

## Embeddable Rod Style

## Micropulse E Style

Introduction

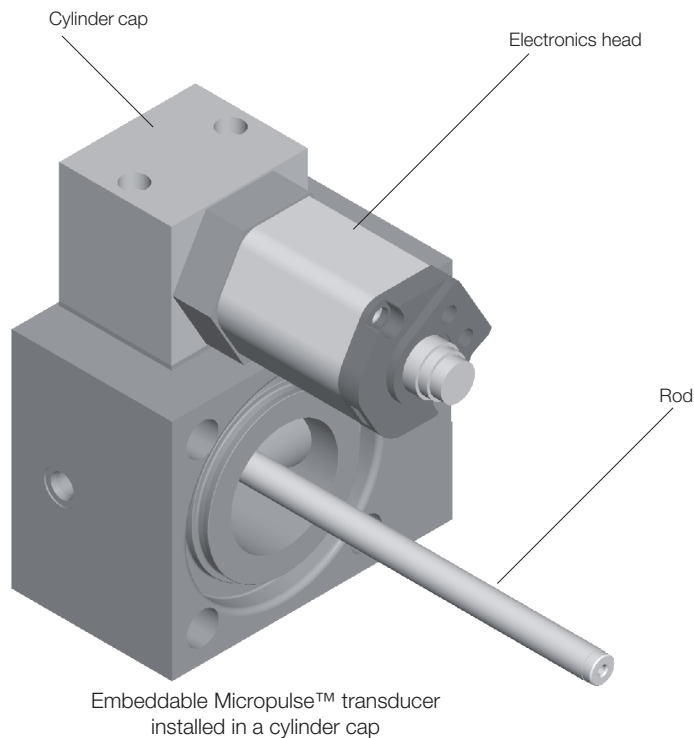
The unique “E” housing offers the ability to mount the electronics away from the pressure tube. This allows the electronics to be placed in a safe, out-of-the way area where space is an issue. This remote mounting feature facilitates easy access to the electronics without removing the pressure tube from the cylinder.

### Applications:

- Hydraulic cylinder
- Presses
- Mobile

### Features:

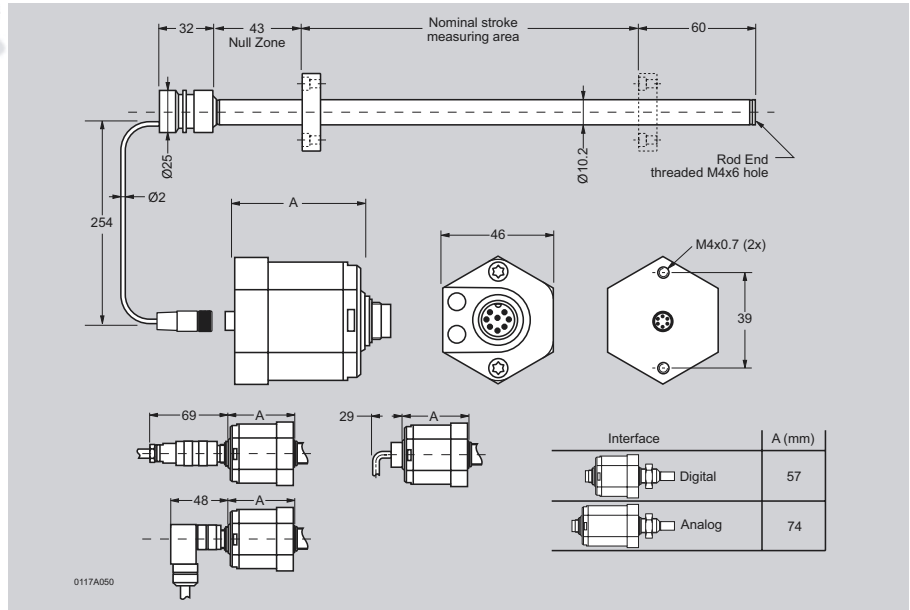
- Space saving embeddable design
- Designed for use in hydraulic cylinders
- Field replaceable electronics module
- Analog, digital and SSI outputs
- 2” to 156”



General Specifications...pg. 48  
Electrical Options...pg. 49  
Accessories...pg. 50  
Wiring Diagrams...pg. 51  
How to order...pg. 52



Series	E Style
Available lengths	51mm (2 in) to 3962mm (156 in)
Output signals	Analog & Digital Pulse



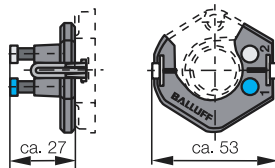
Ordering Code, Electronics Head	BTL-5- -E1-A-S32/KA05 (Electronics Head--see page 53)
Ordering Code, Rod	BTL-5-000-M -E1-A254 (Rod--see page 53)

Measurement type	Linear displacement
Measurement range	51mm (2 in) to 3962mm (156 in)
Shock rating	100g for 6ms (100g for 2ms continuous) per IEC 68 2-27
Vibration rating	12g, 10 to 2000 Hz per IEC 68-2-6
Environmental protection	IP 67 (when BKS-S32/33 is installed)
Housing material (pressure tube)	316 stainless steel
Housing material (electronics head)	anodized aluminum/314L stainless steel
Pressure rating (rod)	400 bar (5800 PSI) max
Operating temperature	-40 to + 185° F
Storage temperature	-40 to + 212° F
Humidity	<90% non-condensing
Connection type	connector or integral cable
Noise immunity	ESD, RFI and BURST per IEC 1000-4-2/3/4/6, severity level 3
Approvals	CE

**Accessories:**  
Magnets are on page 50  
Float magnets are on page 50  
Connectors start on page 85

**Warning:**  
These products are not rated for safety applications.

Calibration device BTL-5-A-EH01



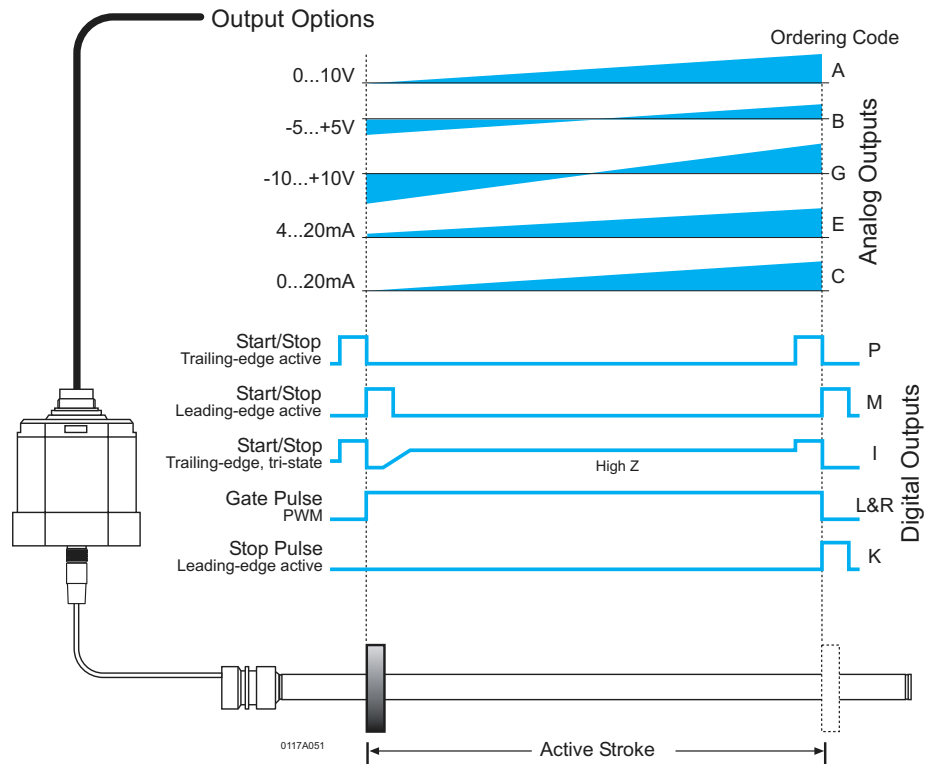
Electrical interface	Analog	Analog	Digital
Electrical type	Voltage	Current	Start/Stop & PWM
Part No. Code	A, B, G	E, C	P, M, I, L, K
Output	0...+10V, -5...+5V, -10...+10V	0...20 mA, 4...20 mA	Start/Stop or Pulse-width-modulated (RS422/RS485)
Output load	>2KΩ (5 mA max)	≤500Ω	per spec
Resolution	≤0.33 mV	≤0.66 μA	Controller dependent
Non-linearity	2KHz	2KHz	±100mm to 500mm stroke, ±0.02 % over 500mm stroke
Repeatability	Resolution/ min 2 μm	Resolution/ min 2 μm	Resolution/ min 2 μm
Hysteresis	≤5 μm	≤5 μm	≤5 μm
Sampling rate	500 Hz stroke >2000mm 1KHz stroke <2000mm	500 Hz stroke >2000mm 1KHz stroke <2000mm	500 Hz stroke >2000mm 1KHz stroke <2000mm
Temperature coefficient*	[150 μV/°C + (5ppm/°C*P*V/NL)] * ΔT	[0.6 μA/°C + (10 ppm/°C*P*V/NL)] * ΔT	[0.6 μA/°C + (10 ppm/°C*P*V/NL)] * ΔT
Operating voltage	24 Vdc ±20% or 15 Vdc ±2%	24 Vdc ±20% or 15 Vdc ±2%	24 Vdc ±20% or 15 Vdc ±2%
Operating current	<150 mA (at 1K Hz sampling rate)	<150 mA (at 1K Hz sampling rate)	<150 mA (at 1K Hz sampling rate)

### Notes:

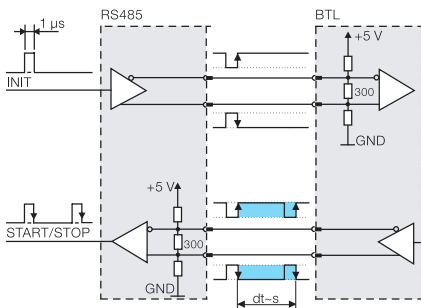
Analog voltage output versions incorporate both rising and falling outputs. Analog current version must be ordered as rising or falling outputs.

### \*Temperature coefficient variables:

- V = output range in V
- I = output range in [mA]
- ΔT = temperature change
- P = magnet position



Analog and Digital Output Options for the Micropulse E Style



RS-485 signal transmission with digital outputs



# Micropulse E Style

## Accessories Magnets & Floats

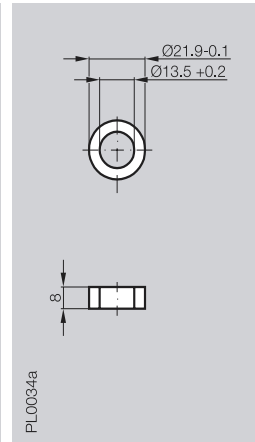
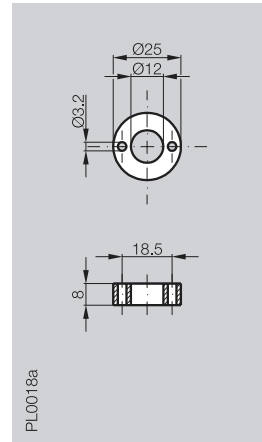
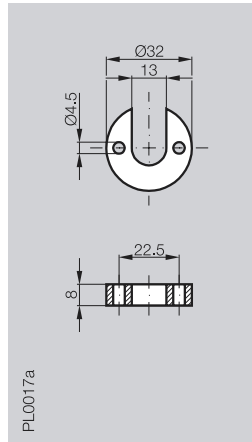
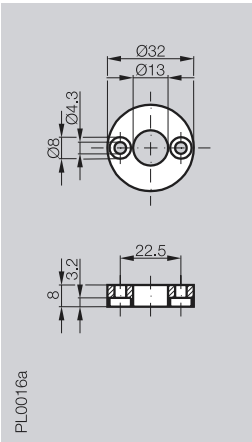
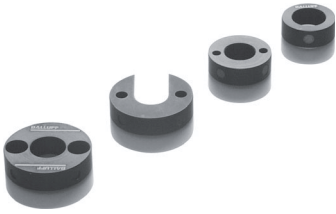
Product  
Type

Magnet  
ø32 ring

Magnet  
ø32 open ring

Magnet  
ø25 ring

Magnet  
ø22 ring



Ordering Code

BTL-Z-P-1013-4R

BTL-Z-P-1013-4S

BTL-Z-P-1012-4R

BTL-Z-P-1014-2R

Material

AL

AL

AL

AL

Weight

12g

12g

12g

10g

Magnet speed

any

any

any

any

Operating/storage  
temperature

-40...+100°C

-40...+100°C

-40...+100°C

-40...+100°C

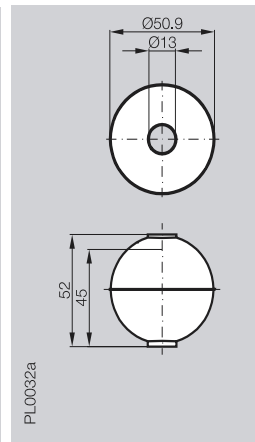
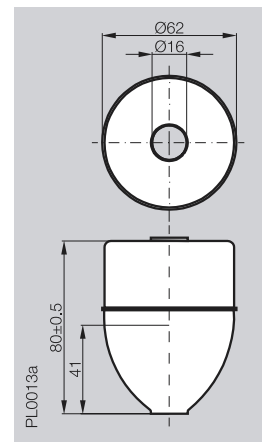
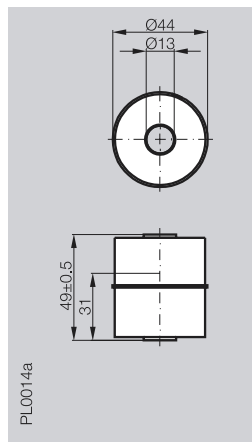
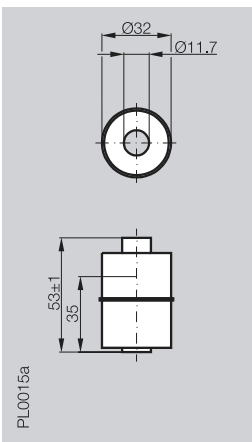
Product  
Type

Magnet  
Barrel float

Magnet  
Barrel float

Magnet  
Bullet float

Magnet  
Sphere float



Ordering Code

BTL2-S-3212-4Z

BTL2-S-4414-4Z

BTL2-S-6216-8P

BTL2-S-5113-4K

Material

Stainless 316

Stainless 316

Stainless 316

Stainless 316

Weight

20g

35g

66g

34g

Operating/storage  
temperature

-40...+120°C

-40...+120°C

-40...+120°C

-40...+120°C

Water displacement

35mm

30mm

41mm

26mm

Pressure (static)

24 bar

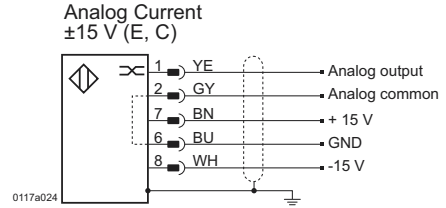
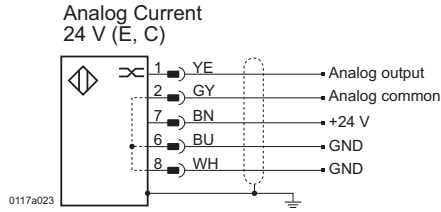
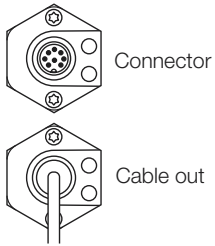
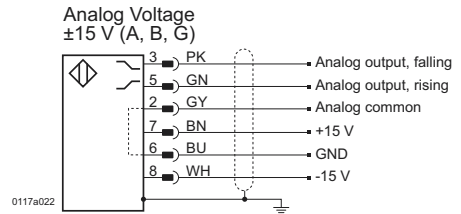
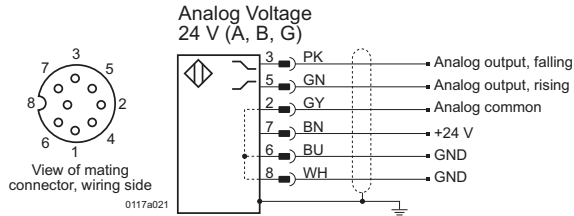
20 bar

15 bar

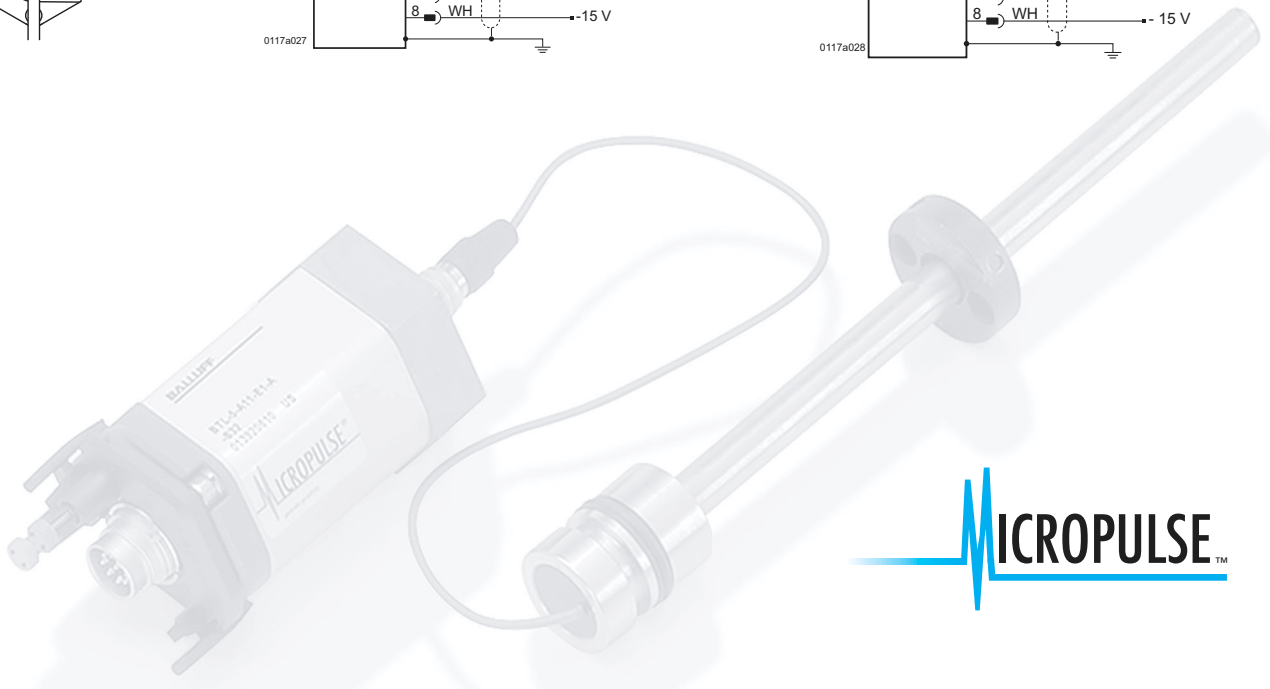
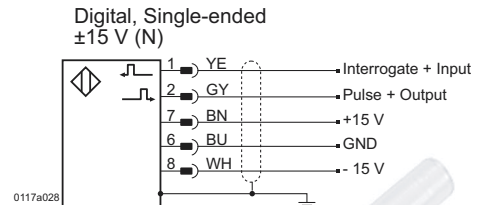
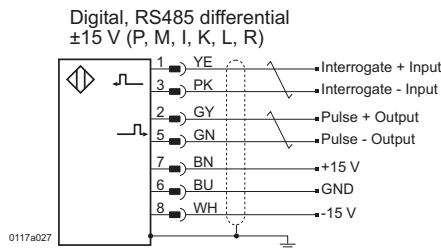
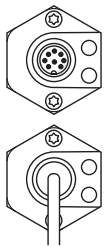
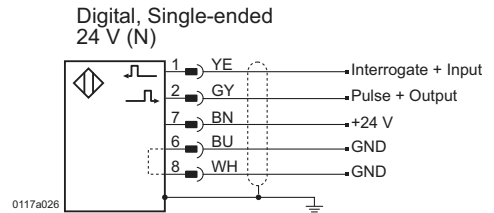
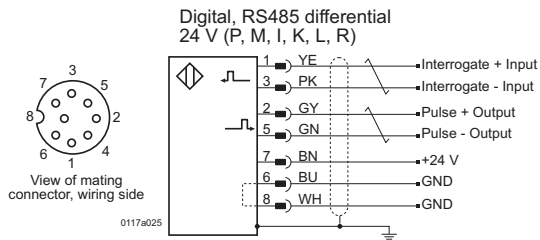
40 bar



**Analog Wiring Diagrams**



**Digital Wiring Diagrams**



# Micropulse E Style

Ordering Code

## Electronics Head



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
B	T	L	-	5	-	A	1	1	-	E	1	-	A	-	S	3	2	-	E	4
															K	A	0	5		

**Balluff - Linear Transducer**

**Generation 5**

**Output Type**

A = 0 to 10Vdc  
B = -5 to +5Vdc  
C = 0 to 20 mA  
E = 4 to 20 mA  
G = -10 to +10 Vdc

I = Differential start/stop with tri-state  
K = Differential stop - leading edge active  
L = Differential pulse-width modulated  
M = Differential start/stop - leading edge active  
N = Single ended start/stop - leading edge active  
P = Differential start/stop - trailing edge active  
R = Differential pulse-width - recirculated

**Supply Voltage**

1 = 24 Vdc ±20%

**Analog Output Operation (blank for digital)**

Voltage type (A, B & G): 1 = User selectable rising or falling

Current type (C & E): 0 = Minimum output at connector

7 = Maximum output at connector

**Embeddable**

**Connection Type**

**S 3 2** = 8-pin quick disconnect metal connector

**K A 0 5** = Integral cable (5m standard; specify length in meters)

**Interrogation** (only valid if output type= R, otherwise leave blank)

I = Internal interrogation, E = External interrogation

**Recirculation** (only valid if output type= R, otherwise leave blank)

1=1 circulation, 2 = 2 circulations, 4 = 4 circulations, 8 = 8 circulations, 16 = 16 circulations

## Rod



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
B	T	L	-	5	-	0	0	0	-	M	0	3	0	5	-	E	1	-	A	2	5	4

**Balluff - Linear Transducer**

**Generation 5**

**Nominal Stroke length**

**0 3 0 5** = 305mm active stroke (see table of standard lengths below)

**Embeddable**

**Connector/Cable**

A254 = Push-lock connector with 254mm integral cable

**Standard Stroke Lengths** (consult factory for additional lengths)

inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	0051	10	0254	24	0610	50	1270	98	2490
3	0077	11	0280	26	0661	54	1372	108	2743
3.5	0090	12	0305	28	0711	60	1524	118	2997
4	0102	13	0330	30	0762	66	1676	126	3200
5	0127	15	0381	32	0813	69	1753	140	3556
6	0152	16	0407	36	0914	72	1829	144	3658
7	0178	18	0457	40	1016	78	1981	148	3759
8	0203	20	0508	42	1067	84	2134	152	3860
9	0230	22	0560	48	1220	89	2261	156	3962