

# Encoders

## Miniature Optical Encoders

**Features:**  
 100 to 360 Pulses per revolution  
 2 Channels  
 Digital output

### Series E4P-360

Pulses per revolution	N	100 - 360	
Signal output (quadrature)		2	channels
Supply voltage	V <sub>DD</sub>	4.5 ... 55	V <sub>DC</sub>
Current consumption, typical	I <sub>DD</sub>	25 max.	
Output current, max. admissible	I <sub>OUT</sub>	8 (per channel)	mA
Pulse width <sup>2)</sup>	P	180 ± 75	°e
Phase shift, channel A to B <sup>2)</sup>	Φ	90 ± 60	°e
Signal rise/fall time, max. (C <sub>LOAD</sub> = 25 pF)	tr/tf	0.50 / 0.10	µs
Frequency range <sup>1)</sup> , up to	f	30	kHz
Inertia of code disc	J	0.21	gcm <sup>2</sup>
Operating temperature range		-10 ... + 85	°C

### Ordering information

Encoder type	number of channels	pulses per revolution	in combination with DC-Micromotors
E4P-100	2	100	M2232U M3138U M4870U MD2230
E4P-108	2	108	
E4P-120	2	120	
E4P-125	2	125	
E4P-128	2	128	
E4P-250	2	250	
E4P-256	2	256	
E4P-300	2	300	
E4P-360	2	360	

NOTE: MD2230, M2232U motors require 12" length 26 AWG PVC red and black motor leads

### Features

These incremental shaft encoders in combination with the MICRO-DRIVES DC-Micromotors are designed for indication and control of both, shaft velocity, and direction of rotation as well as positioning.

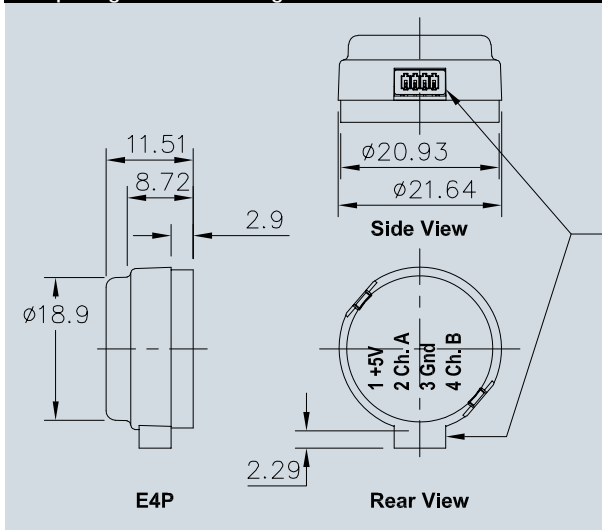
An all-in-one emitter and detector chip (AEDR 8300) transmits and receives LED light reflected off a low inertia metal disc with a push-on hub to give two channels with 90° phase shift.

This economical and smaller low profile encoder is fitted with a snap fit plastic cover and is designed to attach with screws or adhesive backed tape. A thru-shaft option is available upon request.

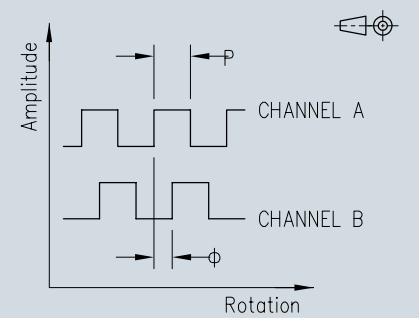
The Molex high retention snap-in polarized connector easily attaches to a variety of cable options. We recommend the 4-pin connector with 300 mm 26 AWG wires. Other cable combinations and lengths are available upon request.

Recommended cable order part number is CA-3285-1FT

### Output signals / Circuit diagram / Connector information



Connector:  
 Molex 53048-0410  
 Mating Connector:  
 Molex 51021-0400 (Housing)  
 Molex 50079-8100 (Pins)

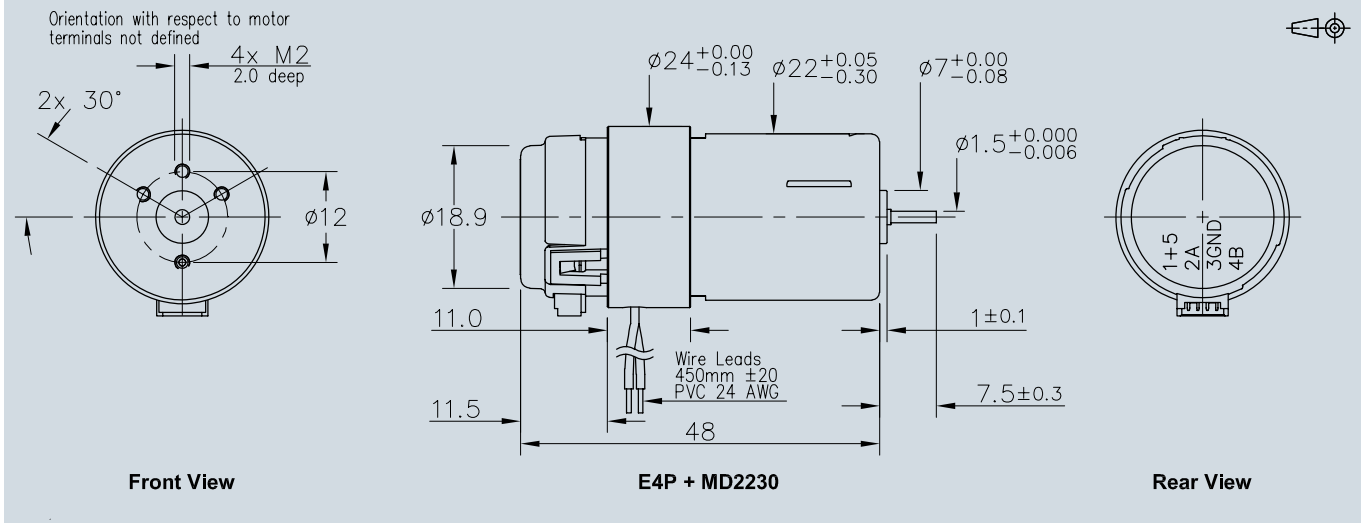


Amplitude  
 CHANNEL A  
 CHANNEL B  
 Rotation

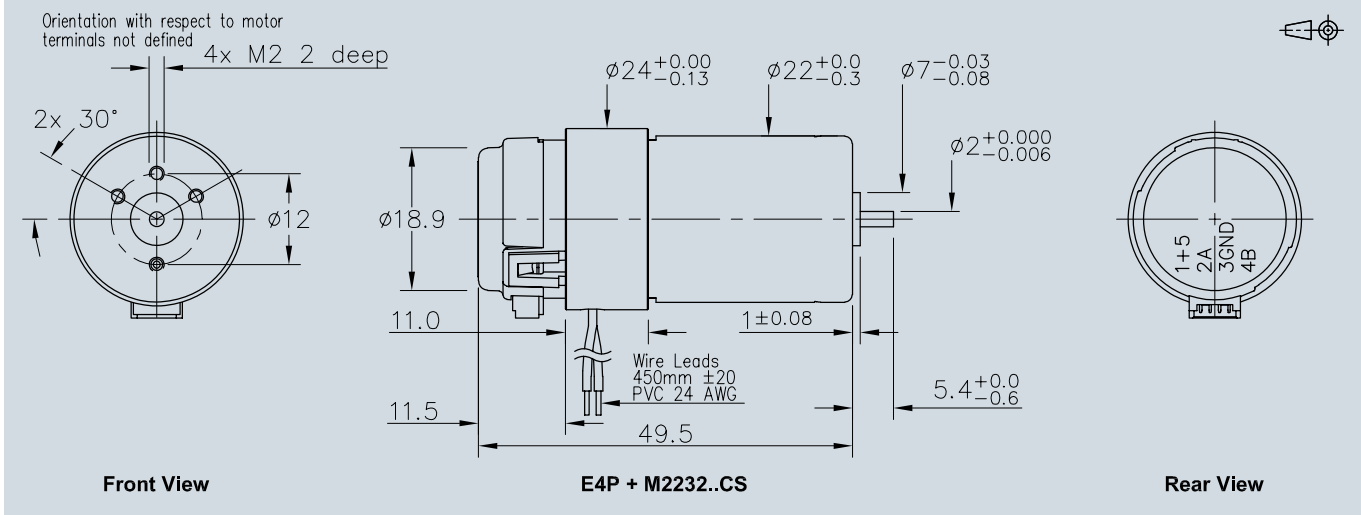
Admissible deviation of phase shift:  
 $\Delta\Phi = |90^\circ - \frac{\Phi}{P} * 180^\circ| \leq 45^\circ$

**Output signal**  
 with clockwise rotation as seen from the shaft end

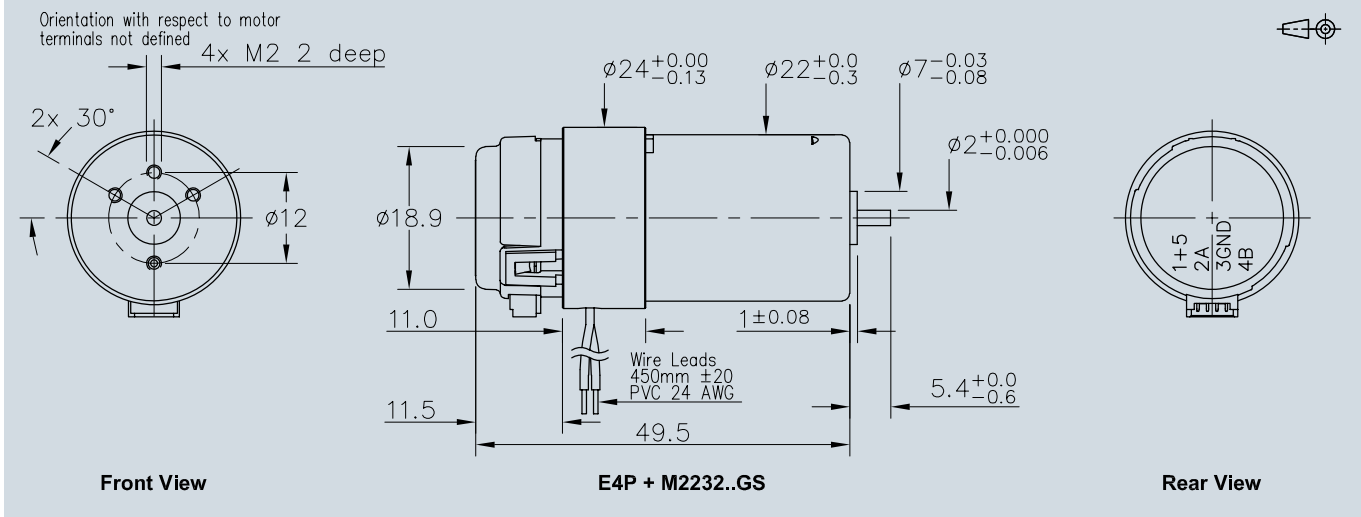
### E4P with Gearmotor MD2230E...-123



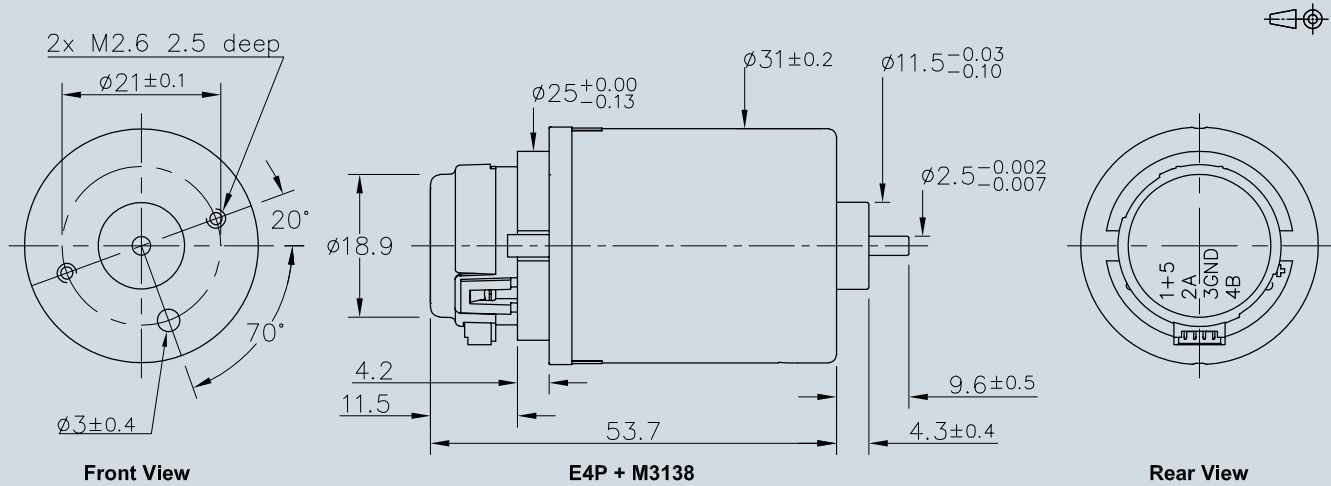
### E4P with Gearmotor M2232 ... CS



### E4P with Gearmotor M2232U...GS

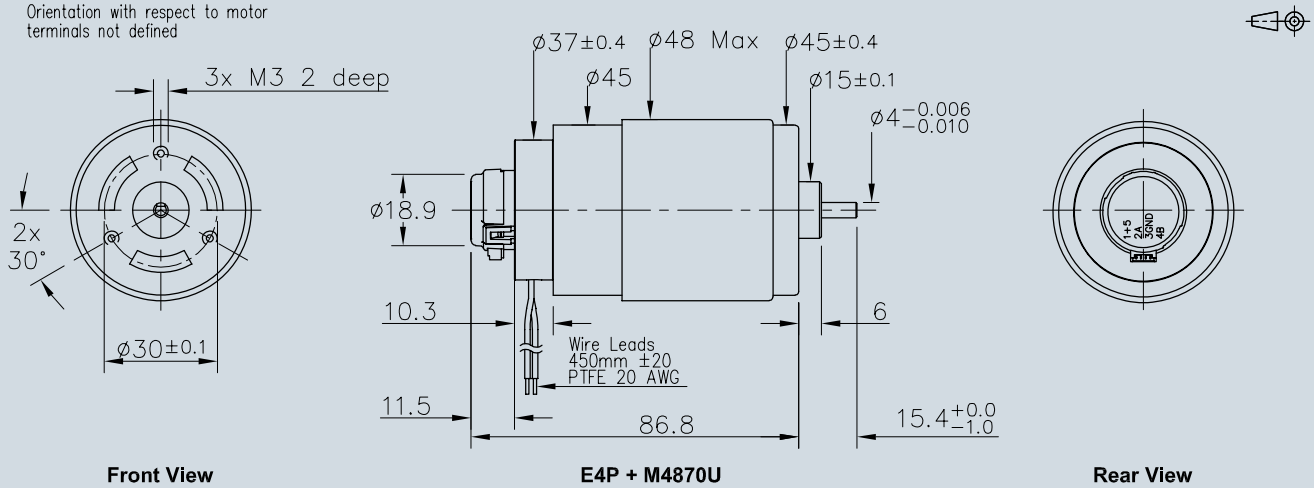


**E4P with Gearmotor M3138U...GS**



**E4P with Gearmotor M4870U...GB**

Orientation with respect to motor terminals not defined



## Series E4P-360

Part number	Description
E4P-100-250	for MD2230 motor with 100 pulse, 2 channel encoder
E4P-108-250	for MD2230 motor with 108 pulse, 2 channel encoder
E4P-120-250	for MD2230 motor with 120 pulse, 2 channel encoder
E4P-125-250	for MD2230 motor with 125 pulse, 2 channel encoder
E4P-128-250	for MD2230 motor with 128 pulse, 2 channel encoder
E4P-250-250	for MD2230 motor with 250 pulse, 2 channel encoder
E4P-256-250	for MD2230 motor with 256 pulse, 2 channel encoder
E4P-300-250	for MD2230 motor with 300 pulse, 2 channel encoder
E4P-360-250	for MD2230 motor with 360 pulse, 2 channel encoder
E4P-100-250	for M2232U motor with 100 pulse, 2 channel encoder
E4P-108-250	for M2232U motor with 108 pulse, 2 channel encoder
E4P-120-250	for M2232U motor with 120 pulse, 2 channel encoder
E4P-125-250	for M2232U motor with 125 pulse, 2 channel encoder
E4P-128-250	for M2232U motor with 128 pulse, 2 channel encoder
E4P-250-250	for M2232U motor with 250 pulse, 2 channel encoder
E4P-256-250	for M2232U motor with 256 pulse, 2 channel encoder
E4P-300-250	for M2232U motor with 300 pulse, 2 channel encoder
E4P-360-250	for M2232U motor with 360 pulse, 2 channel encoder
E4P-100-098	for M3138U motor with 100 pulse, 2 channel encoder
E4P-108-098	for M3138U motor with 108 pulse, 2 channel encoder
E4P-120-098	for M3138U motor with 120 pulse, 2 channel encoder
E4P-125-098	for M3138U motor with 125 pulse, 2 channel encoder
E4P-128-098	for M3138U motor with 128 pulse, 2 channel encoder
E4P-250-098	for M3138U motor with 250 pulse, 2 channel encoder
E4P-256-098	for M3138U motor with 256 pulse, 2 channel encoder
E4P-300-098	for M3138U motor with 300 pulse, 2 channel encoder
E4P-360-098	for M3138U motor with 360 pulse, 2 channel encoder
E4P-100-157	for M4870U motor with 100 pulse, 2 channel encoder
E4P-108-157	for M4870U motor with 108 pulse, 2 channel encoder
E4P-120-157	for M4870U motor with 120 pulse, 2 channel encoder
E4P-125-157	for M4870U motor with 125 pulse, 2 channel encoder
E4P-128-157	for M4870U motor with 128 pulse, 2 channel encoder
E4P-250-157	for M4870U motor with 250 pulse, 2 channel encoder
E4P-256-157	for M4870U motor with 256 pulse, 2 channel encoder
E4P-300-157	for M4870U motor with 300 pulse, 2 channel encoder
E4P-360-157	for M4870U motor with 360 pulse, 2 channel encoder

Encoder requires cable CA-MIC4-NC-1 to connect to control device.