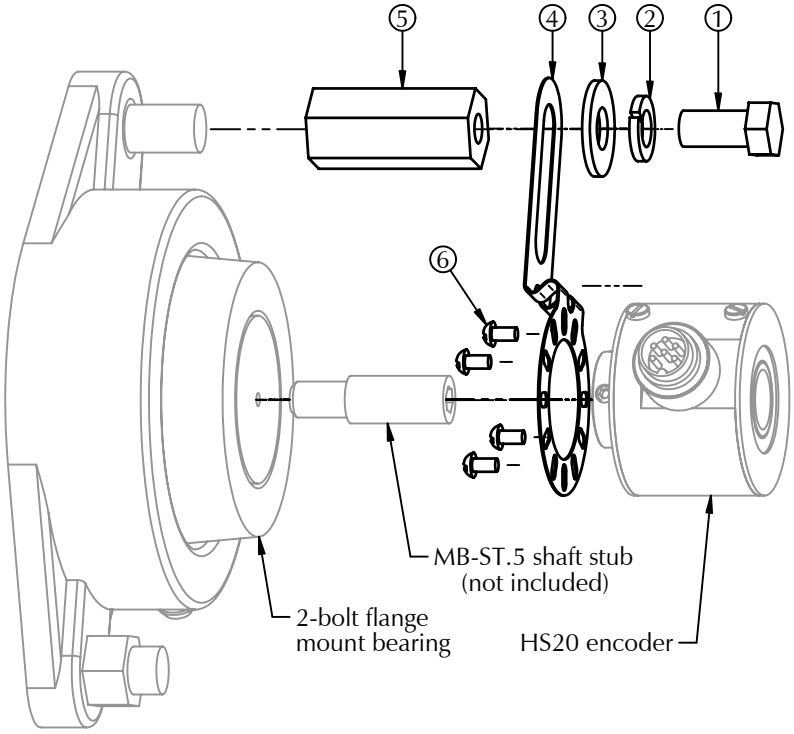
1. If using the MB-ST.5 shaft stub (purchase separately), drill and tap a 3/8-16 hole, at least 5/8" deep into the end of the conveyor shaft. Insert the MB-ST.5 shaft stub or equivalent. The shaft stub should be in-line with the shaft axis, so there is minimum wobble when the shaft is rotating.

2. Fasten the MB-FB2 flexible tether to the face of the encoder using the four 6-32 screws (supplied).

3. Attach the coupling nut to one of the 1/2" threaded mounting studs of the flange bearing. It may be necessary to remove the existing 1/2" nut.

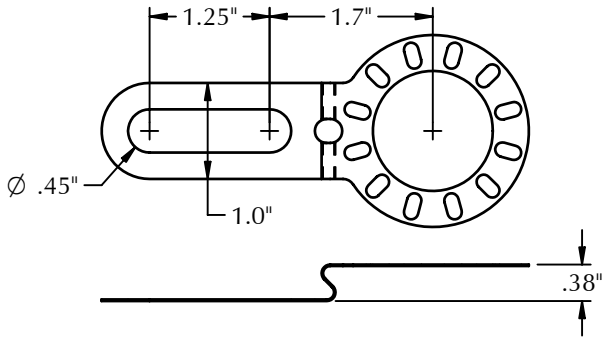
4. Install the HS20 onto the shaft stub (MB-ST.5), such that the flexible tether rests on the coupling nut. Tighten the encoder set screws.

5. Secure the tether to the coupling nut using the 3/8-16 cap screw and washers as shown.

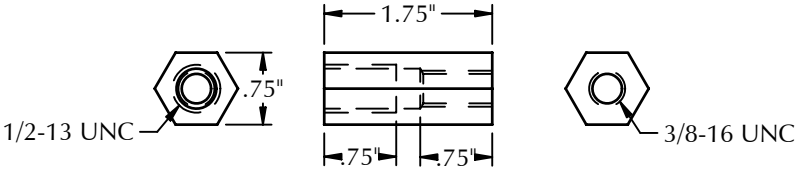


MB-FB2C includes the following parts			
#	Description	Part No.	Qty
1	3/8-16 x 3/4" cap screw	550-SCR303	1
2	3/8" split lock washer	550-WSH005	1
3	3/8" flat washer	550-WSH007	1
4	MB-FB2 flexible tether	500-MSC010	1
5	Coupling nut	500-MCH118	1
6	6-32 x 3/16" round head screw	550-SCR202	4

MB-FB2 Flexible Tether



Coupling Nut



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MB-FB2C-1 Hollow shaft encoder mounting

DESCRIPTION

The MB-FB2C-1 provides a means to mount the model HS20 hollow shaft encoder to a conveyor roller that is supported by a 2-bolt flange mount bearing with a bolt spacing of 3.4" to 5.9". It is commonly used with the MB-ST.5 shaft stub that is attached to the end of the conveyor roller and supports the HS20 encoder. The MB-FB2C-1 provides a tether that prevents the HS20 from rotating yet is flexible, thus avoiding excess load on the encoder bearings. Mounting hardware anchors the tether to one of the 3/8" threaded mounting studs of the flange bearing.

INSTALLATION

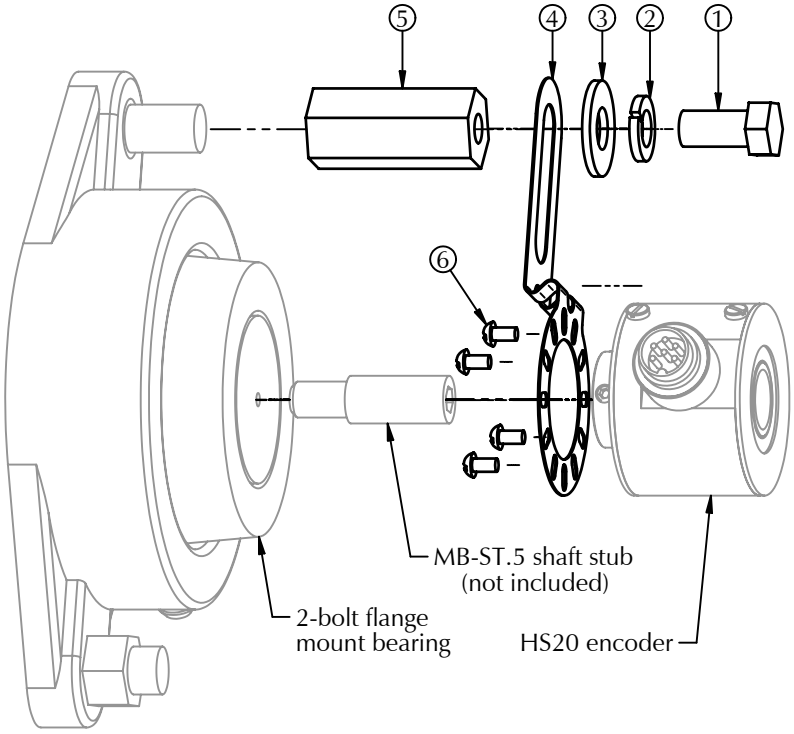
1. If using the MB-ST.5 shaft stub (purchase separately), drill and tap a 3/8-16 hole, at least 5/8" deep into the end of the conveyor shaft. Insert the MB-ST.5 shaft stub or equivalent. The shaft stub should be in-line with the shaft axis, so there is minimum wobble when the shaft is rotating.

2. Fasten the MB-FB2 flexible tether to the face of the encoder using the four 6-32 screws (supplied).

3. Attach the coupling nut to one of the 3/8" threaded mounting studs of the flange bearing. It may be necessary to remove the existing 3/8" nut.

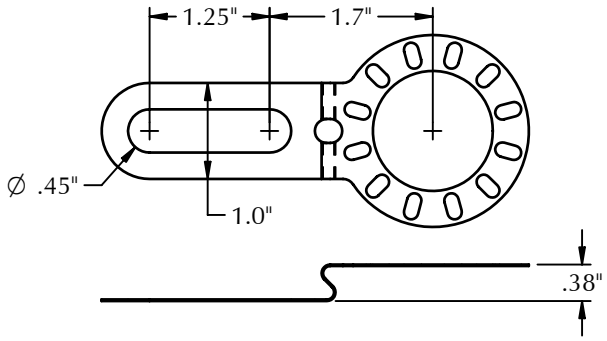
4. Install the HS20 onto the shaft stub (MB-ST.5), such that the flexible tether rests on the coupling nut. Tighten the encoder set screws.

5. Secure the tether to the coupling nut using the 3/8-16 cap screw and washers as shown.

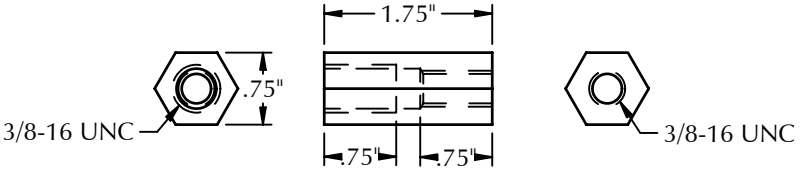


MB-FB2C includes the following parts			
#	Description	Part No.	Qty
1	3/8-16 x 3/4" cap screw	550-SCR303	1
2	3/8" split lock washer	550-WSH005	1
3	3/8" flat washer	550-WSH007	1
4	MB-FB2 flexible tether	500-MSC010	1
5	Coupling nut	500-MCH118-1	1
6	6-32 x 3/16" round head screw	550-SCR202	4

MB-FB2 Flexible Tether



Coupling Nut



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MB-FB2D Hollow shaft encoder mounting

DESCRIPTION

The MB-FB2D provides a means to mount the model HS20 hollow shaft encoder to a conveyor roller that is supported by a 2-bolt flange mount bearing with a bolt spacing of 3.75" to 6.75". It is commonly used with the MB-ST.5 shaft stub (not included) that is attached to the end of the conveyor roller and supports the HS20 encoder. The MB-FB2D provides a rigid tether, locked in place by a second MB-ST.5 shaft stub (included) that prevents the HS20 from rotating, yet has free non-rotational movement, thus avoiding excess load on the encoder bearings. A coupling nut anchors the tether shaft stub to one of the 1/2" threaded mounting studs of the flange bearing.

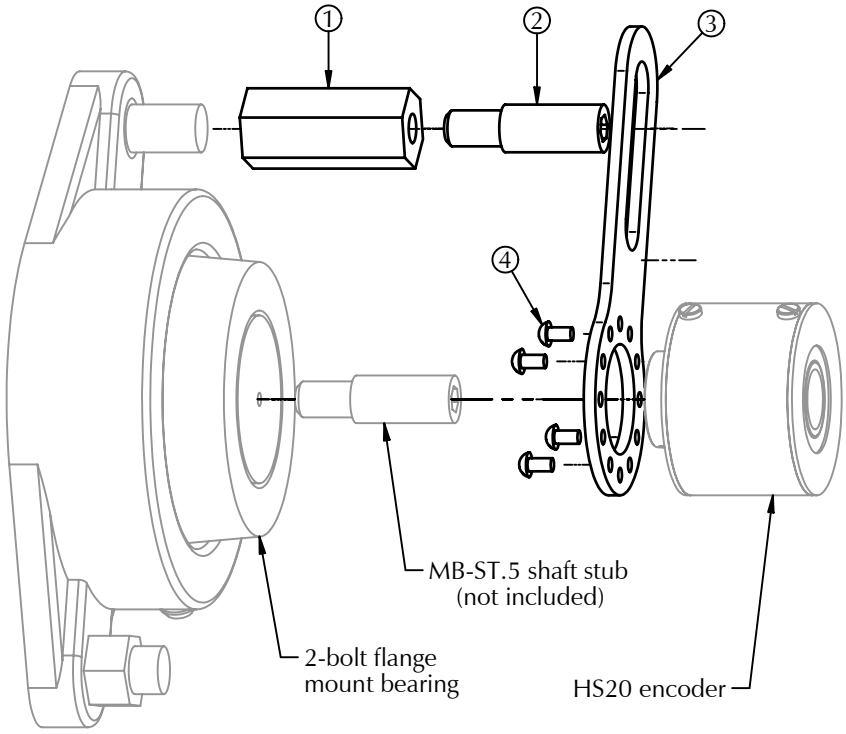
INSTALLATION

1. If using the MB-ST.5 shaft stub (purchased separately) drill and tap a 3/8-16 hole, at least 5/8" deep into the end of the conveyor shaft. Insert the MB-ST.5 shaft stub or equivalent. The shaft stub should be in-line with the shaft axis, so there is minimum wobble when the shaft is rotating.

2. Fasten the MB-FB2B rigid tether to the face of the encoder using the four 6-32 screws (supplied).

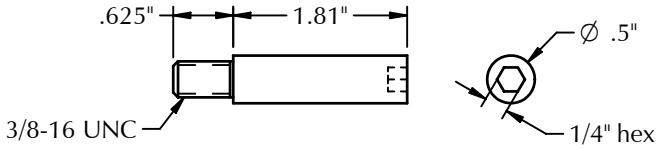
3. Attach the coupling nut and the shaft stub to one of the 1/2" threaded mounting studs of the flange bearing as shown. It may be necessary to remove the existing 1/2" nut.

4. Install the HS20 onto the shaft stub (MB-ST.5 or equivalent), such that the slot of the rigid tether fits over the second shaft stub as shown. Tighten the encoder set screws.

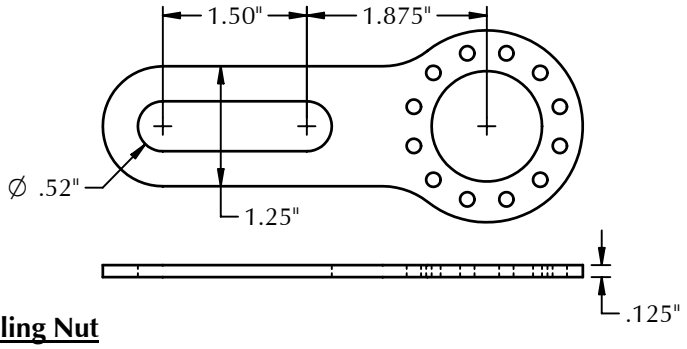


MB-FB2D includes the following parts			
#	Description	Part No.	Qty
1	Coupling nut	500-MCH118-0	1
2	MB-ST.5 shaft stub	500-MSC-ST.5	1
3	MB-FB2B rigid tether (aluminum)	500-MCH110	1
4	6-32 x 1/4" round head screw	550-SCR200	4

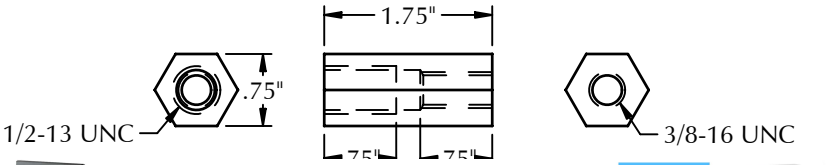
MB-ST.5 Shaft Stub



MB-FB2B Rigid Tether



Coupling Nut



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MB-FB2D-1 Hollow shaft encoder mounting

DESCRIPTION

The MB-FB2D-1 provides a means to mount the model HS20 hollow shaft encoder to a conveyor roller that is supported by a 2-bolt flange mount bearing with a bolt spacing of 3.75" to 6.75". It is commonly used with the MB-ST.5 shaft stub (not included) that is attached to the end of the conveyor roller and supports the HS20 encoder. The MB-FB2D-1 provides a rigid tether, locked in place by a second MB-ST.5 shaft stub (included) that prevents the HS20 from rotating, yet has free non-rotational movement, thus avoiding excess load on the encoder bearings. A coupling nut anchors the tether shaft stub to one of the 3/8" threaded mounting studs of the flange bearing.

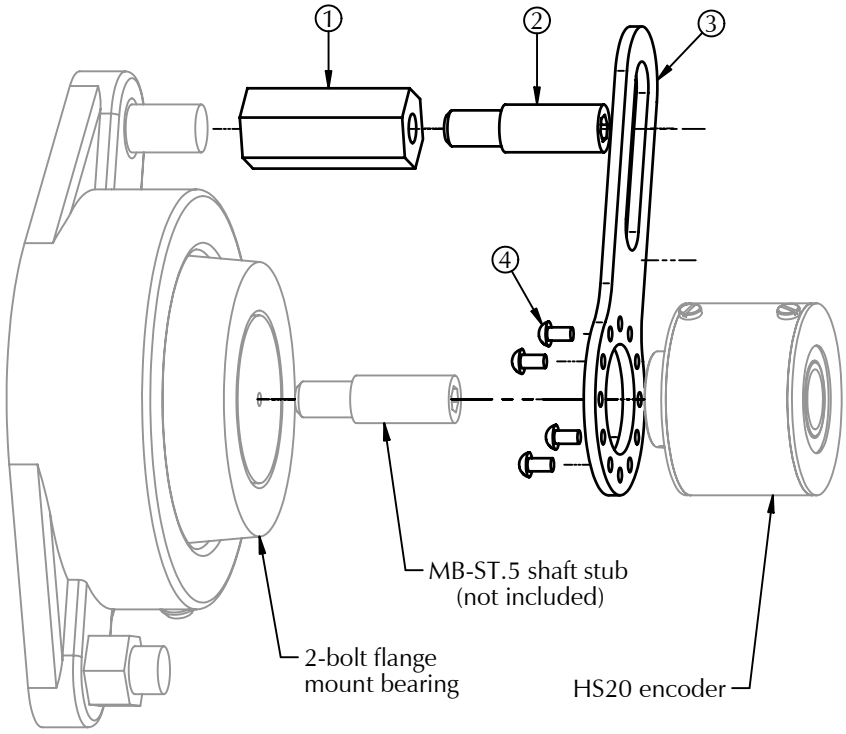
INSTALLATION

1. If using the MB-ST.5 shaft stub (purchased separately) drill and tap a 3/8-16 hole, at least 5/8" deep into the end of the conveyor shaft. Insert the MB-ST.5 shaft stub or equivalent. The shaft stub should be in-line with the shaft axis, so there is minimum wobble when the shaft is rotating.

2. Fasten the MB-FB2B rigid tether to the face of the encoder using the four 6-32 screws (supplied).

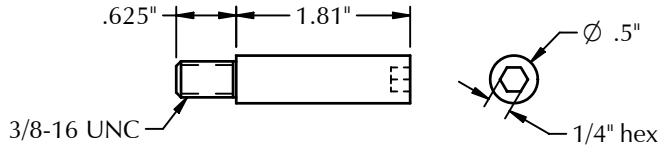
3. Attach the coupling nut and the shaft stub to one of the 3/8" threaded mounting studs of the flange bearing as shown. It may be necessary to remove the existing 3/8" nut.

4. Install the HS20 onto the shaft stub (MB-ST.5 or equivalent), such that the slot of the rigid tether fits over the second shaft stub as shown. Tighten the encoder set screws.

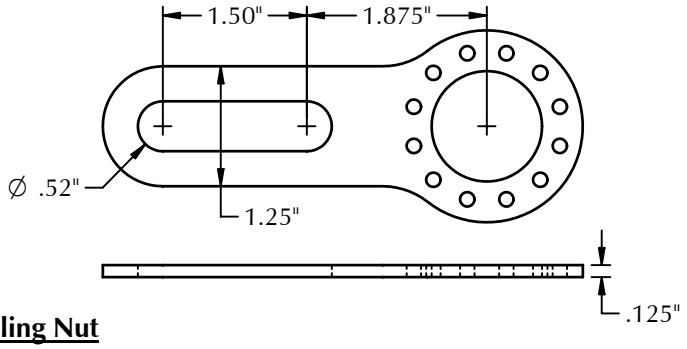


MB-FB2D includes the following parts			
#	Description	Part No.	Qty
1	Coupling nut	500-MCH118-1	1
2	MB-ST.5 shaft stub	500-MSC-ST.5	1
3	MB-FB2B rigid tether (aluminum)	500-MCH110	1
4	6-32 x 1/4" round head screw	550-SCR200	4

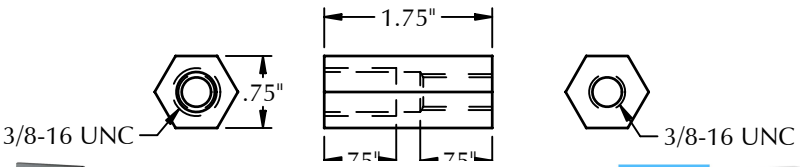
MB-ST.5 Shaft Stub



MB-FB2B Rigid Tether



Coupling Nut



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MB-FL8 Shaft encoder mounting bracket

DESCRIPTION

The MB-FL8 provides a means to mount the Model R20, RG, RL or RS shaft encoders to a conveyor roller that is supported by a 2-bolt flange mount bearing with a bolt spacing of 4" to 6". A 3/8" threaded stud is inserted into a hole drilled and tapped at the end of the conveyor roller. The flexible rubber hose accomodates the misalignment between the threaded stud and the encoder shaft, eliminating excess load on the encoder bearings.

INSTALLATION

1. Drill and tap a 3/8-16 hole, 3/4" deep, in the end of the conveyor roller. To minimize the excess load on the encoder bearings, the hole must be in-line with the conveyor roller axis.

2. Insert the stud into the drilled hole.

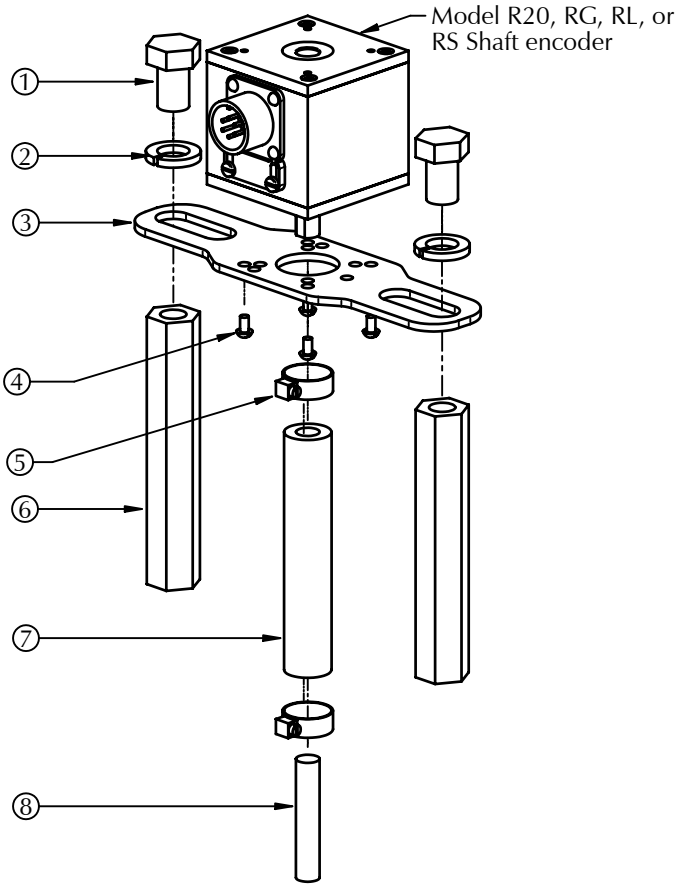
3. Attached the rubber hose to the stud using one of the hose clamps.

4. Attach the 3/4" hex MB-FL8 mounting posts to the 2 flange mount bearing studs.

5. Assemble the encoder to the MB-FL8 mounting base using the 6-32 screws (or 8-32 for RL encoder).

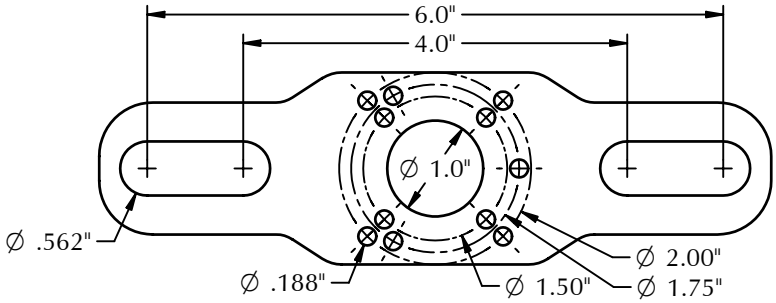
6. Assemble the mounting plate and encoder to the mounting posts using the 1/2-13 bolts and lock washers. At the same time insert the encoder shaft into the hose and clamp it using the other hose clamp, shortening the hose if necessary.

NOTE: For maximum protection of the encoder bearings, the distance between the end of the encoder shaft and the end of the threaded stud should be as large as possible.

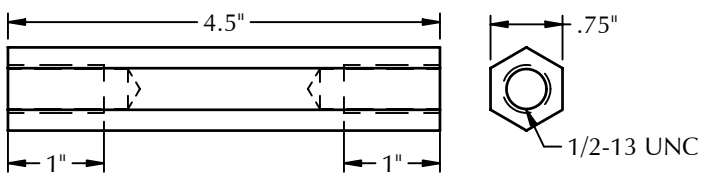


#	Description	Part No.	Qty
1	1/2-13 x 3/4 Bolt	550-SCR311	2
2	1/2" split-lock washer	550-WSH015	2
3	MB-FL8 Mounting Plate, 1/8" aluminum	500-MCH113	1
4	6-32 x 1/4" screws	550-SCR200	4
5	Hose clamp	500-MSC018	2
6	MB-FL8 Hex Post, 3/4" steel	500-MCH114	2
7	3/8"ID, 3/4"OD rubber hose	500-MSC019	1
8	3/8-16 x 2" threaded stud	500-MSC020	1

MB-FL8 Mounting Plate



MB-FL8 Hex Post



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MB-FL8A Shaft encoder mounting bracket

DESCRIPTION

The MB-FL8A attaches the Model R20, RG, RL or RS shaft encoders to a conveyor roller, supported by a 2-bolt flange mount bearing with a bolt spacing of 4" to 6". A threaded stud is inserted into a hole drilled and tapped at the end of the conveyor roller. The flexible rubber hose accomodates the misalignment between the threaded stud and the encoder shaft, eliminating excess load on the encoder bearings.

INSTALLATION

1. Drill and tap a 3/8-16 hole, 3/4" deep, in the end of the conveyor roller. To minimize the excess load on the encoder bearings, the hole must be in-line with the conveyor roller axis.

2. Insert the stud into the drilled hole.

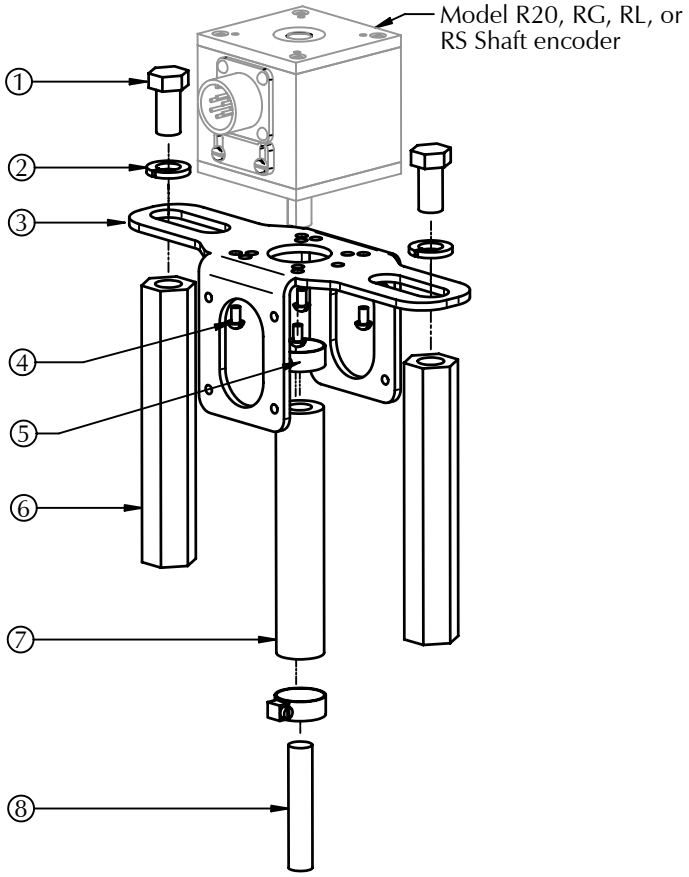
3. Attached the rubber hose to the stud using one of the hose clamps.

4. Attach the 3/4" hex MB-FL8A mounting posts to the 2 flange mount bearing studs.

5. Assemble the encoder to the MB-FL8A mounting base using the 6-32 screws (or 8-32 for RL encoder).

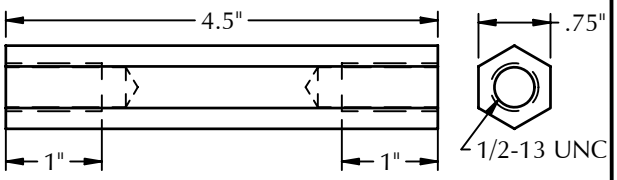
6. Assemble the mounting plate and encoder to the mounting posts using the 1/2-13 bolts and lock washers. At the same time insert the encoder shaft into the hose and clamp it using the other hose clamp, shortening the hose if necessary.

NOTE: For maximum protection of the encoder bearings, the distance between the end of the encoder shaft and the end of the threaded stud should be as large as possible.

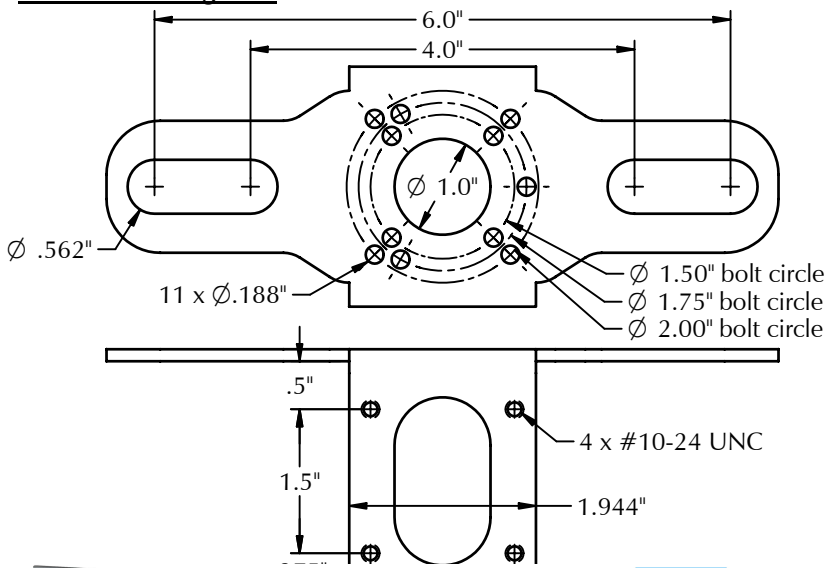


#	Description	Part No.	Qty
1	1/2-13 x 3/4 Bolt	550-SCR311	2
2	1/2" split-lock washer	550-WSH015	2
3	MB-FL8A Mounting Plate, 1/8" aluminum	500-MCH113	1
4	6-32 x 1/4" screws	550-SCR200	4
5	Hose clamp	500-MSC018	2
6	MB-FL8 Hex Post, 3/4" steel	500-MCH114	2
7	3/8"ID, 3/4"OD rubber hose	500-MSC019	1
8	3/8-16 x 2" threaded stud	500-MSC020	1

MB-FL8 Hex Post



MB-FL8 Mounting Plate



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Model: MB-UB1 — Under-belt mounting

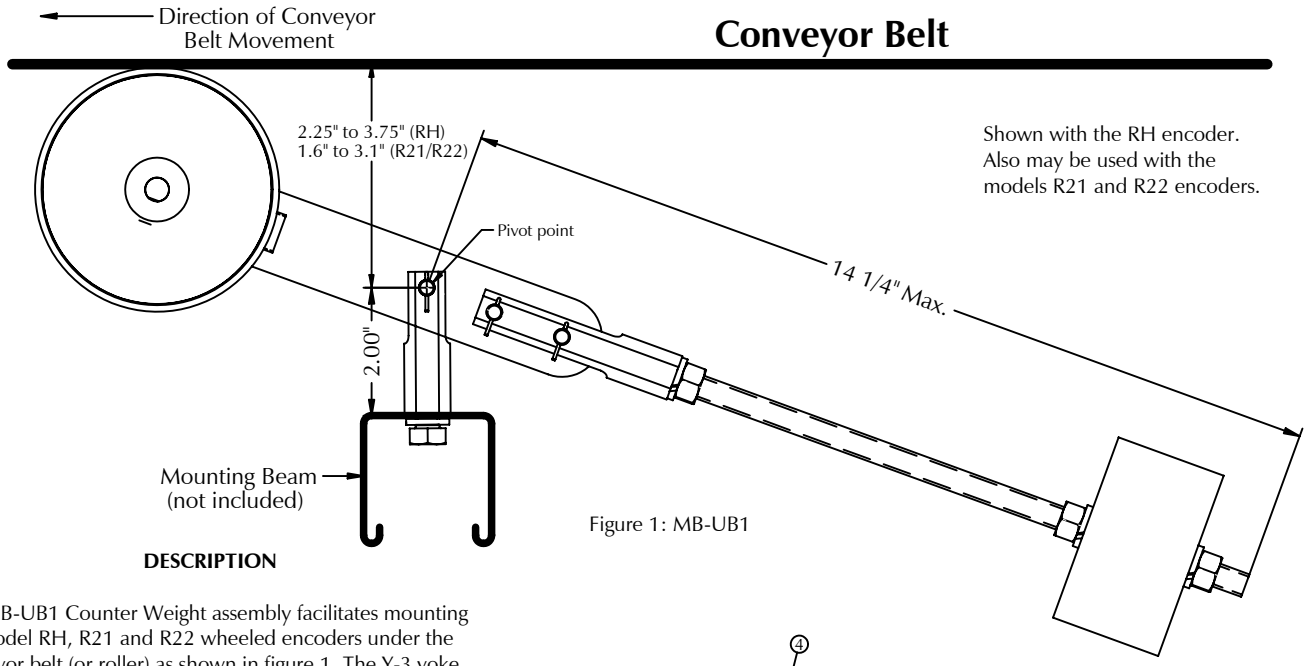

Figure 1: MB-UB1

DESCRIPTION

The MB-UB1 Counter Weight assembly facilitates mounting the model RH, R21 and R22 wheeled encoders under the conveyor belt (or roller) as shown in figure 1. The Y-3 yoke provides a pivot point so the encoder wheels maintain contact and alignment with the belt, compensating for up/down and some sideways movement of the belt. Nylon washers are included to accomodate the thinner handle on the R21 and R22 wheeled encoders.

INSTALLATION

1. Assemble the Y-2 yoke assembly on the end of the encoder arm as shown in figure 2.

2. Assemble the weight and threaded rod (figure 3).

3. Assemble the Y-3 yoke assembly (figure 4).

4. Bolt the Y-3 yoke to a mounting beam (not supplied) using the 3/8-16 bolt and lock washer. The Y-3 should be perpendicular to the conveyor belt with the pivot point below the conveyor belt as shown in figure 1, and positioned so the encoder is aligned with the belt. Caution: If the encoder is not aligned with the belt, premature wheel wear will result.

5. Adjust the position of the 1.25 lb. weight along the threaded rod. Locating the weight at the end of the rod results in the maximum upward force of the wheels against the belt (this is the normal configuration). The weight can be positioned closer to the encoder along the rod to reduce the upward force.

6. Attach the encoder cable so the cord is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways encoder movement.

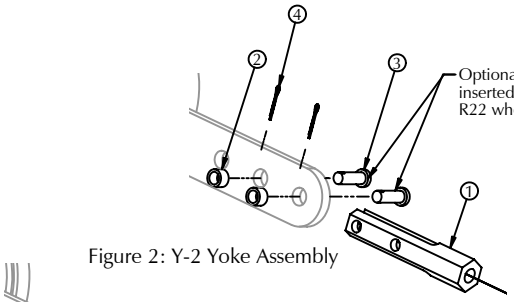

Figure 2: Y-2 Yoke Assembly

Y-2 Yoke Components			
#	Description	Part No.	Qty
1	Y-2 Yoke	500-MCH075	1
2	Plastic Bushing	500-MSC007	2
3	Clevis Pin	550-MSC004	2
4	Cotter Pin	550-MSC005	2
	Nylon Washer	550-WSH006	4

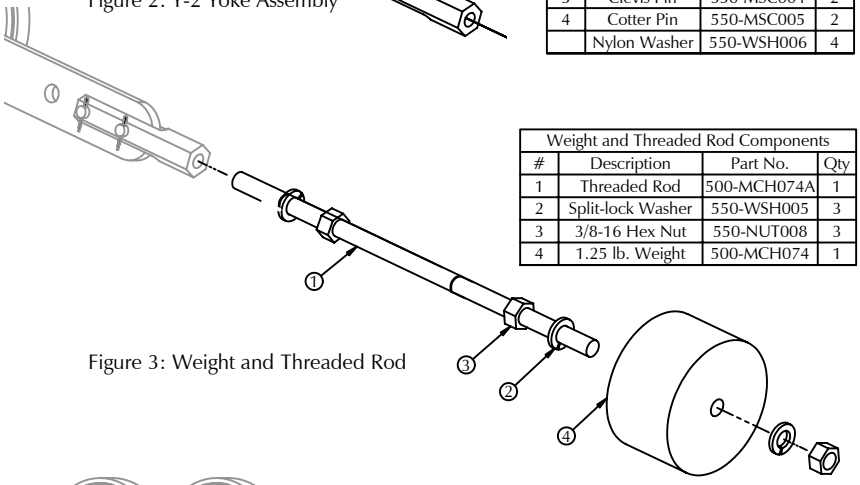

Figure 3: Weight and Threaded Rod

Weight and Threaded Rod Components			
#	Description	Part No.	Qty
1	Threaded Rod	500-MCH074A	1
2	Split-lock Washer	550-WSH005	3
3	3/8-16 Hex Nut	550-NUT008	3
4	1.25 lb. Weight	500-MCH074	1

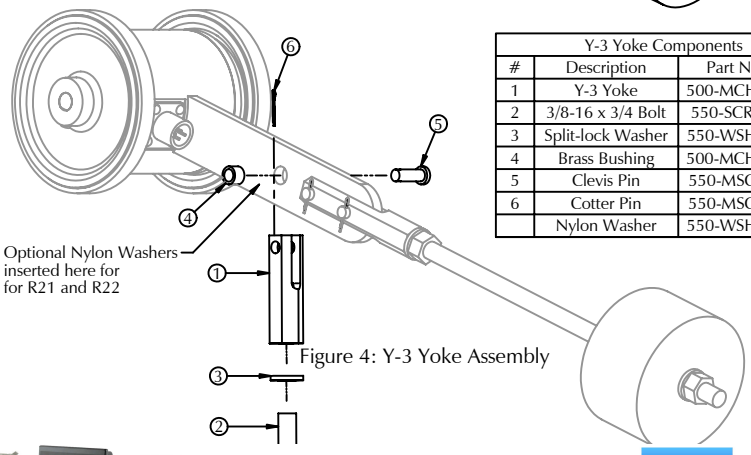

Figure 4: Y-3 Yoke Assembly

Y-3 Yoke Components			
#	Description	Part No.	Qty
1	Y-3 Yoke	500-MCH077	1
2	3/8-16 x 3/4 Bolt	550-SCR303	1
3	Split-lock Washer	550-WSH005	1
4	Brass Bushing	500-MCH041	1
5	Clevis Pin	550-MSC004	1
6	Cotter Pin	550-MSC005	1
	Nylon Washer	550-WSH006	2

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Model: MB-UB1 M185 Under-belt mounting

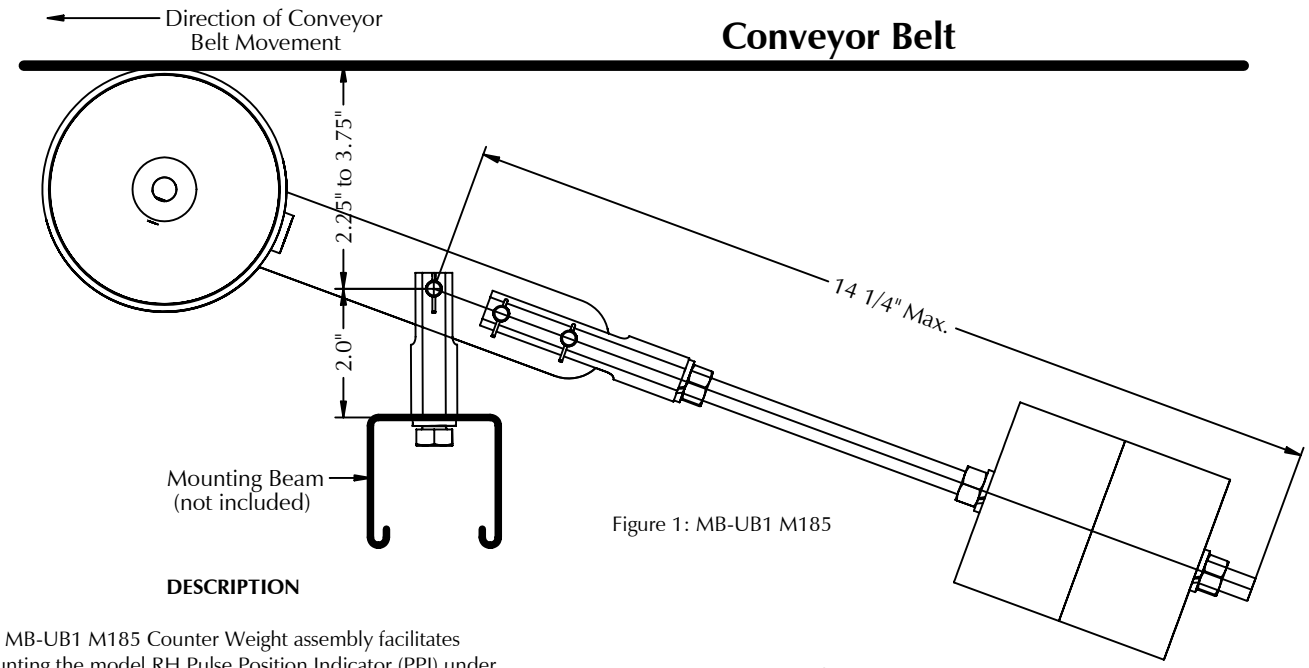

Figure 1: MB-UB1 M185

DESCRIPTION

The MB-UB1 M185 Counter Weight assembly facilitates mounting the model RH Pulse Position Indicator (PPI) under the conveyor belt (or roller) as shown in figure 1. The Y-3 yoke provides a pivot point so the PPI wheels maintain contact and alignment with the belt, compensating for up/down and some sideways movement of the belt.

INSTALLATION

1. Assemble the Y-2 yoke assembly on the end of the PPI arm as shown in figure 2.

2. Assemble the weight and hardware (figure 3).

3. Assemble the Y-3 yoke assembly (figure 4).

4. Bolt the Y-3 yoke to a mounting beam (not supplied) using the 3/8-16 bolt and lock washer. The Y-3 should be perpendicular to the conveyor belt with the pivot point 2-1/4"/57mm to 3-3/4"/95mm below the conveyor belt, and positioned so the PPI is aligned with the belt. Caution: If the PPI is not aligned with the belt, premature wheel wear will result.

5. Adjust the position of the 2 x 1.25 lb. weights along the threaded rod. Locating the weight at the end of the rod results in the maximum upward force of the wheels against the belt (this is the normal configuration). The weight can be positioned closer to the PPI along the rod to reduce the upward force.

6. Attach the PPI cable so the cord is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways PPI movement.

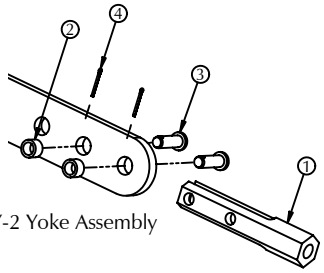

Figure 2: Y-2 Yoke Assembly

Y-2 Yoke Components			
#	Description	Part No.	Qty
1	Y-2 Yoke	500-MCH075	1
2	Plastic Bushing	500-MSC007	2
3	Clevis Pin	550-MSC004	2
4	Cotter Pin	550-MSC005	2

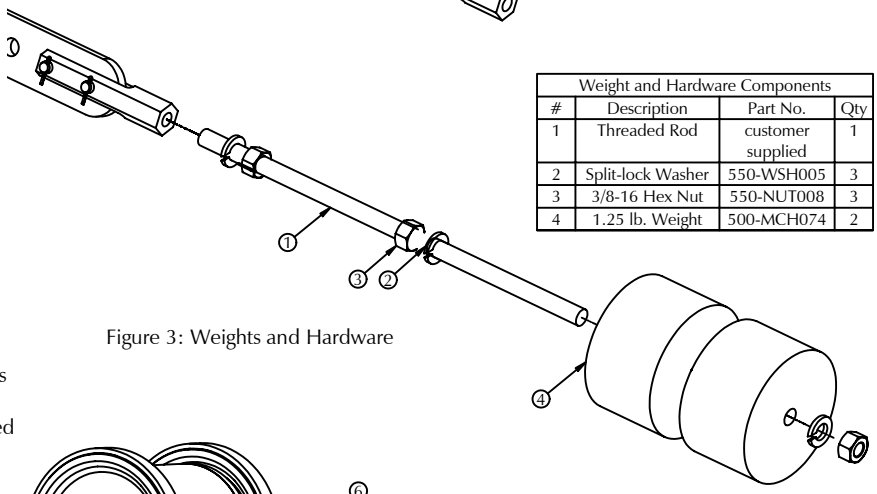

Figure 3: Weights and Hardware

Weight and Hardware Components			
#	Description	Part No.	Qty
1	Threaded Rod	customer supplied	1
2	Split-lock Washer	550-WSH005	3
3	3/8-16 Hex Nut	550-NUT008	3
4	1.25 lb. Weight	500-MCH074	2

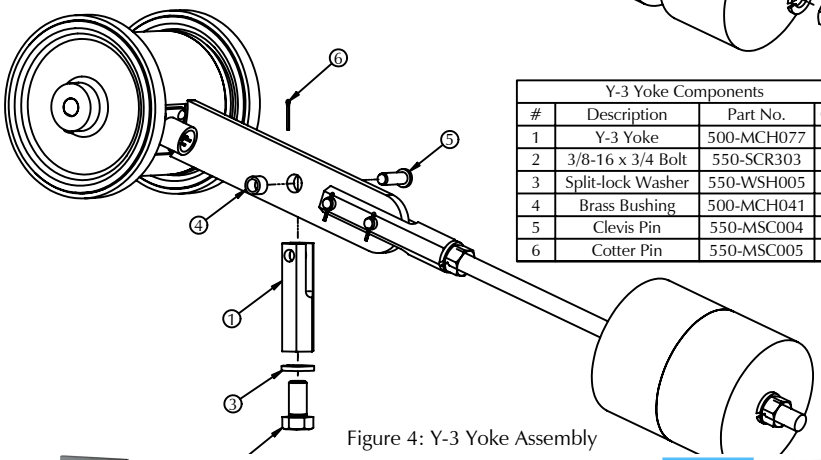

Figure 4: Y-3 Yoke Assembly

Y-3 Yoke Components			
#	Description	Part No.	Qty
1	Y-3 Yoke	500-MCH077	1
2	3/8-16 x 3/4 Bolt	550-SCR303	1
3	Split-lock Washer	550-WSH005	1
4	Brass Bushing	500-MCH041	1
5	Clevis Pin	550-MSC004	1
6	Cotter Pin	550-MSC005	1

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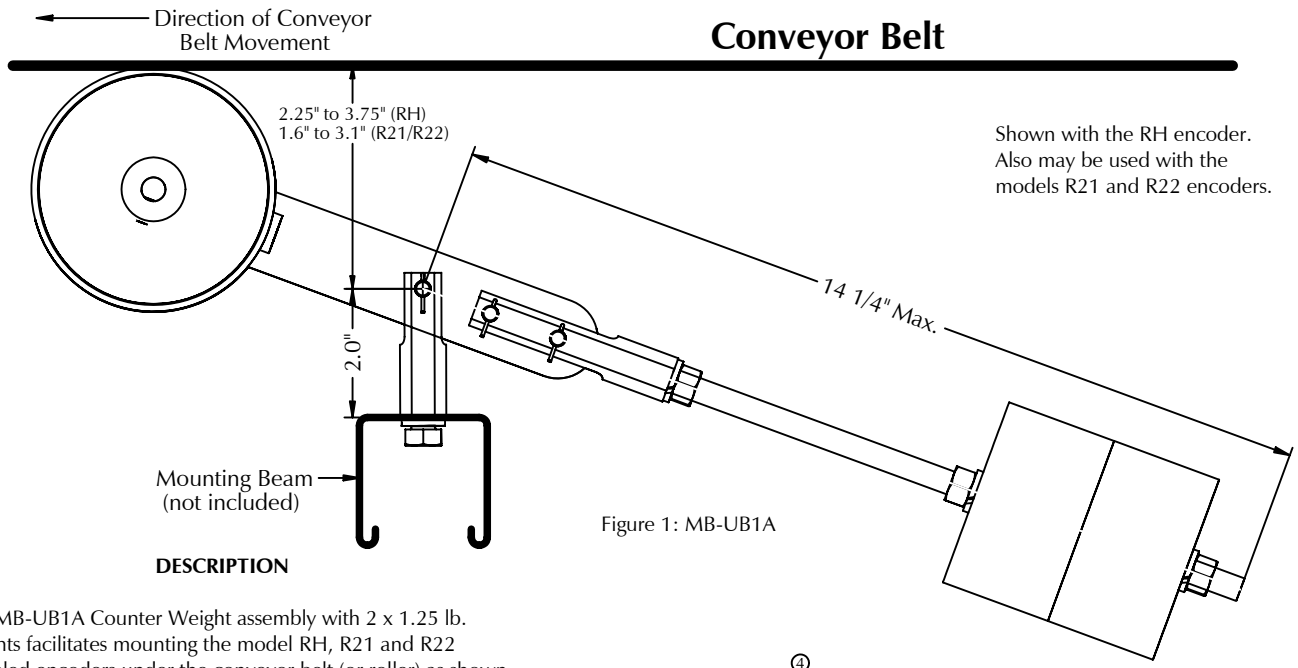
Model: MB-UB1A — Under-belt mounting



Shown with the RH encoder. Also may be used with the models R21 and R22 encoders.

Figure 1: MB-UB1A

DESCRIPTION

The MB-UB1A Counter Weight assembly with 2 x 1.25 lb. weights facilitates mounting the model RH, R21 and R22 wheeled encoders under the conveyor belt (or roller) as shown in figure 1. The Y-3 yoke provides a pivot point so the encoder wheels maintain contact and alignment with the belt, compensating for up/down and some sideways movement of the belt. Nylon washers are included to accomodate the thinner handle on the R21 and R22 encoders.

INSTALLATION

1. Assemble the Y-2 yoke assembly on the end of the encoder arm as shown in figure 2.

2. Assemble the weights and hardware (figure 3).

3. Assemble the Y-3 yoke assembly (figure 4).

4. Bolt the Y-3 yoke to a mounting beam (not supplied) using the 3/8-16 bolt and lock washer. The Y-3 should be perpendicular to the conveyor belt with the pivot point below the conveyor belt as shown in figure 1, and positioned so the encoder is aligned with the belt. Caution: If the encoder is not aligned with the belt, premature wheel wear will result.

5. Adjust the position of the weights along the threaded rod. Locating the weights at the end of the rod results in the maximum upward force of the wheels against the belt (this is the normal configuration). The weight can be positioned closer to the encoder along the rod to reduce the upward force.

6. Attach the encoder cable so the cord is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways encoder movement.

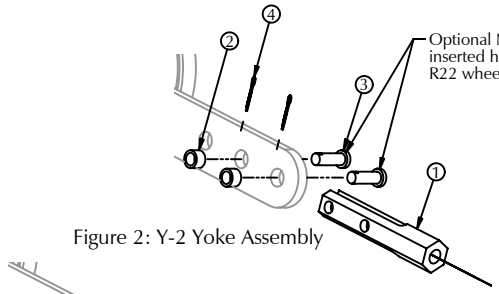


Figure 2: Y-2 Yoke Assembly

Y-2 Yoke Components			
#	Description	Part No.	Qty
1	Y-2 Yoke	500-MCH075	1
2	Plastic Bushing	500-MSC007	2
3	Clevis Pin	550-MSC004	2
4	Cotter Pin	550-MSC005	2
	Nylon Washer	550-WSH006	4

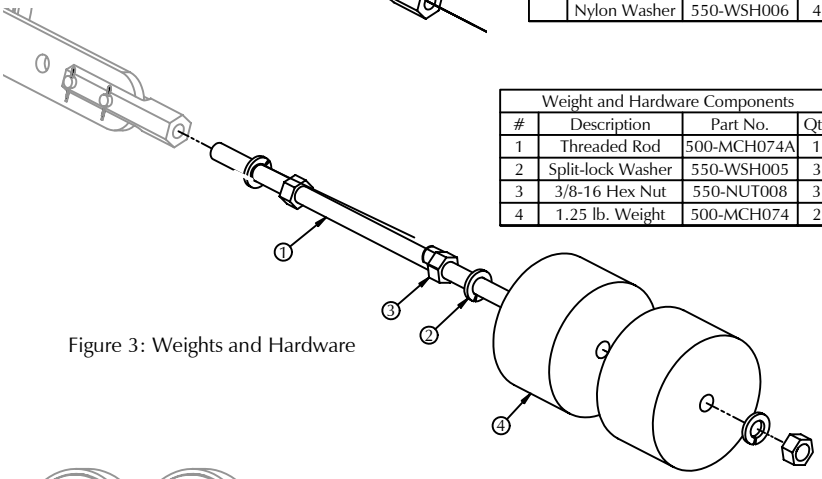
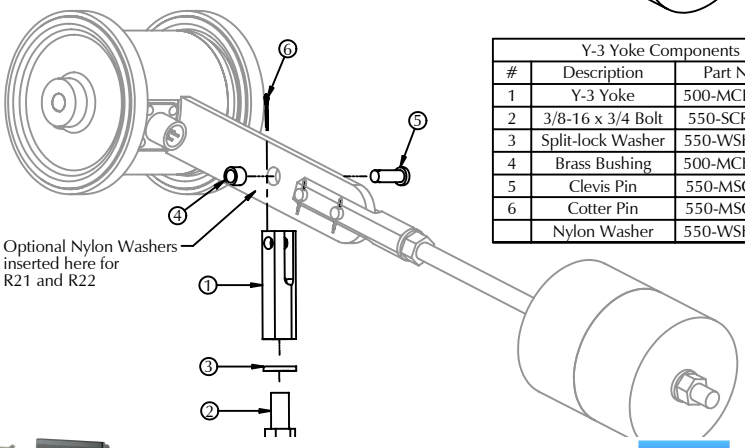


Figure 3: Weights and Hardware

Weight and Hardware Components			
#	Description	Part No.	Qty
1	Threaded Rod	500-MCH074A	1
2	Split-lock Washer	550-WSH005	3
3	3/8-16 Hex Nut	550-NUT008	3
4	1.25 lb. Weight	500-MCH074	2



Y-3 Yoke Components			
#	Description	Part No.	Qty
1	Y-3 Yoke	500-MCH077	1
2	3/8-16 x 3/4 Bolt	550-SCR303	1
3	Split-lock Washer	550-WSH005	1
4	Brass Bushing	500-MCH041	1
5	Clevis Pin	550-MSC004	1
6	Cotter Pin	550-MSC005	1
	Nylon Washer	550-WSH006	2

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Model: MB-UB1M — Under-belt mounting

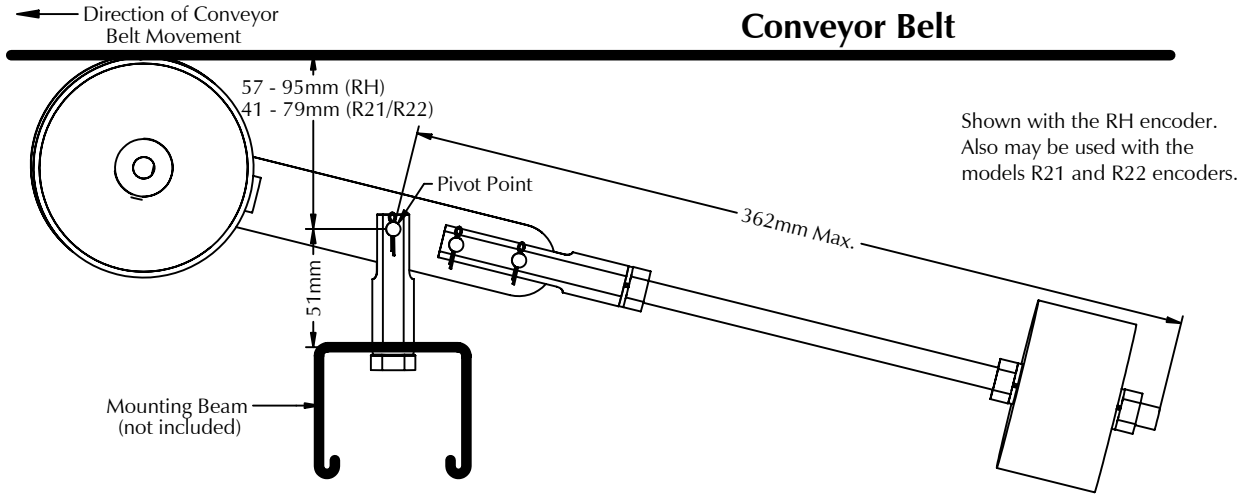

Figure 1: MB-UB1M (units in millimeters)

DESCRIPTION

The MB-UB1M Counter Weight assembly facilitates mounting the model RH, R21 and R22 wheeled encoders under the conveyor belt (or roller) as shown in figure 1. The Y-3M yoke provides a pivot point so the encoder wheels maintain contact and alignment with the belt, compensating for up/down and some sideways movement of the belt. Nylon washers are included to accomodate the thinner handle on the R21 and R22 wheeled encoders.

INSTALLATION

1. Assemble the Y-2M yoke assembly on the end of the encoder arm as shown in figure 2.

2. Assemble the weight and threaded rod (figure 3).

3. Assemble the Y-3M yoke assembly (figure 4).

4. Bolt the Y-3M yoke to a mounting beam (not supplied) using the M10-1.5 bolt and lock washer. The Y-3M should be perpendicular to the conveyor belt with the pivot point below the conveyor belt as shown in figure 1, and positioned so the encoder is aligned with the belt. Caution: If the encoder is not aligned with the belt, premature wheel wear will result.

5. Adjust the position of the .6 kg. weight along the threaded rod. Locating the weight at the end of the rod results in the maximum upward force of the wheels against the belt (this is the normal configuration). The weight can be positioned closer to the encoder along the rod to reduce the upward force.

6. Attach the encoder cable so the cord is clear of the pivot point, and with sufficient slack to allow for expected up/down and sideways encoder movement.

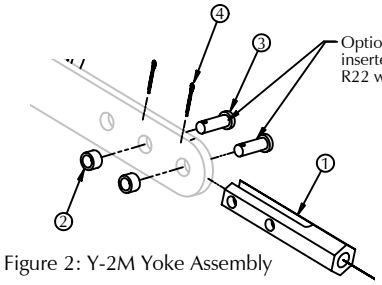

Figure 2: Y-2M Yoke Assembly

Y-2M Yoke Components			
#	Description	Part No.	Qty
1	Y-2M Yoke	605-0150-01	1
2	Plastic Bushing	543-2668	2
3	Clevis Pin	541-0001	2
4	Cotter Pin	541-0002	2
	Nylon Washer	543-3806	4

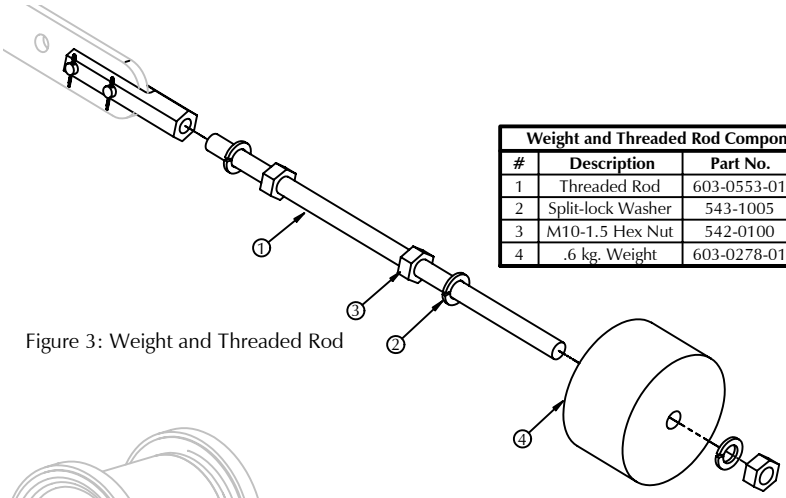

Figure 3: Weight and Threaded Rod

Weight and Threaded Rod Components			
#	Description	Part No.	Qty
1	Threaded Rod	603-0553-01	1
2	Split-lock Washer	543-1005	3
3	M10-1.5 Hex Nut	542-0100	3
4	.6 kg. Weight	603-0278-01	1

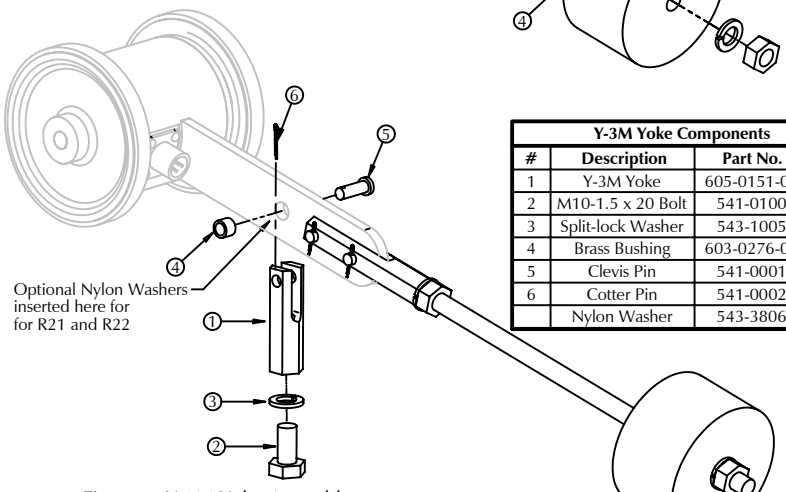

Figure 4: Y-3M Yoke Assembly

Y-3M Yoke Components			
#	Description	Part No.	Qty
1	Y-3M Yoke	605-0151-01	1
2	M10-1.5 x 20 Bolt	541-0100	1
3	Split-lock Washer	543-1005	1
4	Brass Bushing	603-0276-01	1
5	Clevis Pin	541-0001	1
6	Cotter Pin	541-0002	1
	Nylon Washer	543-3806	2

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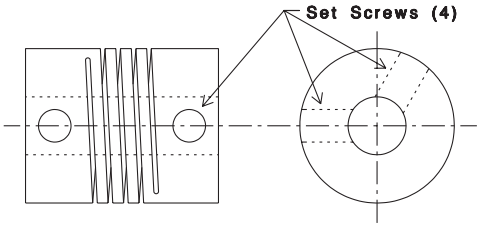
Flexible Shaft Couplings

Helical coil style flexible couplings are available for shaft-to-shaft connection of the encoder. Their one-piece design results in no moving parts, no maintenance, and no backlash. These significantly reduce bearing wear caused by parallel, angular, and skewed (three-dimensional) misalignment of the mating shafts.

The couplings are manufactured from a single piece of aluminum and include 4 set screws, as shown in the diagram to the right. Other sizes are available.



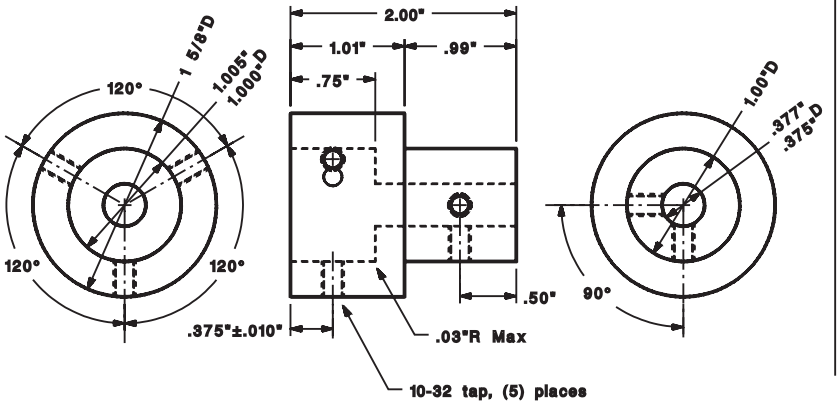
Model	Shaft Diameter	Dimensions D x L (in.)
AE087-10-10	5/16″	.875 x 1
AE087-8mm-8mm	8mm	.875 x 1
AE100-12-12	3/8″	1 x 1.25
AE100-10mm-10mm	10mm	1 x 1.25
AE-100-12mm-12mm	12mm	1 x 1.25

MB-085 Rigid Shaft Couplings

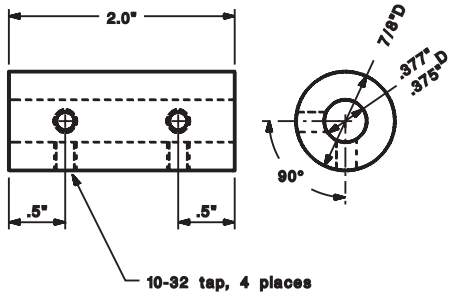
Rigid aluminum couplings are available for shaft-to-shaft connection of the encoder. These are appropriate where axial and angular misalignment is not an issue. The **MB-085** couples a 3/8" diameter encoder shaft to a 1" diameter shaft (see figure below). The **MB-085-.75** couples a 3/8″ diameter encoder shaft to a ¾″ diameter shaft. The MB-085-.375 couples a 3/8″ diameter encoder shaft to a 3/8″ diameter shaft.

Please inquire about other models.The couplings are manufactured from a single piece of aluminum and include 4 or 5 set screws, as shown in the diagrams below.

MB-085 or MB-085-.75



MB-085-.375



Notes: 1. Supplied with (5) 10-32 x 5/16"L cup point socket set screws, alloy steel with black oxide finish.
2. Runout: +/- .010"

MB-ST-M10 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST-M10 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HRL encoders. The HS20 or HRL should be ordered with a 10mm shaft bore so it fits the MB-ST-M10.

INSTALLATION

1. Drill and tap an M8 x 1.25mm hole, at least 13mm deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST-M10 shaft stub. Tighten with a 5mm hex key.

3. Install the HS20 or HRL hollow shaft encoder onto the shaft stub and tighten the set screws.

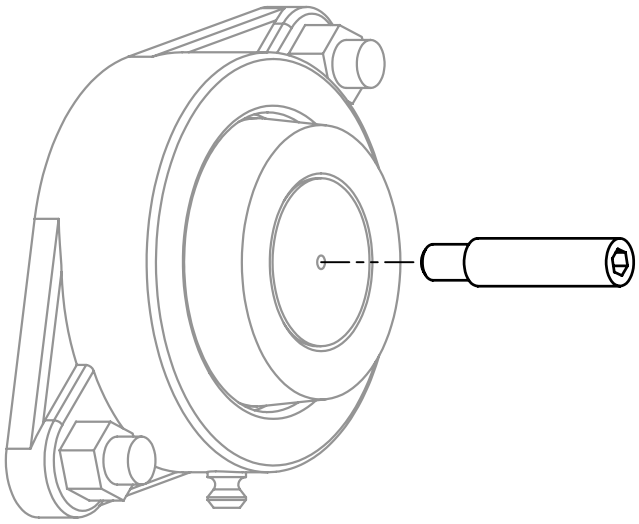


Figure 1: MB-ST-M10 and conveyor roller bearing

DIMENSIONS

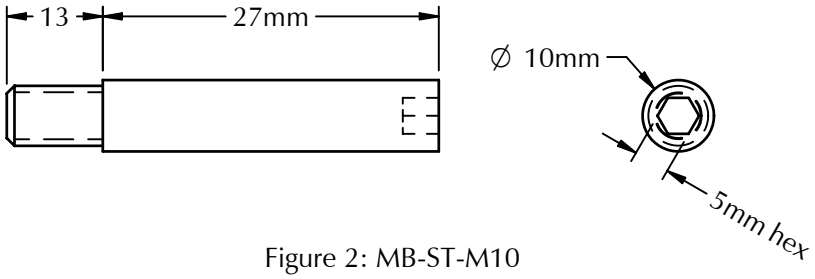


Figure 2: MB-ST-M10

MB-ST-M12 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST-M12 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HS30 encoders. The HS20 or HS30 should be ordered with a 12mm shaft bore so it fits the MB-ST-M12.

INSTALLATION

1. Drill and tap a M10-1.5mm hole, at least 16mm deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST-M12 shaft stub. Tighten with a 6mm hex key.

3. Install the HS20 or HS30 hollow shaft encoder onto the shaft stub and tighten the set screws.

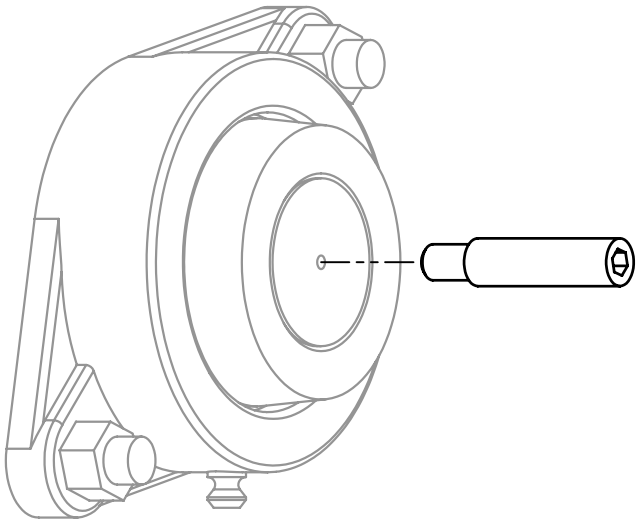


Figure 1: MB-ST-M12 and conveyor roller bearing

DIMENSIONS

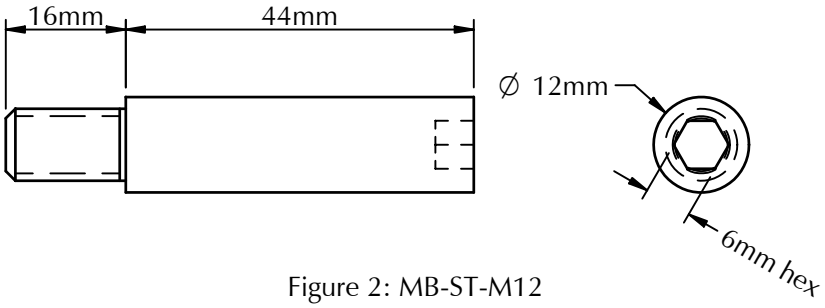


Figure 2: MB-ST-M12

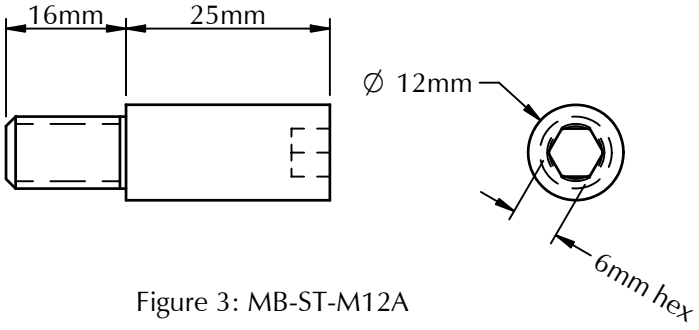


Figure 3: MB-ST-M12A

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MB-ST.250 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST.250 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HS25 encoders. The HS20 or HS25 should be ordered with a 1/4" shaft bore so it fits the MB-ST.250

INSTALLATION

1. Drill and tap a 10-24 hole, at least 3/8" deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST.250 shaft stub. Tighten with a 1/8" hex key.

3. Install the HS20 or HS25 hollow shaft encoder onto the shaft stub and tighten the set screws.

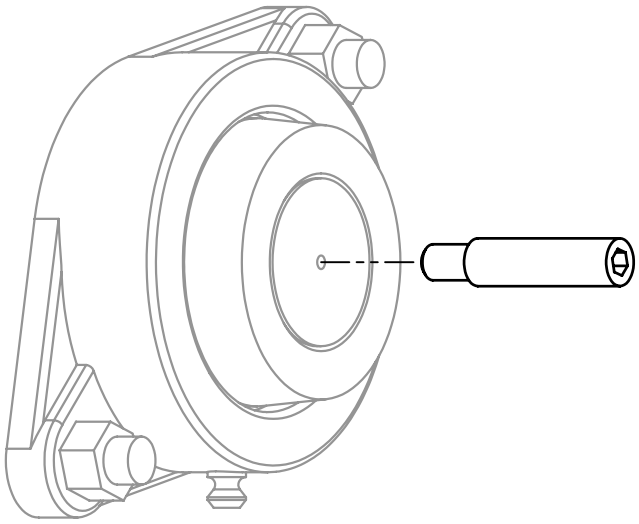

Figure 1: MB-ST.250 and conveyor roller bearing

DIMENSIONS

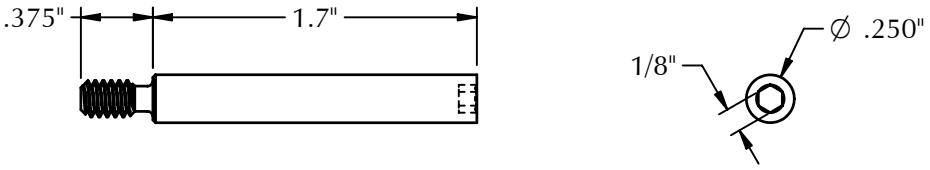

Figure 2: MB-ST.250

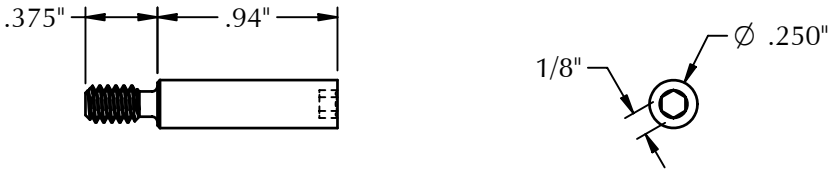

Figure 3: MB-ST.250A

MB-ST.312 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST.312 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HS25 encoders. The HS20 or HS25 should be ordered with a 5/16" shaft bore so it fits the MB-ST.312

INSTALLATION

1. Drill and tap a 1/4-20 hole, at least 1/2" deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST.312 shaft stub. Tighten with a 5/32" hex key.

3. Install the HS20 or HS25 hollow shaft encoder onto the shaft stub and tighten the set screws.

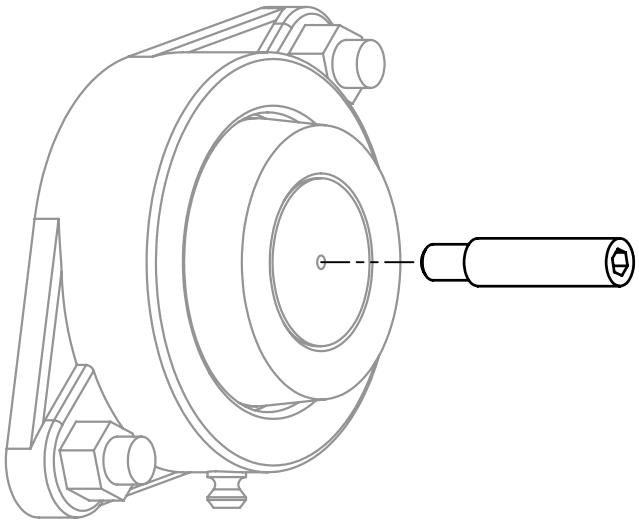

Figure 1: MB-ST.312 and conveyor roller bearing

DIMENSIONS

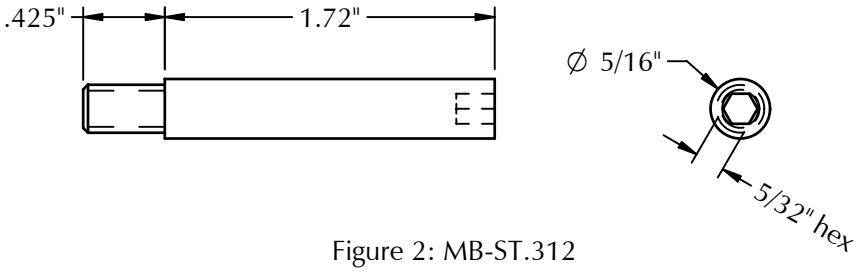

Figure 2: MB-ST.312

MB-ST.375 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST.375 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HS25 encoders. The HS20 or HS25 should be ordered with a 3/8" shaft bore so it fits the MB-ST.375

INSTALLATION

1. Drill and tap either a 5/16-18, 10-24, or 3/8-16 hole, at least 1/2" deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST.375 shaft stub. Tighten with a 3/16" hex key or a screw driver.

3. Install the HS20 or HS25 hollow shaft encoder onto the shaft stub and tighten the set screws.

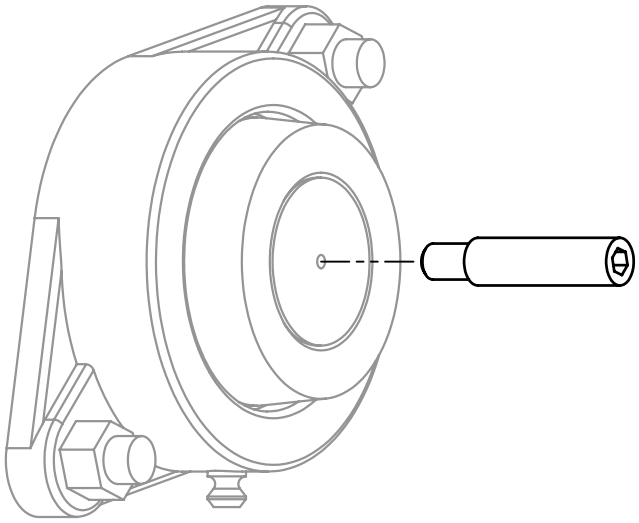

Figure 1: MB-ST.375 and conveyor roller bearing

DIMENSIONS

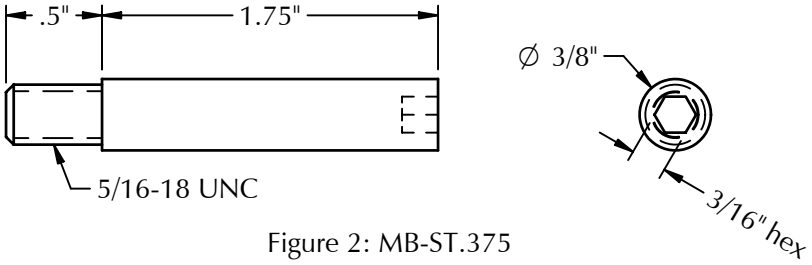

Figure 2: MB-ST.375

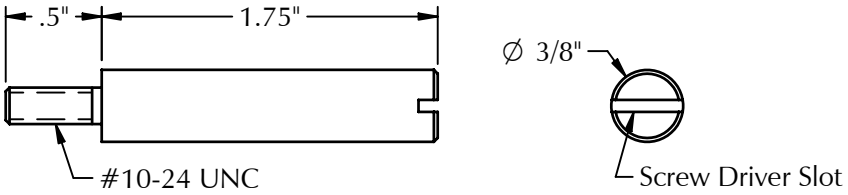

Figure 3: MB-ST.375A

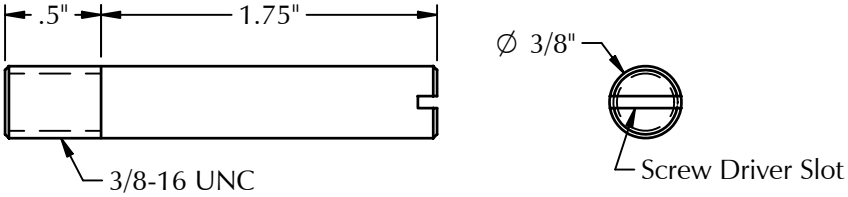

Figure 4: MB-ST.375B

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MB-ST.5 Hollow Shaft Encoder Shaft Stubs

DESCRIPTION

The MB-ST.5 can be installed on the end of a conveyor roller to provide a mounting shaft for a hollow shaft encoder, such as the HS20 or HS30 encoders. The HS20 or HS30 should be ordered with a 1/2" shaft bore so it fits the MB-ST.5

INSTALLATION

1. Drill and tap a 3/8-16 hole, at least 5/8" deep, into the end of the conveyor roller. The hole must be centered and in-line with the conveyor roller axis so there is minimum wobble when the roller is rotating.

2. Insert the MB-ST.5 shaft stub. Tighten with a 1/4" hex key.

3. Install the HS20 or HS30 hollow shaft encoder onto the shaft stub and tighten the set screws.

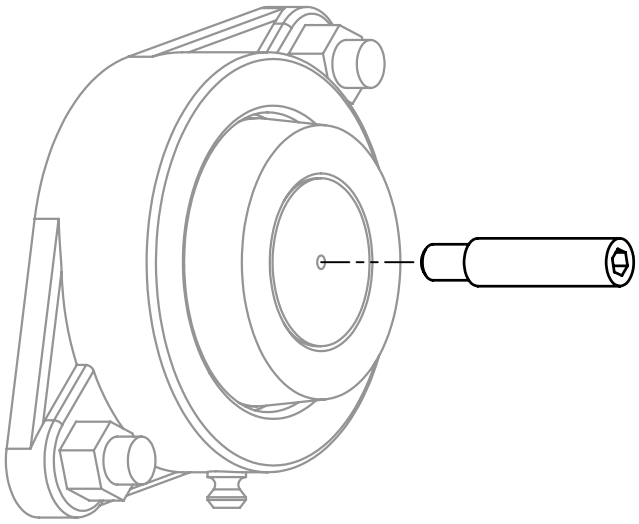

Figure 1: MB-ST.5 and conveyor roller bearing

DIMENSIONS

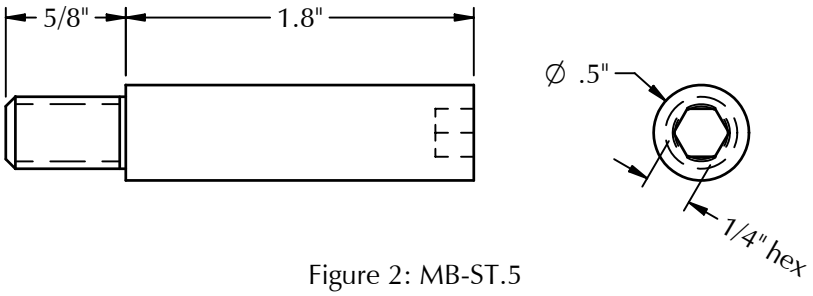

Figure 2: MB-ST.5

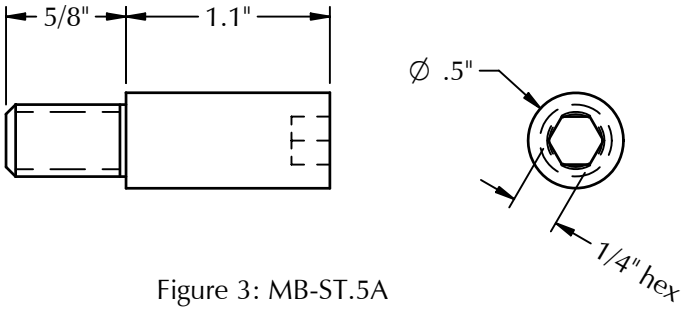

Figure 3: MB-ST.5A

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