

# Common Specifications

## Permissible Overhung Load and Permissible Thrust Load

### AR Series

Unit = N (lb.)

Type	Motor Frame Size mm [in.]	Model	Gear Ratio	Permissible Overhung Load Distance from Shaft End mm [in.]					Permissible Thrust Load
				0 [0]	5 [0.2]	10 [0.39]	15 [0.59]	20 [0.79]	
Standard Type	28 [1.10]	<b>AR24</b>	-	25 (5.6)	34 (7.6)	52 (11.7)	-	-	1.5 (0.33)
		<b>AR26</b>							2.2 (0.49)
	42 [1.65]	<b>AR46</b>		35 (7.8)	44 (9.9)	58 (13)	85 (19.1)	-	4.6 (1.03) [6.1 (1.37)]*
	60 [2.36]	<b>AR66</b>		90 (20)	100 (22)	130 (29)	180 (40)	270 (60)	8.8 (1.98) [11.8 (2.6)]*
		<b>AR69</b>							13.7 (3) [16.7 (3.7)]*
	85 [3.35]	<b>AR98</b>						18 (4) [24 (5.4)]*	
		<b>AR911</b>		260 (58)	290 (65)	340 (76)	390 (87)	480 (108)	29 (6.5)
TH Geared Type	28 [1.10]	<b>AR24</b>	<b>7.2, 10, 20, 30</b>	15 (3.3)	17 (3.8)	20 (4.5)	23 (5.1)	-	10 (2.2)
	42 [1.65]	<b>AR46</b>	<b>3.6, 7.2, 10, 20, 30</b>	10 (2.2)	14 (3.1)	20 (4.5)	30 (6.7)	-	15 (3.3)
	60 [2.36]	<b>AR66</b>		70 (15.7)	80 (18)	100 (22)	120 (27)	150 (33)	40 (9)
	90 [3.54]	<b>AR98</b>		220 (49)	250 (56)	300 (67)	350 (78)	400 (90)	100 (22)
PS Geared Type	28 [1.10]	<b>AR24</b>	<b>5, 7.2, 10</b>	45 (10.1)	60 (13.5)	80 (18)	100 (22)	-	20 (4.5)
	42 [1.65]	<b>AR46</b>	<b>5, 7.2, 10</b>	73 (16.4)	84 (18.9)	100 (22)	123 (27)	-	50 (11.2)
			<b>25, 36, 50</b>	109 (24)	127 (28)	150 (33)	184 (41)	-	
	60 [2.36]	<b>AR66</b>	<b>5</b>	200 (45)	220 (49)	250 (56)	280 (63)	320 (72)	100 (22)
			<b>7.2, 10</b>	250 (56)	270 (60)	300 (67)	340 (76)	390 (87)	
			<b>25, 36, 50</b>	330 (74)	360 (81)	400 (90)	450 (101)	520 (117)	
	90 [3.54]	<b>AR98</b>	<b>5, 7.2, 10</b>	480 (108)	540 (121)	600 (135)	680 (153)	790 (177)	300 (67)
			<b>25</b>	850 (191)	940 (210)	1050 (230)	1190 (260)	1380 (310)	
			<b>36</b>	930 (200)	1030 (230)	1150 (250)	1310 (290)	1520 (340)	
			<b>50</b>	1050 (230)	1160 (260)	1300 (290)	1480 (330)	1710 (380)	
PN Geared Type	28 [1.10]	<b>AR24</b>	<b>5, 7.2, 10</b>	45 (10.1)	60 (13.5)	80 (18)	100 (22)	-	20 (4.5)
	42 [1.65]	<b>AR46</b>		100 (22)	120 (27)	150 (33)	190 (42)	-	
	60 [2.36]	<b>AR66</b>	<b>5</b>	200 (45)	220 (49)	250 (56)	280 (63)	320 (72)	100 (22)
			<b>7.2, 10</b>	250 (56)	270 (60)	300 (67)	340 (76)	390 (87)	
			<b>25, 36, 50</b>	330 (74)	360 (81)	400 (90)	450 (101)	520 (117)	
	90 [3.54]	<b>AR98</b>	<b>5</b>	480 (108)	520 (117)	550 (123)	580 (130)	620 (139)	300 (67)
			<b>7.2, 10</b>	480 (108)	540 (121)	600 (135)	680 (153)	790 (177)	
			<b>25</b>	850 (191)	940 (210)	1050 (230)	1110 (240)	1190 (260)	
			<b>36</b>	930 (200)	1030 (230)	1150 (250)	1220 (270)	1300 (290)	
			<b>50</b>	1050 (230)	1160 (260)	1300 (290)	1380 (310)	1490 (330)	
Harmonic Geared Type	30 [1.18]	<b>AR24</b>	<b>50, 100</b>	100 (22)	135 (30)	175 (39)	250 (56)	-	140 (31)
	42 [1.65]	<b>AR46</b>		180 (40)	220 (49)	270 (60)	360 (81)	510 (114)	220 (49)
	60 [2.36]	<b>AR66</b>		320 (72)	370 (83)	440 (99)	550 (123)	720 (162)	450 (101)
	90 [3.54]	<b>AR98</b>		1090 (240)	1150 (250)	1230 (270)	1310 (290)	1410 (310)	1300 (290)

● The motor product name has characters for identifying the serie's name.

\*The brackets [ ] indicate the value for the electromagnetic brake type.

#### Note

● With a double shaft product, the output shaft located on the opposite side of the motor output shaft is used to install a slit disk or similar device. Do not apply any load torque, overhung load or thrust load on this output shaft.



## ● RK Series, CRK Series, CMK Series, RBK Series, PK Series, PV Series

Unit = N (lb.)

Type	Motor Frame Size mm [in.]	Motor Model	Gear Ratio	Permissible Overhung Load Distance from Shaft End mm [in.]					Permissible Thrust Load
				0 [0]	5 [0.2]	10 [0.39]	15 [0.59]	20 [0.79]	
PN Geared Type	28 [1.10]	PK523	<b>5, 7.2, 10</b>	45 (10.1)	60 (13.5)	80 (18)	100 (22)	—	20 (4.5)
	42 [1.65]	PK544	<b>5, 7.2, 10</b>	100 (22)	120 (27)	150 (33)	190 (42)	—	
	60 [2.36]	PK566	<b>5</b>	200 (45)	220 (49)	250 (56)	280 (63)	320 (72)	100 (22)
			<b>7.2, 10</b>	250 (56)	270 (60)	300 (67)	340 (76)	390 (87)	
	90 [3.54]	PK564	<b>25, 36, 50</b>	330 (74)	360 (81)	400 (90)	450 (101)	520 (117)	300 (67)
			<b>5</b>	480 (108)	520 (117)	550 (123)	580 (130)	620 (139)	
		PK599	<b>7.2, 10</b>	480 (108)	540 (121)	600 (135)	680 (153)	790 (177)	
			<b>25</b>	850 (191)	940 (210)	1050 (230)	1110 (240)	1190 (260)	
			<b>36</b>	930 (200)	1030 (230)	1150 (250)	1220 (270)	1300 (290)	
			<b>50</b>	1050 (230)	1160 (260)	1300 (290)	1380 (310)	1490 (330)	
Harmonic Geared Type	20 [0.79]	PK513	<b>50, 100</b>	50 (11.2)	75 (16.8)	—	—	—	60 (13.5)
	30 [1.18]	PK523		110 (24)	135 (30)	175 (39)	250 (56)	—	140 (31)
	42 [1.65]	PK543		180 (40)	220 (49)	270 (60)	360 (81)	510 (114)	220 (49)
	60 [2.36]	PK564		320 (72)	370 (83)	440 (99)	550 (123)	720 (162)	450 (101)
	90 [3.54]	PK596		1090 (240)	1150 (250)	1230 (270)	1310 (290)	1410 (310)	1300 (290)

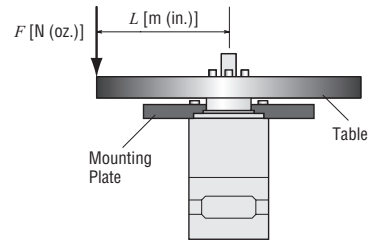
● The motor product name has characters for identifying the serie's name.

## ■ Permissible Moment Load (Harmonic Geared Type)

If an eccentric load is applied when attaching an arm or table to the flange face, calculate the moment load with the following formula. The moment load should not exceed the permissible values shown in the table below.

Moment Load:  $M [N \cdot m (oz \cdot in)] = F \times L$

Type	Motor Frame Size mm (in.)	Permissible Moment Load N·m (oz-in)
Harmonic Geared Type	20 (0.79)	0.7 (99)
	30 (1.18)	2.9 (410)
	42 (1.65)	5.6 (790)
	60 (2.36)	11.6 (1640)



## Encoder Specifications

### TTL Type Encoder

◇ 0.72° **RK** Series, 0.36°/0.72° **CRK** Series Pulse Input Package, 0.36°/0.72° **PK** Series

Item	Encoder Code	Specifications			
		R17	R18	R27	R28
Type		Incremental			
Resolution		500 P/R	1000 P/R	500 P/R	1000 P/R
Output		2-Channel A, B		3-Channel A, B, Index	
Input Current		17 mA (Typ.)	57 mA (Typ.)	57 mA (Typ.)	55 mA (Typ.)
Input Voltage		5 VDC ± 10%			
Output Type		TTL			
Output Voltage (TTL)	Low	0.4 VDC, 3.2 mA (Max.)	0.5 VDC, 8 mA (Max.)	0.5 VDC, 8 mA (Max.)	0.5 VDC, 8 mA (Max.)
	High	2.4 VDC, -200 μA (Min.)	2.4 VDC, -40 μA (Min.)	2.4 VDC, -40 μA (Min.)	2.0 VDC, -8 mA (Min.)
Response Frequency		100 kHz (Max.)			

◇ 1.8° **RBK** Series, 0.9°/1.8° **CMK** Series, 0.9°/1.8° **PK** Series

#### • Motor Frame Size: 28 mm (1.10 in.)

Item	Encoder Code	Specifications
		R15
Type		Incremental
Resolution		200
Output		2-Channel A, B
Input Current		21 mA (Typ.)
Input Voltage		5 VDC ± 10%
Output Type		TTL
Output Voltage (TTL)	Low	0.4 VDC, 6 mA (Max.)
	High	2.4 VDC, -1.2 mA (Min.)
Response Frequency		60 kHz (Max.)

#### • Motor Frame Size: 35 mm (1.38 in.), 42 mm (1.65 in.), 56.4 mm (2.22 in.), 60 mm (2.36 in.), 85 mm (3.35 in.)

Item	Encoder Code	Specifications			
		R15	R16	R25	R26
Type		Incremental			
Resolution		200 P/R	400 P/R	200 P/R	400 P/R
Output		2-Channel A, B		3-Channel A, B, Index	
Input Current		17 mA (Typ.)		57 mA (Typ.)	
Input Voltage		5 VDC ± 10%			
Output Type		TTL			
Output Voltage (TTL)	Low	0.4 VDC, 3.2 mA (Max.)		0.5 VDC, 8 mA (Max.)	
	High	2.4 VDC, -200 μA (Min.)		2.0 VDC, -8 mA (Min.)	
Response Frequency		100 kHz (Max.)			

### Differential Type Encoder

◇ 0.36°/0.72° **CRK** Series Built-In Controller Package, 0.36°/0.72° **PK** Series

Item	Encoder Code	Specifications
Type		Incremental
Resolution		500 P/R (0.72° High-Torque, Standard, <b>TH-PS</b> -Harmonic Geared Type) 1000 P/R (0.36° High-Torque Type)
Output		3-Channel A, B, Index
Input Current		500 P/R: 58 mA (Typ.)
		1000 P/R: 56 mA (Typ.)
Input Voltage		5 VDC ± 10%
Output Type		Differential
Output Voltage	Low	0.4 VDC, 20 mA (Max.)
	High	2.4 VDC, -40 mA (Min.)
Response Frequency		100 kHz (Max.)

## Encoder Pin-Outs

### ● TTL Type Encoder

◇ 0.72° **RK Series**, 0.36°/0.72° **CRK Series** Pulse Input Package, 0.36°/0.72° **PK Series**

Motor Pin No.	Lead Wire Color of Connection Cable for Encoder	Encoder Code	
		<b>R17, R18</b>	<b>R27, R28</b>
1	Brown	GND	
2	Purple	—	Index Channel
3	Blue	A Channel	
4	Orange	+5 VDC Power	
5	Yellow	B Channel	

◇ 1.8° **RBK Series**, 0.9°/1.8° **CMK Series**, 0.9°/1.8° **PK Series**

#### ● Motor Frame Size: 28 mm (1.10 in.)

Motor Pin No.	Lead Wire Color of Connection Cable for Encoder	Encoder Code <b>R15</b>
1	Red	+5 VDC Power
2	Blue	A Channel
3	Black	GND
4	Yellow	B Channel

#### ● Motor Frame Size: 35 mm (1.38 in.), 42 mm (1.65 in.), 56.4 mm (2.22 in.), 60 mm (2.36 in.), 85 mm (3.35 in.)

Motor Pin No.	Lead Wire Color of Connection Cable for Encoder	Encoder Code	
		<b>R15, R16</b>	<b>R25, R26</b>
1	Brown	GND	
2	Purple	—	Index Channel
3	Blue	A Channel	
4	Orange	+5 VDC Power	
5	Yellow	B Channel	

### ● Differential Type Encoder

◇ 0.36°/0.72° **CRK Series** Built-In Controller Package, 0.36°/0.72° **PK Series**

Motor Pin No.	Lead Wire Color of Connection Cable for Encoder	Description	Driver Pin (CN5)
1	—	N/C	9*
2	White	+5 VDC Power	7
3	Black	GND	8
4	—	N/C	—
5	Brown	A Channel—	2
6	Red	A Channel+	1
7	Blue	B Channel—	4
8	Green	B Channel+	3
9	Orange	Index—	6
10	Yellow	Index+	5

\*Driver pin 9 is for shielded and is the color purple.

## Encoder Dimensions

These drawings show the dimensions of only the encoder portion of the encoder-equipped motors. Check the website for the dimensions of the entire product.  
www.orientalmotor.com

### Encoder Dimension Table

#### ◇ TTL Type Encoder Motor

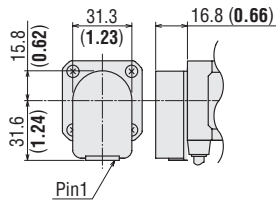
Series	Motor Frame Size [mm (in.)]	Type (with Encoder)	Dimension No.
0.72° <b>RK</b> Series	42 (1.65)	0.72° Standard Type <b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	1
	60 (2.36)	0.72° Standard Type	2
	60 (2.36)	<b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	3
	85 (3.35)	0.72° Standard Type	4
	90 (3.54)	<b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	5
0.36°/0.72° <b>CRK</b> Series Pulse Input 0.36°/0.72° <b>PK</b> Series	42 (1.65)	0.36°/0.72° High-Torque Type	6
	60 (2.36)	0.36° High-Torque Type	7
	42 (1.65)	0.72° Standard Type	8
	42 (1.65)	<b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	1
	60 (2.36)	0.72° Standard Type	9
0.9°/1.8° <b>CMK</b> Series 0.9°/1.8° <b>PK</b> Series	60 (2.36)	<b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	10
	28 (1.10)	1.8° High-Torque Type <b>SH</b> Geared Type	11
	35 (1.38)	1.8° High-Torque Type	12
	42 (1.65)	1.8° High-Torque Type	13
	56.4 (2.22)	1.8° High-Torque Type	14
	42 (1.65)	0.9° Standard Type 1.8° Standard Type <b>SH</b> Geared Type	15
	50 (1.97)	1.8° Standard Type	16
	56.4 (2.22)	0.9° Standard Type 1.8° Standard Type	17
	60 (2.36)	<b>SH</b> Geared Type	18
	28 (1.10)	1.8° High-Torque Type	11
1.8° <b>RBK</b> Series	35 (1.38)	1.8° High-Torque Type	12
	42 (1.65)	1.8° High-Torque Type <b>PL</b> Geared Type	13
	60 (2.36)	<b>PL</b> Geared Type	19
	56.4 (2.22)	1.8° Standard Type	17
	85 (3.35)	1.8° Standard Type	20

#### ◇ Differential Type Encoder Motor

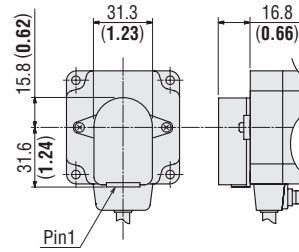
Series	Motor Frame Size [mm (in.)]	Type (with Encoder)	Dimension No.
0.36°/0.72° <b>CRK</b> Series Built-In Controller 0.36°/0.72° <b>PK</b> Series	42 (1.65)	0.36°/0.72° High-Torque Type	21
	60 (2.36)	0.36° High-Torque Type	22
	42 (1.65)	0.72° Standard Type	23
	42 (1.65)	<b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	24
	60 (2.36)	0.72° Standard Type	25
	60 (2.36)	<b>TH</b> Geared Type <b>PS</b> Geared Type Harmonic Geared Type	26

● Dimensions unit = mm (in.)

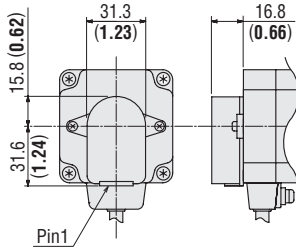
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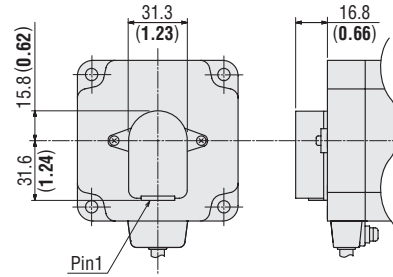
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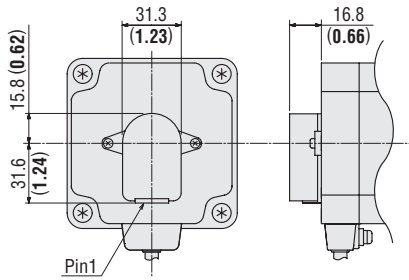
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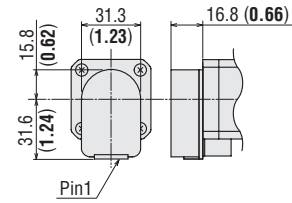
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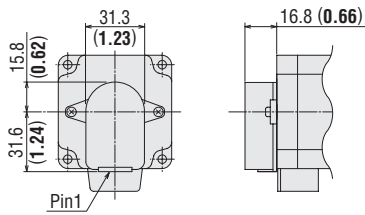
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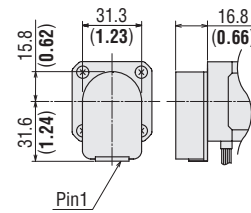
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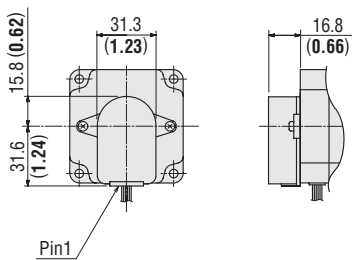
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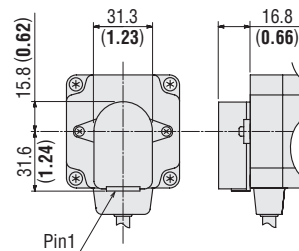
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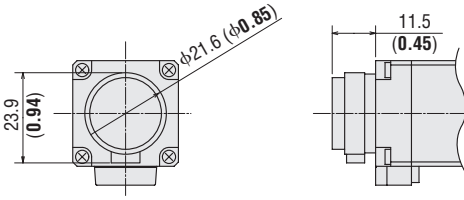
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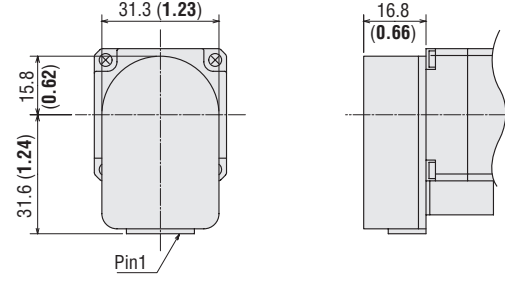
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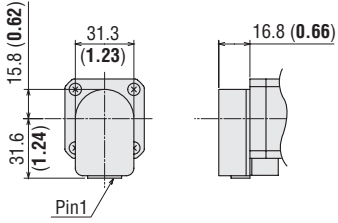
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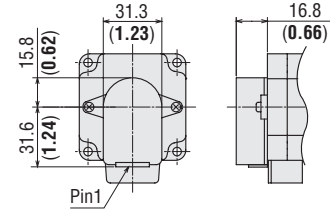
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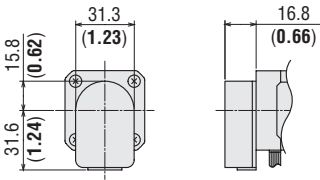
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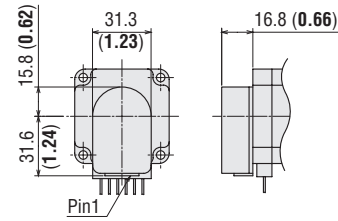
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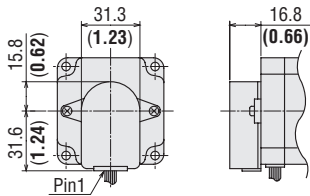
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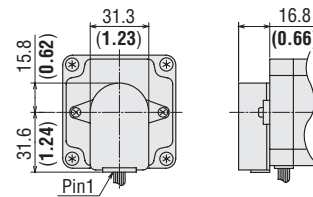
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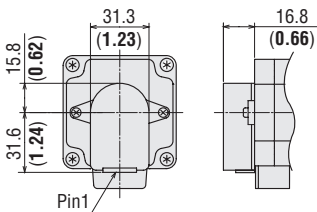
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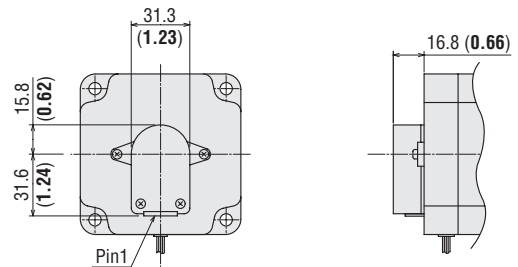
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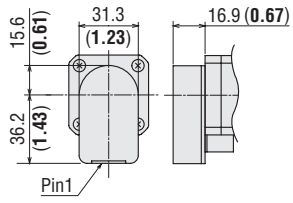
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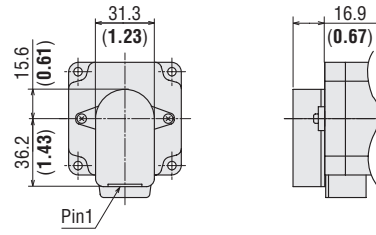


● Dimensions unit = mm (in.)

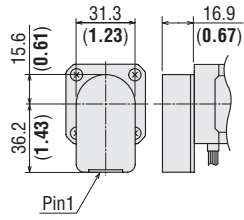
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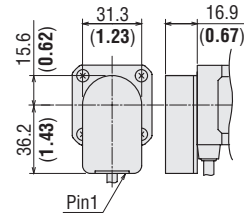
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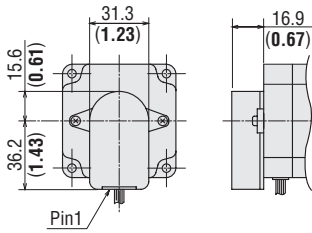
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24



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26

