# Linear Measurement Technology
***EZ-track®***

## Analog profile series

**Low Profile Extrusion Housing:**

The Q21 series is housed in low profile, environmentally sealed, anodized aluminum housings. The electronics and the sensing element are incorporated into a housing that is less than 1 inch tall without the need for a can or head on the sensor to house the electronics (typical competitive devices are 2.5 times larger). Reducing the profile of the sensor lessens mounting issues and eliminates the need for special mounting fixtures, allowing the Q21 series to fit into applications where others are too bulky.

**Enhanced Resolution Analog Profile Series (Q21R/Q35R) Specifications:**

| | | |
|---|---|---|
| Output: | Current:<br>20-4 mA<br>4-20 mA | Voltage:<br>0-10 VDC<br>10-0 VDC |
| Load Impedance: | ≤ (voltage in - 4) ÷ 0.02 Ω<br>(example: 10 VDC £300 Ω) | ≥1000 Ω |
| Span: | 5 to 180 in. (Q35 style maximum length 36 in.) | |
| Repeatability: | +/-0.006% of full span or +/-0.002 in., whichever is greater | |
| Resolution: | 0.001 in. internal (For span lengths <65"); 16 bit (For lengths >65) | |
| Operating Temperature: | -40 to +158°F (-40 to +70°C) | |
| Null Zone: | 3.00 in. | |
| Dead Zone: | 2.00 in. | |
| Operating Voltage: | 13.5-30 VDC | |
| Current Consumption: | 120 mA at 15 VDC, 2.5 watts maximum | |
| Response Time: | ≤ 50 in. 1 ms<br>50 to 100 in 2 ms<br>101 to 150 in 3 ms<br>151 to 180 in 4 ms | |
| LED: | Green = Power is applied and magnet is present in the programmed range<br>Red = Fault, magnet is in the Null Zone, Dead Zone or lost<br>Yellow = Magnet is out of the active programmed range, but still within the active | |
| Protection Rating: | IP67 | |
| Agency Approval: | CE | |

**Enhanced Resolution Analog Profile Series (Q21R/Q35R) Specifications:**

| | | |
|---|---|---|
| Output: | Current:<br>20-4 mA<br>4-20 mA | Voltage:<br>+5 to -5 VDC 0-10 VDC<br>-5 to +5 VDC 10-0 VDC<br>0 to +5 VDC -10 to +10 VDC<br>+5 to 0 VDC +10 to -10 VDC |
| Load Impedance: | ≤ (voltage in - 4) ÷ 0.02 Ω<br>(example: 10 VDC ≤ 300 Ω) | ≥1000 Ω |
| Span: | 4 to 180 in. (Q35 span maximum length 36 in.) | |
| Repeatability: | +/-0.01% of full span or +/-0.014 in., whichever is greater | |
| Resolution: | 0.014 in. for stroke lengths less than 60 in.; For lengths over 60 in.: 12 bits | |
| Operating Temperature: | -40 to +158°F (-40 to +70°C) | |
| Null Zone: | 3.00 in. | |
| Dead Zone: | 1.50 in. | |
| Operating Voltage: | 10-30 VDC | |
| Current Consumption: | 10 mA (maximum) | |
| Response Time: | 50 in. or less: 1 ms updates with 5 ms settling time<br>50 in. or greater: 2 ms updates with 4 ms settling time | |
| LED: | Green = power is applied and magnet is present in the programmed range<br>Red = fault, magnet is in the null zone, dead zone or lost<br>Yellow = magnet is out of the active programmed range, but still within the active | |
| Protection Rating: | IP67 | |
| Agency Approval: | CE | |

**Diagnostic LED:**
The ***EZ-track*** Series utilizes a diagnostic LED that enables the operator to understand the state of the sensor dependent upon the position of the target magnet.

The LED flashes to indicate it is in AGC mode (Q21 and Q35 series). This feature simplifies programming and troubleshooting, effectively reducing setup and maintenance time.

**Various Analog Outputs Available Profile Style:**
The Q21 and Q35 series may be ordered in a variety of outputs.

Although sensors may be ordered with any of the above outputs, the units may easily be changed in the field to reverse the analog signal. Thus, one model can be used for two applications by programming the "zero" and "span" appropriately.

**Automatic Gain Control:**
The Automatic Gain Control (AGC) feature allows the ***EZ-track*** to sense a magnet other than the standard slide magnet and adjust to the magnetic field strength accordingly. With the ability to sense a standard floating magnet up to 3/8 inch away, the user has greater mounting flexibility for various applications.

**FM Approved Installation (Class I, Division 2):**
The ***EZ-track*** Q21 unit can be ordered for use in a Class I, Division 2 environment. The unit utilizes a Euro-G Fast-Lock.

## Analog profile series

### Part number key: Analog profile series

| LT | 12 | E | - | Q | 21 | R | - | LI | 0 | X3 | - | H1141 | /S16xx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Sensor family**
LT = linear transducer

**Measurement span**

**Units of measurement**
E = inches

**Housing style**
Q = profile

**Housing height**
21 = 21 mm
35 = 35 mm

**Resolution**
(blank) = standard resolution
R = enhanced resolution

**Output configuration**
LU = voltage
LI = current

**Output type**

| Voltage | Current |
|---|---|
| 0 = 0-10 V | 0 = 4-20 mA |
| 1 = 10-0 V | 1 = 20-4 mA |
| 2 = -10 to 10 V* | |
| 3 = 10 to -10 V* | |
| 4 = 0-5 V* | |
| 5 = 5-0 V* | |
| 6 = -5 to 5 V* | |
| 7 = -5 to 5 V* | |

* Q21 / Q35 versions only

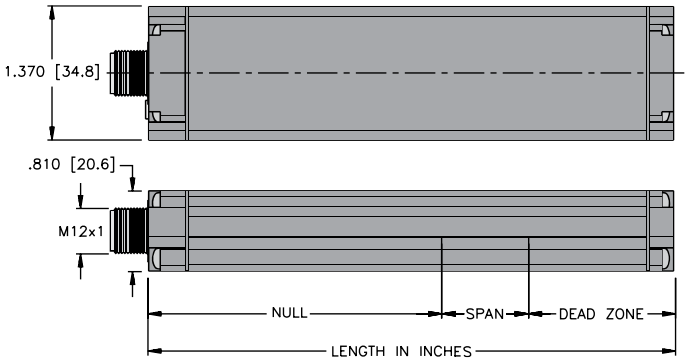
**Number of LEDs**
X3 = 3 way diagnostic LED

**Connection type**
H1141 = M12 ***eurofast®*** 4-pin connector (standard res.)
H1151 = M12 ***eurofast*** 5-pin connector (enhanced res.)

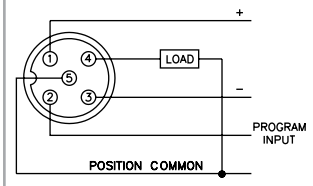
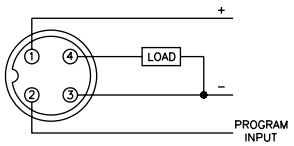
**Unit rating**
(blank) = IP67
S1661 = IP68

**Note:** In addition to the LDT, a typical system includes a magnet, mounting feet and cable (all sold separately).

### Dimensions: Q21 analog profile series



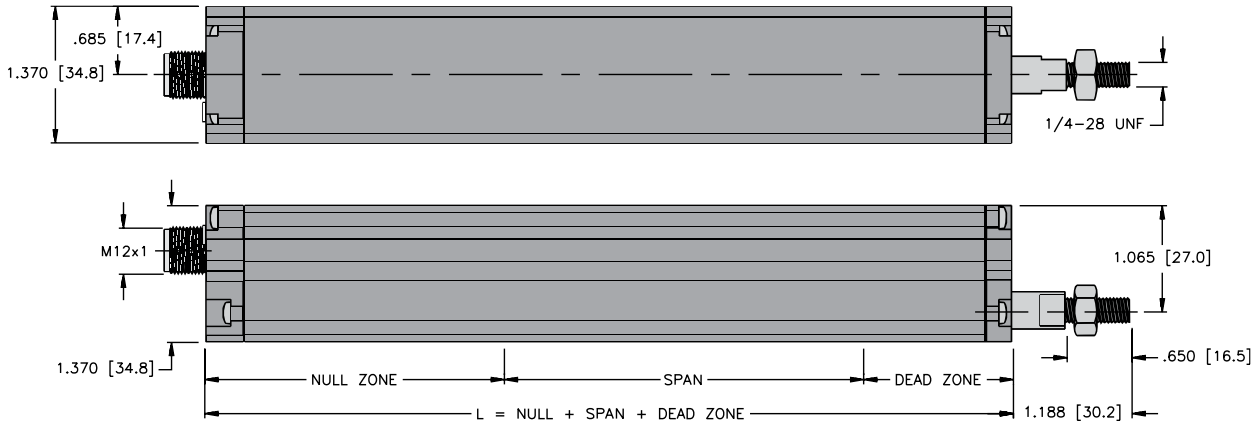

### Wiring Diagrams: Q21/Q35

| 5-pin ***eurofast*** Connection | 4-pin ***eurofast*** Connection |
|---|---|
|  |  |
| Mating Cordset: **RK 4.5T-*/S618** | Mating Cordset: **RK 4.4T-*/S618** |



* Length in meters.

### Dimensions: Q35 analog profile series



# Linear Measurement Technology
***EZ-track®***

## Quadrature profile series

**Direct Quadrature Output:**
Directly interface to the PLC input card and reduce installation time, vendors and cost. The Q21-DQ provides A and B channel quadrature output signals that are proportional to the position of the magnet assembly along the length of the probe, and output directly from the transducer to the controller. The quadrature output makes it possible to directly interface to virtually any incremental encoder input or counter card, eliminating costly absolute encoder converters and special PLC interface modules.

An index channel (Z) is also provided and its position may be set by the user at any position along the active system. The A, B and Z channels are differential outputs: the connection for each output consists of two signal wires. These are typically described as the "+" and "-" signals. Differential signals are much less prone to interference caused by electrical noise or ground loops, often found in single ended connections.

**Quadrature Profile Series (Q21-DQ/Q35-DQ) Specifications:**

| | |
|---|---|
| Output: | Quadrature, A, $\overline{A}$, B, $\overline{B}$, Z, $\overline{Z}$ |
| Span: | 5 to 180 inches (Q35 maximum length 36 inches) |
| Repeatability: | +/-0.001% of full span or +/- 0.001 inches, whichever is greater |
| Resolution: | 0.001 inches internal (1000 pulses per inch) |
| Operating Temperature: | -4 to +158°F (-20 to +70°C) |
| Null Zone: | 3.00 in. |
| Dead Zone: | 2.00 in. |
| Operating Voltage: | 13.5-30 VDC |
| Current Consumption: | 3 watts maximum (1 watt typical) |
| Response Time: | £50 in . 1 ms<br>50 to 100 in 2 ms<br>101 to 150 in 3 ms<br>151 to 180 in 4 ms |
| Inputs: | Option N NPN (used with sourcing outputs)<br>Option P PNP (used with sinking outputs)<br>Option T TTL<br>Option R 5 V differential<br>Option L 10 to 30 VDC, Volt = Vin-1 Volt |
| Output Frequency: | 10 kHz - 1 MHz |
| Nonlinearity: | +/- 0.05% of full span |
| LED: | Green = Power is applied and magnet is present in the programmed range<br>Red = Fault, magnet is in the Null Zone, Dead Zone or lost |
| Protection Rating: | IP67 |
| Agency Approval: | CE |

**Replace Incremental Output Devices:**
The Q21-DQ may be used in certain applications to replace incremental rotary and linear encoders. The quadrature output may be used in applications requiring 0.001 inch resolution and repeatability.

**Velocity Feedback:**
The ***EZ-track*** quadrature produces pulses that are sent to the controller in packets at a fixed frequency. The period of the pulses does not change with magnet velocity. Therefore, velocity can not be determined from the pulse packets unless the controller can interpolate velocity from position over time. If your application requires a velocity feedback, please consider the Linear Encoder on pages M4-M5 or consult factory.

**Incremental Output, Absolute Functionality:**
The Q21-DQ allows you to use an incremental output, while taking advantage of an absolute sensing technology. The Burst Input on the transducer triggers a data transfer of all incremental position data relative to the transducer's zero position. This can be used to achieve absolute position updates when power is restored to the system or anytime an update is needed to re-zero or home the machine.

**Programmable Zero Point:**
The Zero Input allows you to set the probes reference position at any point along the active span. The probe will output an increasing or decreasing signal based on the direction the magnet is moving in relation to the established zero point. See Quadrature Part Number Key to select storage mode.

**Volatile Storage:**
The zero point will be kept until a new zero pulse is sent or until the probe loses power. The zero point can be programmed an infinite number of times.

**Non-Volatile Storage:**
**T**he probe will store the zero position even in the event of a power failure. The zero point can be set 100,000 times.

**Transducer Inputs:**
The Burst and Zero Inputs are single ended connections: the connection for each input consists of only one wire. The Q21-DQ is available with either +24 VDC level signal or TTL level thresholds. Additionally, the 24 VDC may be specified as either sinking or sourcing relative to the probe's input.

**Quadrature Output Resolution and Speed:**
The internal resolution of the Q21-DQ transducer is 0.001 inches. This would be represented to the encoder input device by specifying an output resolution of 1,000 cycles per inch (CPI).

**Frequency or Pulse Rate:**
For a typical incremental encoder output, the resolution of the encoder and the speed of travel govern the frequency and pulse width of the output pulses. The output pulse rate from the ***EZ-track*** transducer is fixed and controlled internally. This output frequency is user specified (10 kHz to 1MHz) so that it does not exceed the maximum input rate of the counter card. If the controller's maximum input frequency falls between two available frequencies, choose the lower frequency.

**Output Drivers:**
The Q21-DQ uses an OL7272 line driver and may be configured for either a TTL level output or a 10-30 VDC level output. Option R has a 5 VDC TTL level output regardless of input power. Option L has an output of 1 volt less than the probe's input voltage and should be used when driving input cards that are not TTL compatible.

TURCK
Industrial Automation

## Quadrature profile series

### Part number key: Quadrature profile series

| LT | 12 | E | - | Q | 21 | - | DQ | R | A | N | N | X2 | - | H11121 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Sensor family**
LT = linear transducer

**Measurement span**

**Units of measurement**
E = inches

**Housing style**
Q = profile

**Housing height**
21 = 21 mm
35 = 35 mm

**Output configuration**
DQ = quadrature

**Output type**
**Quadrature**
R = differential RS422 line driver (TTL compatible)
L = differential line driver, 10-30 VDC

**Quadrature cycle frequency (quadrature)**
A = 10 kHz
B = 25 kHz
C = 50 kHz
D = 75 kHz
E = 100 kHz
F = 150 kHz
G = 250 kHz
H = 500 kHz
I = 1.0 MHz

**Zero offset storage (quadrature)**
V = volatile (non-retentive)
N = nonvolatile (100,000 storage cycles maximum)

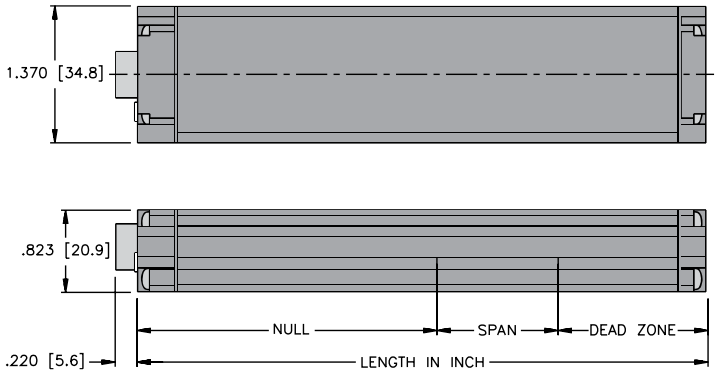
**Input type (quadrature)**
N = sinking input (used with sourcing outputs)
P = sourcing input (used with sinking inputs)
T = TTL level

**Number of LEDs**
X2 = 2 way diagnostic LED

**Connection type**
H11121 = M12 ***eurofast®*** 12-pin connector

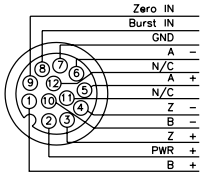
**Note:** In addition to the LDT, a typical system includes a magnet, mounting feet and cable (all sold separately).

### Dimensions: Q21-DQ quadrature profile series




### Wiring Diagram: Q21-DQ/ Q35-DQ

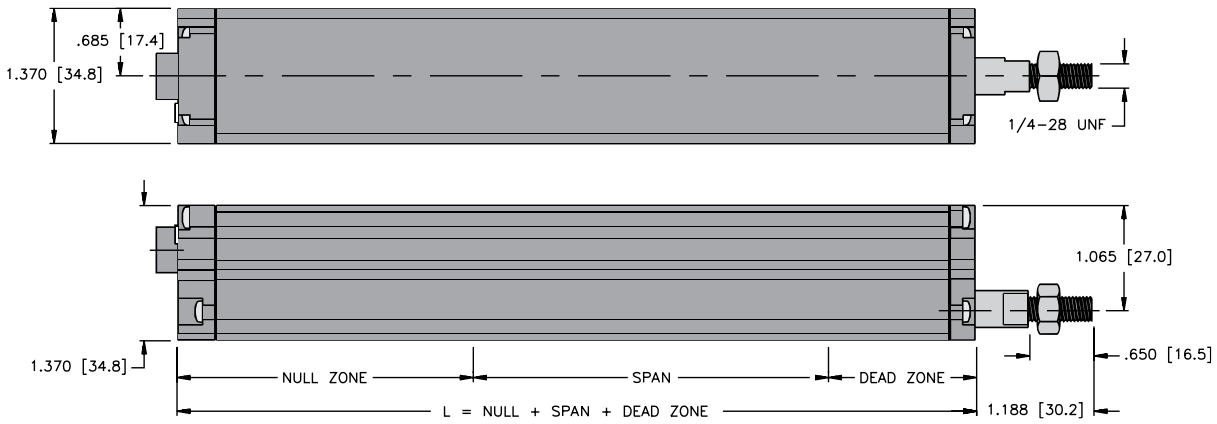
12-pin ***eurofast*** connection




Mating Cordset: **RKC 12T-*/S618**

* Length in meters.

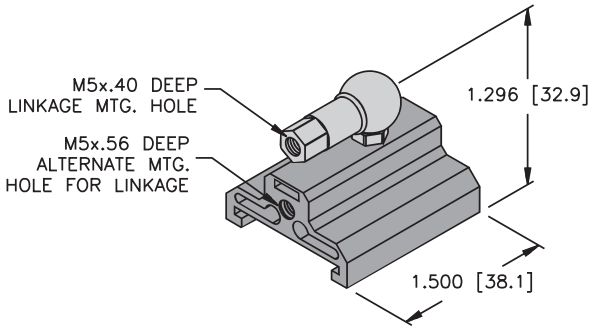
### Dimensions: Q35-DQ quadrature profile series



## Profile series accessories

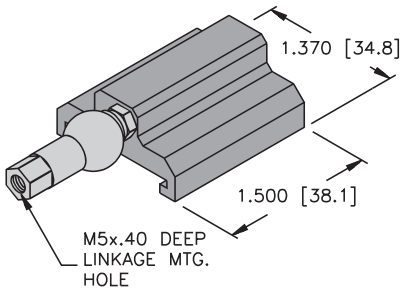
### Slide magnet

**SM-Q21 [A5600]**



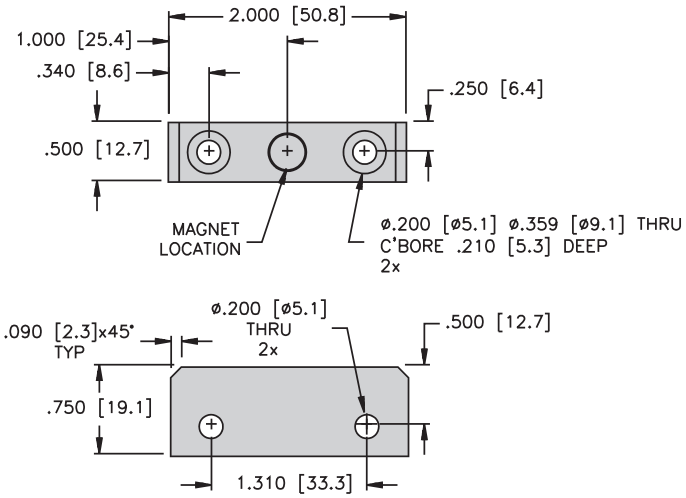

### Slide magnet with slide adapter

**SA-Q21 [A0864]**



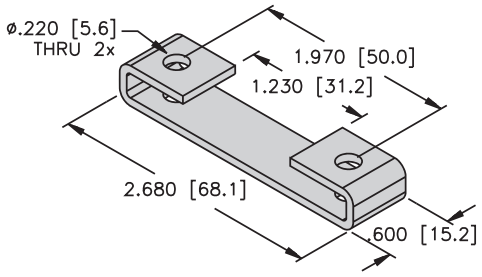

### Floating magnet

**FM-Q21 [A5500]**




### Q21 mounting brackets

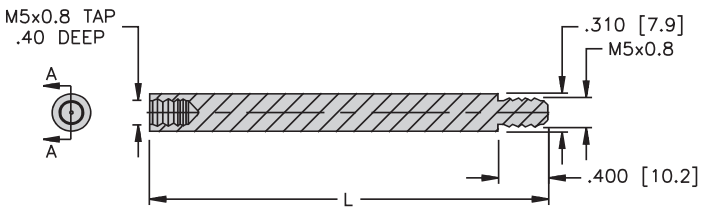
**MB-Q21 [A5700]**




(Note: Mount every 3 feet)

### Control arms

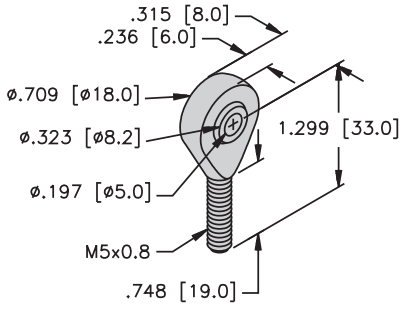
**CA*E-Q21**




* Lengh in inches.

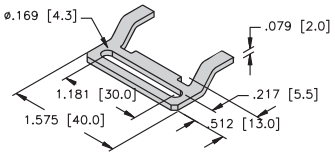
### Rod ends

**RE-Q21 [A0865]**



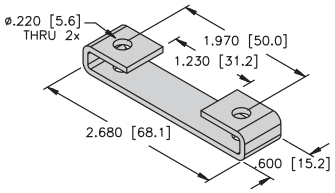
## Mounting Brackets for Q25L.. Sensor

### MB1-Q25



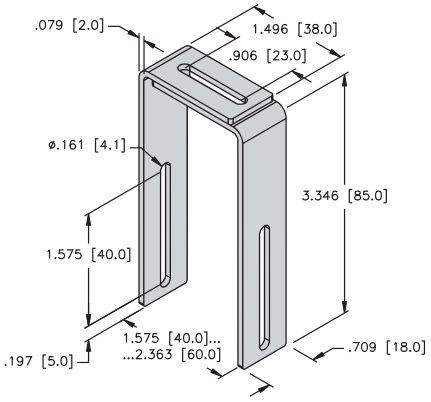

Mounting Clip

### MB-Q21



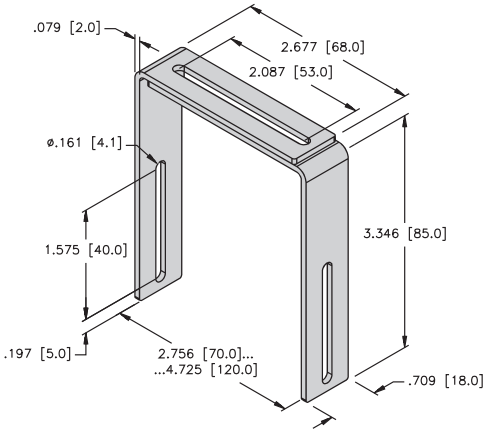

Mounting Bracket

### MB2.1-Q25



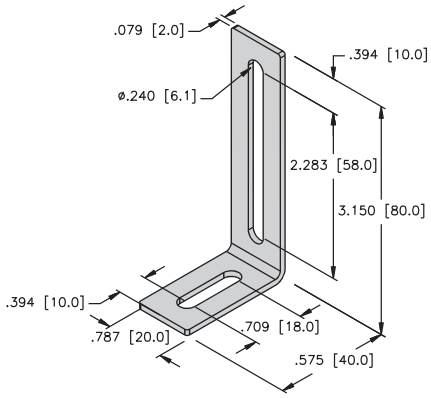

Mounting bracket for cylinders 40-60 mm

### MB2.2-Q25



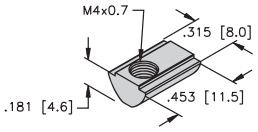

Mounting bracket for cylinders 70-120 mm

### MB3-Q25



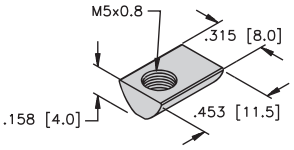

Mounting clip for lateral mounting

### MN-M4-Q25



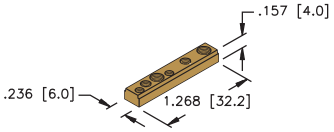

Sliding block with M4 thread
for the backside profile

### MN-M5-Q25




Sliding block with M5 thread
for the backside profile

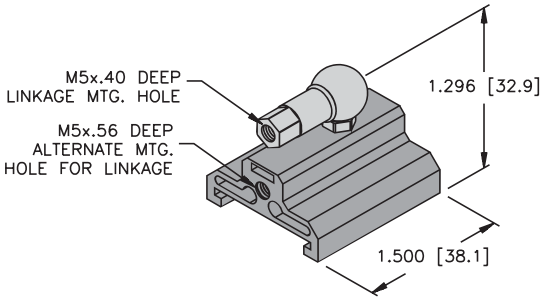
### MN-C




Sliding block for T-groove cylinder
5-8 mm.

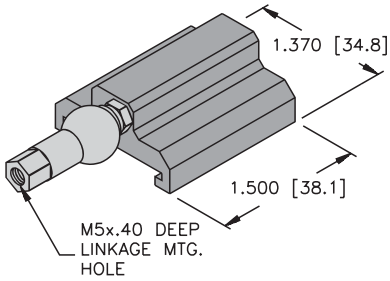
# Profile Style Accessories

## Slide Magnet



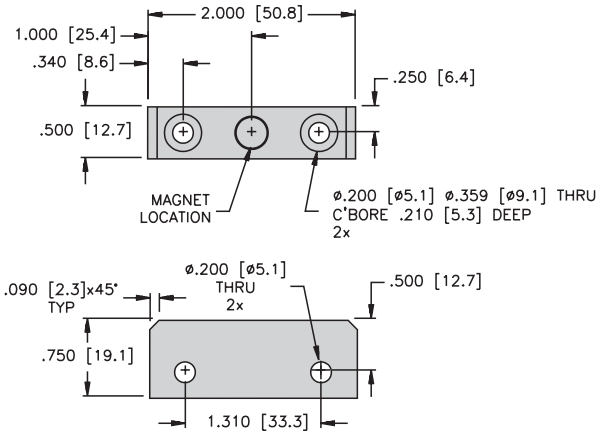

**SM-Q21**

## Slide Magnet with Slide Adapter



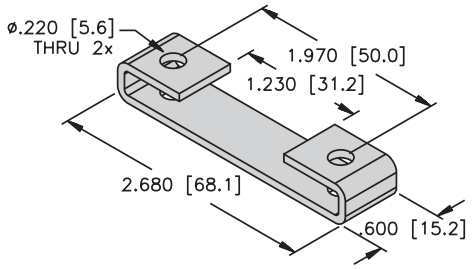

**SA-Q21**

## Floating Magnet



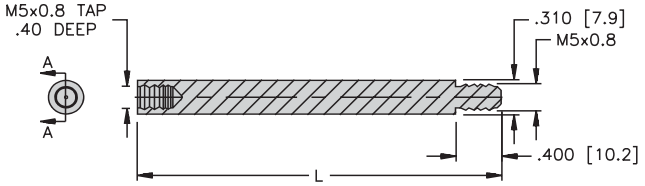

**FM-Q21**

## Q21 Mounting Brackets




**MB-Q21**

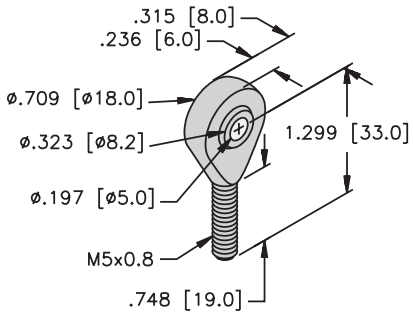
## Control Arms




**CA**E-Q21**

** = length in inches, consult factory for stocked lengths.

## Rod Ends

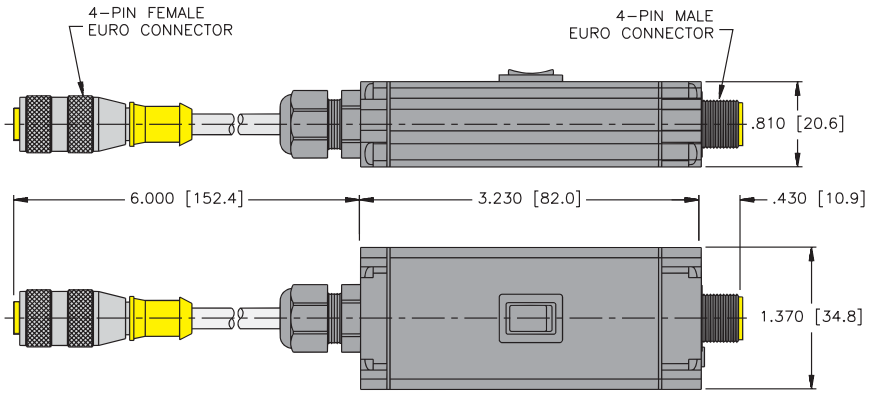



**RE-Q21**

All dimensions shown as: Inches [mm]

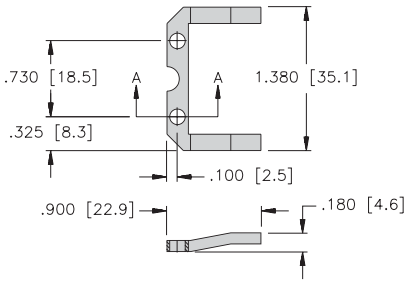
# Profile Style Accessories (cont.)

## Rocker Programmer



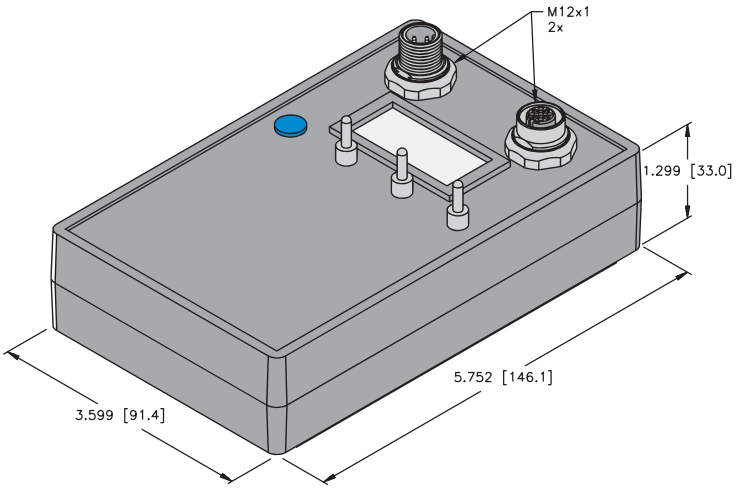

**RP-Q21**

## Q21 Upside Down Brackets



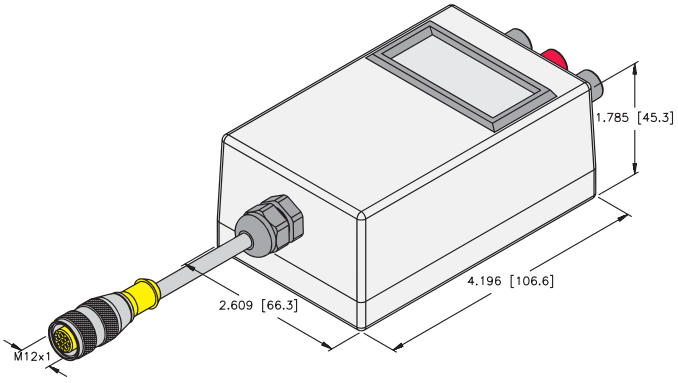

**UB-Q21**

## Test and Programming Device




**TB 3-LIU**

## Test and Programming Device



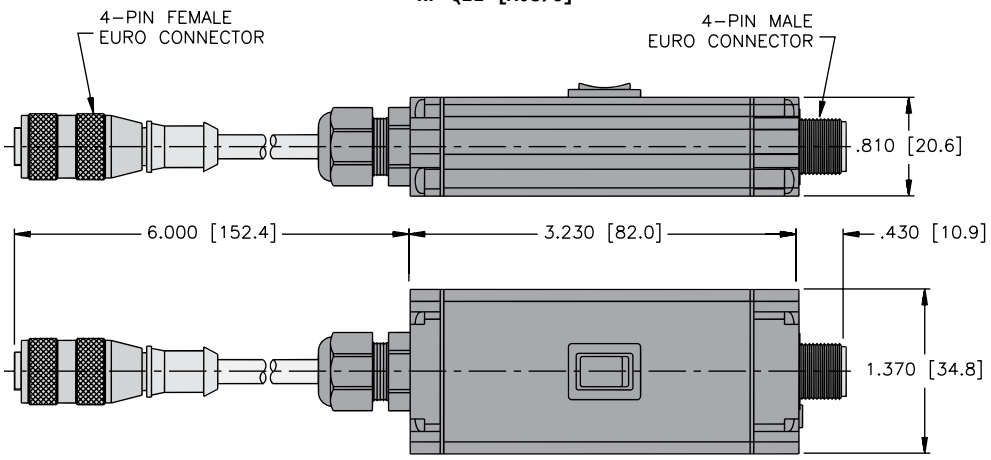

**TB-LDT (voltage)**
**TB-LDT-LI (current)**

All dimensions shown as: Inches [mm]

## Profile series accessories

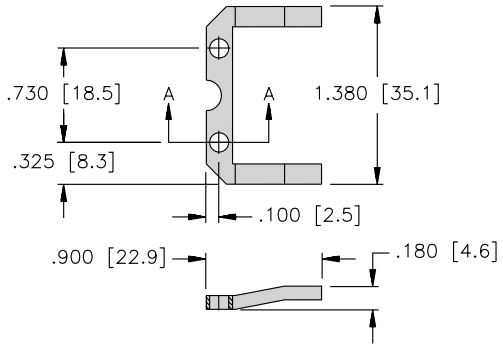
### Rocker programmer

**RP-Q21 [A0875]**




### Q21 upside down brackets

**UB-Q21 (2/bag) [A5500]**




### Test and programming device

**TB2-LDT [M6900298] (voltage)**
**TB2-LDT-LI [A58002] (current)**