

CS Series Stroke Counter



Eclipse Series Panel Meter



Hour Meter



Fusion Integrated Machine Control



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Totalizers



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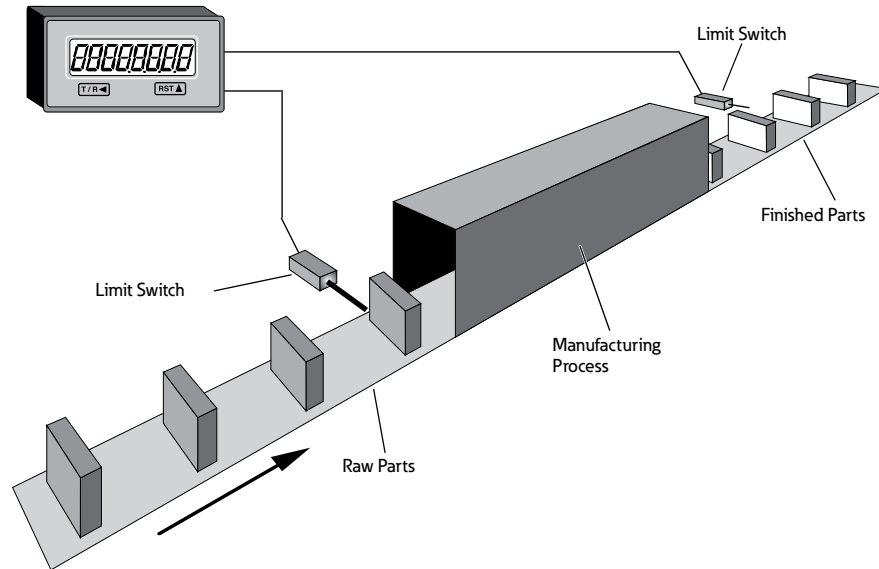
Product Overview

Totalizers are used in a wide variety of applications where accurate totals are needed. Typical applications include counting the number of parts produced, amount of material used, or the number of machine cycles occurring. Totalizers are the simplest and most common type of counter. As an added bonus, some models can perform both totalizing and ratemeter functions.

Typical Application

Parts are fed into a machine or process, an operation is performed, and the finished parts exit the machine or process. The subtract totalizer is used to indicate the number of parts in process.

Application Example



Product Selection Guide

Totalizers

	Characteristics	Typical Applications	Panel Cutout in Inches (mm)	Page
Mechanical 	Various size ranges for different duty cycles and environments No power supply needed Long life and always readable display	Winding and spooling equipment Position display Mechanical piece/cycle counting	Various mounting configurations	V13-T1-4
Electromechanical 	Various price, voltage and size ranges for different duty cycles and environments Long life and always readable display	Coin-operated equipment Gaming machines Printing presses Secondary machines (e.g. punch press)	Various mounting configurations	V13-T1-28
E5-024-C 	Non-replaceable battery (min. eight-year life) Compact, low cost and high efficiency Eight-digit LCD totalizers Manual or electrical reset Various counting modes/inputs	Replacement for mechanical counters Transaction counting Parts counting Position indication or measurement	0.870 x 1.772 (22 x 45)	V13-T1-41
E5-24-E 	Compact device with bright, LED display Multiple functions available: count, time, rate, multifunction, double-function 24 Vdc Power	Count, measure, time where small package and easy-to-read display required Position display Motor/pulley RPM	0.870 x 1.772 (22 x 45)	V13-T1-43
Courier 	Replaceable lithium battery Eight-digit, high-visibility LCD display Optional backlighting Various input options available	Portable/mobile/remote flow monitoring (e.g. sewer pumping, pesticide application) Position display, RPM Length measurement (e.g. carpet, cable)	1.299 x 2.667 (33 x 68)	V13-T1-45
E5-496-E 	Economical, multifunction display Large, LED characters AC or DC power options	Large, easy-to-read display Position display Motor/pulley RPM	1.772 x 3.780 (45 x 96)	V13-T1-48
Ambassador 	Eight-digit, high-visibility, two-line LCD display User-configurable control inputs Highly flexible control/display	Flow control where simultaneous total and rate display are required Cut-to-length and other simple processes where flexibility of inputs/outputs required	2.667 x 2.667 (68 x 68)	V13-T1-60
Hour Meter/Counter 	Combination counter consists of time meter and adding counter in one Without reset High shock resistance Magnified figures Protection IP52 (front) Data retention if power is lost Long service life UL approved	General counting Service interval for measurement systems (respiratory ventilators, oxygen machines, dialysis machines) Small appliances UV lamps Display panels in cars	1.988 (50.5) dia. or DIN rail	V13-T1-101

Mechanical Totalizers (Stroke)**Contents****Description****Page****Mechanical Totalizers (Stroke)**X Series/Pushbutton Desk Tally **V13-T1-5**CS Series **V13-T1-7**H Series **V13-T1-9**D Series **V13-T1-11****Mechanical Totalizers (Revolution)** **V13-T1-13****Electromechanical Totalizers** **V13-T1-28****Electronic Totalizers** **V13-T1-40****Mechanical Totalizers (Stroke)****Product Overview**

Eaton's mechanical totalizers are available in a variety of heavy-duty configurations for applications when power is unavailable.

Features

- Variety of reset methods available
- Accurate counting without need for power

X Series/Pushbutton Desk Tally

Product Description

X Series Counters

Model X Series is a dustproof and rustproof series of counters for light and medium-duty work. They are sound and durable, requiring a minimum of driving effort, and have been especially designed for incorporation as integral parts of a variety of machines and equipment.

Pushbutton Desk Tally

Ruggedly constructed counters with feather-touch pushbutton operation and maximum readability. Specifications and dimensions are basically the same as the X Series counters. Will give long and accurate service in areas requiring hand counting or during hand operations.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model X Series Stroke Counters and Pushbutton Desk Tallies, consider:

- Number of figures
- Drive

X Series Stroke Counter



X Series Stroke Counters and Pushbutton Desk Tallies

No. of Figures	Drive	Reset	Mounting	Catalog Number	Order Number
5	LH lever	Knob	Base	5-X-1-1-L	40272401
4	RH lever	Knob	Base	4-X-1-1-R	40263401
5	RH lever	Knob	Base	5-X-1-1-R	40272402
5	LH lever	Knob	Base	5-X-1-1-L-REV ^①	40272400
5	RH lever	Knob	Base	5-X-1-1-R-REV ^①	40272403
4	Push bar	Knob	Base	4-X-2	21619400
4	Pushbutton	Knob	Base	4-X-2-A	33245400

Pushbutton Desk Tally



Note

^① Reverse stroke.

Technical Data and Specifications

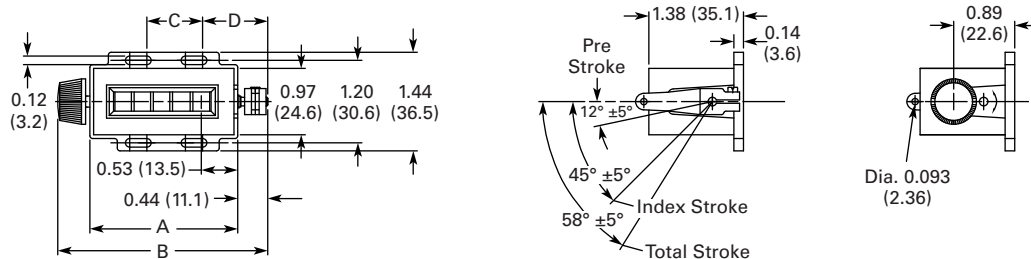
General Specifications

Description	Specification
Figures	4 or 5
Speed	1000 cpm
Shaft	0.125 in (3.2 mm) diameter stainless steel
Drive	Drive parts of nylon
Bearings	Oil-less, maintenance free
Finish	Black frame and Cyclocac black cover
Stroke operation	33° minimum; 58° maximum ^①
Figure size	3/16 in (4.8 mm) high, white-on-black background
Reset	Knob

Dimensions

Approximate Dimensions in Inches (mm)

X Series



Model	A	B	C	D
4-X-1-1_	1.86 (47.2)	2.76 (70.2)	0.62 (15.7)	0.89 (22.6)
5-X-1-1_	2.16 (54.8)	3.06 (77.8)	0.81 (20.6)	0.95 (24.1)

Note

^① Operating stroke angles apply to forward stroke counter only. Check factory for angles of reverse stroke counter.

CS Series

Product Description

Model CS Series of small, compact, top reading stroke counters is designed for use in most industrial applications. These counters are ruggedly built and feature a single casting case, which assures great rigidity and a tight seal for working parts.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model CS Series Stroke Counters, consider:

- Number of figures
- Drive lever

CS Series Stroke Counter



CS Series Stroke Counters

No. of Figures	Drive	Reset	Mounting	Catalog Number	Order Number
5	RH lever	Wing nut	Base	5-CS-1-1-R	31062401
5	RH lever	Wing nut	Base	5-CS-1-1-R-RP ①	01464400

Technical Data and Specifications

General Specifications

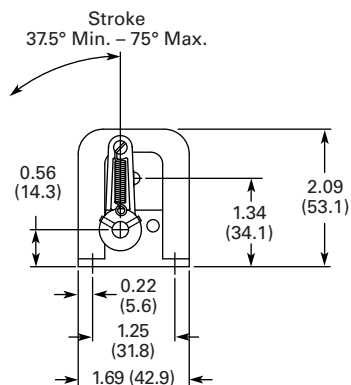
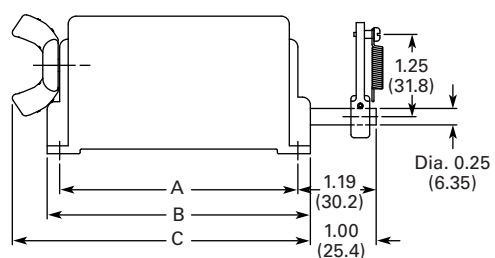
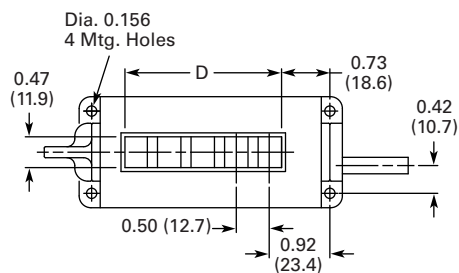
Description	Specification
Figures	4 or 5
Speed	600 cpm
Stroke operation	37-1/2° minimum; 75° maximum
Shaft	0.25 in (6.4 mm) diameter stainless steel, rustproof
Drive	Accurately machined, hardened steel parts
Bearings	Oil-less, maintenance free
Figure size	11/32 in (8.7 mm) high, black-on-white background
Reset	Contoured wing nut
Finish	Black frame
Operating lever	Cast zinc. Adjustable to any position. Furnished complete with pull spring.

Note

① Special feature: rustproof.

Dimensions

Approximate Dimensions in Inches (mm)

CS Series

Model	A	B	C	D
4-CS-1_	3.12 (79.2)	3.50 (88.9)	4.03 (102.3)	1.87 (47.6)
5-CS-1_	3.62 (91.9)	4.00 (101.6)	4.53 (115.0)	2.38 (60.5)

H Series

Product Description

Model H Series heavy-duty counters are designed for hard usage and long, trouble-free service. They are high speed, streamlined counters constructed of the highest quality materials and drive shaft moves in oil-less bearings. All shafts are stainless steel. The drive

action is designed with overstroke so counter does not bottom, increasing life and permitting easier installation. The sturdy cover is stamped steel, locked into position on a heavy, die-cast base of a special alloy. A heavy steel mounting plate is adjustable for either bottom

or back mounting. Model "H" has earned the reputation of being the "work horse" of industrial counters. Wing nut or tamper-proof reset lock which requires a key to reset the counter, guarding against unauthorized resetting or tampering.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model H Series Stroke Counters, consider:

- Number of figures
- Drive lever location (left or right side)
- Type of reset (lock or wing nut)

H Series Stroke Counter



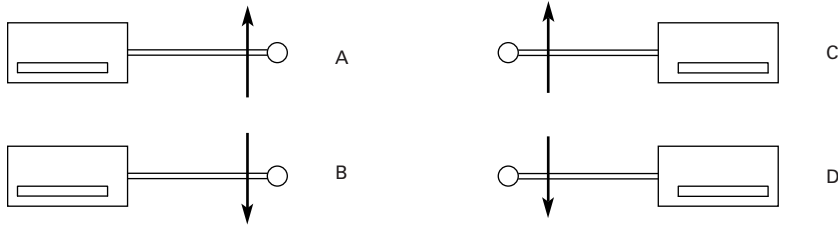
H Series Stroke Counters

No. of Figures	Drive	Reset	Mounting	Catalog Number	Order Number
5	RH lever	Wing nut	Base	5-H-1-1-R	40205400
5	LH lever	Wing nut	Base	5-H-1-1-L	40205401
5	RH lever	Wing nut	Base	5-H-1-1-R-REV ①	00597400
5	LH lever	Wing nut	Base	5-H-1-1-L-REV ①	00598400
5	RH lever	Lock reset	Base	5-H-1-2-R	40206404
5	LH lever	Lock reset	Base	5-H-1-2-L	40206405
5	RH lever	Lock reset	Base	5-H-1-2-R-RP ②	40206400
5	LH trip arm	Wing nut	Base	5-H-5-C	31049402
5	LH trip arm	Wing nut	Base	5-H-5-D	31049403
5	RH trip arm	Lock reset	Base	5-H-6-A	01533400
5	RH trip arm	Lock reset	Base	5-H-6-B	01534400
5	LH trip arm	Lock reset	Base	5-H-6-D	01536400

Notes

① Special feature: Reverse stroke.

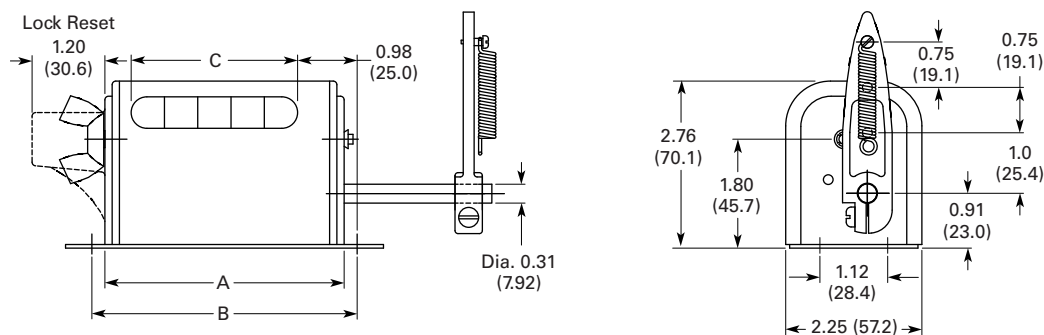
② Special feature: Rustproof.

Technical Data and Specifications**Direction Location for 5H5 and 5H6****General Specifications**

Description	Specification
Figures	5
Speed	800 cpm
Stroke operation	37° stroke to count; 60° maximum stroke
Shaft	0.31 in (7.9 mm) diameter stainless steel, rustproof
Drive	Accurately machined, hardened steel parts; Geneva drive for extra long life
Bearings	Oil-less, maintenance free
Figure sizes	11/32 in (8.7 mm) high, black-on-white background
Reset	Wing nut or tumbler lock reset
Finish	Black frame and cover
Operating lever	Adjustable to any position. Furnished complete with pull spring for attaching.

Dimensions

Approximate Dimensions in Inches (mm)

H Series

Model	A	B	C
Five figure units	3.95 (100.4)	4.38 (111.3)	2.75 (69.9)

D Series

Product Description

Model D Series are medium-duty stroke counters available with 4, 5 or 6 figures that have been designed for general service on small production machines.

Although compact, “D” models are sturdily constructed and thoroughly tested for accuracy and efficient operation.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model D Series Stroke Counters, consider:

- Number of figures
- Drive lever

D Series Stroke Counter



D Series Stroke Counters

No. of Figures	Drive	Reset	Mounting	Catalog Number	Order Number
4	RH lever	Wing nut	Base	4-D-1-1-R	34269401
5	RH lever	Wing nut	Base	5-D-1-1-R	34269402
6	RH lever	Wing nut	Base	6-D-1-1-R	34269403
4	LH lever	Wing nut	Base	4-D-1-1-L	34269405
5	LH lever	Wing nut	Base	5-D-1-1-L	34269406

Technical Data and Specifications

General Specifications

Description	Specification
Figures	4, 5 and 6
Speed	400 cpm
Shaft	0.25 in (6.4 mm) diameter stainless steel, rustproof
Drive	Nylon ratchet and Delrin drive plate. Right-hand drive standard; left-hand drive available
Bearings	Oil-less, maintenance free
Figure size	1/4 in (6.4 mm) high, black-on-white background
Reset	Wing nut
Finish	Black frame and cover
Operating lever	Adjustable to any position. Furnished complete with pull string

1.1

Counters, Panel Meters, Tachometers and Timers

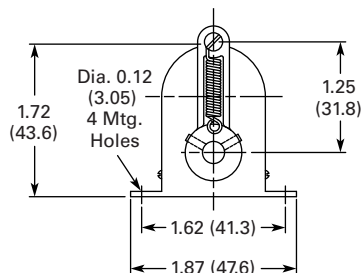
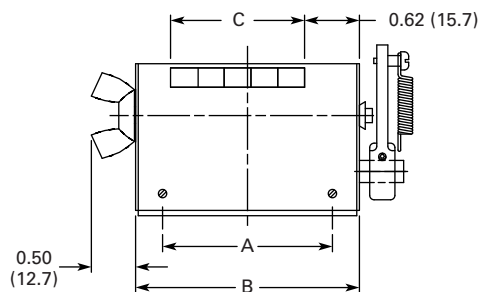
Totalizers

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Dimensions

Approximate Dimensions in Inches (mm)

D Series



Model	A	B	C
4-D-1-1_	1.59 (40.4)	2.20 (55.9)	1.20 (30.6)
5-D-1-1_	1.92 (48.8)	2.53 (64.3)	1.51 (38.5)
6-D-1-1_	2.26 (57.5)	2.87 (73.0)	1.83 (46.4)

Mechanical Totalizers (Revolution)



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T Series	V13-T1-24
H Series	V13-T1-26
Electromechanical Totalizers	V13-T1-28
Electronic Totalizers	V13-T1-40

Mechanical Totalizers (Revolution)

Product Overview

Eaton’s mechanical totalizers are available in a variety of heavy-duty configurations for applications when power is unavailable.

Features

- Variety of reset configurations available
- Accurate length measurement for application where power is not available

X Series**Product Description**

Model X Series are dust- and rust-proof counters designed for small, medium-duty units, accurate, durable and require a minimum of driving effort.

They are especially designed for incorporation as integral parts of a variety of equipment that gets severe usage under adverse climatic conditions.

Product Selection**When Ordering Specify**

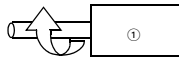
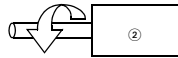
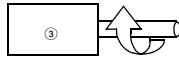
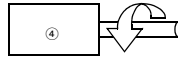
To determine a model number from the Product Selection table for Model X Series Revolution Counters, consider:

- Number of figures
- Ratio
- Drive shaft location
- Shaft rotation direction

X Series Revolution Counter

**X Series Revolution Counters**

No. of Figures	Drive	Rotation	Reset	Mounting	Catalog Number	Order Number
4	LH	Clockwise ①	Knob	Base	4-X-7-1-L-CL	40270406
4	LH	Anti-clockwise ②	Knob	Base	4-X-7-1-L-AC	40270404
4	RH	Clockwise ③	Knob	Base	4-X-7-1-R-CL	40270407
4	RH	Anti-clockwise ④	Knob	Base	4-X-7-1-R-AC	40270405
5	RH	Anti-clockwise ④	Knob	Base	5-X-7-1-R-AC	40275406
4	LH	Clockwise ①	Knob	Base	4-X-7-1-L-CL ⑤	40270402
5	LH	Clockwise ①	Knob	Base	5-X-7-1-L-CL ⑤	40275402
4	LH	Anti-clockwise ②	Knob	Base	4-X-7-1-L-AC ⑤	40270400
5	LH	Anti-clockwise ②	Knob	Base	5-X-7-1-L-AC ⑤	40275400
4	RH	Clockwise ③	Knob	Base	4-X-7-1-R-CL ⑤	40270403
5	RH	Clockwise ③	Knob	Base	5-X-7-1-R-CL ⑤	40275403
4	RH	Anti-clockwise ④	Knob	Base	4-X-7-1-R-AC ⑤	40270401
5	RH	Anti-clockwise ④	Knob	Base	5-X-7-1-R-AC ⑤	40275401

Top View—Left-Hand Drive**Clockwise Shaft Rotation****Anti-Clockwise Shaft Rotation****Top View—Right-Hand Drive****Clockwise Shaft Rotation****Anti-Clockwise Shaft Rotation****Notes**

When shaft is turned in the reverse direction of rotation, the counter will subtract.

- ① Top view—left-hand drive with clockwise shaft rotation.
- ② Top view—left-hand drive with anti-clockwise shaft rotation.
- ③ Top view—right-hand drive with clockwise shaft rotation.
- ④ Top view—right-hand drive with anti-clockwise shaft rotation.
- ⑤ Special feature: 10:1 ratio.

Technical Data and Specifications

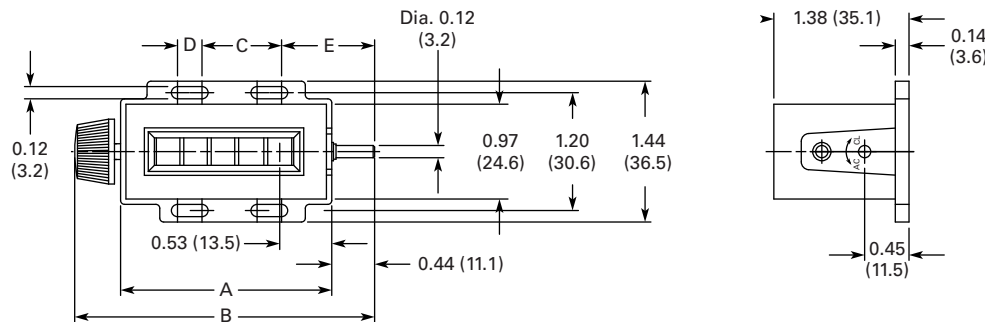
General Specifications

Description	Specification
Figures	4 or 5
Speed	1000 cpm in 1:1 ratio; 10,000 cpm in 10:1 ratio for intermittent duty
Rotation direction	Clockwise or anti-clockwise when viewed from right-hand end of counter
Ratio	1:1 and 10:1 standard in 4-X-7 models 10:1 standard in 5-X-7 models
Shaft	0.125 in (3.2 mm) diameter stainless steel; standard length 0.44 in (11.1 mm)
Bearings	Oil-less, maintenance free
Figure size	3/16 in (4.8 mm) high, white-on-black background
Reset	Knob
Finish	Black frame, Cycolac black cover
Drive	Right- or left-hand drive; drive parts of Delrin
Ratio information	1:1 is one count to each revolution of drive shaft, 10:1 is ten counts to each revolution

Dimensions

Approximate Dimensions in Inches (mm)

X Series



Model	A	B	C	D	E
4-X-7-1_	1.86 (47.2)	2.76 (70.2)	0.62 (15.7)	0.19 (4.8)	0.89 (22.6)
5-X-7-1_	2.16 (54.8)	3.06 (77.8)	0.81 (20.6)	0.25 (6.4)	0.95 (24.1)

CS Series

Product Description

Model CS Series top reading revolution counters are designed for use in most industrial applications. The entire case is a single casting.

This provides greater rigidity, tighter seal of working parts and more streamlined contour. The unit is compact, rugged and features a flush mounted window to assure greater visibility.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model CS Series Revolution Counters, consider:

- Number of figures
- Ratio
- Drive shaft location
- Shaft rotation direction

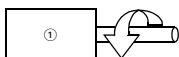
CS Series Revolution Counter



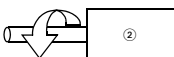
CS Series Revolution Counters

No. of Figures	Drive	Rotation	Reset	Mounting	Catalog Number	Order Number
5	RH	Anti-clockwise ^②	Wing nut	Base	5-CS-7-1-R-AC	31060411
4	RH	Anti-clockwise ^②	Wing nut	Base	4-CS-7-1-R-AC ^③	31057403
5	RH	Anti-clockwise ^②	Wing nut	Base	5-CS-7-1-R-AC ^③	00443400
4	RH and LH	Clockwise ^④	None	Base	4-CS-7-3-CL ^⑤	31057408
4	RH and LH	Anti-clockwise ^⑥	None	Base	4-CS-7-3-AC ^⑤	31057409

Top View—Right-Hand Drive



Clockwise Shaft Rotation

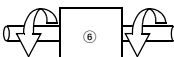


Anti-Clockwise Shaft Rotation

Top View—Right- and Left-Hand Drive



Clockwise Shaft Rotation



Anti-Clockwise Shaft Rotation

Notes

When shaft is turned in the reverse direction of rotation, the counter will subtract.

- ① Top view—right-hand drive with clockwise shaft rotation.
- ② Top view—right-hand drive with anti-clockwise shaft rotation.
- ③ Special feature: 10:1 ratio.
- ④ Top view—right- and left-hand drive with clockwise shaft rotation.
- ⑤ Special feature: 10:1 ratio, non-reset, double shaft.
- ⑥ Top view—right- and left-hand drive with anti-clockwise shaft rotation.

Technical Data and Specifications

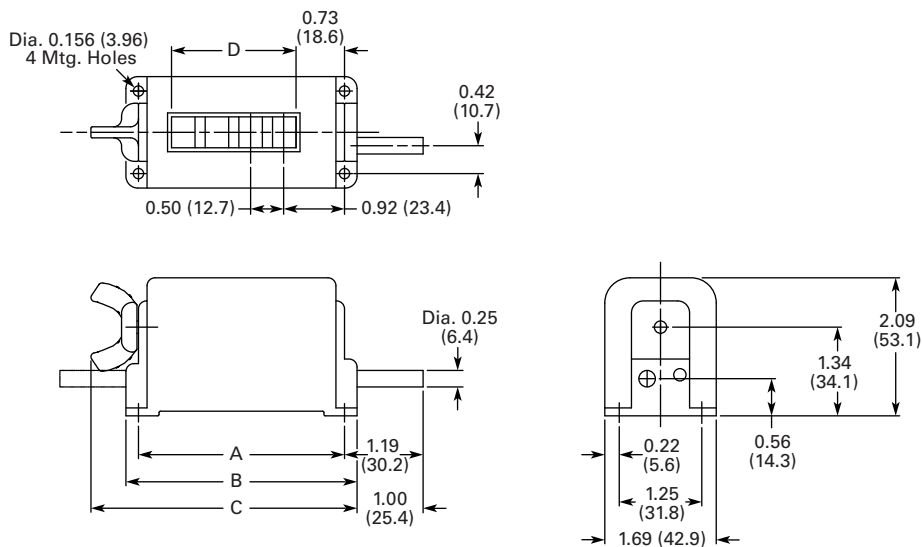
General Specifications

Description	Specification
Figures	4 or 5
Speed	600 cpm in 1:1 ratio
Rotation direction	Clockwise or anti-clockwise when viewed from right-hand end of counter
Ratio	1:1 standard
Shaft	0.25 in (6.4 mm) diameter stainless steel; standard length 1 in (25.4 mm)
Drive	Spur gear
Bearings	Oil-less, maintenance free
Figure size	11/32 in (8.7 mm) high, black-on-white background
Reset	Contoured wing nut
Finish	Black frame

Dimensions

Approximate Dimensions in Inches (mm)

CS Series



Model	A	B	C	D
4-CS-7_	3.12 (79.2)	3.50 (88.9)	4.03 (102.3)	1.89 (47.9)
5-CS-7_	3.62 (91.9)	4.00 (101.6)	4.53 (115.0)	2.38 (60.5)

D-7 Series**Product Description**

Model D-7 Series spur gear end drive units are compact counters that meet a variety of needs. Accurate, dependable and moderately priced, they are especially

recommended for braiding machines, low-speed coil winders, wire measuring equipment and all medium-duty revolution applications.

Product Selection**When Ordering Specify**

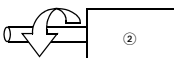
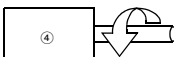
To determine a model number from the Product Selection table for Model D-7 Series Revolution Counters, consider:

- Number of figures
- Shaft drive
- Shaft rotation direction
- Reset or non-reset

D-7 Series Revolution Counter

**D-7 Series Revolution Counters**

No. of Figures	Drive	Rotation	Reset	Mounting	Catalog Number	Order Number
5	LH	Clockwise ①	Wing nut	Base	5-D-7-1-L-CL	31127408
5	LH	Anti-clockwise ②	Wing nut	Base	5-D-7-1-L-AC	31127405
5	RH	Clockwise ③	Wing nut	Base	5-D-7-1-R-CL	31127431
5	RH	Anti-clockwise ④	Wing nut	Base	5-D-7-1-R-AC	31127400
5	LH	Anti-clockwise ②	None	Base	5-D-7-3-L-AC	31127412
5	RH	Clockwise ③	None	Base	5-D-7-3-R-CL	31127438

Top View—Left-Hand Drive**Clockwise Shaft Rotation****Anti-Clockwise Shaft Rotation****Top View—Right-Hand Drive****Clockwise Shaft Rotation****Anti-Clockwise Shaft Rotation****Notes**

When shaft is turned in the reverse direction of rotation, the counter will subtract.

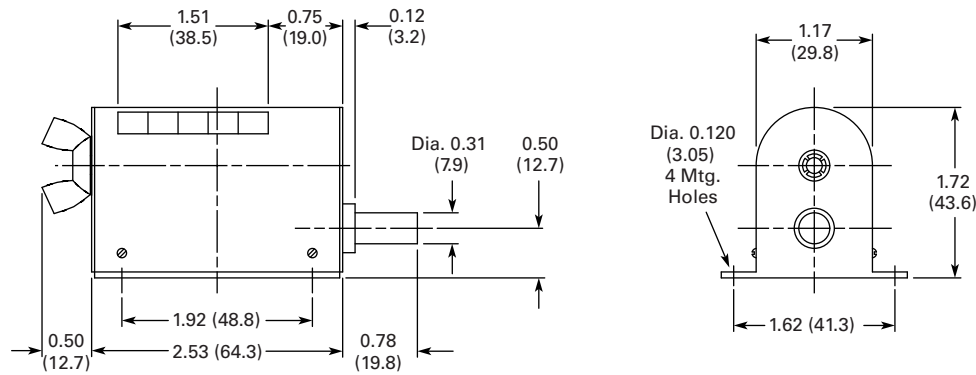
- ① Top view—left-hand drive with clockwise shaft rotation.
- ② Top view—left-hand drive with anti-clockwise shaft rotation.
- ③ Top view—right-hand drive with clockwise shaft rotation.
- ④ Top view—right-hand drive with anti-clockwise shaft rotation.

Technical Data and Specifications**General Specifications**

Description	Specification
Figures	5 standard
Speed	Up to 800 cpm in 1:1 ratio
Rotation direction	Clockwise or anti-clockwise when viewed from right-hand end of counter
Ratio	1:1 standard
Shaft	0.31 in (7.9 mm) diameter stainless steel; 0.66 in (16.7 mm) right-hand drive, 0.63 in (15.9 mm) left-hand drive
Drive	Right- or left-hand spur gear drive
Bearings	Oil-less, maintenance free
Figure size	1/4 in (6.4 mm) high, black-on-white background
Finish	Black frame and cover
Reset	Wing nut or non-reset

Dimensions

Approximate Dimensions in Inches (mm)

D-7 Series

D-6 Series**Product Description**

Model D-6 right-angle worm drive counters are ruggedly designed for high speeds on light-duty applications. Small “D” counters are easily

adapted as accessory equipment on machinery where right-angle drive is desired to permit full view reading of the counter.

Product Selection**When Ordering Specify**

To determine a model number from the Product Selection table for Model D-6 Series Revolution Counters, consider:

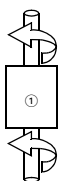
- Shaft rotation direction

D-6 Series Revolution Counter

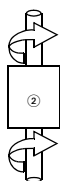


D-6 Series Revolution Counters

No. of Figures	Drive	Rotation	Reset	Mounting	Catalog Number	Order Number
5	Front and rear	Anti-clockwise ^①	Wing nut	Base	5-D-6-1-AC	31052401
6	Front and rear	Anti-clockwise ^①	Wing nut	Base	6-D-6-1-AC	31052402
5	Front and rear	Clockwise ^②	Wing nut	Base	5-D-6-1-CL	31052404
6	Front and rear	Clockwise ^②	Wing nut	Base	6-D-6-1-CL	31052405
5	Front and rear	Anti-clockwise ^①	Wing nut	Base	5-D-8-1-AC ^③	40187401
5	Front and rear	Clockwise ^②	Wing nut	Base	5-D-8-1-CL ^③	40187417
6	Front and rear	Clockwise ^②	Wing nut	Base	6-D-8-1-CL ^③	40187418
5	Front and rear	Clockwise ^②	Wing nut	Base	5-D-9-1-CL ^④	40187404
5	Front and rear	Anti-clockwise ^①	Wing nut	Base	5-D-9-1-AC ^④	40187410
5	Front and rear	Clockwise ^②	Wing nut	Base	5-D-90-1-CL ^⑤	40187414
5	Front and rear	Anti-clockwise ^①	Wing nut	Base	5-D-90-1-AC ^⑤	40187408

Top View of Counter

Anti-Clockwise Shaft Rotation



Clockwise Shaft Rotation

Notes

When shaft is turned in the reverse direction of rotation, the counter will subtract.

^① Top view of counter—anti-clockwise shaft rotation.

^② Top view of counter—clockwise shaft rotation.

^③ Special feature: Measuring wheels and brackets available for lineal measurement in feet.

^④ Special feature: Measuring wheels and brackets available for lineal measurement in yards and 1/8ths.

^⑤ Special feature: Measuring wheels and brackets available for lineal measurement in yards.

Technical Data and Specifications

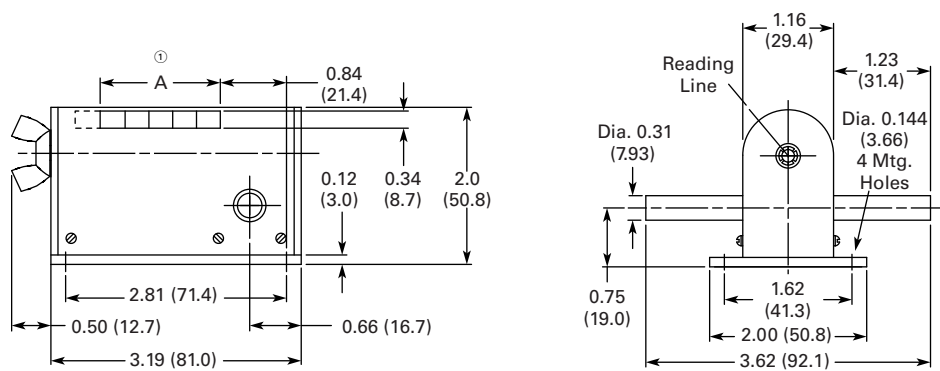
General Specifications

Description	Specification
Figures	5 or 6
Speed	Up to 1500 cpm in 1:1 ratio
Rotation direction	Clockwise or anti-clockwise when viewed from right-hand end of counter
Ratio	1:1 standard
Shaft	0.31 in (7.9 mm) diameter stainless steel; 1.25 in (31.8 mm) length standard
Drive	Worm drive
Bearings	Oil-less, maintenance free
Figure size	1/4 in (6.4 mm) high, black-on-white background
Finish	Black frame and cover
Reset	Wing nut

Dimensions

Approximate Dimensions in Inches (mm)

D-6 Series



Note

① A = 1.85 in (46.9 mm) for 6 figures and 1.53 in (38.9 mm) for 5 figures.

HDW Series

Product Description

Model HDW Series are high speed, end drive revolution counters that have the rugged features of all “H” counters, with the addition of double worm drive that produces speeds up to 2000 cpm. Lightweight precision molded wheels reduce centrifugal force and

eliminate slipping. They are particularly recommended for quick starting and stopping machines, such as coil winders and wire measuring or reeling equipment and on applications where continuous high speed measuring is required.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model HDW Series Revolution Counters, consider:

- Shaft drive
- Shaft rotation direction

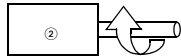
HDW Series
Revolution Counter



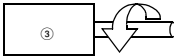
HDW Series Revolution Counters

No. of Figures	Drive	Rotation	Reset	Mounting ^①	Catalog Number	Order Number
5	RH	Clockwise ^②	Wing nut	Base	5-HDW-7-1-R-CL	31050400
5	RH	Anti-clockwise ^③	Wing nut	Base	5-HDW-7-1-R-AC	31050401
5	LH	Clockwise ^④	Wing nut	Base	5-HDW-7-1-L-CL	31050402
5	LH	Anti-clockwise ^⑤	Wing nut	Base	5-HDW-7-1-L-AC	31050403

Top View—Right-Hand Drive



Clockwise Shaft Rotation

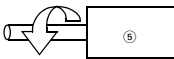


Anti-Clockwise Shaft Rotation

Top View—Left-Hand Drive



Clockwise Shaft Rotation



Anti-Clockwise Shaft Rotation

Notes

When shaft is turned in the reverse direction of rotation, the counter will subtract.

- ① Mounting plate is adjustable for base or back mounting.
- ② Top view—right-hand drive with clockwise shaft rotation.
- ③ Top view—right-hand drive with anti-clockwise shaft rotation.
- ④ Top view—left-hand drive with clockwise shaft rotation.
- ⑤ Top view—left-hand drive with anti-clockwise shaft rotation.

Technical Data and Specifications

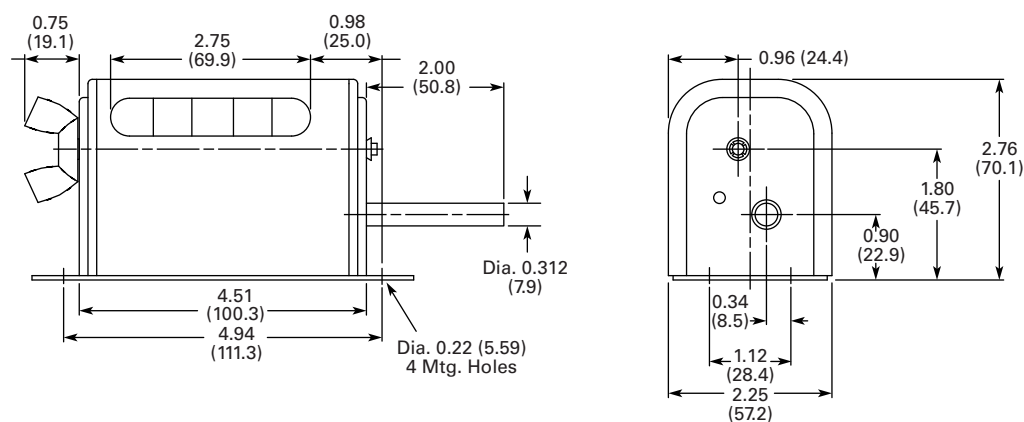
General Specifications

Description	Specification
Figures	5
Speed	Up to 2000 cpm
Rotation direction	Clockwise or anti-clockwise when viewed from right-hand end of counter
Ratio	1:1 only
Shaft	0.31 in (7.9 mm) diameter stainless steel; standard length 2 in (50.8 mm)
Drive	Right- or left-hand drive
Bearings	Oil-less, maintenance free
Figure size	11/16 in (17.5 mm) high, white-on-black background
Reset	Wing nut or tumbler lock reset
Finish	Black frame and cover

Dimensions

Approximate Dimensions in Inches (mm)

HDW Series



T Series**Product Description**

Model T Series worm drive revolution counters are sturdy, high speed instruments used on many

heavy machines, engines or motors. Variety of drive permits direct connection. Suitable for panel mounting.

Product Selection**When Ordering Specify**

To determine a model number from the Product Selection table for Model T Series Revolution Counters, consider:

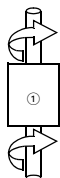
- Shaft rotation direction

T Series Revolution Counter

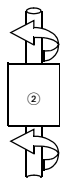


T Series Revolution Counters

No. of Figures	Drive	Rotation	Reset	Mounting	Catalog Number	Order Number
5	Top and bottom	Anti-clockwise ②	Wing nut	Back	5-T-6-1-AC	40342401

Top View of Counter

Clockwise Shaft Rotation



Anti-Clockwise Shaft Rotation

Notes

When shaft is turned in the reverse direction of rotation, the counter will subtract.

- ① Top view of counter—clockwise shaft rotation.
- ② Top view of counter—anti-clockwise shaft rotation.
- ③ Special feature: Measuring wheels and brackets available for lineal measurement in feet.
- ④ Special feature: Measuring wheels and brackets available for lineal measurement in yards and 1/8ths.
- ⑤ Special feature: Measuring wheels and brackets available for lineal measurement in yards.

Technical Data and Specifications

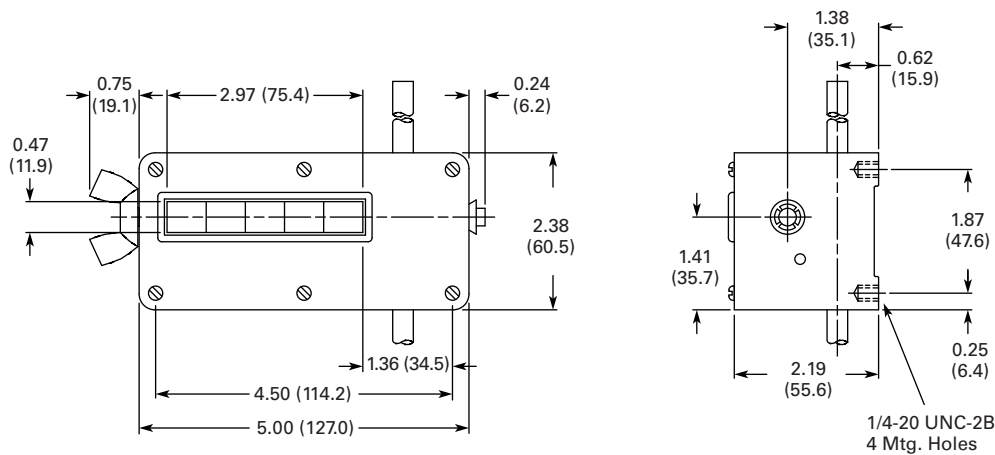
General Specifications

Description	Specification
Figures	5 standard
Speed	1500 cpm in 1:1 ratio
Rotation direction	Clockwise or anti-clockwise determined top looking down
Ratio	1:1 standard
Shaft	0.31 in (7.9 mm) diameter stainless steel; standard extends 2 in (50.8 mm) top and bottom
Drive	Hobbed steel and bronze worm gearing; subtracts when reversed
Bearings	Oil-less, maintenance free
Figure size	11/32 in (8.7 mm) high, black-on-white background
Reset	Left-hand wing nut standard
Finish	Black frame and face plate

Dimensions

Approximate Dimensions in Inches (mm)

T Series



H Series

Product Description

Model H Series are heavy-duty, end drive revolution counters designed for industrial use; suitable for

speeds up to 800 cpm. They are available with either right- or left-hand drive, and with wing nut reset.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model H Series Revolution Counters, consider:

- Drive shaft location
- Shaft rotation direction

H Series Revolution Counter



H Series Revolution Counters

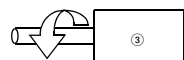
No. of Figures	Drive	Rotation	Reset	Mounting ^①	Ratio	Catalog Number	Order Number
5	LH	Clockwise ^②	Wing nut	Base	1.1	5-H-7-1-L-CL	00509400
5	LH	Anti-clockwise ^③	Wing nut	Base	1.1	5-H-7-1-L-AC	00510400
5	RH	Clockwise ^④	Wing nut	Base	1.1	5-H-7-1-R-CL	00513400
5	RH	Anti-clockwise ^⑤	Wing nut	Base	1.1	5-H-7-1-R-AC	00514400
5	LH	Clockwise ^⑥	Wing nut	Base	3.2	5-H-8-1-L-CL ^⑦	00601400
5	LH	Anti-clockwise ^⑧	Wing nut	Base	3.2	5-H-8-1-L-AC ^⑦	00602400
5	RH	Clockwise ^⑥	Wing nut	Base	3.2	5-H-8-1-R-CL ^⑦	00605400
5	RH	Anti-clockwise ^⑧	Wing nut	Base	3.2	5-H-8-1-R-AC ^⑦	00606400
5	LH	Clockwise ^⑥	Wing nut	Base	1.2	5-H-9-1-L-CL ^⑨	00619400
5	LH	Anti-clockwise ^⑧	Wing nut	Base	1.2	5-H-9-1-L-AC ^⑨	00620400
5	RH	Clockwise ^⑥	Wing nut	Base	1.2	5-H-9-1-R-CL ^⑨	00617400
5	RH	Anti-clockwise ^⑧	Wing nut	Base	1.2	5-H-9-1-R-AC ^⑨	00618400
5	LH	Clockwise ^⑥	Wing nut	Base	1.2	5-H-9-0-1-L-CL ^⑩	00611400
5	RH	Clockwise ^⑥	Wing nut	Base	1.2	5-H-9-0-1-R-CL ^⑩	00609400
5	RH	Anti-clockwise ^⑧	Wing nut	Base	1.2	5-H-9-0-1-R-AC ^⑩	00610400

For 5-H-8 and 5-H-9 Series Counters, drive shaft extends from both sides of the counter. Specifying RH or LH drive will determine the location of the reset (i.e. LH drive will have reset on the right-hand side of the counter, and RH drive will have reset on left-hand side of the counter).

Top View—LH Drive

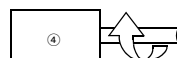


Clockwise Shaft Rotation

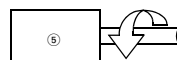


Anti-Clockwise Shaft Rotation

Top View—RH Drive



Clockwise Shaft Rotation

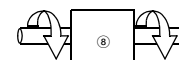


Anti-Clockwise Shaft Rotation

Top View—RH and LH Drive



Clockwise Shaft Rotation



Anti-Clockwise Shaft Rotation

Notes

When shaft is turned in the reverse direction of rotation, the counter will subtract.

^① Mounting plate is adjustable for base or back mounting.

^② Top view—left-hand drive with clockwise shaft rotation.

^③ Top view—left-hand drive with anti-clockwise shaft rotation.

^④ Top view—right-hand drive with clockwise shaft rotation.

^⑤ Top view—left-hand drive with anti-clockwise shaft rotation.

^⑥ Top view—right-hand and left hand drive with clockwise shaft rotation.

^⑦ Special feature: Measuring wheels and brackets available for lineal measurement in feet.

^⑧ Top view—right-hand and left hand drive with anti-clockwise shaft rotation.

^⑨ Special feature: Measuring wheels and brackets available for lineal measurement in yards and 1/8ths.

^⑩ Special feature: Measuring wheels and brackets available for lineal measurement in yards.

Technical Data and Specifications

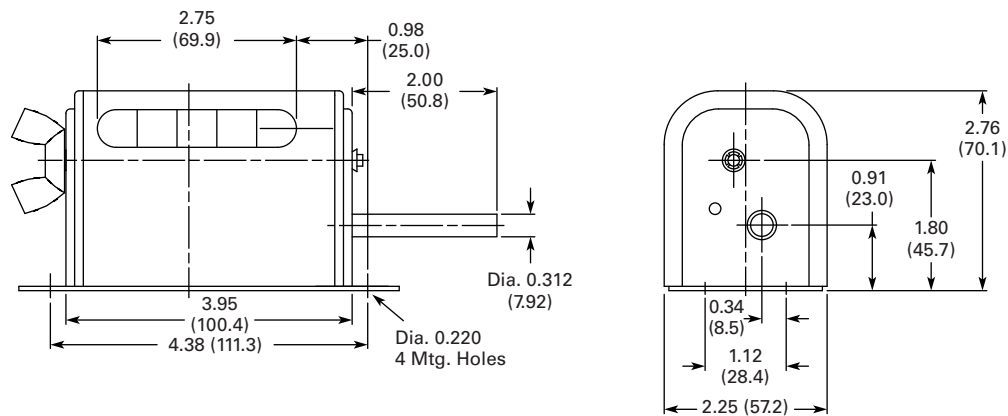
General Specifications

Description	Specification
Figures	5
Speed	Up to 800 cpm
Rotation direction	Clockwise or anti-clockwise when viewed from right-hand end of counter
Shaft	0.31 in (7.9 mm) diameter stainless steel; standard length 2 in (50.8 mm)
Drive	Right- or left-hand drive
Bearings	Oil-less, maintenance free
Figure size	11/32 in (8.7 mm) high, white-on-black background
Reset	Wing nut
Finish	Black frame and cover
Mounting bracket available	Order number 01465400

Dimensions

Approximate Dimensions in Inches (mm)

H Series



Electromechanical Totalizers**Contents****Description****Page****Mechanical Totalizers**

Stroke	V13-T1-4
Revolution	V13-T1-13

Electromechanical Totalizers

Micro Display Counter	V13-T1-29
SE Series	V13-T1-31
MF Series	V13-T1-33
RMF Series	V13-T1-35
ME Series	V13-T1-37
Electronic Totalizers	V13-T1-40

Electromechanical Totalizers**Product Overview**

Eaton's electromechanical counters provide accurate counting from a variety of electrical signals and a display that is always readable, even when power is not present.

Features

- Available with reset and without
- Always readable display
- Variety of mounting options

Standards and Certifications

- UL certifications on some products (see individual product pages for details)



Micro Display Counter

Product Description

Eaton's micro display counter is perfect for 12 Vdc applications where small size is important.

Features

- Seven-digit micro adding counter
- High shock resistance
- Low power consumption; suitable for battery consumption
- Small dimensions
- Large optical figures
- Different viewing possibilities
- Flush mount with integrated spring clip
- Protection IP65
- Stores value also at power failure
- Long service life

Standards and Certifications

- cRU[®]us certified
- CE marked



Product Selection

Micro Display Counter



Micro Display Counter

Description	Catalog Number
Micro display counter	7-Y-3013PM-401

Technical Data and Specifications

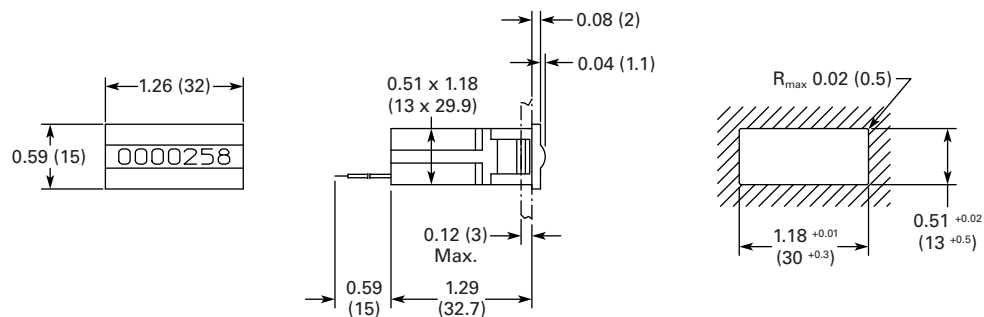
General Specifications

Description	Specification
Electrical connections	Built-in counter, flying leads, AWG 22, approx. 5.9 in (150 mm)
Power consumption	At 68 °F (20 °C) and nominal voltage At 25 Imp/s: approx. 250 mW
Rated voltage	12 Vdc ±10%
Counting frequency	25 Imp/s
Pulse duration	Min. 20 ms
Pulse interval	Min. 20 ms
Cycle duration factor	100%
Number of digits	7
Counting system	Adding
Figure size	0.05 x 0.16 in (1.2 x 4 mm) high optical
Color of figures	White-on-black
Reset	No reset
Ambient temperature	14 to 140 °F (–10 to 60 °C)
Mounting position	Any
Operating Life	>50 x 10 ⁶ pulses
Protection	IP65 (only front side)
Housing	Clear plastic
Weight	0.53–0.71 oz (15–18 g)

1

Dimensions

Approximate Dimensions in Inches (mm)

Micro Display Counter

SE Series**Product Description**

Compact electromechanical counters.

Features

- Low-cost electromechanical counter
- Multiple voltage ranges for almost any application
- Compact with various mounting options
- Wire leads for electrical connections

Standards and Certifications

- UL recognized

**Product Selection****SE Series Counter—
Electromechanical****SE Series Electromechanical Counters**

Description	Catalog Number	Order Number
Six-Digit Electric Counter		
Bottom mount sub-miniature 12 Vdc	6-Y-41610-401-SE	41610401
Bottom mount sub-miniature 24 Vdc	6-Y-41610-402-SE	41610402
Bottom mount sub-miniature 120 Vac	6-Y-41610-406-SE	41610406
Bottom mount sub-miniature 240 Vac	6-Y-41610-407-SE	41610407
Base mount sub-miniature 12 Vdc	6-Y-41611-401-SE	41611401
Base mount sub-miniature 24 Vdc	6-Y-41611-402-SE	41611402
Base mount sub-miniature 120 Vac	6-Y-41611-406-SE	41611406
Base mount sub-miniature 240 Vac	6-Y-41611-407-SE	41611407
Panel mount sub-miniature 12 Vdc	6-Y-41613-401-SE	41613401
Panel mount sub-miniature 24 Vdc	6-Y-41613-402-SE	41613402
Panel mount sub-miniature 120 Vac	6-Y-41613-406-SE	41613406
Panel mount sub-miniature 240 Vac	6-Y-41613-407-SE	41613407
Special base mount sub-miniature 12 Vdc	6-Y-41622-401-SE	41622401
Special base mount sub-miniature 24 Vdc	6-Y-41622-402-SE;	41622402
Special base mount sub-miniature 120 Vac	6-Y-41622-406-SE	41622406
Special top mount sub-miniature 12 Vdc	6-Y-41623-401-SE	41623401
Special top mount sub-miniature 24 Vdc	6-Y-41623-402-SE	41623402
Special top mount sub-miniature 120 Vac	6-Y-41623-406-SE	41623406
Special top mount sub-miniature 240 Vac	6-Y-41623-407-SE	41623407
Snap-in mount sub-miniature 12 Vdc	6-Y-42613-401-SE	42613401
Snap-in mount sub-miniature 24 Vdc	6-Y-42613-402-SE	42613402
Snap-in mount sub-miniature 120 Vac	6-Y-42613-406-SE	42613406
Snap-in mount sub-miniature 240 Vac	6-Y-42613-407-SE	42613407

Technical Data and Specifications

General Specifications

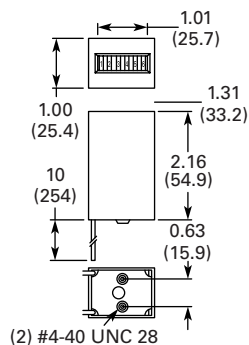
Description	Specification
Figures	6
Count speed	600 cpm
Figure size	5/32 in (4.0 mm)
Reset	None
Mounting	Base, bottom, top, panel or snap-in
Finish	Black, self-extinguishing plastic
Power requirements	DC: 1.5W, AC: 5.0V

Dimensions

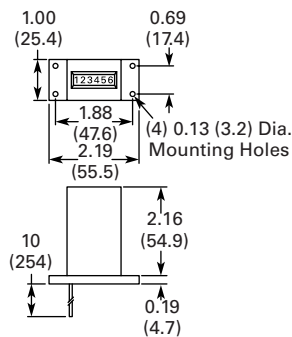
Approximate Dimensions in Inches (mm)

SE Series

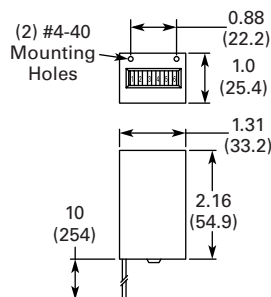
Bottom Mount



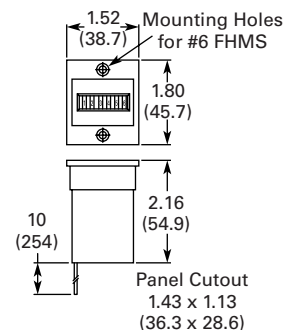
Base Mount



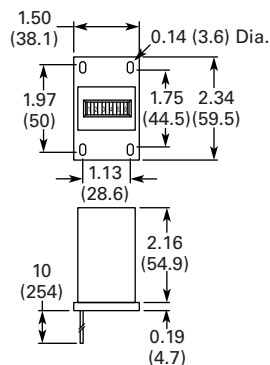
Top Mount



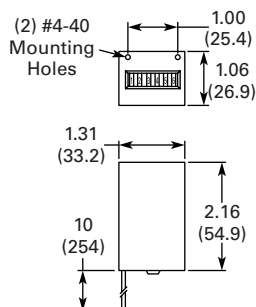
Panel Mount



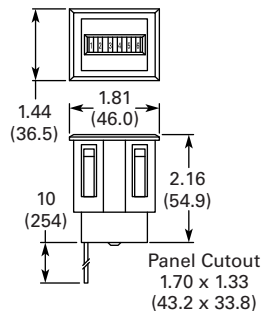
Special Base Mount



Special Top Mount



Snap Mount



MF Series

Product Description

Model MF Series are shaded pole electric counters with straight AC operation and feature a non-rectified, shaded pole coil designed to withstand transient, high voltage spikes. This feature,

combined with a simplified, hinged escapement drive, also eliminates the possibility of miscounts and greatly adds to the life of the counter. Tallies at speeds up to 750 cpm.

Product Selection

MF Series Electric Counter



MF Series Electric Counters

No. of Figures	Voltage	Reset	Mounting	Catalog Number	Order Number
6	120 Vac	Knob	Base	6-Y-1-MF-120A ①	32651400
7	120 Vac	Knob	Panel	7-Y-1-MF-PM-120A ①	32652400
7	120 Vac	Non-reset	Panel	7-Y-13-MF-PM-120A ①	32652402
6	120 Vac	Knob	Panel	6-Y-1-MF-PM-120A ①	32653400
6	120 Vac	Keylock reset	Panel	6-Y-12-MF-PM-120A ①	32654400
6	24 Vac	Keylock reset	Panel	6-Y-12-MF-PM-24A	32654403
7	120 Vac	Keylock reset	Panel	7-Y-12-MF-PM-120A ①	32655400

Technical Data and Specifications

General Specifications

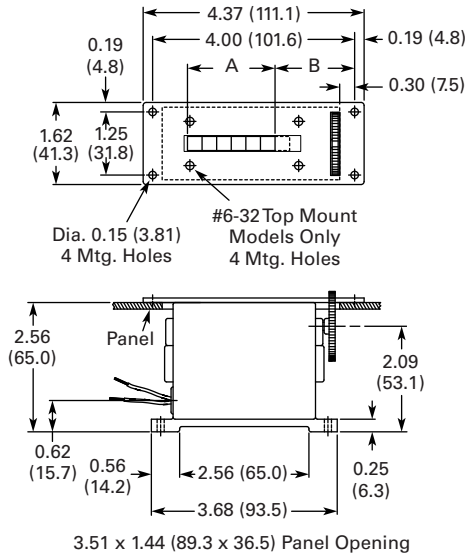
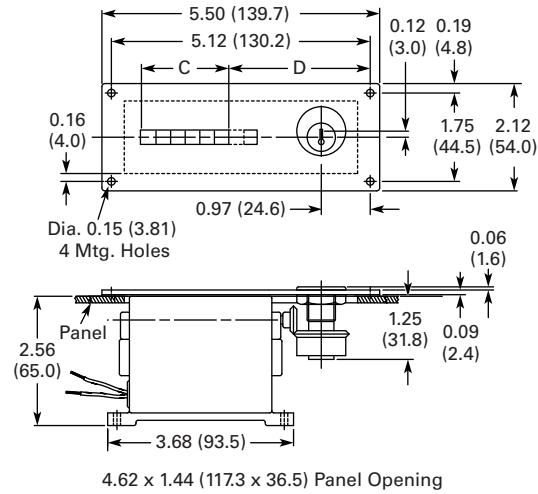
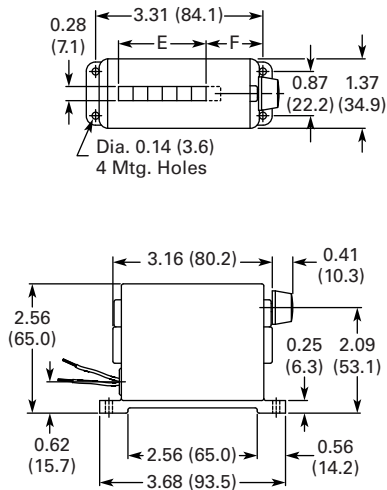
Description	Specification
Figures	6 or 7
Speed	Up to 750 cpm
Figure size	3/16 in (4.8 mm) high, white-on-black background
Reset	Knob, key or non-reset
Mounting	Base or panel mount
Finish	Black frame and side covers
Electrical connections	Two-wire leads, 9 in (229 mm) long, AWG 22 (0.34 mm ²), stripped 0.38 in (9.5 mm)
Power requirements	12 watts
Coils	Various AC voltages and frequencies can be supplied on special order. Count coils are designed for continuous duty at rated voltage.

Note

① UL Recognized.

Dimensions

Approximate Dimensions in Inches (mm)

MF Series**Panel Mounted****Panel Mounted with Tumbler Lock****Base Mounted**

Model	A	B	C	D	E	F
Six figures	1.73 (44.0)	1.58 (40.0)	1.73 (43.9)	2.80 (71.1)	1.73 (44.0)	1.12 (28.6)
Seven figures	2.02 (51.4)	1.29 (32.7)	2.03 (51.6)	2.50 (63.5)	2.02 (51.4)	0.84 (21.2)

RMF Series

Product Description

Model RMF Series of electric counters are designed to give accurate counts through a wide range of speeds up to 1000 cpm. It features a strong, silent, fast operating DC electromagnetic drive with a compact, dependable

built-in higher capacity rectifier for AC operation. The counter has a minimum of moving parts that never need lubrication under normal operating conditions. Compact and rigid, it

continues to operate dependably even when subject to severe shock and vibrations. Entirely enclosed to prevent damage from moisture and dust. Available in 6 or 7 figures.

Product Selection

When Ordering Specify

To determine a model number from the Product Selection table for Model RMF Series Electronic Counters, consider:

- Number of figures
- Voltage
- Type of reset
- Type of mounting

**RMF Series Counter—
Electromechanical**



RMF Series Electromechanical Counters

No. of Figures	Voltage	Reset	Mounting	Catalog Number	Order Number
6	24 Vdc	Knob	Panel	6-Y-1-RMF-PM-24D	31013400
7	24 Vdc	Knob	Panel	7-Y-1-RMF-PM-24D	31019400
7	115 Vac	Knob	Base	7-Y-1-RMF-115A ①	31025400
7	115 Vac	Non-reset	Base	7-Y-13-RMF-115A ①	31026400
7	115 Vac	Knob	Panel	7-Y-1-RMF-PM-115A ①	31026401
7	115 Vac	Non-reset	Panel	7-Y-13-RMF-PM-115A ①	31026402
6	115 Vac	Non-reset	Base	6-Y-13-RMF-115A ①	31039400
6	230 Vac	Knob	Panel	6-Y-1-RMF-PM-230A	31066413
6	115 Vac	Knob	Panel	6-Y-1-RMF-PM-115A ①	31066416
6	115 Vac	Keylock reset	Panel	6-Y-12-RMF-PM-115A ①	31083403
6	230 Vac	Keylock reset	Panel	6-Y-12-RMF-PM-230A	31083405
7	115 Vac	Keylock reset	Panel	7-Y-12-RMF-PM-115A ①	31083409
6	24 Vac	Keylock reset	Panel	6-Y-12-RMF-PM-24A	31083411
6	24 Vdc	Keylock reset	Panel	6-Y-12-RMF-PM-24D	31083415
7	24 Vdc	Keylock reset	Panel	7-Y-12-RMF-PM-24D	31083421
7	230 Vac	Keylock reset	Panel	7-Y-12-RMF-PM-230A	31083427
6	24 Vac	Knob	Base	6-Y-1-RMF-24A	31155400
6	240 Vac	Knob	Base	6-Y-1-RMF-240A	31155401
6	115 Vac	Knob	Base	6-Y-1-RMF-115A ①	31155402
6	115 Vac	Non-reset	Panel	6-Y-13-RMF-PM-115A ①	31155405
7	24 Vdc	Non-reset	Panel	7-Y-13-RMF-PM-24D	33183400

Note

① UL recognized.

Technical Data and Specifications**General Specifications**

Description	Specification
Figures	6 or 7
Speed	Up to 1000 cpm
Figure size	3/16 in (4.8 mm) high, white-on-black background
Reset	Knob, key or non-reset
Mounting	Base or panel mount
Finish	Black frame and side covers
Electrical connections	Two-wire leads, 9 in (229 mm) long, AWG 22 (0.34 mm ²), stripped 0.38 in (9.5 mm)
Power requirements	7 watts
Coils	Various voltages and frequencies can be supplied on special order. Count coils are designed for continuous duty at rated voltage

Dimensions

Refer to table and illustrations on **Page V13-T1-34** for information.

ME Series

Product Description

Small in size and price, but large in design versatility and model variety is the ME Series of miniature electric counters. Models in most popular AC or DC voltages operate on as little as 3 watts, with the non-reset

models measuring only 1 x 1.593 x 2.187 in (25.4 x 40.5 x 55.5 mm) and weighing just three ounces (85 grams).

Available in 4, 6 or 7 figures, the counters feature stainless steel self-lubricating shafts, nylon pinions and a synchronous electromagnetic drive to assure accurate,

reliable, long life operation. Designed for mounting flexibility and aesthetic attractiveness, the miniature electric counters are available with three types of mounting and a glare retarding finish Delrin, with crisp easy-to-read numerals set close to a tamper-proof sealed figure window.

Standards and Certifications

- UL recognized

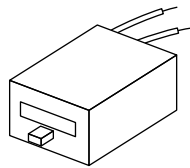


Product Selection

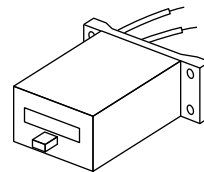
When Ordering Specify

When ordering ME Series Miniature Electric Counters, specify catalog numbers according to the features selected.

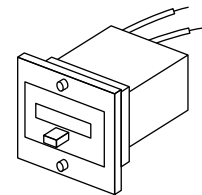
Bottom Mount Wire Leads



Base Mount Wire Leads



Panel Mount Wire Leads



ME Series Miniature Electric Counter



ME Series Miniature Electric Counters

No. of Figures	Voltage	Reset	Mounting	Catalog Number	Order Number
4	12 Vdc	Pushbutton	Bottom	4-Y-41312-401-MEQ	41312401
4	24 Vdc	Pushbutton	Bottom	4-Y-41312-402-MEQ	41312402
4	120 Vac	Pushbutton	Bottom	4-Y-41312-406-MEQ	41312406
4	24 Vdc	Pushbutton	Base	4-Y-41313-402-MEQ	41313402
4	120 Vac	Pushbutton	Base	4-Y-41313-406-MEQ	41313406
4	240 Vac	Pushbutton	Base	4-Y-41313-407-MEQ	41313407
4	12 Vdc	Pushbutton	Panel	4-Y-41314-401-MEQ	41314401
4	24 Vdc	Pushbutton	Panel	4-Y-41314-402-MEQ	41314402
4	120 Vac	Pushbutton	Panel	4-Y-41314-406-MEQ	41314406
4	240 Vac	Pushbutton	Panel	4-Y-41314-407-MEQ	41314407

ME Series Miniature Electric Counter**ME Series Miniature Electric Counters, continued**

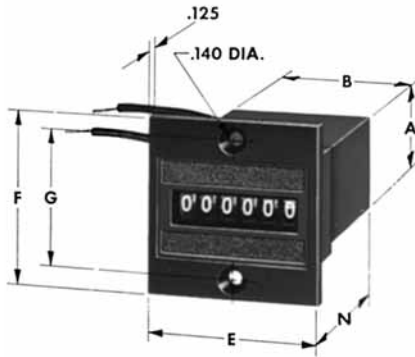
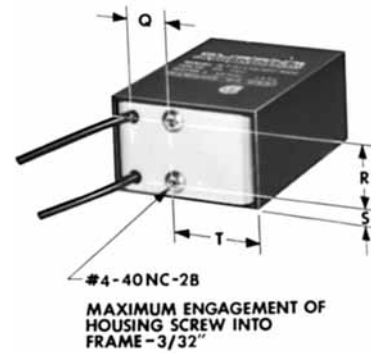
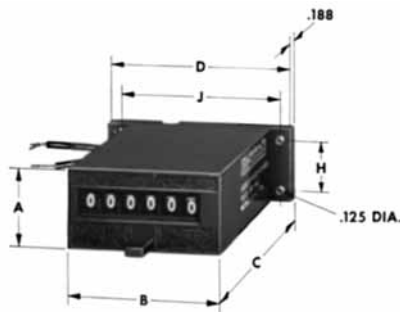
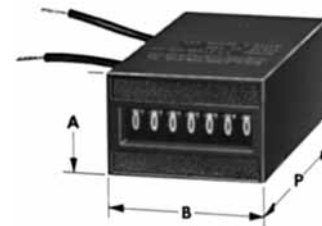
No. of Figures	Voltage	Reset	Mounting	Catalog Number	Order Number
6	24 Vdc	Non-reset	Bottom	6-Y-41119-402-ME	41119402
6	120 Vac	Non-reset	Bottom	6-Y-41119-406-ME	41119406
6	12 Vdc	Non-reset	Base	6-Y-41345-401-ME	41345401
6	24 Vdc	Non-reset	Base	6-Y-41345-402-ME	41345402
6	120 Vac	Non-reset	Base	6-Y-41345-406-ME	41345406
6	240 Vac	Non-reset	Base	6-Y-41345-407-ME	41345407
6	12 Vdc	Non-reset	Panel	6-Y-41346-401-ME	41346401
6	24 Vdc	Non-reset	Panel	6-Y-41346-402-ME	41346402
6	120 Vac	Non-reset	Panel	6-Y-41346-406-ME	41346406
6	240 Vac	Non-reset	Panel	6-Y-41346-407-ME	41346407
7	12 Vdc	Non-reset	Bottom	7-Y-41238-401-ME	41238401
7	24 Vdc	Non-reset	Bottom	7-Y-41238-402-ME	41238402
7	120 Vac	Non-reset	Bottom	7-Y-41238-406-ME	41238406
7	12 Vdc	Non-reset	Base	7-Y-41337-401-ME	41337401
7	24 Vdc	Non-reset	Base	7-Y-41337-402-ME	41337402
7	120 Vac	Non-reset	Base	7-Y-41337-406-ME	41337406
7	12 Vdc	Non-reset	Panel	7-Y-41349-401-ME	41349401
7	24 Vdc	Non-reset	Panel	7-Y-41349-402-ME	41349402
7	120 Vac	Non-reset	Panel	7-Y-41349-406-ME	41349406
7	240 Vac	Non-reset	Panel	7-Y-41349-407-ME	41349407

Technical Data and Specifications**General Specifications**

Description	Specification
Figures	4, 6 and 7
Speed	Up to 1000 cpm
Figure size	3/16 in (4.8 mm) high
Reset	Pushbutton and non-reset
Reset force	Pushbutton models only, 20 oz. (568 grams) maximum
Mounting	Base, bottom, panel
Finish	Black self-extinguishing plastic
Electrical connections	Wire leads, 10 in (254 mm) long, AWG 20, stripped 3/8 in (9.5 mm), and pin terminals
Power requirements	3W
Coils	Count coils are designed for continuous duty at rated voltage

Dimensions

Approximate Dimensions in Inches (mm)

ME Series Counters**Panel Mounted****Bottom Mounted****Base Mounted****Bottom Mounted****ME Series Counters****4 Figure Pushbutton Reset Counters**

Dimension	Inches (mm)
A	1.00 (25.4)
B	1.60 (40.6)
C	2.64 (67.1)
D	2.19 (55.6)
E	1.80 (45.7)
F	1.80 (45.7)
G	1.40 (35.6)
H	0.69 (17.5)
J	1.88 (47.8)
K	0.50 (12.7)
L	0.49 (12.4)
M	0.94 (23.9)
N	2.45 (62.2)
P	2.45 (62.2)
Q	0.45 (11.4)
R	0.63 (16.0)
S	0.19 (4.8)
T	0.68 (17.3)

6 and 7 Figure Non-Reset Counters

Dimension	Inches (mm)
A	1.00 (25.4)
B	1.60 (40.6)
C	2.38 (60.5)
D	2.19 (55.6)
E	1.80 (45.7)
F	1.80 (45.7)
G	1.40 (35.6)
H	0.69 (17.5)
J	1.88 (47.8)
K	0.50 (12.7)
L	0.49 (12.4)
M	0.94 (23.9)
N	2.19 (55.6)
P	2.19 (55.6)
Q	0.45 (11.4)
R	0.63 (16.0)
S	0.19 (4.8)
T	0.88 (22.4)

Recommended Panel Mount Cut-Outs**4 Figure Counters
Pushbutton Reset**

1.72 x 1.11 (43.7 x 28.2)

**6 and 7 Figure Counters
Non-Reset**

1.72 x 1.11 (43.7 x 28.2)

Electronic Totalizers



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Mechanical Totalizers

Stroke **V13-T1-4**Revolution **V13-T1-13**Electromechanical Totalizers **V13-T1-28**

Electronic Totalizers

1/32 DIN LCD Totalizers **V13-T1-41**1/32 DIN LED Multifunction
Totalizer/Timer/Ratemeter **V13-T1-43**Courier Series **V13-T1-45**1/8 DIN LED Multifunction
Totalizer/Timer/Ratemeter **V13-T1-48**

Electronic Totalizers

Product Overview

Eaton's electric totalizers provide a flexible and accurate method of displaying count and measurement data in an easily readable format.

Features

- LED and LCD readouts
- Variety of sizes and packages
- Programmable inputs and displays available

Standards and Certifications

- Most products are UL certified (see individual product pages for details)
- CE



1/32 DIN LCD Totalizers**Product Description**

Compact battery powered totalizers where AC power is unavailable.

Features

- Low price and high efficiency
- Large eight-digit LCD display, height of the figures 0.31 in (8 mm)
- Various counting modes like up/down differential available
- High voltage input for 10–260 Vac/Vdc voltage pulses
- IP65
- Screw terminals, RM 5 mm
- Lifetime of the battery approximately eight years
- Locking of the reset key
- Operating temperature 14 to 140 °F (–10 to 60 °C)
- All version of positive or negative counting edge
- Filter function for bounce-free counting with mechanical contacts

Standards and Certifications

- UL recognized
- CE marked

**Product Selection**

E5-024-C04_

**1/32 DIN LCD Totalizers**

Description	Catalog Number
Eight-Digit LCD Totalizer, Battery Power	
4–30 Vdc powered, NPN/PNP 0.94 x 1.89 in (24 x 48 mm)	E5-024-C0400
10–120V input AC/DC powered, NPN only 0.94 x 1.89 in (24 x 48 mm)	E5-024-C0408
Count up/down 4–30 Vdc powered, NPN only, 0.94 x 1.89 in (24 x 48 mm)	E5-024-C0410

Technical Data and Specifications**1/32 DIN LCD Totalizers**

Description	Specification
Power supply	Non-replaceable lithium battery (lifetime approximately eight years at 68 °F (20 °C))
Display	LCD, eight-digits
Figure size	0.31 in (8 mm) high
Mode	Adding or subtracting (selectable), counting direction, differential counting or phase discriminator single or dual evaluation (selectable)
Display range	–9999999 to 99999999, with overflow display
Reset	Manual and electrical
Interference emissions	EN 55011 Class B, EN 61 000-6-2, EN 61010 Section 1 (only AC versions)
Housing	Dark gray RAL 7021
Operating temperature	14 to 131 °F (–10 to 55 °C)
Ambient temperature	14 to 140 °F (–10 to 60 °C)
Storage temperature	–4 to 158 °F (–20 to 70 °C)
Protection	IP65 (from front)
Weight	Approx. 1.76 oz (50 g)

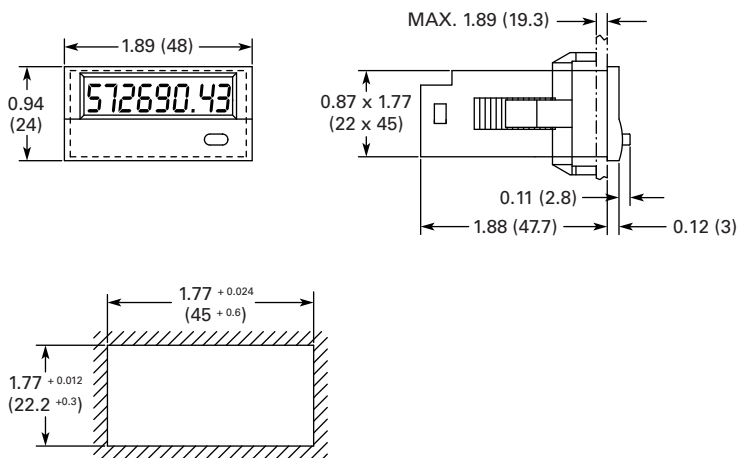
1/32 DIN LCD Totalizers, continued

Description	Specification
Counting inputs:	
Counting input of the DC version	Max. 30 Vdc
Slow counting input	Max. 30 Hz (NPN)
Fast counting input	Max. 12 kHz (PNP)
Switching level	NPN: Low 0–0.7V, High 3–30 Vdc PNP: Low 0–0.7V, High 3–30 Vdc
Counting Input of the high voltage versions	10–260 Vac/Vdc
Counting input	Optocoupler input, max. 30 Hz
Min. pulse time	16 ms
Switching level	Low: 0–2 Vac/Vdc High: 10–260 Vac/Vdc
Counting direction switching (only DC versions)	Contact input, open collector NPN (switching at 0 Vdc) Switching level, NPN—Low, 0–0.7V, High 3–5 Vdc
Reset input (only DC and high voltage)—	
Minimum pulse time	DC: 50 ms; high voltage: 16 ms
Contact input NPN	Low: 0–0.7V High: 3–30 Vdc
High voltage input	10–260 Vac/Vdc
Electrical reset key locking (for DC and AC)	Contact input, open collector NPN (switching at 0V) Switching level, NPN—Low, 0–0.7V, High 3–5 Vdc

Dimensions

Approximate Dimensions in Inches (mm)

1/32 DIN LCD Totalizers



1/32 DIN LED Multifunction Totalizer/Timer/Ratemeter**Product Description**

Compact LED display for a variety of input signals.

Features

- Display counter adding and subtracting
- Position display
- Frequency counter/ratemeter
- Timer
- Display range: -199.999 to 999.999 with zero blanking
- Screw terminal
- Locking SET-key

Standards and Certifications

- UL recognized
- CE marked

**Product Selection****E5-024-C04****1/32 DIN LED Multifunction Totalizer/Timer/Ratemeter**

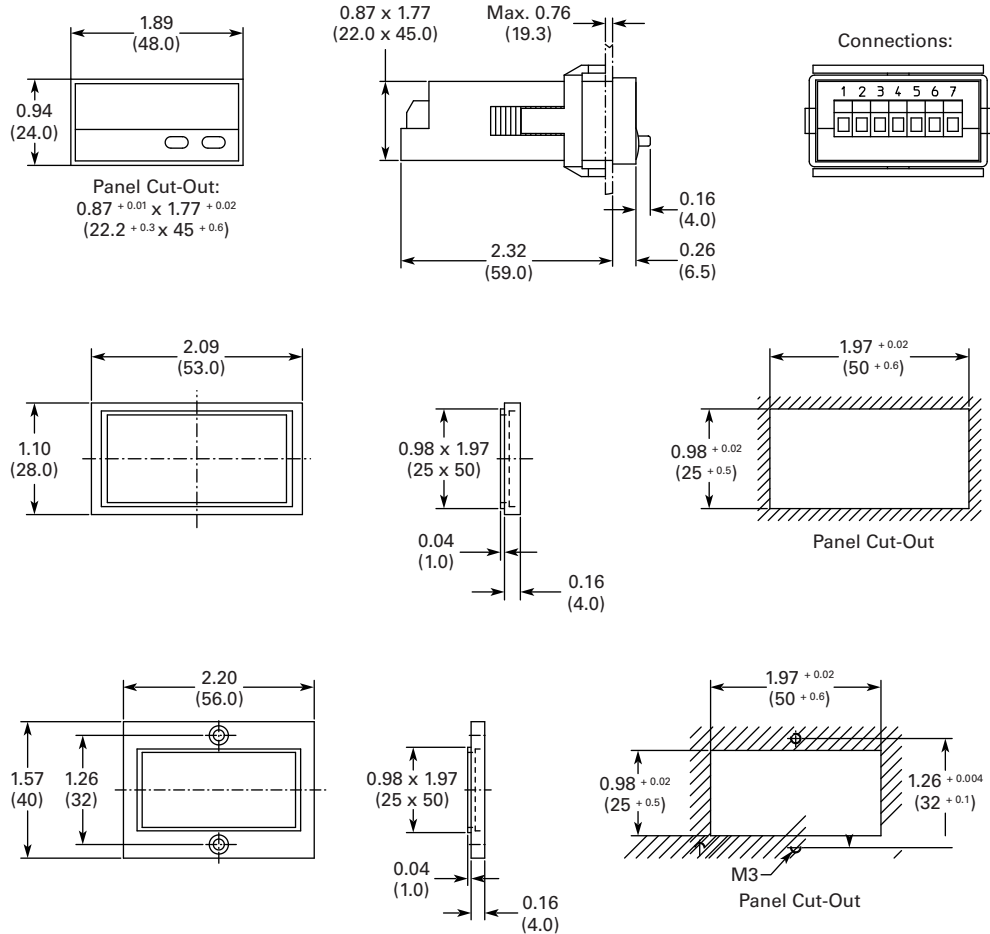
Description	Catalog Number
LED Single channel totalizer, 10–30 Vdc power 0.94 x 1.89 in (24 x 48 mm)	E5-024-E0402
LED multifunction totalizer/timer/ratemeter 10–30 Vdc power 0.94 x 1.89 in (24 x 48 mm)	E5-424-E0402
LED double-function totalizer/timer/ratemeter 10–30 Vdc power 0.94 x 1.89 in (24 x 48 mm)	E5-524-E0402
LED totalizer with quadrature, 10–30 Vdc power 0.94 x 1.89 in (24 x 48 mm)	E5-024-E0432

Technical Data and Specifications**General Specifications**

Description	Specification
Supply voltage	10–30 Vdc with reverse polarity protection
Current consumption	Max. 55 mA
Display	Six-digit red, seven-segment LED display
Figure size	0.31 in (8 mm) high
Data backup	EEPROM
Housing	Dimension 3.78 x 1.89 in (48 x 24 mm) according to DIN 43 700; RAL 7021 gray
Polarity of inputs	Programmable, NPN or PNP
Input resistance	Approx. 10 Kohms
Counting frequency	60 kHz, can be damped to 30 Hz, position display max. 25 kHz
Resolution	Timer 0.001 sec.
Reset time	5 ms
Level of inputs	
High	0.6 x U _B –30 Vdc
Low	0–0.2 x U _B (Vdc)
Error	
Tachometer	<0.1%
Timer	<50 ppm
Ambient temperature	4 to 131 °F (–20 to 55 °C)
Storage temperature	–13 to 167 °F (–25 to 75 °C)
EMC	According to EC EMC directive 89/36/EWG
Immunity to interference	EN 61 000-6-4/ EN 55011 Class B
Emitted interference	EN 61 000-6-2
Protection	IP65 (from front)
Weight	Approx. 5.29 oz (150 g)

Dimensions

Approximate Dimensions in Inches (mm)

1/32 DIN LED Multifunction Totalizer/Timer/Ratemeter

Courier Series

Product Description

Eaton's Courier Series is a high quality totalizer powered by a replaceable lithium battery.

Features

- Eight-digit totalizer
- 1/Tau ratemeter
- Scaling capabilities
- Remote reset terminal
- 0.43 in (10.9 mm) display
- Front panel reset
- NEMA 4X

Standards and Certifications

- CE marked



Product Selection

When Ordering Specify

When ordering Courier Series Electronic Totalizers and Ratemeters, specify order numbers according to the features selected.

Courier Series



Courier Series, Eight-Digit LCD

Description	Catalog Number
Totalizer, battery	53300400
Add/subtract (10 kHz, PNP input) totalizer, battery	53300401
Add/subtract (20 Hz, NPN/contact input) totalizer, battery	53300402
Totalizer/ratemeter, battery	53300405
RMF panel mount totalizer, key reset, 60–160 Vac/Vdc count input	53300800
RMF panel mount totalizer, dry contact input	53300850
RMF panel mount totalizer, 60–160 Vac/Vdc count input	53300851
Totalizer—extended temperature range, battery	53301400
Totalizer—1/Tau ratemeter—extended temperature range	53301404
Totalizer/ratemeter—extended temperature range, battery	53301405
Totalizer/ratemeter, mag pickup, battery	53301475
Backlight totalizer, battery	53302400
Backlight add/subtract (10 kHz, PNP input) totalizer, battery	53302401
Backlight add/subtract (20 Hz, NPN/contact input) totalizer, battery	53302402
Backlight totalizer/ratemeter, battery	53302405

Technical Data and Specifications**General Specifications**

Description	Specification
Power	
Internal battery	3V, lithium
Life expectancy	5 years +
Replacement part	36367-202
Backlight	
Backlight	10–30 Vdc at 30 mA max. ① Reverse polarity protected
Physical	
Operating temperature	–4 to 158 °F (–20 to 70 °C)
Storage temperature	–4 to 158 °F (–20 to 70 °C)
Operating humidity	60% noncondensing
Weight	2.2 oz (62 g) net
Figure size	0.43 in (10.9 mm) high
Front panel rating	NEMA 4X when mounted with gasket provided
Case material	Cyclac X-17
Totalizer	
Type	UP counting
Digits	Eight
Count Accuracy	
Operated within specifications	100%
DC Common (Terminal 1) Count Inputs	
Input B (terminal 2) low speed input designed for contact closures to DC common	
Speed	0 to 20 Hz
Min. low time	10 ms
Min. high time	40 ms
Input impedance	101 Kohms
Voltage thresholds	
Low	0–0.4 Vdc
High	2.0–28 Vdc
Max. high	28 Vdc
Input A (terminal 3) high speed input requiring a voltage source such as a current sourcing sensor or a current sinking sensor used with the provided pull up resistors	
Speed	0 to 10 kHz
Min. low time ②	80 ms
Min. high time ②	20 ms
Input impedance	2 Kohms above 5 Vdc
Voltage thresholds	
Low	0–1.2 Vdc
High	2.0–28 Vdc
Max. high	28 Vdc
Reset Input	
Reset input (terminal 4) designed for contact closures to DC common	
Min. low ③	0.25 to 1 sec. (reset is maintained)
Voltage thresholds	
Low	0–0.4 Vdc
High	2.0–28 Vdc
Front Panel Reset Enable	
Front panel reset enable (terminal 5)	
Operation	Level sensitive (maintained)

Notes

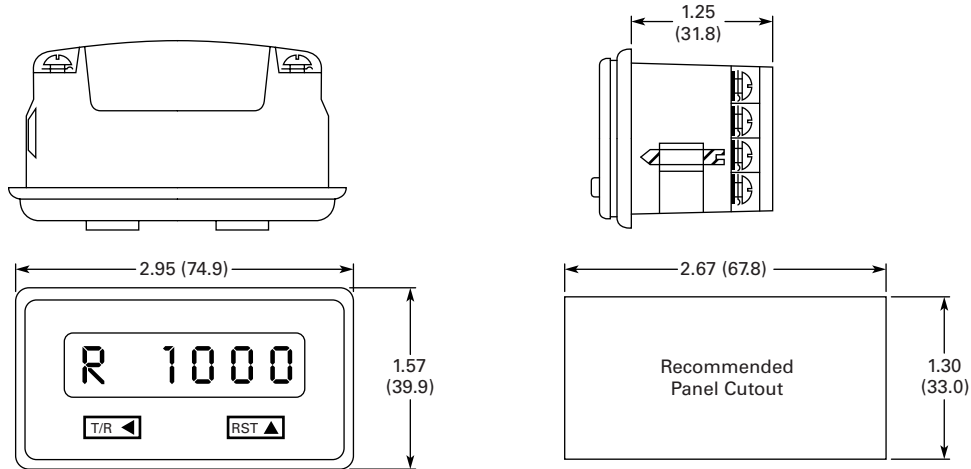
① Derate operating temperature 1 °C/volt above 17 Vdc.

② The times are with a 0–5.0V swing.

③ The required pulse width varies with count speed, scale factor and number of digits displayed.

Dimensions

Approximate Dimensions in Inches (mm)

Courier Series

1 1/8 DIN LED Multifunction Totalizer/Timer/Ratemeter

Product Description

LED display for a variety of input signals.

Features

- Display counter adding and subtracting
- Position display
- Frequency counter/ratemeter
- Timer, res. up to 0.001 second
- Programmable mode
- Display range: –199.999 to 999.999 with zero blanking
- Connection with screw terminal
- Locking SET-key for reset

Standards and Certifications

- UL recognized
- CE marked



Product Selection

E5-496-E040

1/8 DIN LED Multifunction Totalizer/Timer/Ratemeter



Description	Catalog Number
LED Multifunction Counter/Timer/Ratemeter	
90–260 Vac power 3.78 x 1.89 in (96 x 48 mm)	E5-496-E0401
10–30 Vdc power 3.78 x 1.89 in (96 x 48 mm)	E5-496-E0402

Technical Data and Specifications

General Specifications

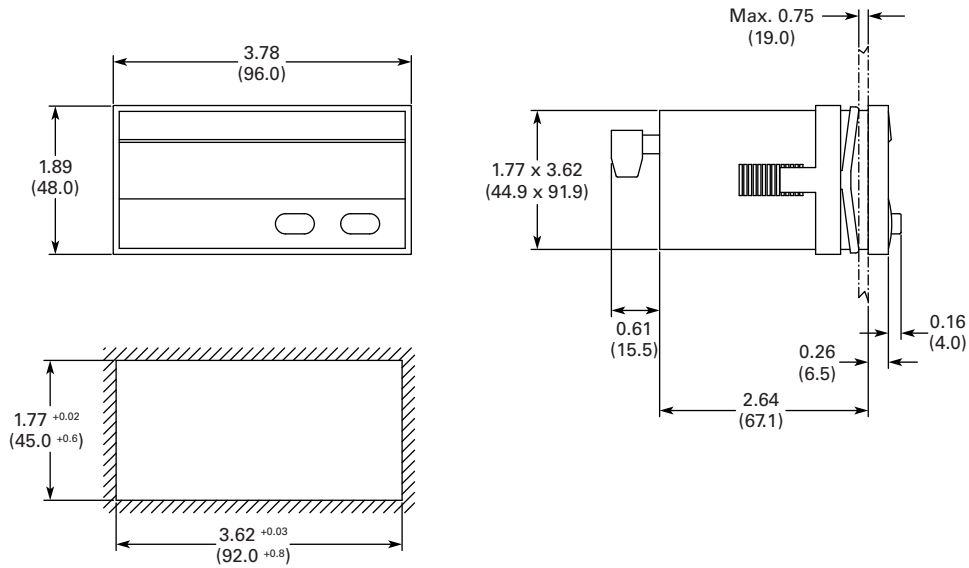
Description	Specification
Supply voltage	10–30 Vdc with reverse polarity protection; 90–260 Vac
Current consumption	Max. 50 mA 6 VA
Display	Six-digit red, seven-segment LED display
Figure size	0.55 in (14 mm) high
Data backup	EEPROM
Housing	Dimension 3.78 x 1.89 in (96 x 48 mm) according to DIN 43 700; RAL 7021 gray
Polarity of inputs	Programmable, NPN or PNP for all inputs
Input resistance	Approx. 10 Kohms
Counting frequency	60 kHz, can be damped to 30 Hz depending on operating mode at position display max. 25 kHz ①
Reset time	5 ms
Resolution timer	Up to 0.001 second
Input switching level	
DC version (standard version)	High: 0.6 x U _B –30 Vdc Low: 0–0.2 x U _B (Vdc)
AC version	High: 12–30 Vdc Low: 0–4 Vdc
Voltage supply for sensors	24 Vdc ±15%/100 mA at AC versions
Accuracy	
Tachometer	<0.1%
Timer	<50 ppm
Ambient temperature	–4 to 149 °F (–20 to 65 °C)
Storage temperature	–13 to 167 °F (–25 to 75 °C)
EMC	According to EC EMC directive 89/36/EWG
Immunity to interference	EN 61 000-6-4/ EN 55011 Class B
Emitted interference	EN 61-000-6-2
Protection	IP65 (from front)
Weight	Approx. 5.29 oz (150 g)

Note

① For further specifications, please refer to the user manual.

Dimensions

Approximate Dimensions in Inches (mm)

1/8 DIN LED Multifunction Totalizer/Timer/Ratemeter

Count Controls/Preset Counters



Contents

Description

Page

Count Controls/Preset Counters

Product Selection Guide **V13-T1-51**

1/16 DIN Battery Powered LCD

Count Control **V13-T1-52**

1/16 DIN LCD Preset Counters with Rate

and Time **V13-T1-54**Ambassador Series (Totalizers) **V13-T1-60**Ambassador Series (Count Control) **V13-T1-63**PD-Q and PD-ER Series **V13-T1-67**Learn
Online

Product Overview

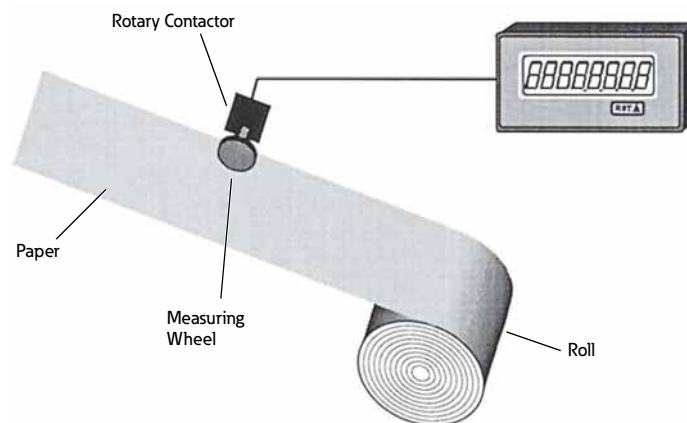
Count controls are counters that provide output signal(s) at preset count value(s).

Typical applications include cut-to-length, batching, filling, mixing and dispensing. A variety of count controls in different sizes, display types and feature sets are available from Eaton.

Application Description

The illustration shows a simple cut-to-length application. The roll of paper is measured using a measuring wheel and rotary contactor (or encoder). Once the desired length is reached, an output signal may be directed to a shear for activation. Following the cut-off, the count control will reset to zero and begin measurement of the next piece. Options such as batch counting, where the number of cut pieces is counted, are also typical of this application.

Application Example



Product Selection Guide

Count Controls/Preset Counters/Totalizers

	Characteristics	Panel Cutout in Inches (mm)	Page
E5-148-C 	Low cost, simple count control Battery operated Easy-to-change preset values Two-line display: input and preset values	1.772 x 1.772 (45 x 45)	V13-T1-52
E5-648-C 	Two-line display: counter, timer or tachometer AC or DC power options Wide choice of count modes for pulse inputs, time or frequency Two or four presets	1.772 x 1.772 (45 x 45)	V13-T1-54
Ambassador 	Six-digit, high-visibility, two-line LCD display User-configurable control inputs Highly flexible control/display	2.667 x 2.667 (68 x 68)	V13-T1-63
PD-Q and PD-ER 	Electromechanical pre-set counter Easy setpoint adjustment using pushbuttons Base mount or panel mount	2.72 x 1.59 (69 x 40.5) (panel mount model)	V13-T1-67
Fusion 	Integrated controller combines operator interface, ladder logic and high-speed counting	2.667 x 5.433 (68 x 138)	V13-T1-103

1/16 DIN Battery Powered LCD Count Control**Product Description**

Battery-powered electronic preset counter.

Features

- Replacement for electromechanical preset counters
- No power supply necessary (battery operated)
- Count and reset input electrically separated from counter through optocoupler input range 12–250 Vac/Vdc
- Two-line LC display count, preset and level of the output
- Screw terminal
- Data security, through two exchangeable lithium batteries, lifetime minimum eight years
- Easy programming
- Counter presets easily via presetting keys allocated to each decade
- Output: Potential free relay, programmable normally open or normally closed contact

Standards and Certifications

- cRU[®]us approval
- CE marked

**Product Selection****E5-148-C1400****1/16 DIN Battery Powered LCD Count Control**

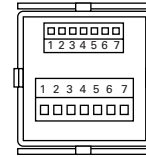
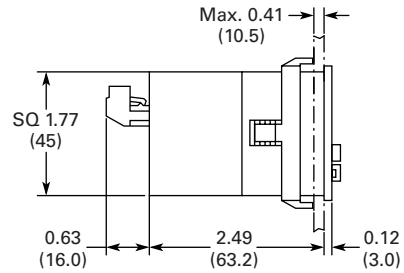
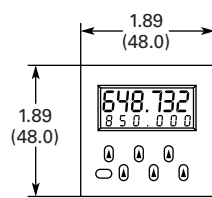
Description	Catalog Number
Single Preset Count Control	
Battery power 1.89 x 1.89 in (48 x 48 mm)	E5-148-C1400

Technical Data and Specifications**General Specifications**

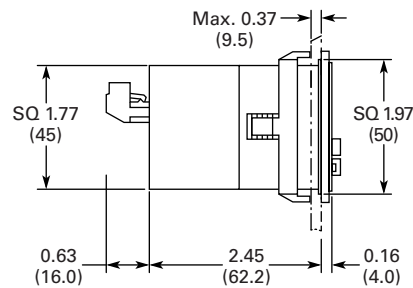
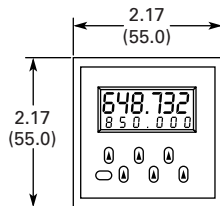
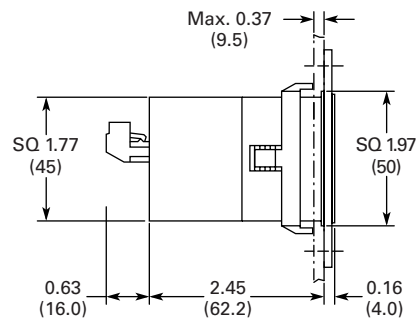
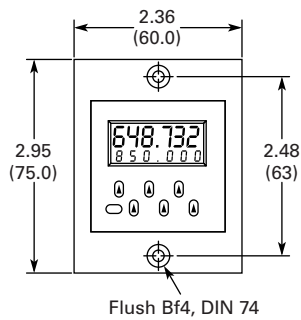
Description	Specification
Power supply	2 pcs user exchangeable lithium batteries, type 1/2 AA lithium 3.6V
Display	Two-line LCD display, six digits; 999999
Figure size	0.28 in (7 mm) or 0.18 in (4.5 mm) high
Input	Reset, count and keylock inputs
Input polarity	Bi-directional optocoupler input for the reset count inputs; reset, count and keyboard lock is connected to 3 Vdc
Input min. pulse duration	Reset input 50 ms; keyboard lock input 15 ms
Input switching levels	
Low	<3 Vac/Vdc
High	12–250 Vac/Vdc
Input frequency	Max. 25 Hz
Input resistance	110 Kohms
Output	Bistable relay with potential free contact (programmable as normally closed or normally open contact)
Max. switching voltage	250 Vac/220 Vdc
Max. switching current	2A
Max. switching capacity	60 VA/30W
Output response time	<20 ms, max. 4 Hz
Data retention	Via two batteries, eight years or 5x10 ⁶ power operations of the output relay and an ambient temperature of 77 °F (25 °C)
Ambient temperature	14 to 122 °F (–10 to 50 °C)
Storage temperature	–13 to 140 °F (–25 to 60 °C)
EMC	According to EC EMC directive 89/36/EEG, EN 61 000-6-4/ EN 55011 Class B, EN 61 000-6-2
Protection	IP65 (front)
Weight	Approx. 2.82 oz (80 g)

Dimensions

Approximate Dimensions in Inches (mm)

1/16 DIN Battery Powered LCD Count Control

Panel Cut-Out 1.77 x 1.77 (45 x 45)

With Front Bezel No. 2
Panel Cut-Out 1.97 x 1.97 (50 x 50)With Front Bezel No. 3
Panel Cut-Out 1.97 x 1.97 (50 x 50)

1 1/16 DIN LCD Preset Counters with Rate and Time

Product Description

AC or DC powered preset counters that can function as timer or tachometer/ratemeter.

Features

- Two-line display with green backlight (E5-648-C2421 and E5-648-C2422) or multi-color red/green LED backlighting (E5-648-C4461 and E5-648-C4462)
- Programmable as preset counter, batch counter or totalizer
- Power supply: 90–260 Vac or 10–30 Vdc
- Direct input of the presets via front keys or Teach-In input
- Relay outputs
- Scaling by multiplication and division factors 0.0001 to 99.999
 - Two preset values, two outputs
 - Four preset values, four outputs

Standards and Certifications

- cRU[®]us approval
- CE marked



Product Selection

E5-648-C_



1/16 DIN Two-Line LCD Count Control

Description	Catalog Number
Two Preset LCD Count Control with Backlighting	
90–260 Vac power 1.89 x 1.89 in (48 x 48 mm)	E5-648-C2421
10–30 Vdc power 1.89 x 1.89 in (48 x 48 mm)	E5-648-C2422
Four Preset LCD Count Control with Multi-Color Display	
90–260 Vac power 1.89 x 1.89 in (48 x 48 mm)	E5-648-C4461
10–30 Vdc power 1.89 x 1.89 in (48 x 48 mm)	E5-648-C4462 ^①

Technical Data and Specifications

General Specifications

Description	Specification
Power supply	10–30 Vdc external fuse protection
	90–260 Vac max. 8 VA external fuse protection
Display	Two-line LCD display, six digits with programmable decimal point
Figure size	0.35 in (9 mm) high upper line
	0.28 in (7 mm) high lower line
Count inputs	Two count inputs (A and B), programmable for count/count direction, up/up, up/down, quadrature, quad2, quad4, A/B or (A-B)/A x 100%
Input polarity	Programmable for all inputs in common NPN/PNP
Input resistance	Approx. 5 Kohms
Count frequency	Max. 55 kHz with programmable filter for 30 Hz (see manual for details)
Input min. pulse duration	10 ms for control inputs/1 ms for reset input
Switching levels	
DC supply voltage	
High	0.6 x UB–30 Vdc
Low	0–0.2 x UB (Vdc)
AC supply voltage	
High	12–30 Vdc
Low	0–4 Vdc
Pulse shape	Variable (Schmitt-Trigger characteristics)

Note

^① Not a stocked product, contact Eaton Care for assistance.

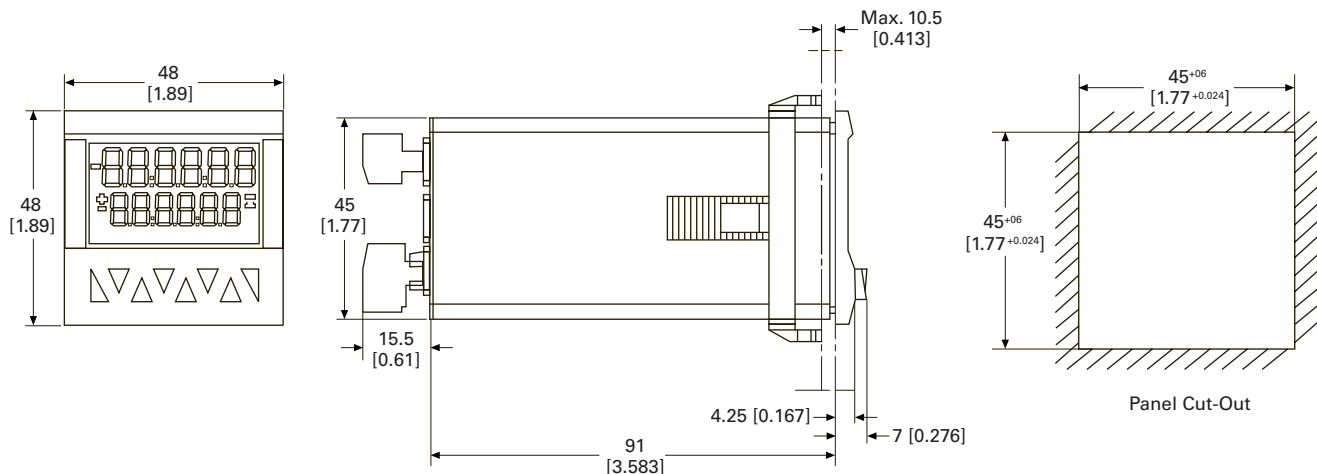
General Specifications, continued

Description	Specification
Output 1	
Relay	Programmable as normally open or normally closed
Switching voltage max.	250 Vac/110 Vdc
Switching current max.	3 A Vac/3 A Vdc
Switching current at DC min.	30 mA Vdc
Switching power at DC	90 W
Switching power at AC max.	750 VA
Output 2	
Relay	Relay with changeover/Form C contact
Switching voltage max.	250 Vac/110 Vdc
Switching current max.	3 A Vac/3 A Vdc
Switching current at DC min.	30 mA Vdc
Switching power at DC	90 W
Switching power at AC max.	750 VA
Reaction time of the outputs	Approximately 10 ms
Data retention	Min. 10 years or 1 million memory cycles
Sensor supply voltage	
AC powered unit	24 Vdc $\pm 15\%$, 80 mA
DC powered unit	Max. 80 mA, DC voltage is connected through
Ambient operating temperature	-4 to 149 °F (-20 to +65 °C)
Storage temperature	-13 to 167 °F (-25 to 75 °C)
EMC	
Emitted interference	EN 55011 Class B
Immunity to interference	EN 61000-6-2
Protection	IP65 (front)
Weight	Approx. 4.4 oz (125 g)

Dimensions

Approximate Dimensions in mm [Inches]

1/16 DIN Two-Line LCD Count Control



1

President Series (Count Control)**Product Description**

Eaton's President Series features an easy-to-read LED and a simple preset input by means of the large keypad.

Features

- Five- or six-digit, LED display, 0.56 in (14 mm)
- 2 or 3 presets
- 15 Vdc at 100 mA output power
- Rear panel screw terminals
- 20 mA current loop communications
- 2 Form C relays
- Tactile keypad NEMA 4 front panel

Standards and Certifications

- UL listed
- CSA marked
- CE marked

**Product Selection**

58831400

**President Series Count Control**

Description	Features					Main Counter	Presets	Digits	Catalog Number
	Totalizer	Batch Counter	Rate	Scaler	Crop-Cut				
Dual preset	—	—	—	✓	—	1	2	5	58831400
Dual preset with totalizer or batch counter	①	①	—	✓	✓	1	2	6	58851400
Three presets with floating pre-warn	—	—	—	✓	—	1	3	6	58861400
Main counter, batch and totalizer presets	②	②	✓	✓	—	3	1 ea.	6	58827400
Two independent count registers	③	③	✓	✓	—	3	1 ea.	6	58827410

Notes

- ① These models have, in addition to the main count register, a register that may be configured to be used as either a totalizer or single preset batch counter. These two functions are mutually exclusive.
- ② The model 58827-400 has both a totalizer and a batch counter, each with a single preset. In addition, the batch counter may be configured as an additional totalizer with control instead of batch counter.
- ③ The model 58827-410 has two completely independent count input channels feeding two independent, single preset count registers. In addition, a third single preset register may be used as either a totalizer or a batch counter for one or both of the two main counters.

Technical Data and Specifications

President Series—Count Control

	Model			
Description	58831400	58851400	58827400	58827410
AC power requirements	120V/240V +10%/-20%, 47–63 Hz	120V/240V +10%/-20%, 47–63 Hz	120V/240V +10%/-20%, 47–63 Hz	120V/240V +10%/-20%, 47–63 Hz
DC power requirements	11–28 Vdc	11–28 Vdc	11–28 Vdc	11–28 Vdc
Power consumption	18 watts max.	18 watts max.	18 watts max.	18 watts max.
DC power output ①	15 Vdc +1/-2; 150 mA if powered from AC or less than 24 Vdc, 100 mA if powered from 24 Vdc or greater			
Operating temperature	32 to 130 °F (0 to 55 °C)	32 to 130 °F (0 to 55 °C)	32 to 130 °F (0 to 55 °C)	32 to 130 °F (0 to 55 °C)
Operating humidity	85% relative, noncondensing	85% relative, noncondensing	85% relative, noncondensing	85% relative, noncondensing
Storage temperature	–10 to 160 °F (–40 to 71 °C)	–10 to 160 °F (–40 to 71 °C)	–10 to 160 °F (–40 to 71 °C)	–10 to 160 °F (–40 to 71 °C)
Front panel rating	NEMA 4 rating when mounted with gasket provided	NEMA 4 rating when mounted with gasket provided	NEMA 4 rating when mounted with gasket provided	NEMA 4 rating when mounted with gasket provided
Main counter scaler range	5 Digits (0.0001 to 9.9999)	5 digits (0.0001 to 9.9999)	5 digits (0.0001 to 9.9999)	5 digits (0.0001 to 9.9999)
Count input frequency	See table on Page V13-T1-57	See table on Page V13-T1-57	See table on Page V13-T1-58	See table on Page V13-T1-58
Control input impedance	4.5 Kohms to +5 Vdc	6.8 Kohms to 15 Vdc when control is powered by AC line; 6.8 Kohms to 10 Vdc when control is powered by DC line		
Control input response time	Min. high 5.3 ms; min. low 3.9 ms	High 10.5 to 24.5 Vdc; Low 0.0 to 4.5 Vdc when powered by AC		
Relay contact output ratings	SPDT Form C; 10 amps resistive at 24 Vdc or 230 Vac; 1/3 hp at 115 Vac or 230 Vac; 150 Vdc max switched voltage; 5,000,000 operations mechanical life, 100,000 operations at resistive rating			
Transistor output ratings	Open collector NPN transistor with Zener diode transient surge protection; 30 Vdc max. load; 300 mA max. per transistor; 480 mA total for all transistors. Use 5 mA per relay coil when calculating total transistor current			
Communications	Dual port 20 mA current loop, standard ASCII code			

58831400 and 58861400 Count Frequency

Scale Factor	Count Speed (Pulses per Second)	
	Nominal Count	Quadrature and/or Doubled Count
<1.0000	5,000	2,500
1.0000	7,500	3,750
1.9999	4,000	2,000
2.0000	6,000	3,000
9.0000	2,000	1,000
9.9999	1,500	750

58851400 Count Frequency

Scale Factor	Count Speed (Pulses per Second)			
	Function 61 value = "0"		Function 61 value = "1"	
	Nominal Count	Quadrature and/or Doubled Count	Nominal Count	Quadrature and/or Doubled Count
<1.0000	5,000	2,500	3,500	1,750
1.0000	7,500	3,750	4,500	2,250
1.9999	4,000	2,000	2,400	1,200
2.0000	6,000	3,000	3,600	1,800
9.0000	2,000	1,000	1,100	550
9.9999	1,500	750	1,000	500

Note

^① DC power output is only regulated if unit is powered by AC or greater than 18.5 Vdc.

58827400 Count Frequency

Scale Factor	Count Speed (Pulses per Second)		
	Count Up	Count Down	Quadrature
0.999	4,000	2,250	2,000
1.000	5,000	3,500	3,500
1.999	3,500	2,000	1,250
2.000	4,000	3,000	2,750
9.000	1,500	1,500	1,500
9.999	1,250	1,000	1,000

58827410 Count Frequency

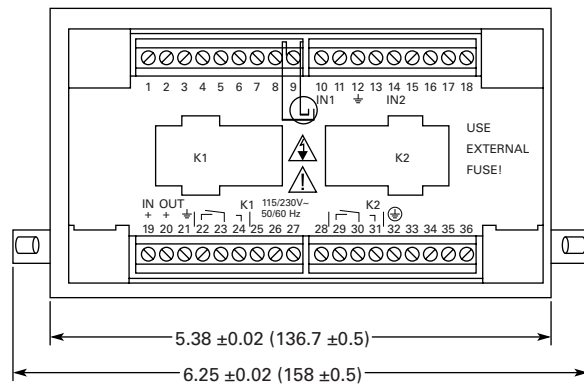
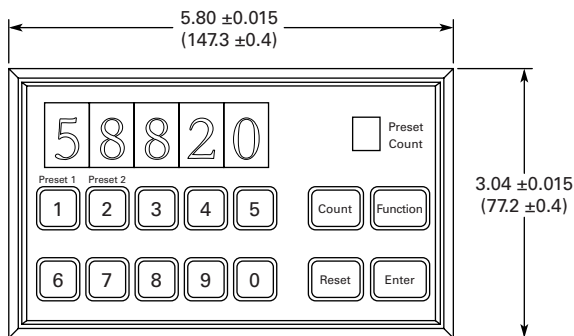
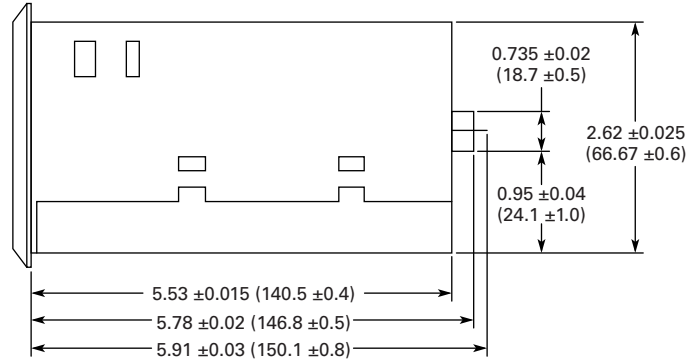
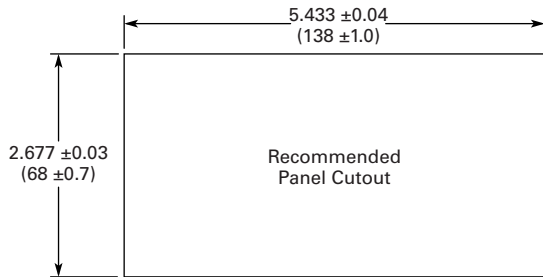
Sample Scale Factor	Count Speed (Pulses per Second)				
	Typical Combinations of Features ^①				
	C1 = ON C2 = OFF C3 = OFF RM = OFF	C1 = ON C2 = ON C3 = OFF RM = OFF	C1 = ON C2 = ON C3 = ON RM = OFF	C1 = ON C2 = ON C3 = OFF RM = ON	C1 = ON C2 = ON C3 = ON RM = ON
0.0001–0.9999	6,000	3,000	2,300	2,600	2,000
1.0000	9,000	4,500	3,500	4,000	3,000
5.0000	4,500	2,250	1,000	2,000	750
9.9999	1,500	1,000	500	750	550

Note

^① C1: Counter #1; C2: Counter #2; C3: Counter #3; RM: Ratemeter.

Dimensions

Approximate Dimensions in Inches (mm)

President Series Count Control

Ambassador Series (Totalizers)**Product Description**

Eaton's Ambassador Series is our most noise-immune totalizer available. Various counting modes can be set by the user.

Features

- AC powered, two-line LCD display
- Eight-digit totalizer
- 1/Tau ratemeter
- Totalizer and ratemeter scaling
- Four user-configurable control inputs
- Two solid-state outputs
- RS-485 serial communications

Standards and Certifications

- UL listed
- CE marked

**Product Selection****Ambassador Series****Ambassador Series Totalizers**

Description	Catalog Number
115 Vac LCD	57601400

Technical Data and Specifications**General Specifications**

Description	Specification
Power Input	
AC operation	115 Vac ($\pm 15\%$) std., 50 to 60 Hz, 7 W
DC power output	12 Vdc ($\pm 25\%$), 100 mA maximum (includes all line and load variations)
Environmental	
Operating temperature	32 to 131 °F (0 to 55 °C)
Storage temperature	−4 to 158 °F (−20 to 70 °C)
Operating humidity	85% relative, noncondensing
Rating	NEMA 4 when mounted with gasket provided
Totalizer	
Type	Bi-directional
Digits	Eight
Scaler range	0.00001 to 9.99999
Decimal point	Five positions, programmable
Totalizer Count Speeds ^①	
Maximum speed—solid-state (high speed)	
Mode	Input A/Input B
Add/sub	20 kHz
Add/add	20 kHz
Count/direction	15 kHz
Count x 2/direction	7.5 kHz
Quadrature	6.5 kHz
Quadrature x 2	6.5 kHz
Maximum speed—contact (low speed)	
Mode	Input A/Input B
Add/sub	40 kHz
Add/add	40 kHz
Count/direction	0 kHz

Note

^① The maximum count speed depends on the selected count mode. All maximum speeds are shown with square waves (50% duty cycle) input.

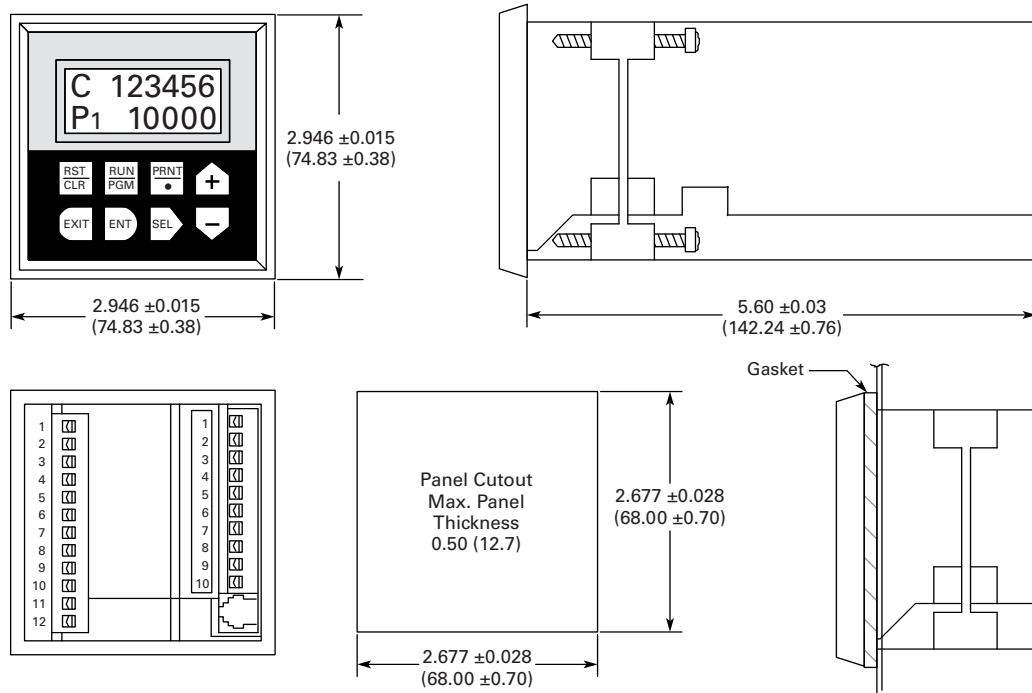
General Specifications, continued

Description	Specification
Count Inputs	
Sink	
Impedance	4.6 Kohms to +5 Vdc
Voltage	
High	3.5 to 34.0 Vdc
Low	0.0 to 1.9 Vdc
Source (high)	
Impedance	2.3 Kohms to common
Voltage	
High	3.5 to 17.0 Vdc (100% duty cycle)
Low	0.0 to 1.9 Vdc
Source (low)	
Impedance	2.3 Kohms to common
DC voltage	
High	0.6 to 17.0 Vdc
Low	−17.0 to −0.6 Vdc
AC voltage	17 Vac (48V peak-peak) maximum
Control Inputs	
Impedance	4.7 Kohms to +5 Vdc
Voltage	
High	+3.7 to +24 Vdc
Low	0.0 to 0.9 Vdc
Response	Minimum low 15 ms, minimum high 15 ms
Transistor Outputs (2)	
Type	NPN open collector with transient protection
Maximum voltage (OFF state)	30 Vdc
Maximum current (ON state)	200 mA at 1.3 Vdc
Communication	
Type	RS-485
Format	1 start bit, 7 data bits (ASCII), 1 parity bit, 1 stop bit
Protocol	Opto-22 compatible
Speed	300, 1200, 2400, 4800, 9600 and 19200 baud
Parity	Odd, even, none (space transmitted, ignore received)
Count Accuracy	
Operating within specifications	100% when operated within the specified count speeds and count signal high and low times
Rate Indicator	
Type	1/Tau
Digits	Six
Scaler range	0.00001 to 99999
Decimal point	Five positions, programmable
Accuracy	±0.015% of reading
Update time	1 second, fixed
Zero time	10 seconds, fixed
Connections	
Type	Dual depluggable screw terminal strips
Conductor size	14–22 AWG (2.1–0.38 mm ²), 600V, solid, stranded or fused (preferred)

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Dimensions

Approximate Dimensions in Inches (mm)

Ambassador Series Totalizer

Ambassador Series (Count Control)**Product Description**

Eaton's Ambassador Series provides up to four presets in one of the most noise-immune packages available.

Features

- AC powered, two-line LCD display
- Eight-digit totalizer
- 1/Tau ratemeter
- Totalizer and ratemeter scaling
- Four user-configurable control inputs
- Up to two output relays
- Two solid-state outputs
- RS-485 serial communications
- Feet/inches control available

Standards and Certifications

- UL listed
- CE marked

**Product Selection**

57601401

**Ambassador Series Count Control**

Description	Catalog Number
Single preset with rate, 115 Vac	57601401
Dual preset with rate, 115 Vac	57601403
Dual preset with rate, batch and totalizer, 115 Vac	57601404
Four preset with rate, batch and totalizer, 115 Vac	57601405
Four preset with rate, batch and totalizer, 230 Vac	57602405

Technical Data and Specifications**General Specifications**

Description	Specification
Power Input	
AC operation	115 Vac ($\pm 15\%$) std., 50 to 60 Hz, 7W 230 Vac ($\pm 15\%$) opt., 50 to 60 Hz, 7W
Power Output	
DC operation	12 Vdc ($\pm 25\%$), 100 mA maximum (includes all line and load variations)
Environmental	
Operating temperature	32 to 131 °F (0 to 55 °C)
Storage temperature	−4 to 158 °F (−20 to 70 °C)
Operating humidity	85% relative, noncondensing
NEMA 4 rating	When mounted with gasket provided
Main Counter	
Type	Bi-directional
Digits	Six
Presets	Varies by model
Reset modes	Auto or manual reset to zero or preset
Scaler range	0.00001 to 9.99999
Decimal point	Five positions (six on four-preset models)
Output latency	See table on Page V13-T1-65
Batch Counter	
Type	Increment with main counter recycle or final preset signal
Digits	Six
Presets	One
Output latency	<1 ms

General Specifications, continued

Description	Specification
Totalizer	
Type	Bi-directional, same or opposite of main counter
Digits	Eight
Scaler	Shared with main counter
Decimal point	Tracks main counter
Count Input Speeds	
See tables on Page V13-T1-65	
Count Inputs	
Sink Impedance	4.6 Kohms to +5 Vdc
Voltage High	3.5 to 34.0 Vdc
Low	0.0 to 1.9 Vdc
Source (high) Impedance	2.3 Kohms to common
Voltage High	3.5 to 17.0 Vdc (100% duty cycle)
Low	0.0 to 1.9 Vdc
Source (low) Impedance	2.3 Kohms to common
DC voltage High	0.6 to 17.0 Vdc
Low	−17.0 to −0.6 Vdc
AC voltage	17 Vac (48V peak-peak) maximum
Control Inputs	
Impedance	4.7 Kohms to +5 Vdc
Voltage High	+3.7 to +24 Vdc
Low	0.0 to 0.9 Vdc
Response	Minimum low 15 ms, minimum high 15 ms
Relay Outputs	
Type	SPDT contacts
UL ratings	250 Vac, 360 V A pilot duty
Transistor Outputs (2)	
Type	NPN open collector with transient protection
Maximum voltage (OFF state)	30 Vdc
Maximum current (ON state)	200 mA at 1.3 Vdc
Communication	
Type	RS-485
Format	1 start bit, 7 data bits (ASCII), 1 parity bit, 1 stop bit
Protocol	Opto-22 compatible
Speed	300, 1200, 2400, 4800, 9600 and 19200 baud
Parity	Odd, even, none (space transmitted, ignore received)
Rate Indicator (Not available on models 57601-415 and 57601-485)	
Type	1/Tau
Digits	Six
Presets	Two
Scaler range	0.00001 to 99999
Decimal point	Five positions, programmable
Accuracy	±0.015% of reading
Update time	See table on Page V13-T1-65
Zero time	See table on Page V13-T1-65
Connections	
Type	Dual depluggable screw terminal strips
Conductor size	14–22 AWG (2.1–0.38 mm ²), 600V, solid, stranded, or fused (preferred)

Output Latency for Ambassador Control

Style Number	Output Latency
5760X401	0.7 to 2 ms
5760X403	0.7 to 2.7 ms
5760X404	0.7 to 2.7 ms
5760X405	<1 ms

Rate Indicator Specs for Ambassador Control

Style Number	Update Time	Zero Time
5760X401	1 second, fixed	10 seconds, fixed
5760X403	1 second, fixed	10 seconds, fixed
5760X404	1 second, fixed	10 seconds, fixed
5760X405	0.1 to 99.9 seconds, programmable	0.1 to 99.9 seconds, programmable

Ambassador Count Input Speeds—5760X405 ①

Solid-State	A or B	A and B
A – B	8250/8250	3000/3000
A + B	8250/8250	4000/4000
–A + B	8000/8000	3000/3000
A, B Dir	8000/40	—
2A, B Dir	4500/40	—
A, B Rst	8250	—
Quad x 1	—	3250
Quad x 2	—	3250
Quad x 4	—	2000
Tot A/Cnt B	14000/9000	6500/6500
Tot + Cnt B	16000/8500	6500/6500

Ambassador Count Input Speeds—5760X401, 5760X403, 5760X404

Mode Input A/B	Maximum Speed ②	
	Solid-State (High Speed)	Contact (Low Speed)
Add/sub	20 kHz	40 kHz
Add/add	20 kHz	40 kHz
Count/direction	15 kHz	40 kHz
Count x 2/direction	7.5 kHz	—
Quadrature	6.5 kHz	—
Quadrature x 2	6.5 kHz	—

Notes

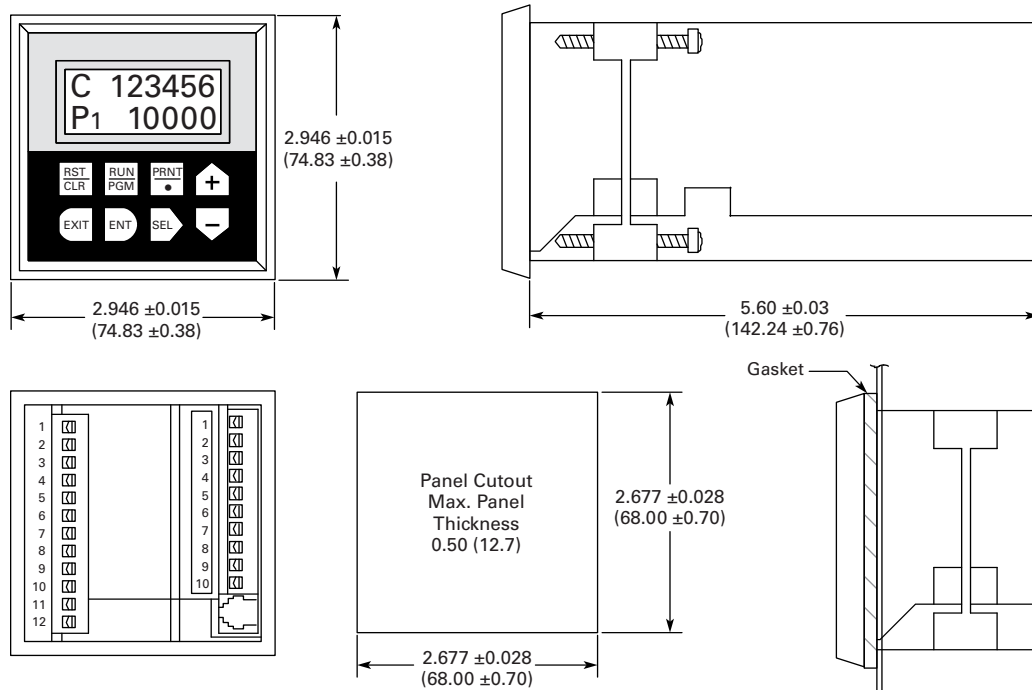
① Contact inputs = 40 Hz; B direction inputs = 40 Hz and B reset input = 10 μ S min. low. Input A not active on ft/in control.

② The maximum count speed depends on the selected count mode. All maximum speeds are shown with square waves (50% duty cycle) input.

1

Dimensions

Approximate Dimensions in Inches (mm)

Ambassador Series

PD-Q and PD-ER Series**Product Description**

The PD-Q Series is a five-digit, true subtracting electric predetermined counter that features pushbutton operation of both predetermined count settings and reset. The predetermined count is set by holding the RESET button in and then depressing the easy to operate pushbutton selectors under each digit. The unit subtracts, one count for each contact closure or impulse and actuates a 4 ampere, 250 Vac switch when zero is reached.

The output signal from this switch can be used to halt or change the flow of items being counted, and/or operate other electrical apparatus. The counter returns to the predetermined number when the RESET button is depressed and it is immediately ready to control the next lot or batch.

The PD-ER Series is identical to the PD-Q Series, except that it has electric reset (ER) for remote operation, allowing either local or remote use.

Features

- Easy setpoint adjustment
- Available in base mount or panel mount configurations

Standards and Certifications

- UL recognized as indicated

**Product Selection****When Ordering Specify**

When ordering PD-Q and PD-ER Series Predetermined Counters, specify catalog numbers according to the features selected.

5-Y-41433-*-PD-Q**PD-Q and PD-ER Series Predetermined Counters**

Voltage	Mounting	Wire Leads	Catalog Number	Order Number
12 Vdc	Panel	Rear	5-Y-41433-401-PD-Q	41433401
24 Vdc	Panel	Rear	5-Y-41433-402-PD-Q	41433402 ①
120 Vac	Panel	Rear	5-Y-41433-406-PD-Q	41433406 ①
240 Vac	Panel	Rear	5-Y-41433-407-PD-Q	41433407
24 Vac	Panel	Rear	5-Y-41433-408-PD-Q	41433408
24 Vdc	Base	Rear	5-Y-41469-402-PD-Q	41469402 ①
120 Vac	Base	Rear	5-Y-41469-406-PD-Q	41469406 ①
240 Vac	Base	Rear	5-Y-41469-407-PD-Q	41469407
24 Vdc	Base	Side	5-Y-41470-402-PD-Q	41470402 ①
120 Vac	Base	Side	5-Y-41470-406-PD-Q	41470406 ①
240 Vac	Base	Side	5-Y-41470-407-PD-Q	41470407
24 Vdc	Panel	Rear	5-Y-41625-402-PD-ER	41625402 ①
120 Vac	Panel	Rear	5-Y-41625-406-PD-ER	41625406 ①
240 Vac	Panel	Rear	5-Y-41625-407-PD-ER	41625407

Note

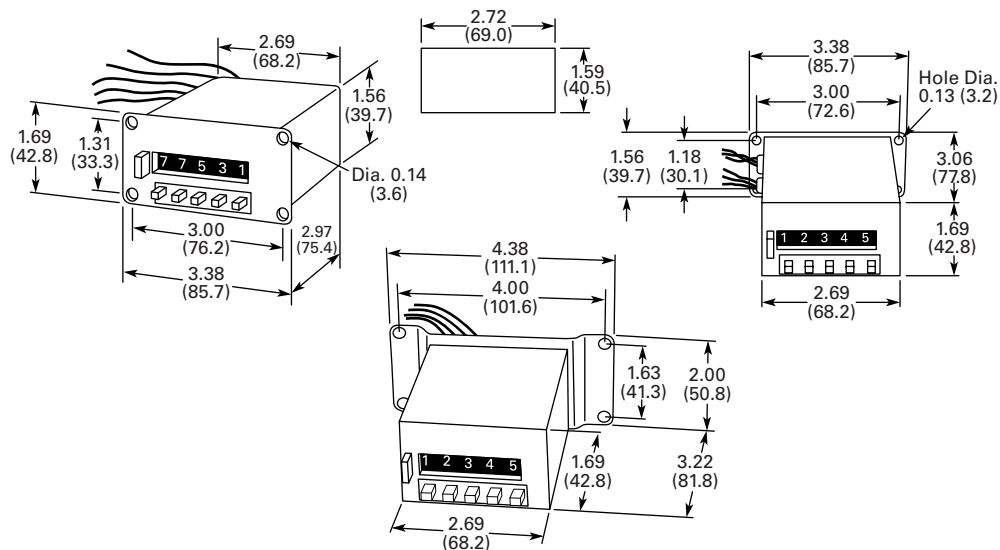
① UL recognized.

Technical Data and Specifications**General Specifications**

Description	Specification
Number of digits	Five
Speed	1000 cpm
Window	Acrylic
Shaft	Stainless steel
Frame	Zinc alloy die cast
Digit size	3/16 in high by 7/64 in wide (4.8 x 2.8 mm)
Weight	
Series PD-Q	0.53 lb (0.24 kg)
Series PD-ER	1.06 lb (0.48 kg)
Finish	Dull Instrument black with red RESET button
Power consumption	
Series PD-Q	9 watts
Series PD-ER	Count coil 9 watts, reset coil 20 watts
Switch rating	SPDT, 4 amperes at 250 Vac

Dimensions

Approximate Dimensions in Inches (mm)

PD-Q and PD-ER Series

Tachometers/Ratemeters



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Product Selection Guide **V13-T1-70**Courier Series **V13-T1-71**Eclipse Series **V13-T1-73**Ambassador Series **V13-T1-76**Learn
Online

Product Overview

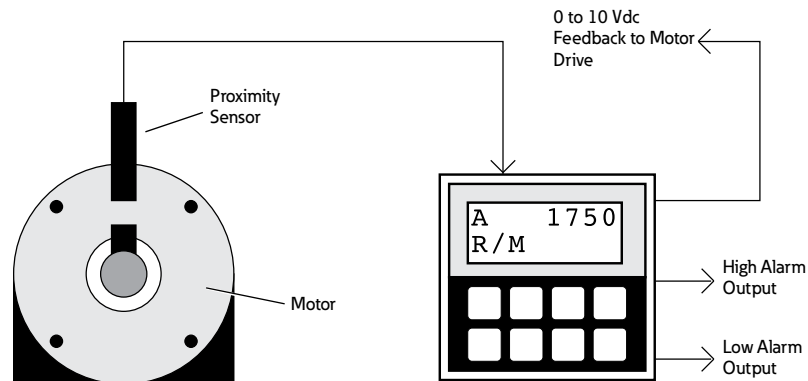
Ratemeters are used in a variety of applications where it is necessary to monitor the speed of a process.

Conveyors, baking ovens, material flow and motor speed are typical uses for ratemeters. Models with alarm outputs can be used to detect high or low rates. Rate indicators are often included as a standard feature on totalizers and count controls.

Typical Application

One of the most common ratemeter applications is a tachometer. A tachometer displays motor or shaft RPM. The inductive proximity sensor detects the key on the shaft and the meter calculates the rate at which the shaft is turning based on a user-defined scaling factor. Signals from encoders, mag pickups, Hall effect sensors, etc. may also be used as inputs.

Application Example



Product Selection Guide

Tachometers/Ratemeters

	Characteristics	Panel Cutout in Inches (mm)	Page
E5-24-E 	Compact device with bright, LED display Multiple functions available: count, time, rate, multifunction, double-function 24 Vdc Power	0.870 x 1.772 (22 x 45)	V13-T1-43
E5-496-E 	Economical, multifunction display Large, LED characters AC or DC power options	1.772 x 3.780 (45 x 96)	V13-T1-48
E5-148-C 	Low cost, simple count control Various power options: battery, AC, DC Easy-to-change preset values Two-line display: input and preset values	1.772 x 1.772 (45 x 45)	V13-T1-52
Courier 	Replaceable lithium battery Eight-digit, high-visibility LCD display Optional backlighting Various input options available	1.299 x 2.677 (33 x 68)	V13-T1-71
Eclipse 	Six-digit, super bright LED display Multiple models available: totalizers, ratemeters, count controls, digital panel meters and flow controls	1.772 x 3.780 (45 x 96)	V13-T1-73
Ambassador 	Six-digit, high-visibility, two-line LCD display User-configurable control inputs Highly flexible control/display	2.667 x 2.667 (68 x 68)	V13-T1-76
Fusion 	Integrated controller combines operator interface, ladder logic and high-speed counting	2.667 x 5.433 (68 x 138)	V13-T1-103

Courier Series

Product Description

Eaton's Courier Series is powered by a replaceable lithium battery.

Features

- 1/Tau ratemeter
- Scaling capabilities
- Remote reset terminal
- 0.43 in (10.9 mm) display
- Front panel reset
- NEMA 4X

Standards and Certifications

- CE marked



Product Selection

Courier Series



LCD 1/Tau Ratemeter ^①

Description	Catalog Number
Battery	53300404
Extended temperature range, battery	53301404
Backlight, battery	53302404

Technical Data and Specifications

General Specifications

Description	Specification
Power	
Internal battery	3V, Lithium
Life expectancy	5 years +
Replacement part	35367-202
Backlight	
Backlight	10–30 Vdc at 30 mA max. ^②
	Reverse polarity protected
Physical	
Operating temperature	
Model 53300-404	32 to 131 °F (0 to 55 °C)
Model 53301-404	–4 to 158 °F (–20 to 70 °C)
Model 53302-404	32 to 131 °F (0 to 55 °C)
Storage temperature	–4 to 158 °F (–20 to 70 °C)
Operating humidity	60% RH (noncondensing)
Weight	2.2 oz. (62 g) net
Display size	0.43 in (10.9 mm) high
Front panel rating	NEMA 4X when mounted with gasket provided
Case material	Cyclac X-17
Rate Indicator	
Type	1/Tau
Digits	4/5 (four calculated, five displayed with fixed 0 in LSD)
Scaler range	0.001 to 9999
Decimal point	Five positions, programmable
Accuracy	±0.2%
Update time	0.7 seconds
Zero time	10 seconds

Notes

^① For units with rate and total, see Totalizers.

^② Derate operating temperature 1 °C/Volt above 17 Vdc.

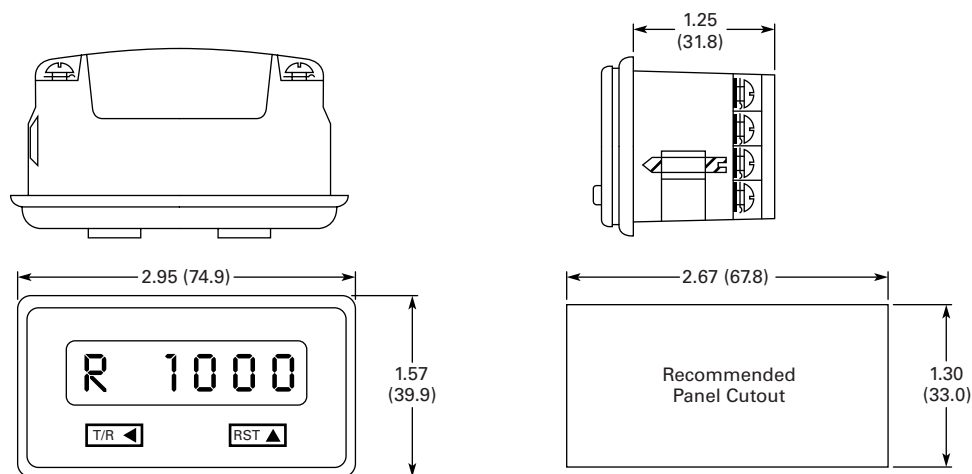
General Specifications, continued

Description	Specification
DC Common (Terminal 1) Rate Inputs	
Input B (terminal 2) low speed input designed for contact closures to DC common	
Speed	0 to 20 Hz
Min. low time	10 ms
Min. high time	40 ms
Input impedance	101k ohm
Voltage thresholds	
Low	0–0.4 Vdc
High	2.0–28 Vdc
Max. high	28 Vdc
Input A (terminal 3) high speed input requiring a voltage source such as a current sourcing sensor or a current sinking sensor used with the provided pull up resistors	
Speed	0 to 10 Hz ①
Min. low time	80 ms ①
Min. high time	20 ms ①
Input impedance	2 Kohms above 5 Vdc
Voltage thresholds	
Low	0–1.2 Vdc
High	2.0–28 Vdc
Max. high	28 Vdc
Programmable Enable Input (Terminal 5)	
Operation	Level sensitive (maintained)
Count Accuracy	
Operated within specifications	100%

Dimensions

Approximate Dimensions in Inches (mm)

Courier Series Ratemeter



Note

① Times are with a 0–5.0V swing.

Eclipse Series

Product Description

Eaton's Eclipse Series offers a high visibility LED and a variety of optional outputs.

Features

- 1/8 DIN cutout
- NEMA 4X front panel
- Universal AC power supply (85–265 Vac)
- Removable screw terminals
- Short depth: 3.6 in (91 mm)
- Front panel programming

Standards and Certifications

- UL and cUL listed
- CE marked



Product Selection

57700470



Eclipse Series Five-Digit LED Ratemeter

Description	Catalog Number
85–265 Vac	57701470
85–265 Vac, alarms	57701471
85–265 Vac, analog out	57701472
85–265 Vac, alarms, analog out	57701473

Technical Data and Specifications

General Specifications

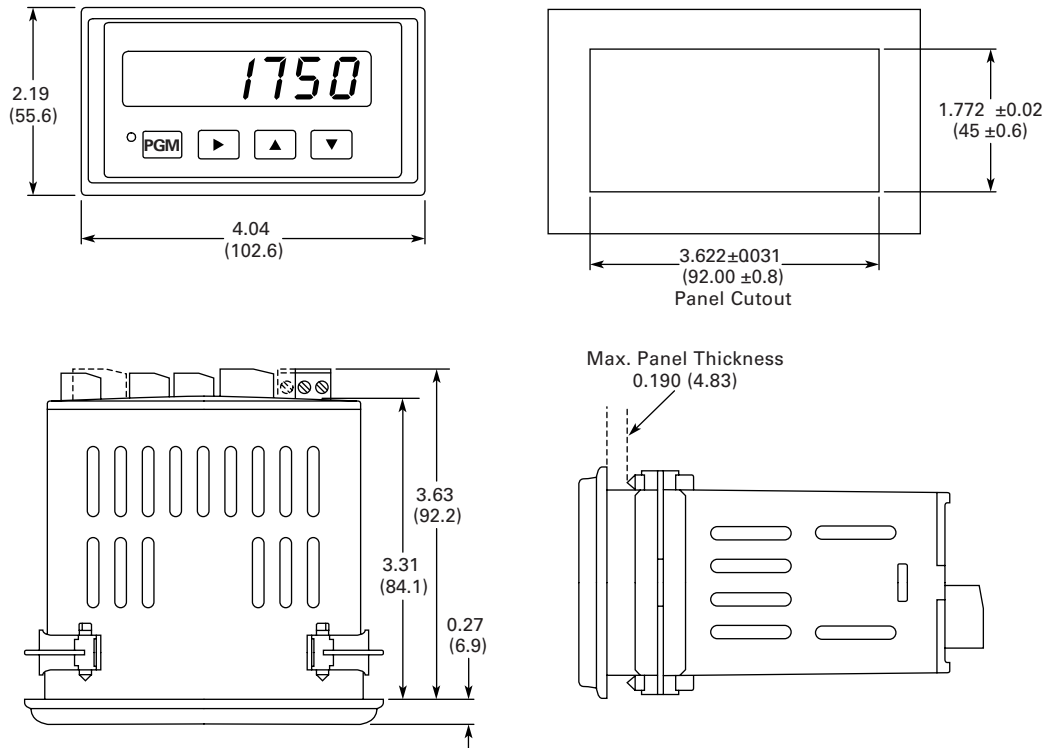
Description	Specification
Input Power	
AC powered models (57701-4XX)	
Input power	85–265 Vac, 47–63 Hz, 20 V A
External fuse	0.2A, 250 Vac, time delay (T200 mA, 250V)
Isolation dielectric strength	2300 Vac
Human Interface	
Display	Five digits
Type	0.56 in high, seven segment, red LED
Indicator	One red LED program/calibration indicator
Update time	0.1 to 99.9 seconds minimum
Data Retention	
Memory type	EEPROM, no batteries required
Duration	100 years
Signal Input	
Rate/process time	Signal in
Sensor type	Sink or source, DIP switch selectable
Input impedance	4.75 Kohms to +5 Vdc or 34.9 Kohms to ground
Thresholds	
High	3.5 to 28 Vdc
Low	0 to 1.9 Vdc, for single ended signals
Magnetic pickup range	200 mV p-p to 65V rms into 34.9 Kohms
Frequency response	200 Hz max. or 10 kHz max. (5V signals), DIP switch selectable
Program Enable Input	
Sensor type	Sink only
Input impedance	4.75 Kohms to +5 Vdc
Thresholds	
High	3.5 to 28 Vdc
Low	0 to 1.9 Vdc
Response	25 ms max. (5V signal)

General Specifications, continued

Description	Specification
Accessory Power Output	
Voltage	12 Vdc $\pm 12\%$
Current	75 mA max.
Protection	Short-circuit protected
Optional Outputs	
Relay board	
Number of relays	Two
Contact type	1 set Form C per relay
Contact rating	5 A, 250 Vac or 30 Vdc
Isolation dielectric strength	2300 Vac
Analog retransmission	
Output signals	4–20 mA (<750 ohms) and 0–10 V (>2500 ohms)
Accuracy	0.13% full scale and 100 PPM/°C (and 0.07% full scale change over 4–20 mA load ranges)
Isolation dielectric strength	2300 Vac to signal inputs, relays and AC power inputs; 500 Vac to RS-485 and DC power inputs
RS-485 serial communications	
Baud rate	1200, 2400, 4800, 9600, or 19,200, programmable
Parity	Even, odd or no parity
Address range	00 to 99 decimal
Protocol	Opto 22 [®] compatible
Isolation dielectric strength	2300 Vac to signal inputs, relays and AC power inputs; 500 Vac to analog outputs and DC power inputs
Environmental	
Operating environment	Indoor use to 2000 meters
Temperature	
Operating	32 to 122 °F (0 to 50 °C)
Storage	–4 to 158 °F (–20 to 70 °C)
Humidity	0 to 85% RH, noncondensing
Vibration	2.5 Gs, 30 to 200 Hz
Shock	30 Gs, 11 ms half sinewave
EMC	Immunity to EN 50082-2 (heavy industrial)
	Emissions to EN 50081-2 (heavy industrial)
Front panel	NEMA 4X when mounted with gasket provided
CE EMC immunity and emissions requirements	Met using shielded wiring on the RS-485, analog output and pulse input/ power lines. The shields were connected to earth ground at the Eclipse end of the shields.
Pollution degree 2	Overvoltage Category II

Dimensions

Approximate Dimensions in Inches (mm)

Eclipse Series Ratemeter

Ambassador Series**Product Description**

Eaton's most noise-immune ratemeter with an easy-to-read two-line LCD.

Features

- AC/DC powered, two-line LCD display
- Two-line, five-digit, high visibility, 0.3 in (7.5 mm) characters, backlit display
- One or two rate inputs
- Two rate alarms
- Programmable average and zero times
- Programmable decimal point
- 12 Vdc, 100 mA max. output power
- Removable screw terminals
- RS-485 communications
- NEMA 4 front panel

Standards and Certifications

- UL and cUL listed
- CE marked

**Product Selection**

57150400

Ambassador Series Ratemeter

Description	Catalog Number
Single Input	
LCD rate indicator, 2 rate alarms, 10–15 Vdc	57150400

Technical Data and Specifications**General Specifications**

Description	Specification
Power Input	
Model 57150-40X	10 to 15 Vdc, 300 mA maximum
DC Power Output (AC Models Only)	
Output	12 Vdc ($\pm 25\%$), 100 mA maximum (includes all line and load variations)
Environment	
Operating temperature	32 to 131 °F (0 to 55 °C)
Storage temperature	–4 to 158 °F (–20 to 70 °C)
Operating humidity	85% relative, noncondensing
NEMA 4 rating	When mounted with gasket provided
Ratemeter	
Type	1/Tau
Digits	Five with overrange indication
Scaler range	0.00001 to 99999
Decimal point	Five positions, programmable
Average time	0.1 to 99.9 seconds, programmable
Zero time	0.1 to 99.9 seconds, programmable
Accuracy	$\pm 0.015\%$ of reading
Maximum Rate Input Frequencies	
Maximum frequencies	All maximum frequencies listed are with a square wave input (50-50 duty cycle)
Contact Input	
Contact input	40 Hz

General Specifications, continued

Solid-State Input

Sinking sensor (all DIPs off)	7.3 kHz
Sourcing sensor (push-pull output)	
High threshold (DIPs 1 and 2 on, 3 and 4 off)	0–5V, single input 50 kHz
	0–5V, two inputs 30 kHz (each input)
	0.5–4.5V, single input 40 kHz
	0.5–4.5V, two inputs 30 kHz (each input)
	0–15V, two inputs 22 kHz (each input)
Low threshold (all DIPs on)	–1 to +1V, single input 27 kHz
	–2 to +2V, single input 43 kHz
	≤–3 to ≥+3V, single input 60 kHz
	≤–2 to ≥+2V, two inputs 30 kHz (each input)

Rate Inputs

Sink	
Impedance	4.6 Kohms to +5 Vdc
Voltage	High 3.5 to 34.0, low 0.0 to 1.9 Vdc
Source (high)	
Impedance	2.3 Kohms to common
Voltage	High 3.5 to 17.0 Vdc, low 0.0 to 1.9 Vdc
Source (low)	
Impedance	2.3 Kohms to common
DC voltage	High 0.63 to 17.0 Vdc, low –17.0 to –0.6 Vdc
AC voltage	17 Vac (48V peak-peak) maximum

Control Inputs

Impedance	4.7 Kohms to +5 Vdc
Voltage	High +3.7 to +24 Vdc, low 0.0 to 0.9 Vdc
Response	Min, low 15 ms, min, high 15 ms

Transistor Outputs (x2 for 5715X-401; x4 for 5715X-405)

Type	NPN open collector with transient protection
Max. voltage (OFF state)	30 Vdc
Max. current (ON state)	200 mA at 1.3 Vdc

Communication

Type	RS-485
Format	One start bit, seven data bits (ASCII), one parity bit, one stop bit
Protocol	Opto-22 [®] compatible
Speed	300, 1200, 2400, 4800, 9600, 19200 baud
Parity	Odd, even, none (space transmitted, ignore received)

Analog Output (Models 5715X-401 Only)

Range	0–10 Vdc ± 0.2% at 5 mA
DAC resolution	12 bit

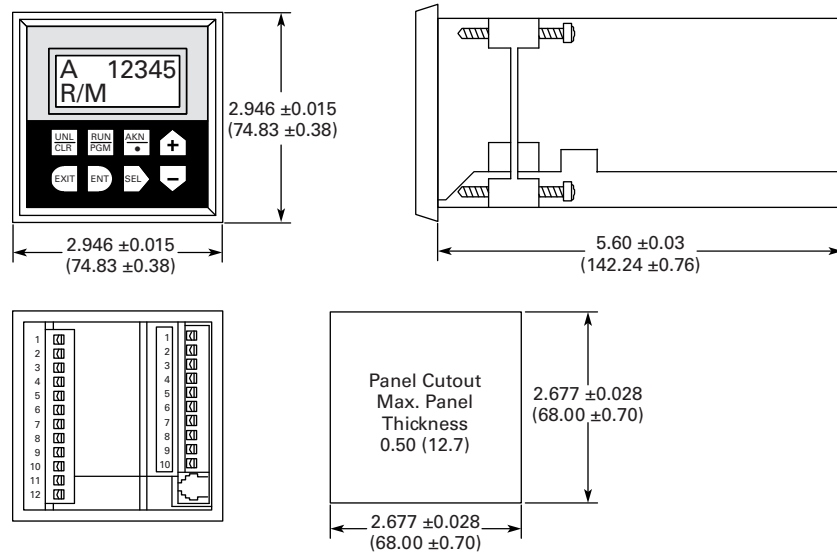
Connections

Type	Dual depluggable screw terminal strips
Conductor size	14–22 AWG (2.1–0.38 mm ²), 600V, solid, stranded or fused (preferred)

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Dimensions

Approximate Dimensions in Inches (mm)

Ambassador Series Ratemeters

Digital Panel Meters



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E5-324-E Series **V13-T1-80**Eclipse Series **V13-T1-82**Learn
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Product Overview

Digital Panel Meters are found anywhere a process variable needs to be indicated. Volts, current, pressure, volume, temperature and frequency are typical applications. The product's short depth makes it flexible and accommodating to panel builder needs. A variety of input and output options allows DPMs to be used virtually anywhere.

Typical Application

- Monitor current draw from motor to identify potential failures
- Display pressure reading from transducer with high-pressure alarm
- Display system voltage and detect under voltage or over voltage conditions

Product Selection Guide

Digital Panel Meters

	Characteristics	Panel Cutout in Inches (mm)	Page
E5-324-E	Bright, easy-to-read LED in 1/32 DIN package Programmable scaling of inputs Input for display-hold 24 Vdc power	0.870 x 1.772 (22 x 45)	V13-T1-80
Eclipse	Six-digit, super bright LED display Multiple models available: DC voltage, AC voltage, DC current, AC current, 5 A AC current, 4–20 mA/0–10 V process meter Various output options including relay, analog and RS-485	1.772 x 3.780 (45 x 96)	V13-T1-82



E5-324-E Series**Product Description**

Eaton's most compact panel meter provides an easy-to-read LED in a very small package.

Features

- Galvanic isolation with protection against incorrect polarity
- Automatic MIN/MAX value detection
- Freely programmable characteristic curve end points
- Input Range—
 - Single current measuring input (0/4–20 mA)
 - Single voltage measuring input (0/2–10V)
- Compact display for analog standard signals
- Display range –19.999 to 99.999 with zero blanking
- Modern industrial design
- Input for display-hold

Standards and Certifications

- UL recognized
- CE marked

**Product Selection****E5-324-E0402****E5-324-E0402 Digital Panel Meter****Description**

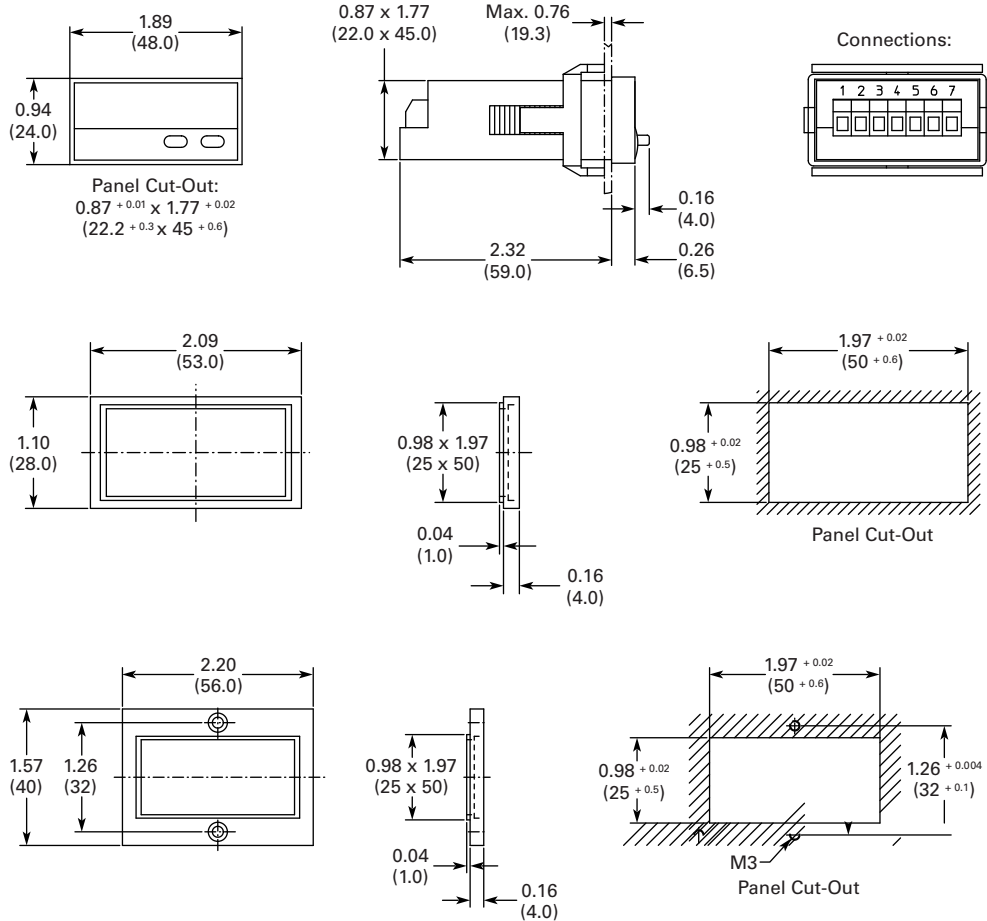
LED digital panel meter, 24 x 48 mm

Catalog Number**E5-324-E0402****Technical Data and Specifications****General Specifications**

Description	Specification
Supply voltage	10–30 Vdc, galvanically isolated with integrated protection against incorrect polarity
Current consumption	Max. 50 mA
Display	Five-digit display, red seven-segment LEDs; 0.31 in (8 mm) high
Measuring rate	Two measurements/second
Data backup	EEPROM
Housing	Housing for control panel 1.898 x 0.94 in (48 x 24 mm); acc. to DIN 43 700, RAL 7021, dark gray
Ambient temperature	14 to 122 °F (–10 to 50 °C)
EMC	According to EC EMC directive 89/36/EEC
Interference emissions	EN 61 000-6-4/EN 55011 Class B
Interference resistance	EN 61 000-6-2
Protection	IP65 (front)
Input current measurement	0–20 mA, 4–20 mA, voltage drop max. 1.5 Vdc
Input voltage measurement	0–10V, 2–10V
Input resistance approx.	1M ohm
Max. input signal level	30 Vdc
Control inputs	
High	4–30 Vdc
Low	0–2 Vdc
Resolution	14 bits
Error	<0.1% for the whole measuring range at an ambient temperature of 68 °F (20 °C)
Weight: Approx	1.76 oz (50 g)
Connection technique	Screw terminal, pitch 0.2 in (5.08 mm), seven-poles

Dimensions

Approximate Dimensions in Inches (mm)

E5-324-E Series

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Eclipse Series**Product Description**

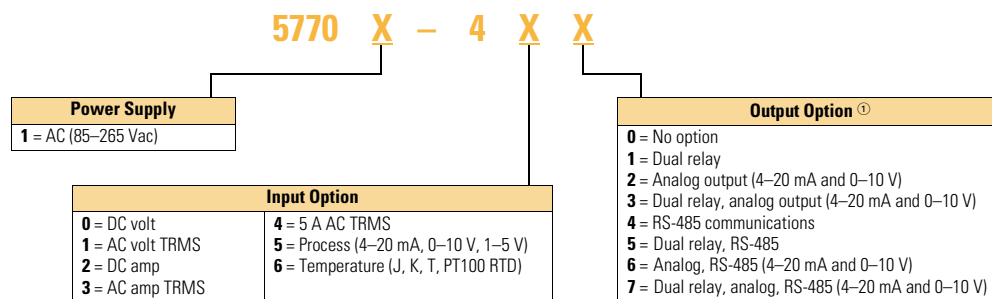
Eaton's Eclipse Series panel meter features a high-visibility LED and is available with a variety of input and scaling options.

Features

- Four full digits
- 1/8 DIN Size
- Red, LED display
- 0.56 in (14 mm) high characters
- Scalable display
- Flashing alarms
- Maximum/minimum data hold
- Optional analog, relay and RS-485 outputs
- NEMA 4X
- Depluggable terminal blocks

Standards and Certifications

- UL and cUL listed
- CE marked

**Eclipse Series Panel Meter****Catalog Number Selection****Eclipse Series****Note**

① Output options 0, 2, 4 are not available for models -41X and -43X.

Product Selection

Eclipse Series Panel Meter



Eclipse Digital Panel Meter

Description	Catalog Number
85–265 Vac, DC volt	57701400
85–265 Vac, DC volt, relay out	57701401
85–265 Vac, DC volt, analog out	57701402
85–265 Vac, AC volt	57701410
85–265 Vac, AC volt, analog out	57701412
85–265 Vac, DC amp	57701420
85–265 Vac, 5 A AC	57701440
85–265 Vac, 5 A AC, relay out	57701441
85–265 Vac, 5 A AC, analog out	57701442
85–265 Vac, 5 A AC, analog out, relay out	57701443

Eclipse Process

Description	Catalog Number
85–265 Vac	57701450
85–265 Vac, relay out	57701451
85–265 Vac, analog out	57701452
85–265 Vac, analog out, relay out	57701453

Technical Data and Specifications**General Specifications**

Description	Specification
Input Power	
AC powered models (57751-4XX)	
Input power	85–265 Vac, 47–63 Hz, 20 VA
External fuse	0.2 A, 250 Vac, time delay (T200 mA, 250 V)
Isolation dielectric strength	2300 Vac
Human Interface	
Display	±4 full digits
Type	0.56 in (14 mm) high, seven segment, red LED
Update time	0.4 seconds
Alarm	Flashing display
Indicator	One red LED program/calibration indicator with max./min. capture and hold
Data Retention	
Memory type	EEPROM, no batteries required
Duration	100 years
Signal Input	
DC voltage models (5770X-40X)	
Range	±199.9 m Vdc, ±1.999 Vdc, ±19.99 Vdc, ±199.9 Vdc, DIP switch selectable
Impedance	1M ohm
Overrange	750 Vdc/530 Vac except 220 Vdc/Vac on 199.9 mV range
Accuracy	±0.1% of reading, ±0.03% FS, ±0.5 digit, and ±80 PPM/°C
AC voltage models (5770X-41X)	
Range	199.9 m Vac, 1.999 Vac, 19.99 Vac, 199.9 Vac, DIP switch selectable, all ranges true rms
Frequency	40 to 1000 Hz
Impedance	1M ohm (capacity coupled)
Overrange	750 Vdc/530 Vac except 220 Vdc/Vac on 199.9 mV range
Accuracy	±0.5% of reading, ±0.13% FS, ±0.5 digit, ±180 PPM/°C for crest factor = 1; plus ±0.7% for crest factor = 1 to 3; and ±2.5% for crest factor = 5
DC current models (5770X-42X)	
Range	±199.9 µA DC, ±1.999 mA DC, ±19.99 mA DC, ±199.9 mA DC, DIP switch selectable
Impedance	199.9 mV/selected range
Overrange	30 mA (199.9 µA range), 100 mA (1.999 mA range), 300 mA (19.99 mA range), 1A (199.9 mA range)
Accuracy	±0.1% of reading, ±0.03% FS, ±0.5 digit, and ±120 PPM/°C
AC current models (5770X-43X)	
Range	199.9 µA AC, 1.999 mA AC, 19.99 mA AC, 199.9 mA AC, DIP switch selectable, all ranges true rms
Frequency	40 to 1000 Hz
Impedance	199.9 mV/selected range (shunt output capacitive coupled)
Overrange	30 mA (1199.9 µA range), 100 mA (1.999 mA range), 300 mA (19.99 mA range), 1 A (199.9 mA range)
Accuracy	±0.5% of reading, ±0.13% FS, ±0.5 digit, and ±200 PPM/°C for crest factor = 1; plus ±0.7% for crest factor = 1 to 3; and ±2.5% for crest factor = 5

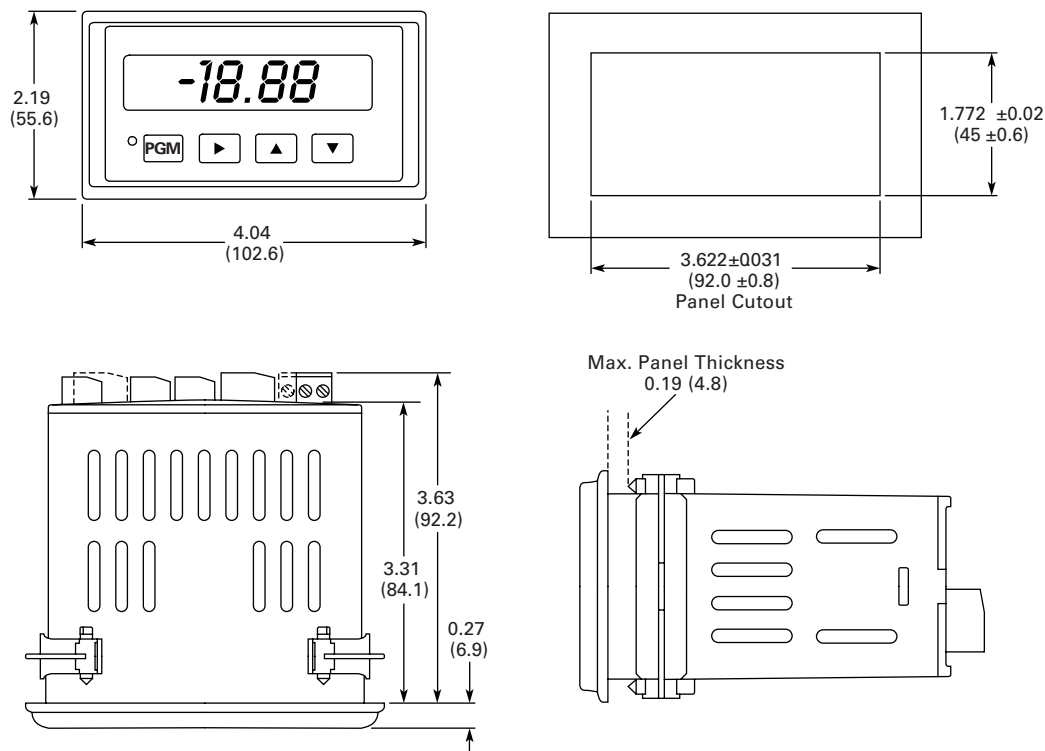
General Specifications, continued

Description	Specification
Signal Input, continued	
5 A AC models (5770X-44X)	
Range	5 A AC, true rms
Frequency	40 to 1000 Hz
Impedance	0.02 ohm (shunt output capacitive coupled)
Overrange	10 A maximum
Accuracy	$\pm 0.4\%$ of reading, $\pm 0.13\%$ FS, ± 0.5 digit, and ± 200 PPM/ $^{\circ}\text{C}$ for crest factor = 1; plus $\pm 0.7\%$ for crest factor = 1 to 3; and $\pm 2.5\%$ for crest factor = 5
Process models (5770X-45X)	
Range	4–20 mA DC, 0–10 Vdc, 1–5 Vdc; separate input terminals for voltage and current signals
Impedance	100 ohms (current input) and 1.27 Mohms (voltage input)
Overrange	50 mA maximum (current input) and 100 V maximum (voltage input)
Power output	24 Vdc $\pm 10\%$, 90 mA max, short-circuit protected
Accuracy	$\pm 0.1\%$ of reading, $\pm 0.03\%$ FS, ± 0.5 digit, and ± 80 PPM/ $^{\circ}\text{C}$
Optional Outputs	
Relay board	
Dual relay	1 set of Form C contacts each
Contact rating	5 A, 250 Vac or 30 Vdc
Isolation dielectric strength	2300 Vac
Analog retransmission	
Output signals	4–20 mA (<750 ohms) and 0–10 V (>2500 ohms)
Accuracy	0.13% FS, 100 PPM/ $^{\circ}\text{C}$, 0.07% FS change with 4–20 mA load, $\pm 0.3\%$ FS for 4–20 mA output, only after exposure to 85% relative humidity
Isolation dielectric strength	2300 Vac to signal inputs, relays and AC power input; 500 Vac to RS-485 and DC power inputs
RS-485 serial communication	
Baud rate	1200, 2400, 4800, 9600 or 19,200, programmable
Parity	Even, odd or no parity
Address range	00 to 99 decimal
Protocol	Opto 22 [®] compatible
Isolation dielectric strength	2300 Vac to signal inputs, relays, and AC power input; 500 Vac to analog outputs and DC power inputs
Environmental	
Operating environment	Indoor use to 2000 meters
Temperature	
Operating	32 to 122 $^{\circ}\text{F}$ (0 to 50 $^{\circ}\text{C}$)
Storage	–4 to 158 $^{\circ}\text{F}$ (–20 to 70 $^{\circ}\text{C}$)
Humidity	0 to 85% RH, noncondensing
Vibration	2.5 Gs, 30 to 200 Hz
Shock	30 Gs, 11 ms half sinewave
EMC/EMI	Per EN 61326-1 industrial
Front panel	NEMA 4X when mounted with gasket provided
Agency approval	CE EMC immunity and emissions requirements were met using shielded wiring on the RS-485, analog output and signal input lines. The shields were connected to earth ground at the Eclipse end of the shields. Conducted emissions requirements were met assuming that the AC signal input would not be connected directly to the AC mains. The measurement error during RF immunity testing was less than $\pm 5\%$ of full scale. In addition, models with an AC signal input had measurement error of less than $\pm 25\%$ of full scale during RF immunity testing of the RS-485 at frequencies below 1 MHz.
Pollution degree 2	Overvoltage Category II

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Dimensions

Approximate Dimensions in Inches (mm)

Eclipse Series

Timers/Hour Meters



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Timers/Hour Meters

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Electromechanical Timers/Hour Meters

V13-T1-95

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Product Overview

Timers are used in applications where time itself is the main focus. These include simple knowledge of how long a machine has been running to determine machine maintenance, for example, (elapsed time) to knowing when to change an elevator cable (cable life and safety). Timers generally have the ability to stop and then to continue on from the point at which they stopped. Timer relays are used in applications where an output is required to make something happen at a predetermined point in time (to stop or start the process).

Typical Application

- Elapsed time indication for interval maintenance of construction and agricultural equipment
- Usage metering for determining charges on rental equipment
- Controlled process timing for adhesive application/curing equipment

Product Selection Guide

Timers/Hour Meters

	Characteristics	Panel Cutout in Inches (mm)	Page
E5-24-E 	Compact device with bright, LED display Multiple functions available: count, time, rate, multifunction, double-function 24 Vdc Power	0.870 x 1.772 (22 x 45)	V13-T1-43
E5-496-E 	Economical, multifunction display Large, LED characters AC or DC power options	1.772 x 3.622 (45 x 92)	V13-T1-48
E5-224-C 	Non-replaceable battery (minimum eight-year life) Compact, low cost and high efficiency Eight-digit LCD timer Manual or electrical reset Various timing modes (Hr/Min/Sec)	0.870 x 1.772 (22 x 45)	V13-T1-90
Hour Meters 	Compact, low-cost LCD and electromechanical elapsed time meters Various power options for almost any power supply	Various	V13-T1-95
Hour Meter/Counter 	Combination counter consists of time meter and adding counter in one Without reset High shock resistance Magnified figures Protection IP52 (front) Data retention if power is lost Long service life UL Approved	1.988 (50.5) dia. or DIN rail	V13-T1-101

Electronic Timers/Hour Meters



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1/32 DIN LCD—Timers

E42DI24/E42DIR Series

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Electronic Timers/Hour Meters

Product Overview

Eaton’s electronic hour meters are a simple and effective way to monitor equipment on time.

Features

- Reset or non-reset
- Variety of power options
- LCD displays

Standards and Certifications

- UL recognized
- CE



1/32 DIN LCD—Timers**Product Description**

Simple battery-powered timers provide an easy-to-read LCD and a variety of timing display options.

Features

- Low price and high efficiency
- Large eight-digit LCD display, height of the figures 0.31 in (8 mm)
- Different time ranges from 0.1 second to 100,000 hours
- 0.1 second synchronization makes it suitable for very short activation times
- High voltage input for 10–260 Vac/Vdc voltage pulses
- IP65
- Screw terminals, RM 5 mm
- Lifetime of the battery approximately eight years
- Locking of the reset key
- Operating temperature 14 to 140 °F (–10 to 60 °C)

Standards and Certifications

- UL recognized
- CE marked

**Product Selection**

E5-224-C04_

1/32 DIN LCD Timers

Description	Catalog Number
Eight-Digit LCD Timer, Battery Power	
Hours/minutes, 0.94 x 1.89 in (24 x 48 mm)	E5-224-C0440
Hours/minutes, 10–260V input, 0.94 x 1.89 in (24 x 48 mm)	E5-224-C0448
Minutes/seconds, 0.94 x 1.89 in (24 x 48 mm)	E5-224-C0450
Minutes/seconds, 10–260V input 0.94 x 1.89 in (24 x 48 mm)	E5-224-C0458

Technical Data and Specifications**General Specifications**

Description	Specification
Power supply	Non-replaceable lithium battery (lifetime approximately eight years at 68 °F (20 °C))
Display	LCD, eight-digits
Figure size	0.31 in (8 mm) high
Counting direction	Adding
Display range	
Time range	99999h 59m (134)
Display	99999 - 59
Time range	99999.99h (134)
Display	99999 - 99
Time range	9999h 59m 59s (135)
Display	9999.59.59
Time range	9999999.9s (135)
Display	9999999.9
Reset	Manual and electrical

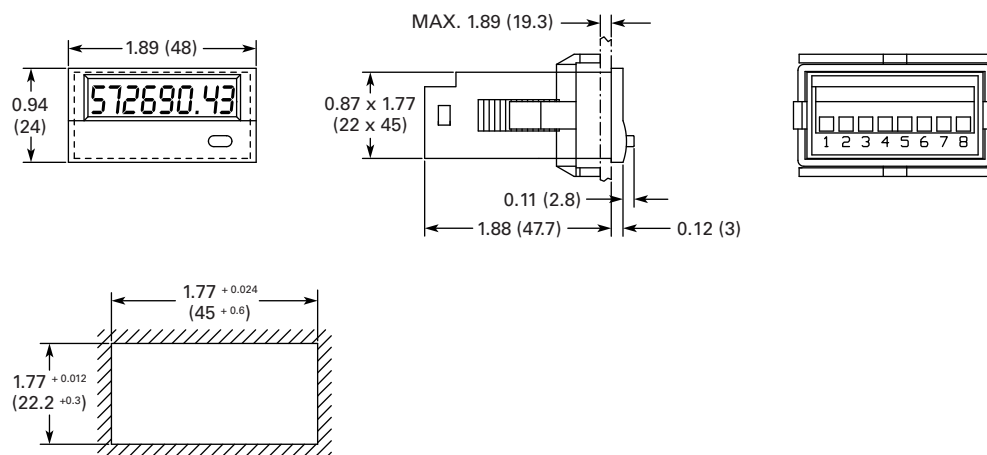
General Specifications, continued

Description	Specification
Timer inputs, DC versions (max. 30 Vdc)	
Timer input	NPN or PNP depending on the type
Switching level	
NPN low	0–0.7V
NPN high	3–30 Vdc
PNP low	0–0.7V
PNP high	4–30 Vdc
Counting start	
NPN	For low signal at the timer input
PNP	For high signal at the timer input
Timer inputs, high voltage version (10–260 Vdc/Vac)	
Timer input	Optocoupler input max. 30 Hz
Min. pulse time	16 ms
Switching level	
Low	0–2 Vdc/Vac
High	10–260 Vdc/Vac
Counting start	For high signal at the timer input
Time range change (mode)	
Contact input—open collector (switching at 0V)	
NPN low	0–0.7V
NPN high	3–5 Vdc
Time range	Depending on the circuit
Reset Input (only DC and high voltage)	
Minimum pulse time	
DC	50 ms
High voltage	10 ms
Contact input (DC)	
NPN low	0–0.7V
NPN high	3–30 Vdc
High voltage input	10–260 Vdc/Vac
Reset locking input (for DC and AC), electrical reset key locking	
Input not active	Reset key locked
Contact input	Open collector NPN (switching at 0V)
Switching level	
NPN low	0–0.7V
NPN high	3–5 Vdc
Interference emissions	EN 55011 Class B, EN 61 000-6-2, EN 61010 Section 1 (only AC versions)
Housing	Dark gray RAL 7021
Operating temperature	14 to 131 °F (–10 to 55 °C)
Ambient temperature	14 to 140 °F (–10 to 60 °C)
Storage temperature	–4 to 158 °F (–20 to 70 °C)
Protection	IP65 (from front)
Weight	Approx. 1.76 oz (50 g)

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Dimensions

Approximate Dimensions in Inches (mm)

1/32 DIN LCD Timers

E42DI24/E42DIR Series**Product Description**

Simple LCD hour meters with flexible input voltages

Features

- Solid-state hour meters
- Record and display up to 99,999.9 hours, rollover and continue timing
- EEPROM memory can retain data for 25+ years
- Time accumulation indicated by flashing hourglass icon
- Memory will arm only when power has been applied for 5 seconds

Standards and Certifications

- UL recognized
- CE compliant

**Product Selection****E42DI24/E42DIR Series Elapsed Time Meters**

	Description	Catalog Number
E42DIR_ 	Round LCD	
	Elapsed hour meter, 48–150 Vdc/100–230 Vac	E42DIR48230
	Elapsed hour meter with reset, 48–150 Vdc/100–230 Vac	E42DIR48230R
	Elapsed hour meter, 12–48 Vdc/20–60 Vac	E42DIR1260
E42DI24_ 	Rectangular LCD	
	Elapsed hour meter, 48–150 Vdc/100–230 Vac	E42DI2448230
	Elapsed hour meter, with reset, 48–150 Vdc/100–230 Vac	E42DI2448230R
	Elapsed hour meter, 12–48 Vdc/20–60 Vac	E42DI241260

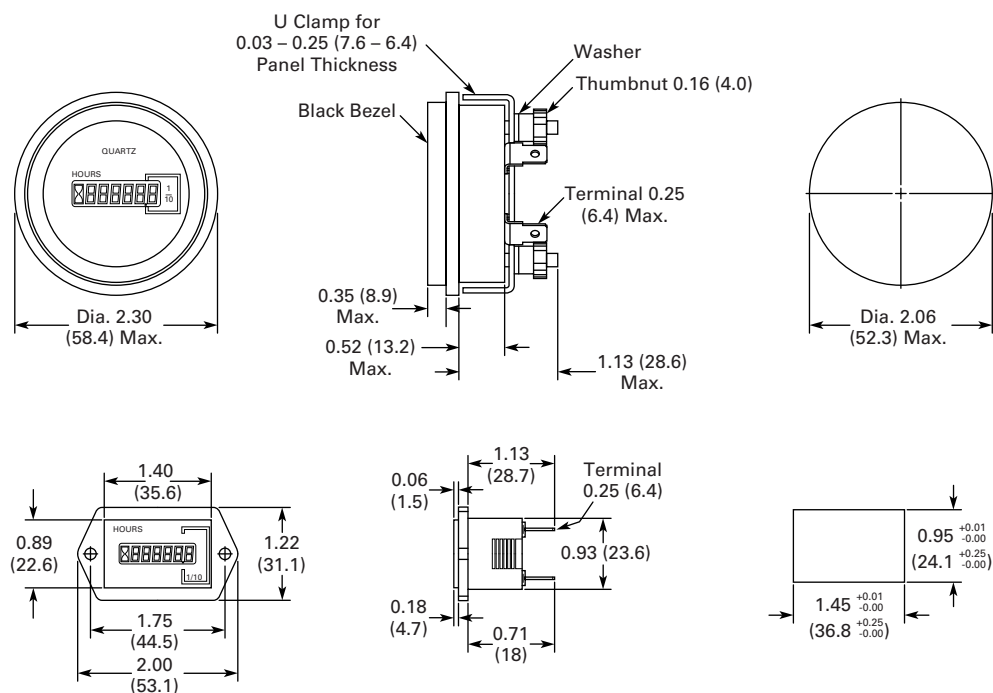
Technical Data and Specifications**General Specifications**

Description	Specification
Function	Solid-state hour meter
Power supply	
E42DIXX1260X	12–48 Vdc $\pm 25\%$ /20–60 Vac $\pm 25\%$
E42DIXX48230X	48–150 Vdc $+23\%$ – 25% /100–230 Vac $+17\%$ – 25%
Frequency range	48–440 Hz
Display	Six-digit LCD, 0.20 in (5 mm)
Accuracy	$\pm 0.1\%$
Recording/display capacity	99,999.9 hours
Resolution	0.1 hour (6 minutes)
Current consumption max. at nominal voltage	
E42DIXX1260X	0.8 mA at 12 Vdc 5.0 mA at 48 Vdc 0.5 mA at 20 Vac 2.5 mA at 60 Vac
E42DIXX48230X	0.8 mA at 48 Vdc 2.5 mA at 150 Vdc 0.9 mA at 100 Vac 2.0 mA at 230 Vac
Input impedance minimum (pins 3 and 4)	
E42DIXX1260X	70 Kohms
E42DIXX48230X	480 Kohms
Operating temperature	–40 to 185 °F (–40 to 85 °C)
Storage temperature	–58 to 194 °F (–50 to 90 °C)
Weight	
E42DIRXXXXXX	1.94 oz (55 g)
E42DI24XXXXXX	0.78 oz (22 g)

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Dimensions

Approximate Dimensions in Inches (mm)

E42DI24/E42DIR Series

Electromechanical Timers/Hour Meters



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Electromechanical Timers/Hour Meters

Product Overview

Eaton’s electromechanical hour meters are available in a variety of configurations and provide a cost-effective way to monitor equipment on time.

Features

- Non-resettable
- Always readable display

Standards and Certifications

- UL recognized
- CE



1

1/16 DIN Hour Meters**Product Description**

Eaton's most cost-effective elapsed time meter. Features IP65 protection against water intrusion.

Typical Application

- General elapsed time
- Service interval for measurement systems—
 - Respiratory ventilators
 - Oxygen machines
 - Dialysis machines
- Small appliances
- UV lamps
- Display panels in cars

Features

- High shock resistance
- Without reset
- Small dimension
- Magnified figures
- Protection IP65
- Data retention if power is lost
- Long service life
- Optional mounting position

Standards and Certifications

- UL recognized

**Product Selection****7-T-65-4848PM-40****1/16 DIN Hour Meters****Description****Catalog Number**

10–30 Vdc, 1.89 x 1.89 in (48 x 48 mm)

8-T-65-4848PM-402

100–130 Vac, 1.89 x 1.89 in (48 x 48 mm)

7-T-65-4848PM-406

T4848DINADAPT**DIN Rail Adapter****Description****Catalog Number**

DIN rail adapter for DIN electromechanical hour meter

T4848DINADAPT

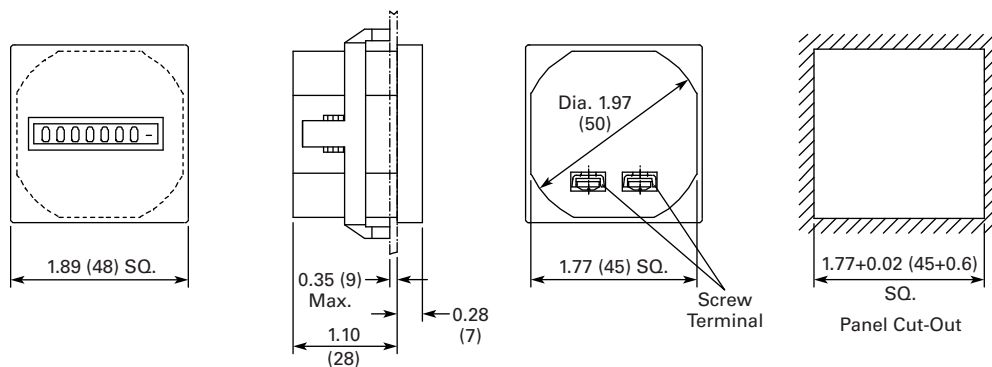
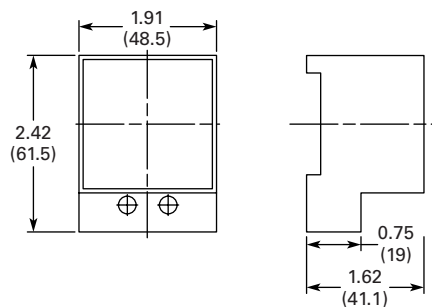
Technical Data and Specifications**General Specifications**

Description	Specification
Electrical connection	Clamp terminal for cable diameter up to 14 AWG (2.5 mm ²), tightening torque max. 0.59 lb-ft (0.8 Nm)
Power consumption	
10–30 Vdc	Approx. 500 mW
100–130 Vdc	Approx. 750 mW
Rated voltages	100–130 Vac, 50 or 60 Hz
	10–30 Vdc
On time	100%
Display	
Seven at AC	99999.99
Eight at DC	999999.99
Accuracy	
AC	Supply frequency + 30 ms
DC	<0.003% (24h)
Count mode	Adding
Figure size	0.16 in (4 mm) high
Color of figures	White and red-on-black
Ambient temperature	5 to 122 °F (–15 to 50 °C)
Mounting position	Any
Protection	IP65
Housing	Plastic
Weight	1.7 oz (48 g)
Operating indicator of the running time meter	
AC	Fast rotating wheel with red dashes
DC	1/100h display turns continuously by 1-digit in 36 seconds
Test voltage	2000 Vac, 50 Hz for AC counters
Options	Further voltages on request
Color of housing	Gray

1

Dimensions

Approximate Dimensions in Inches (mm)

1/16 DIN Hour Meters**DIN Rail Adapter**

71.1 Round Hour Meters

Product Description

Eaton's 6-T-3H hour meters are heavy-duty elapsed time meters with NEMA 4X protection.

Typical Application

- General elapsed time
- Utility vehicles
- Construction machines
- Generators
- Fork-lift trucks
- Car washes
- Outside areas

Features

- Six-digit hour meter for round panel cut-out
- Low cost
- High shock resistance
- Low power consumption
- Small dimension
- Magnified figures
- Waterproof
- NEMA Type 4X rating
- Data retention if power is lost
- Available in 50 pc. bulk package

Standards and Certifications

- UL recognized



Product Selection

6-T-3H-508RPM-40



71.1 Round Hour Meters

Description	Catalog Number
115 Vac, 2.80 in (71.1 mm) round	6-T-3H-508RPM-406
10–80 Vdc, 2.80 in (71.1 mm) round	6-T-3H-508RPM-402

Technical Data and Specifications

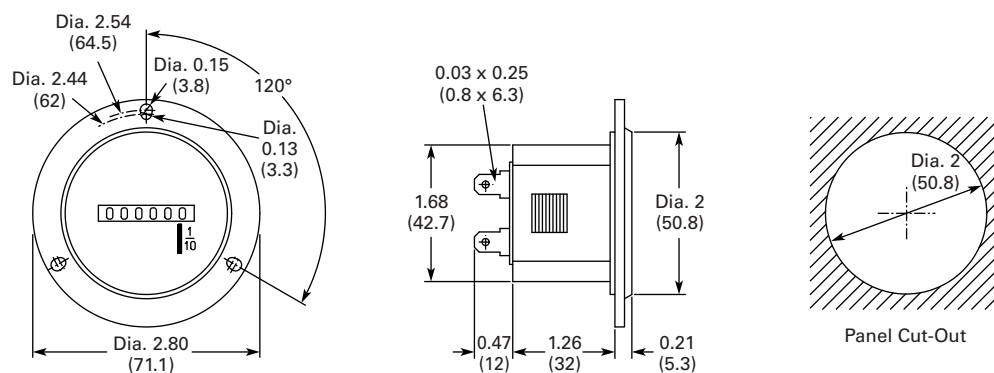
General Specifications

Description	Specification
Electrical connection	Flat pins 0.8 x 6.3
Power consumption	
AC	Max. 0.4 VA
12 Vdc	Max. 0.08W
48 Vdc	Max. 0.7W
Rated voltages	115 Vac $\pm 10\%$, 50/60 Hz, 10–80 Vdc
On time	100%
Display	Six-digits, 99999.9h
Count mode	Adding
Figure size	0.14 in (3.5 mm) high
Reset	None
Ambient temperature	–22 to 149 °F (–30 to 65 °C)
Mounting position	Any
Protection	IP65
Housing	Plastic
Error	<0.02% over the full range

1

Dimensions

Approximate Dimensions in Inches (mm)

71.1 Round Hour Meter

Hour Meter/Counter

Product Description

Eaton's CEC series combination meters provide an event counter and elapsed time meter in one compact unit.

Typical Application

- General counting
- Pump control panels
- Service interval for measurement systems (respiratory ventilators, oxygen machines, dialysis machines)
- Small appliances
- UV lamps
- Display panels in cars

Features

- Combination counter consists of time meter and adding counter in one
- Without reset
- High shock resistance
- Magnified figures
- Protection IP52 (front)
- Data retention if power is lost
- Long service life

Standards and Certifications

- cRU[®]us certified
- CE marked



Product Selection

CEC-...-406



Hour Meter/Counters

Description	Catalog Number
Combination hour meter/counter, 55 mm square front panel mount, 100–130 Vac, 60 Hz	CEC-55PM-406
Combination hour meter/counter, 48 mm DIN rail mount, 100–130 Vac, 60 Hz	CEC-48DR-406

Technical Data and Specifications

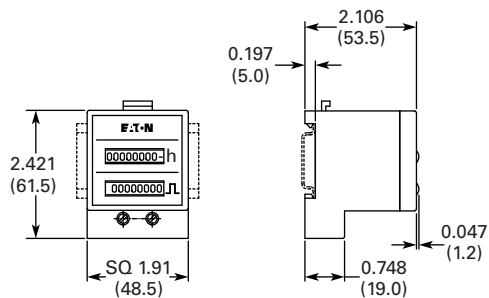
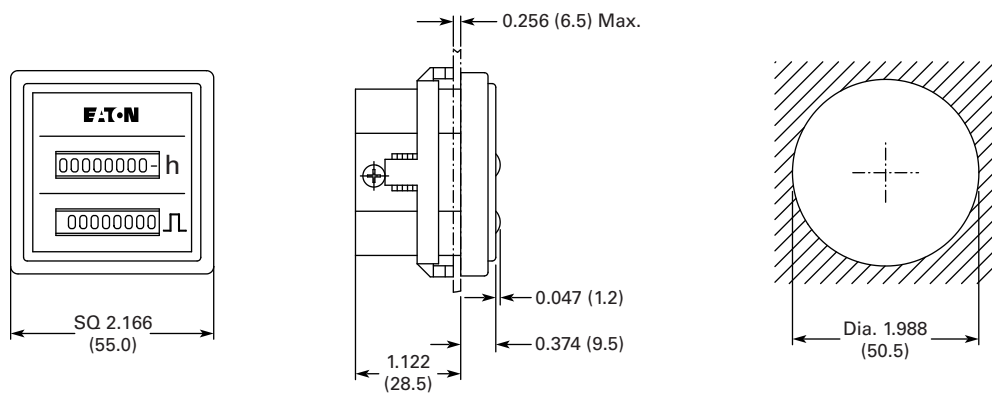
General Specifications

Description	Specification
Electrical connection	Flat pin 0.8 x 6.3 mm with screw terminal, tightening torque max. 0.8 Nm
Power consumption 100–130 Vac	60 Hz, approx. 1.43 VA
Count mode	Adding
Figure size	0.16 x 0.07 in (4 x 1.7 mm)
Color of figures Hour	White on black
Decimal	Red on black
Running time meter operating indicator	Fast rotating wheel with red dashes; 99999.99 hour
Accuracy AC	Supply frequency ± 30 ms
Reset	None
Ambient temperature	5 to 122 °F (–15 to 50 °C)
Mounting position	Any
Color of housing	Black

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Dimensions

Approximate Dimensions in Inches (mm)

DIN Rail Mount**Front Panel Mount**

Fusion Integrated Machine Control



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Fusion Integrated Machine Control

Product Description

The Fusion® Integrated Machine Control has advanced features, including a five-preset high speed counter with pre-warn, a totalizer with preset, a batch counter with preset and a ratemeter with high and low setpoints. Unique to the count control world, the Fusion has five output relays (rather than two), along with two transistors and two analog setpoint or follower outputs. Its ten available parameter sets of pre-loaded values are useful as recipes, for job-stacking or for a variety of application-specific purposes.

The Fusion has a multi-line alphanumeric display which can be programmed to show text messages, logic-generated prompts, alarms and machine status. Up to eight screens can be shown or optionally locked out. Count and time presets can be made view-only or editable. Preset entry is achieved with simple 0-9 keys on the front panel rather than complicated scrolling methods. The Fusion's real time clock/calendar may be displayed and/or used to time and date stamp printouts.

With its ladder logic, the Fusion is actually a 26 I/O controller, making it a complete control for many machines and processes, integrating the functions of external timers, pushbuttons, power supplies, indicating lights, control relays and other components in the same box.

Features

- User-configurable operator interface with back-lit LCD display and 18-button tactile feedback keypad
- High speed counter with five presets and pre-warn, totalizer, batch counter and ratemeter
- 10 parameter sets
- 13 digital inputs
- (2) 4–20 mA inputs
- (2) 0–10 V input
- (3) Form C, 2 Form A, 2 NPN transistor, (1) 4–20 mA, and (1) 0–10 V outputs
- RS-232 and RS-485 serial communications
- 100-line ladder logic processor for ultimate flexibility
- Configuration software included
- NEMA 4X enclosure

Features and Benefits

Feature	Customer Benefit
High speed count functions; including scaling, main counter, five presets, pre-warn, totalizer, batch and rate	“Canned” count functions offer flexibility and ease of setup in the desired units of measure.
High speed counting independent of ladder scan time	Precise and repeatable output response for high performance applications.
Flexible display with selectable character sizes (large, medium, small), run screens and ladder triggered messages	Minimizes confusion and operator errors as information can be tailored to what they need and in their language. Maintenance/management data can be separated. Different character sizes allow optimization of information displayed. Machine status information can be displayed allowing operators to take action.
Simple front panel layout and keypad. Four soft keys and six function keys can be used as inputs	Ease of use for operator. Numeric keypad allows for ease of preset and machine parameter entry. Function keys and soft keys allow easy and quick access to information and/or parameters needed by the operator and don't require using additional inputs. Eliminates cost associated with external pushbuttons and inputs.
Parameter sets	Allows for predefined recipes/jobs to be preloaded for the operator. Simplifies operator interaction and minimizes errors.
Programmable relay logic	Well understood programming method that allows flexibility in control functionality. Easy to tailor the control to various applications.
26 I/O (digital and analog)	Provides application flexibility. Analog inputs allow monitoring key process parameters. Analog outputs allow interfacing to drives and other control products.
Integrated solution	Reduced overall control costs, installation and commissioning. More flexible and capable than traditional count/control solutions but less complex than many PLC solutions.
Windows® and front panel programming	Ease of programming and configuration control.
RS-232 and RS-485 serial communication ports	Allow for direct connection to PC for programming, connection to Modbus® networks, interface to serial printer.
Robust type 4X package. DIN cutout and short depth 2.82 in (71.6 mm)	Suited for wet applications. Same cutout as the President Series—easing the migration. Short depth minimizes the cost and size of the machine panel or control enclosure.
Input power: 85–265 Vac 50/60 Hz or 10–30 Vdc models	Greatly reduces models required for different control voltages.
Output power: 12 Vdc at 75 mA, 24 Vdc at 100 mA	Eliminates the need for an external power supply for encoders, analog transducers, etc.
Depluggable screw terminals	Allows for ease of wiring and removal of control. Terminals are different sizes to error-proof installation.
Non-volatile memory and capacitor backed real time clock	Don't have to worry about a battery failing down the road.
Real time clock	Allows for control functions to be performed on day/time and allows for date/time stamping on printouts.
UL, cUL and CE marked	Ease of meeting machine agency requirements and robust EMC performance.

Standards and Certifications

- UL and cUL listed
- CE marked



Product Selection

57550400



Fusion Integrated Machine Control

Description	Catalog Number
Fusion integrated machine control—10–30 Vdc power	57550400
Fusion integrated machine control—85–265 Vac power	57551400
Fusion configuration software	57590400

Technical Data and Specifications

General Specifications

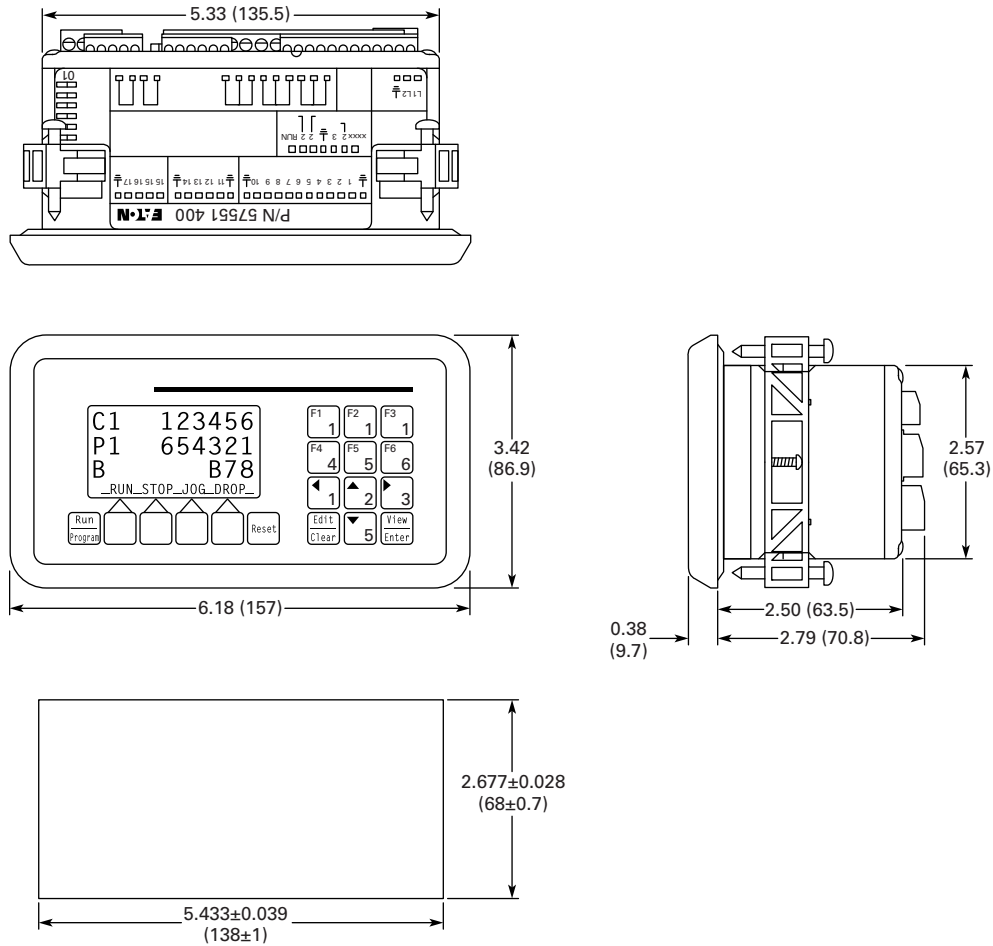
Description	Specification
Environmental	
Operation	Indoor use to 2000 m
Temperature	32 to 122 °F (0 to 50 °C) operating –4 to 158 °F (–20 to 70 °C) storage
Humidity	0 to 85% RH, noncondensing
Vibration	2.5 Gs, 30–200 Hz
Shock	30 Gs, 11 ms half sinewave
EMC	EN61326:1997 All I/O lines except RS-485 <30 m
Front panel	Type 4X indoor use only, when mounted with gasket provided
Safety	UL and cUL listed, CE compliant
Input Power	
AC model	85–265 Vac, 47–63 Hz, 20 VA; isolation 2300 Vac
DC model	10–30 Vdc, 15 VA
Inputs	
Control	
Number	10
Impedance	4.75 Kohms to +5 Vdc
Thresholds	
High	3.5–30 Vdc
Low	0–1.0 Vdc
Counter	
Number	Three (including reset)
Impedance	4.75 Kohms to +5 Vdc or 26.9 Kohms to ground
Thresholds	
High	3.5–30V
Low	0–1.5V, or 200 mV p-p to 50V rms at 26.9 Kohms (mag pickup)
Response	140 Hz or 14 kHz for sinking, push-pull or mag pickup inputs 60 Hz or 6 kHz for sourcing only inputs All frequencies based on 50-50 duty cycle 6 kHz maximum sustained count speed
Analog	
Number	4
Type	4–20 mA and two 0–10 Vdc
Accuracy	±0.5% FS and ±200 PPM/°C
Impedance	100 ohms (current input), 1.27 Mohms (voltage input)
Overrange	45 mA max. (current input), 20 V max. (voltage input)

General Specifications, continued

Description	Specification
Outputs	
Power (AC input model only)	24 Vdc $\pm 15\%$, 100 mA max., short-circuit protected
	12 Vdc $\pm 10\%$, 75 mA max., short-circuit protected
Relays	
Number	3 (Form C), 2 (Form A)
Contacts	5 A, 250 Vac, 30 Vdc
Isolation	2300 Vac
Transistors	
Number	2
Type	NPN Darlington
Ratings	150 mA max. ON current, 30 Vdc max. OFF voltage
Analog	
Number	2, short-circuit protected
Type	4–20 mA (<450 ohms), 0–10 V (>2500 ohms)
Accuracy	$\pm 0.5\%$ FS and ± 200 PPM/ $^{\circ}$ C
Common mode voltage rating	250 Vac
Isolation	2300 Vac
RS-232	
Connector	DB-9S
Polarity	DCE
Baud rate	1200–19200
RS-485	
Connector	Six-wire RJ-12 phonejack
Baud rate	1200–19200
Data Retention	
Program data	
Type	Non-volatile
Duration	100 years, no batteries
Real time clock	
Type	Capacitor
Charge time	Three minutes
Retention	1–5 days
Human Interface	
Display	
Type	128 x 64 pixel graphic LCD with LED backlight
Figure size	0.12 in (3 mm) high, 21 characters per line, 6 lines maximum
	0.24 in (6 mm) high, 10 characters per line, 3 lines maximum
	0.35 in (9 mm) high, 7 characters per line, 2 lines maximum
Keys	
Number	18
Type	Membrane switches with tactile feedback
Real time clock format	Seconds, minutes, hours, day and date

Dimensions

Approximate Dimensions in Inches (mm)

Fusion Integrated Machine Control ^①**Note**

① Recommended panel cutout is 0.375 in (9.5 mm) max. panel thickness.



TC Series

Product Description

Temperature controllers for a wide range of applications including heat treating, baking, packaging, furnace control, and chillers.

Features and Benefits

- Universal temperature inputs allow user to select from PT100 or J, K, T, E, B, R, S, N, L thermocouples without modification to the unit
- Advanced fuzzy modified PID technology minimizes overshoot/undershoot and allows quick and accurate responses
- Fast sampling rate of up to five times per second ensures accuracy in fast processes
- Standard IP65 front panel (TC48) provides protection in wash-down and other challenging environments

Standards and Certifications

- UL recognized
- CSA certified
- CE marked
- RoHS compliant



Contents

Description

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TC Series

Product Selection	V13-T1-109
Technical Data and Specifications	V13-T1-109
Special Control Function Inputs	V13-T1-110

Product Selection

TC24411100



TC484120001



TC964110100



TC Series

Description	Normally Stocked Item	Catalog Number
Temperature control, 24 x 48 mm, two relay out, 90–250 Vac	Yes	TC24411100
Temperature control, 24 x 48 mm, SSR driver/relay out, 90–250 Vac	Yes	TC24412100
Temperature control, 48 x 48 mm, one relay out, relay alarm, 90–250 Vac	Yes	TC484110101
Temperature control, 48 x 48 mm, SSR driver out, 90–250 Vac	Yes	TC484120001
Temperature control, 48 x 48 mm, SSR driver out, relay alarm, 90–250 Vac	Yes	TC484120101
Temperature control, 48 x 48 mm, analog out, relay alarm, 90–250 Vac	Yes	TC484130101
Temperature control, 96 x 48 mm, one relay out, relay alarm, 90–250 Vac	Yes	TC964110100
Temperature control, 24 x 48 mm, two relay out, 11–26 Vac/Vdc	—	TC24511100
Temperature control, 48 x 48 mm, one relay out, relay alarm, 11–26 Vac/Vdc	—	TC485110101
Process control, 24 x 48 mm, analog/relay out, 90–250 Vac	—	PC24463100
Temperature control, 48 x 48 mm, analog out, relay alarm, 90–250 Vac	—	TC24413100

Technical Data and Specifications

General Specifications

Description	Specification
Power	
Power	90–250 Vac, 47–63 Hz, 10 VA (TC24), 12 VA (TC48/TC96), 5 W maximum (TCxx4) 11–26 Vac/Vdc, 10 VA (TC24), 12 VA (TC48/TC96), 5 W maximum (TCxx5)
Input	
Resolution	18 bits
Sampling rate	5 times/second
Temperature effect	±1.5 $\mu\text{V}/^{\circ}\text{C}$ for all inputs except mV input ±3.0 $\mu\text{V}/^{\circ}\text{C}$ for mV input
Sensor lead resistance effect	
T/C	0.2 $\mu\text{V}/\text{ohm}$
Three-wire RTD	2.6 $^{\circ}\text{C}/\text{ohm}$ of resistance difference of 2 leads
Two-wire RTD	2.6 $^{\circ}\text{C}/\text{ohm}$ of resistance sum of 2 leads
Burn-out current	200nA
Common mode rejection ratio (CMRR)	120dB
Normal mode rejection ratio (NMRR)	55dB
Sensor break detection	Sensor open for TC, RTD and mV inputs, sensor short for RTD input, below 1 mA for 4–20 mA, below 0.25 V for 1–5V input
Sensor break response time	Within 4 seconds for TC, RTD, and mV inputs; 0.1 second for 4–20 mA and 1–5 V inputs
Output	
Relay rating	2A/240 Vac; 200,000 life cycles for resistive load
Pulsed voltage	Source voltage 5 V, current limiting resistance of 66 ohms
Linear output	
Resolution	15 bits
Output regulation	0.02% for full load change
Output setting time	0.1 sec. (stable to 99.9%)
Isolation breakdown voltage	1000 Vac
Temperature effect	±0.01% of SPAN/ $^{\circ}\text{C}$

General Specifications, continued

Description	Specification
Alarm	
Alarm relay	Form C rating; 2 A/240 Vac; 200,000 life cycles for resistive load
Alarm functions	Dwell timer, deviation high/low alarm, deviation band high/low alarm, PV high/low alarm
Alarm mode	Normal, latching, hold, latching/hold
Dwell timer	0.1 to 4553.6 minutes
Environmental and Physical	
Operating temperature	14 to 122 °F (–10 to 50 °C)
Storage temperature	–40 to 140 °F (–40 to 60 °C)
Humidity	0–90% RH (noncondensing)
Altitude	2000 m max.
Pollution	Degree 2
Insulation resistance	20 Mohms min. (at 500 Vdc)
Dielectric strength	2000 Vac, 50/60 Hz for 1 minute
Vibration resistance	10–55 Hz, 10 m/s ² for 1 minute
Moldings	Flame resistant polycarbonate
Dimensions	TC96 = 1.88 in (48 mm) (W) x 3.77 in (96 mm) (H) x 3.15 in (80 mm) (D)
	TC48 = 1.88 in (48 mm) (W) x 1.88 in (48 mm) (H) x 4.56 in (116 mm) (D)
	TC24 = 1.96 in (50 mm) (W) x 1.04 in (26.5 mm) (H) x 4.35 (110.5 mm) (D)

Special Control Function Inputs

Input Characteristics

Type	Range	Accuracy at 25 °C	Input Impedance
J	–120 to 1000 °C (–184 to 1832 °F)	±2 °C	2.2 Mohms
K	–200 to 1370 °C (–328 to 2498 °F)	±2 °C	2.2 Mohms
T	–250 to 400 °C (–418 to 752 °F)	±2 °C	2.2 Mohms
E	–100 to 900 °C (–148 to 1652 °F)	±2 °C	2.2 Mohms
B	0 to 1800 °C (32 to 3272 °F)	±2 °C (–200 to 1800 °C)	2.2 Mohms
R	0 to 1767.8 °C (32 to 3214 °F)	±2 °C	2.2 Mohms
S	0 to 1767.8 °C (32 to 3214 °F)	±2 °C	2.2 Mohms
N	–250 to 1300 °C (–418 to 2372 °F)	±2 °C	2.2 Mohms
L	–200 to 900 °C (–328 to 1652 °F)	±2 °C	2.2 Mohms
PT100 (DIN)	–210 to 700 °C (–346 to 1292 °F)	±0.4 °C	1.3 Kohms
PT100 (JIS)	–200 to 600 °C (–328 to 1112 °F)	±0.4 °C	1.3 Kohms
mV	–8 mV to 70 mV	±0.05%	2.2 Mohms
mA	–3 mA to 27 mA	±0.05%	70.5 ohms
V	–1.3 V to 11.5 V	±0.05%	650 Kohms

Accessories and Encoders



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Measuring Wheels	V13-T1-115
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Right Angle, Size 20 Shaft Encoders	V13-T1-122

Accessories and Encoders

Product Overview

Eaton offers a variety of accessories to complement our counting and control product offering.

Features

- Easy integration with Eaton counters

1

DIN Rail Adapter**Product Description**

Allows mounting of 1/32 DIN front panel mounted products to DIN rail inside panel.

Features

- For panel-mounting all DIN size counters, timers and process indicators 0.94 x 1.89 in (24 x 48 mm) or 1.97 x 0.98 in (50 x 25 mm)
- Cut-out: 0.98 x 1.97 in (25 x 50 mm)
- For snap-on fitting to 35 mm top hat DIN rails
- Construction—
 - Mounting panel for counter: Chrome-plated sheet steel
 - Top hat DIN rail adapter: Glass fiber reinforced polyimide

Product Selection**A2448DINADAPT****DIN Rail Adapter****Description**

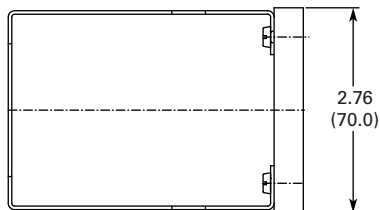
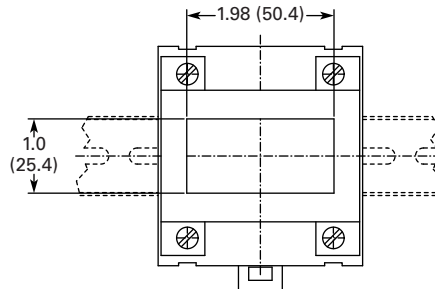
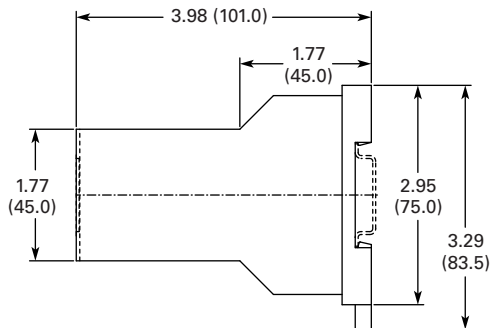
DIN rail adapter for 1/32 DIN panel mount devices

Catalog Number

A2448DINADAPT

**Dimensions**

Approximate Dimensions in Inches (mm)

DIN Rail Adapter

C-Face Ring Tachometer

Product Description

Provides sensing of motor speed when used with ratemeter/tachometer.

Features

- 5–16 Vdc input power
- NPN transistor output, 20 mA sinking capacity
- 60 pulses per resolution
- Zero speed pickup
- Variety of motor C-face sizes: 56, 184, 254, 256
- 39 to 225 °F (4 to 107 °C) operating temperature

Product Selection

47007_

C-Face Sensor



Description	Normally Stocked Item	Catalog Number
Motor size 56C	Yes	47007056
Motor size 143TC, 145TC, 182C, 184C	Yes	47007184
Motor size 184TC, 213C, 215C, 254C	Yes	47007215

1

Magnetic Pickup Sensor and Gear**Product Description**

Sensor ideal for use with a variety of Eaton counters to show motor/shaft speed or measurement.

Features**30-Tooth Gear Accessory**

- 1.6 in (41 mm) diameter
- 0.275 in (7 mm) bore diameter
- Mounting set screw included

Product Selection

47004400 and 28433400

**Magnetic Pickup Sensor and Gear**

Description	Catalog Number
30-tooth gear for magnetic pickup	28433400

Rotary Contactor—ES9513/ES9513RS**Product Description**

Simple reed switch circuit to provide a contact closure for counting.

Features

- No power required
- Reed switch output models for electronic counters
- Contact closure output
- Leaf switch output models for electromechanical counters
- 5/16 in (7.9 mm) double shaft, 2400 rpm max. at 1:1 ratio
- 12 in (304.8 mm) wire leads

Product Selection

3910040

**Rotary Contactor**

Description	Rotary Contactor	Catalog Number
12:1 ratio reed switch output	ES9513RS	39100400
10:1 ratio reed switch output	ES9513RS	39100401
1:1 ratio reed switch output	ES9513RS	41100400
1:3 ratio reed switch output	ES9513RS	41100401
1:3.28 ratio reed switch output	ES9513RS	41100402
1:10 ratio reed switch output	ES9513RS	41100403
1:10 ratio leaf switch output	ES9513	40892400
1:1 ratio leaf switch output	ES9513	40891400
1:3 ratio leaf switch output	ES9513	40892401

Measuring Wheels

Product Description

Measuring wheel mounts to Eaton encoders and rotary contactor to allow for accurate measurement.

Features

- For use with shaft encoders and rotary contactors
- 12 in (304.8 mm) meter circumference
- Urethane, rubber and knurled edges available

Product Selection

Measuring Wheel



1 Ft Circumference Measuring Wheels

Description	Normally Stocked Item	Catalog Number
5/16 in bore, urethane rim	Yes	20144300KIT
3/8 in bore, urethane rim	—	20144303KIT
5/16 in bore, rubber rim	Yes	20154300KIT
3/8 in bore, rubber rim	Yes	20154301KIT
5/16 in bore, knurled rim	Yes	20156300KIT

Mounting Bracket

Product Description

Mounting bracket for Eaton D-Series counters and rotary contactors.

Product Selection

Mounting Bracket



Mounting Bracket

Description	Normally Stocked Item	Catalog Number
Mounting bracket	Yes	40460400

1

Cube Style Shaft Encoders**Product Description**

Provides accurate pulse outputs for use with PLCs and counters.

Features

- 5–28 Vdc input power
- 80 mA current draw
- NPN transistor output, 250 mA sinking capacity
- Square wave output; (50-50 duty cycle)
- Single channel and quadrature models
- Up to 600 pulses per revolution
- 3/8 in (9.5 mm) double ended shaft
- ABEC three double sealed ball bearings
- Tapped holes for face or base mounting
- Military style connector

Product Selection**Cube Shaft Encoder****Cube Shaft Encoders**

Description	Normally Stocked Item	Catalog Number
Single Channel		
60 pulses per revolution	—	38150060
100 pulses per revolution	Yes	38150100
120 pulses per revolution	—	38150120
600 pulses per revolution	Yes	38150600
Quadrature		
60 pulses per revolution	—	38151060
100 pulses per revolution	Yes	38151100
120 pulses per revolution	—	38151120
600 pulses per revolution	Yes	38151600

Accessory**Mounting Bracket****Mounting Bracket** ^①

Description	Normally Stocked Item	Catalog Number
Mounting bracket	—	40460402

Note

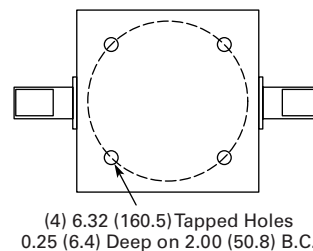
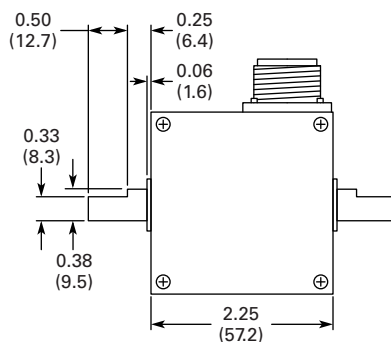
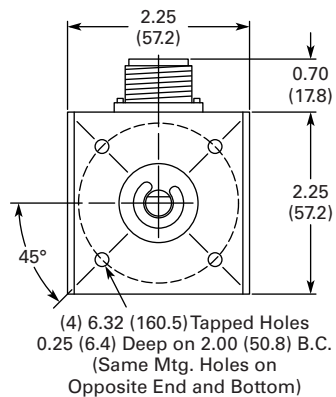
^① 40460400 is shown, 40460402 has additional mounting plate for encoders.

Technical Data and Specifications**General Specifications**

Description	Specification
Electrical	
Input (38150)	
Voltage	9 to 16 Vdc
Current	60 mA max. at 16 Vdc
Ripple	2%
Input (38151)	
Voltage	5 to 28 Vdc
Current	60 mA nom., 100 mA max.
Ripple	≤2%
Output	
Type	Current sinking transistor with 1.5 Kohms pull-up
Sinking current	100 mA max.
Max. voltage at 100 mA	1.3 Vdc
Blocking voltage	40 Vdc max.
Polarity	Positive
Wave shape	Square wave
Pulse rate	
38150	1 to 20,000 pulse per second
38151	1 to 10,000 pulse per second
Rise time	<1 μs
Pulses per rev.	1 to 1270
Accuracy	Within ±0.1°
Environmental	
Operating temperature	32 to 167 °F (0 to 75 °C)
Vibration	3 Gs at 5 to 1000 cps
Shock	20 Gs, 10 ms
Mechanical	
Shaft speed	6000 RPM max.
Shaft rotation	CW or CCW
Bearings	Sealed ball bearings
Starting torque	0.1 oz-in
Moment of inertia	0.0025 ounce in-sec ²
Radial loading	40 pounds operating
Axial loading	30 pounds operating
Shaft	3/8 in (9.5 mm) dia.
Operating life	Up to 100,000 hours, depending on speed
Housing	Aluminum with black anodized finish. Sealed against dust, oil, vapor and moisture.
Mounting	Bottom or front face
Weight	1 lb (0.5 kg) max.
Connector	MS-3102E-14S-6P
Mating connector	MS-3106A-14S-6S with 10 ft (3 m) shielded cable and termination for electronic controls

Dimensions

Approximate Dimensions in Inches (mm)

Cube Shaft Encoders

Heavy-Duty Shaft Encoders

Product Description

Provides accurate pulse outputs for use with PLCs and counters.

Features

- 5–28 Vdc input power
- 80 mA current draw
- NPN transistor output, 250 mA sinking capacity
- Square wave output
- Single channel and quadrature models
- 3/8 in (9.5 mm) single ended shaft
- ABEC 3 double sealed ball bearings
- Tapped holes for face or base mounting
- Military style connector

Product Selection

Heavy-Duty Shaft Encoder



Heavy-Duty Encoder

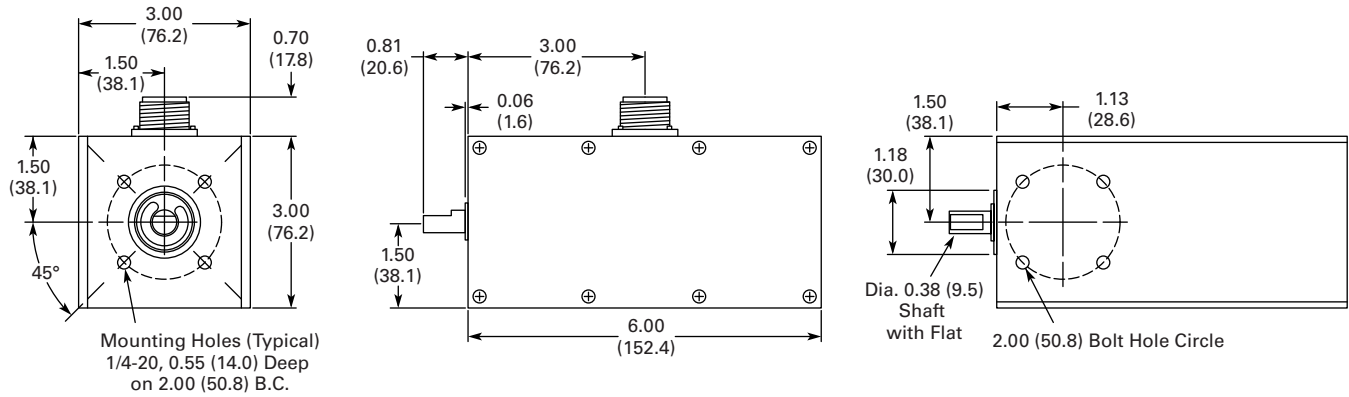
Description	Normally Stocked Item	Catalog Number
Single Channel		
60 pulses per revolution	Yes	48370060
100 pulses per revolution	—	48370100
120 pulses per revolution	Yes	48370120
600 pulses per revolution	Yes	48370600
Quadrature		
60 pulses per revolution	Yes	48371060
100 pulses per revolution	Yes	48371100
100 pulses per revolution	Yes	48371120
600 pulses per revolution	Yes	48371600

Technical Data and Specifications**General Specifications**

Description	Specification
Electrical	
Input	
Voltage	5 to 28 Vdc
Current	60 mA nom., 100 mA max.
Ripple	–2%
Output	
Type	Current sinking transistor with 1.5 Kohms pull-up
Sinking current	100 mA max.
Max. voltage at 100 mA	1.3 Vdc
Blocking voltage	40 Vdc max.
Polarity	Positive
Wave shape	Square wave (50-50 duty)
Pulse rate	0 to 20,000 pulse per second
Rise time	<1 μ S
Pulses per rev.	1 to 1270
Accuracy	Within $\pm 0.1^\circ$ or 6 arc minutes
Environmental	
Operating temperature	32 to 167 $^\circ$ F (0 to 75 $^\circ$ C)
Vibration	3 Gs at 58 to 500 cps
Shock	50 Gs, 11 ms duration
Mechanical	
Shaft speed	6000 RPM max.
Shaft rotation	CW or CCW
Bearings	Sealed ball bearings
Starting torque	1.0 oz-in
Radial loading	50 pounds operating
Axial loading	35 pounds operating
Shaft	3/8 in (9.5 mm) dia.
Housing	Aluminum with black painted finish. Sealed against dust, oil, vapor and moisture.
Mounting	Provisions for bottom or front face
Weight	3.25 lbs (1.47 kg) max.
Connector	MS-3102E-14S-6P
Mating connector	MS-3106A-14S-6S with 10 ft (3 m) shielded cable and termination for electronic controls (Part No. 29665-300)
	Connector, clamp and bushing only (Part No. 29729-300)

Dimensions

Approximate Dimensions in Inches (mm)

Heavy-Duty Encoder

1

Right Angle, Size 20 Shaft Encoders**Product Description**

Provides accurate pulse outputs for use with PLCs and counters.

Features

- 5–28 Vdc input power
- 100 mA current draw
- NPN transistor output, 100 mA sinking capacity
- Quadrature output, two square waves
- Up to 1800 pulses per revolution
- Flange mounting
- 3/8 in (9.5 mm) shaft diameter
- Double shielded ball bearings
- Military style connector

Product Selection

38159

**Right-Angle Shaft Encoder, Size 20**

Description	Catalog Number
100 pulses per revolution	38159100
120 pulses per revolution	38159120
600 pulses per revolution	38159600
1000 pulses per revolution	381591000
1800 pulses per revolution	381591800

Encoder Cables

Description	Catalog Number
10 ft encoder cable	29665300
15 ft encoder cable	29665315
20 ft encoder cable	29665320
25 ft encoder cable	29665325
30 ft encoder cable	29665330
35 ft encoder cable	29665335
40 ft encoder cable	29665340
50 ft encoder cable	29665350
75 ft encoder cable	29665375
100 ft encoder cable	29665400

Technical Data and Specifications

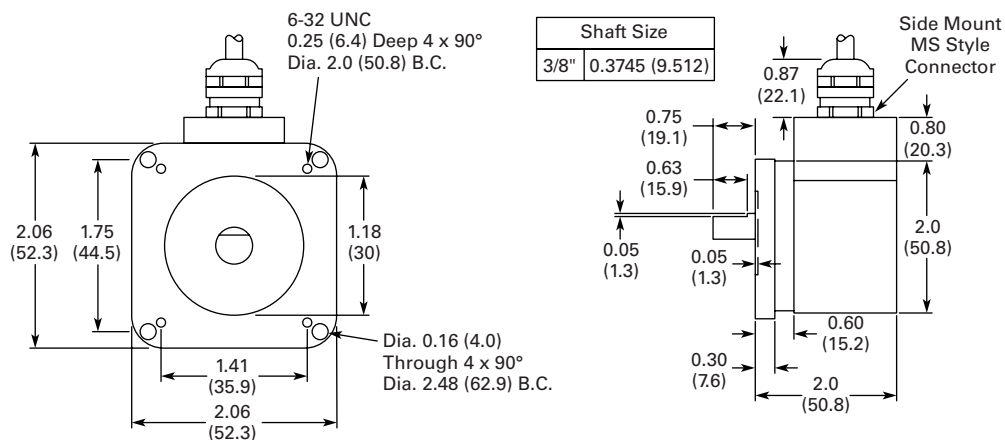
General Specifications

Description	Specification
Electrical	
Input	
Voltage	5 to 28 Vdc (4.75 min., 28.0 max.)
Current	100 mA max. with no output load
Ripple	–2% peak to peak at 5 Vdc
Output	
Type	Quadrature current sinking transistors with 2.2 Kohms pull-up
Sinking current	100 mA max.
Max. voltage at 100 mA	1.3 Vdc
Blocking voltage	40 Vdc max.
Polarity	Positive
Wave shape	Square wave (50-50 duty cycle)
Pulse rate	0 to 100,000 pulses per second
Noise immunity	Tested to BS EN6100-4-2; IEC801-3; BS EN61000-4-4; DDENV 50141; DDENV 50204; BS EN55022 (with European compliance option)
Symmetry	180 electrical degrees ± 18
Quadrature phasing	90 electrical degrees ± 36
Minimum edge separation	54 electrical degrees
Rise time	<1 μ S
Pulses per rev.	1 to 1270
Accuracy	Within $\pm 0.1^\circ$
Environmental	
Operating temperature	32 to 158 °F (0 to 70 °C)
Vibration	20 Gs at 50 to 500 cps
Shock	75 Gs, 11 ms
Mechanical	
Shaft speed	8000 RPM max.
Shaft rotation	CW or CCW
Bearings	Double shielded ball bearings
Starting torque	1.0 oz-in typical
Moment of inertia	5.2×10^4 ounce in-sec ²
Radial and axial loading	(80 lbs max.) 20–40 lbs for bearing life of 1.5×10^9 revolutions
Maximum acceleration	1×10^5 radians/second ²
Shaft	0.375 in (9.5 mm) dia.
Housing	Black non-corrosive finish. Sealed against dust, oil, vapor and moisture.
Mounting	Flange mount
Weight	11 oz (312 g)
Connector	MS-3102E-14S-6P
Mating connector	MS-3106A-14S-6S with 10 ft (3 m) shielded cable and termination for electronic controls (Part No. 29665-300) Connector, clamp and bushing only (Part No. 29729-300)

1

Dimensions

Approximate Dimensions in Inches (mm)

Right-Angle Shaft Encoder

Spare Parts

Style Number	Description
36172202KIT	Front panel gasket
48369200KIT	Mounting clip
28748200KIT	Screw for mounting clip
48355110KIT	Terminal strip—10 position
48355112KIT	Terminal strip—12 position
58802420	Desk kit for President Series (part numbers 5882–5886 and 5782)
29729300	Accessories connector
56460400	Sequence control
57044200KIT	6460 keypad
57740290KIT	Mounting clip
46066220KIT	Gasket
48720623KIT	Ambassador front keypad
28720400KIT	Kit mounting Ambassador Series
48720614KIT	Label position control
48720280KIT	Label membrane switch, Ambassador

General Accessories

Style Number	Description
48160451	Analog to frequency converter
499904xx(08/16)	Simultaneous input processor (anti-coincidence counting from multiple input devices) 8 inputs/16 inputs
38091400	RC surge suppressor
3605945x(0/1)	Solid-state I/O modules (AC input and output, DC input and output) 0 = DC, 1 = AC
36059201	Plug-in-module, 10–32 Vdc or 15–32 Vac input
36059202	Plug-in-module, 12–140 Vac output

Fusion

Style Number	Description
47590200	Front overlay label

Ambassador Family Accessories

Style Number	Description
48183401	Desk mount kit (enclosure for flat surface mounting)
58801460	RS-485 to RS-232 communications converter
58801461	RS-485 to RS-232 communications converter (Europe)
38145400	RS-485 interconnect kit
38146xxx	RS-485 cable—xxx is length in feet, specify with 4 digits (0500 = 500 ft) ^①

President

Style Number	Description
28720302KIT	Mounting kit
28720301KIT	Kit mounting clip and gasket
48720410	5881-0 President replace label
48720420	Label kit
48720430	Kit label replace Lexan to Mylar
48720440	5884 President replace label
48720450	5885 President replace label
48720460	5886 President replace label

Note

^① Call EatonCare.

