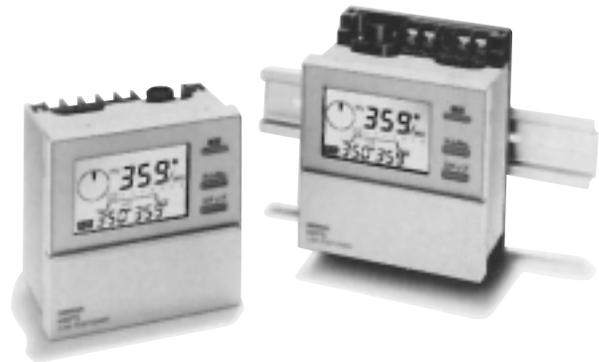


Economical Cam Positioner Does the Work of Eight Cam Switches

- Easy replacement of mechanical cam switches with absolute encoder input
- Simple to set, with single-function keys
- Accepts 330-rpm input, ideal for use with a variety of automatic units for operation timing control
- Equipped with useful functions for switching encoder rotation direction, designating the point of origin, etc.
- Easy-to-read backlit LCD display
- Fits 1/4 DIN size panel cutout
- Up to 16-cam control possible using parallel input adapter and two H8PS's



Ordering Information

Standard stock products are shown in bold in the Part Number Index.

■ CAM POSITIONERS

Mounting method	Output configuration	Part number
Panel mount	NPN transistor output	H8PS-8B
	PNP transistor output	H8PS-8BP
Surface or track mount	NPN transistor output	H8PS-8BF
	PNP transistor output	H8PS-8BFP

■ ABSOLUTE ENCODERS

Description	Part number
Plastic body, 2 m (6.56 ft.) cable	E6CP-AG5C-C
Metal body, 2 m (6.56 ft.) cable	E6F-AG5C-C

■ ACCESSORIES

Description	Part number
NEMA 4 protective cover, clear plastic with steel mounting plate	Y92A-96N
Protective cover, clear hard plastic	Y92A-96B
Shaft coupler for E6CP encoder; 6 mm shaft diameter	E69-C06B
Shaft coupler for E6F encoder, 10 mm shaft diameter	E69-C10B
Encoder extension cable, 5 m (16.4 ft.) length	E69-DF5
Parallel input adapter, allows connection of two H8PS for 16-cam control	Y92C-30
Track mounting base for H8PS-8BF and H8PS-8BFP cam positioners	Y92F-91
DIN rail track, 50 cm (1.64 ft.) length	PFP-50N
DIN rail track, 1 m (3.28 ft.) length	PFP-100N
Spacer	PFP-S
End plate	PFP-M

Functions

Function	Description
Encoder rotational direction switch	Encoder data revolutions can be set to clockwise or counterclockwise via dip switches.
Encoder origin designation	The process display angle can be set to the origin as 0° at the press of a button.
Angle display designation	The unit can convert the display of absolute encoder values of 256 division/revolution to 360°/revolution.
Rotation display monitor	Graphic display of encoder rotational angle position.
TEACH function	The unit can set the ON/OFF angle from actual operation of the machine.
Monitor contents	Process value display with 11 mm (0.43 in.) character height, output display, settings display, set cam number display, mode display, revolution display, operation step display, and error message display.

Specifications

Part number	H8PS-8B	H8PS-8BF	H8PS-8BP	H8PS-8BPF
Supply voltage	24 VDC, 85% to 110% of rated voltage in operation			
Power consumption	Approx. 4 W			
Encoder input	Type	Omron's E6CP and E6F absolute rotary encoders		
	Response speed	Run mode: 330 rpm max. Switch selectable between high speed (60 to 330 rpm) and low speed (up to 60 rpm) Test mode: 60 rpm max. Includes malfunction data detection function		
Output type	NPN open collector transistor		PNP open collector transistor	
Cam outputs	Number	8 lines (output numbers 1 to 8)		
	Rating	100 mA max., 30 VDC; residual voltage 2 V max.		
RUN output	Number	1; Turns ON in RUN and TEST modes, OFF in Program mode in case of error		
	Rating	100 mA max., 30 VDC; residual voltage 2 V max.		
Tachometer	Resolution	60 pulses/revolution signal output for rpm meter		
	Rating	30 mA max., 30 VDC, residual voltage 0.5 V max.	30 mA max., 30 VDC, residual voltage 2 V max.	
Output response time	RUN mode: 0.5 ms max. under high-speed designation 2.5 ms max. under low-speed designation TEST mode: 5 ms max.			
Display type	Backlit LCD			
Materials	Plastic case			
Mounting	Panel, 1/4 DIN cutout	Surface or track	Panel, 1/4 DIN cutout	Surface or track
Memory backup	Battery, 10 years at 25°C			
Connections	Screw terminals for outputs; connector socket for encoder			
Weight	Approx. 300 g (10.5 oz.)			
Enclosure rating	NEMA 4 with optional Y92A-96N panel cover			
Approvals	UL	Recognized, File Number E41515		
	CSA	Certified, File Number LR22310		
	Others	SEV, File Number 1021		
Ambient temperature	Operating	-10° to 55°C (14° to 131°F)		
	Storage	-25° to 65°C (-13° to 149°F)		
Ambient humidity	35 to 85% RH			
Vibration resistance	Malfunction	10 to 55 Hz, 0.5-mm amplitude, and 55 to 150 Hz under 7 G acceleration for 32 minutes in 3 directions		
	Mechanical	10 to 55 Hz, 7.5 mm amplitude, and 55 to 150 Hz under 10 G acceleration for 32 minutes in 3 directions		
Shock resistance	Malfunction	Approx. 20 G		
	Mechanical	Approx. 30 G		
Insulation resistance	100 MΩ minimum at 500 VDC between current-carrying terminal and non-current-carrying metal part			
Dielectric strength	1,000 VAC, 50/60 Hz for 1 minute between current-carrying part and non-current-carrying metal part			

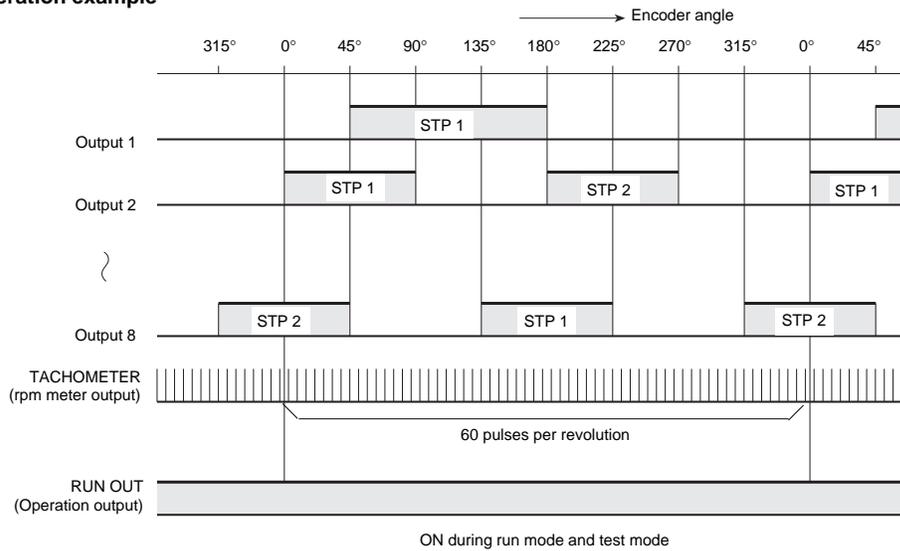
■ TIMING CHART

The H8PS Cam Positioner receives angle signal inputs from the absolute encoder, and outputs ON/OFF angles set initially as control signals (cams No. 1 to 8).

Program example

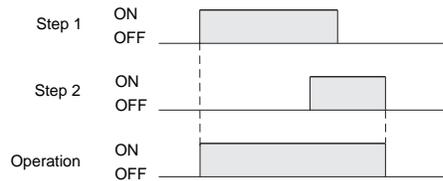
Step	STP 1		STP 2	
	ON angle	OFF angle	ON angle	OFF angle
1	45°	180°	—	—
2	0°	90°	180°	270°
⋮	⋮	⋮	⋮	⋮
8	135°	225°	315°	45°

Operation example

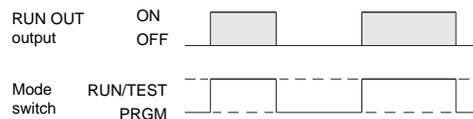


Note:

1.) When the setting angles for STEP 1 and STEP 2 of the same OUT No. are overlapped, the operation is as follows.



2.) The operating output “RUN OUT” does not output during programming.



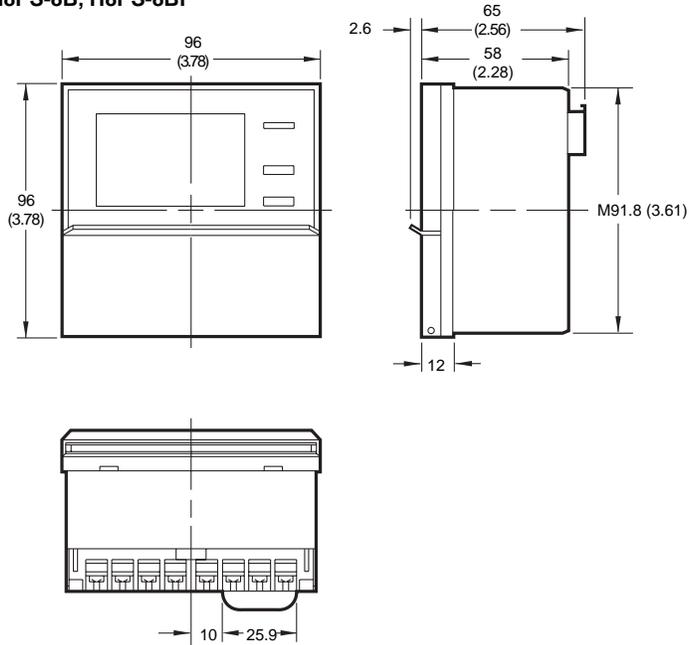
The operation output turns on with the timing shown in the diagram (but it remains off when an error occurs). Thus, you can use the output as a timing signal during running (including test running).

Dimensions

Unit: mm (inch)

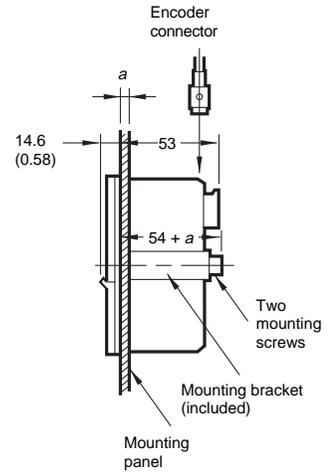
■ CAM POSITIONERS

Panel Mounting Type
H8PS-8B, H8PS-8BP

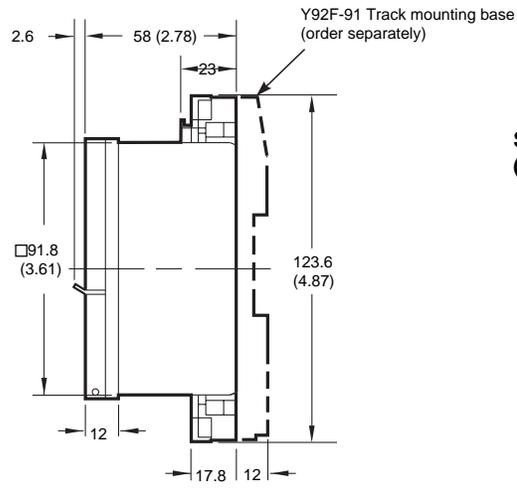
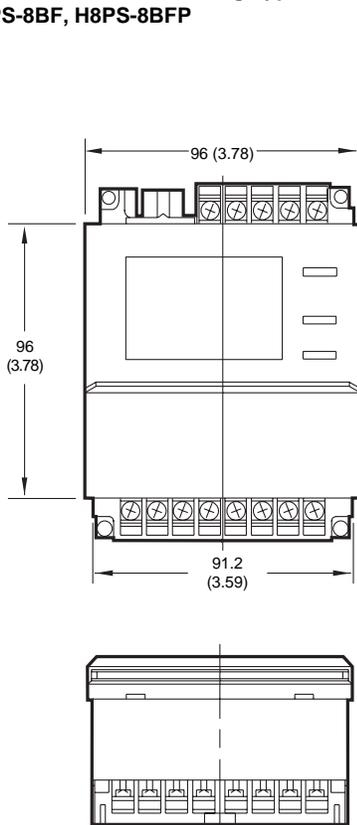


Panel Cutout

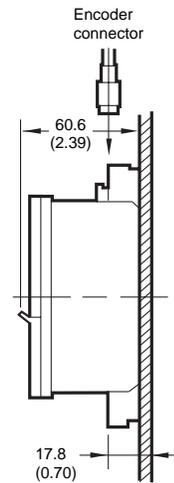
Flush mount
(H8PS-8B, -8BP)



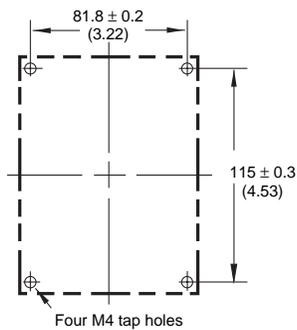
Surface and Track Mounting Type
H8PS-8BF, H8PS-8BFP



Surface mount
(H8PS-8BF, -8BFP)

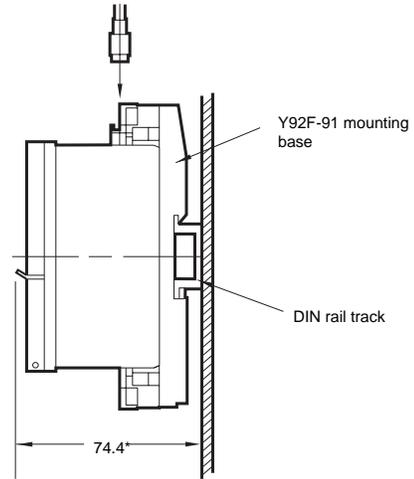
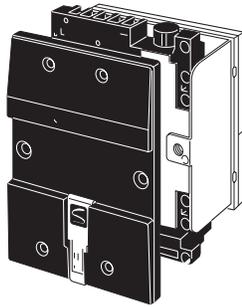


Mounting hole



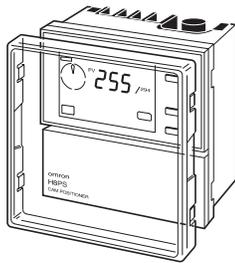
■ ACCESSORIES

Track Mounting Base Y92F-91

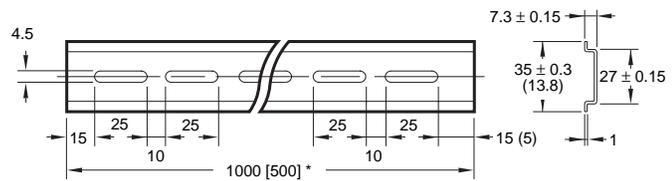


* for PFP-100N or PFP-50N

Protective Cover Y92A-96B



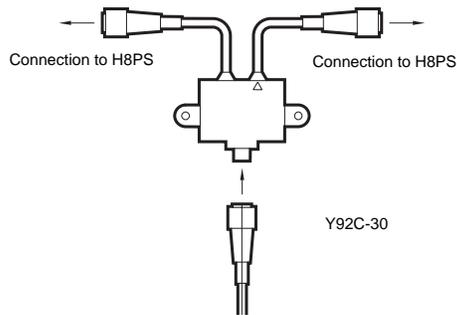
DIN Rail Track PFP-100N/PFP-50N



*Dimensions in brackets are for the PFP-50N

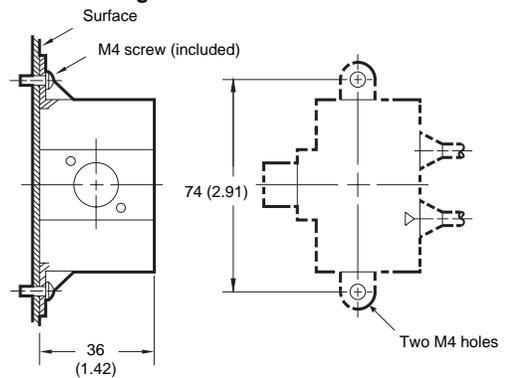
Adapter for Parallel Operation Y92C-30

This adapter enables two H8PS Cam Positioners to share a signal from an encoder.

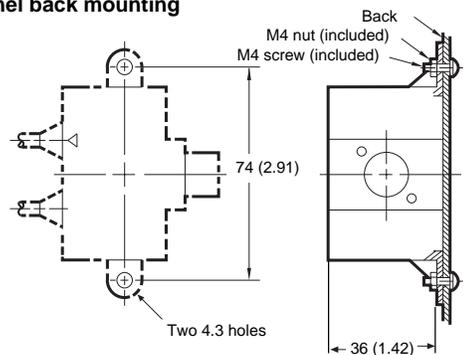


Use the cable marked ▲ when connecting only one H8PS Cam Positioner to the adapter

Panel surface mounting

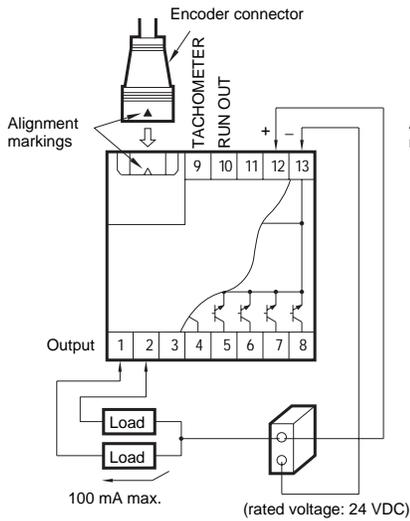


Panel back mounting

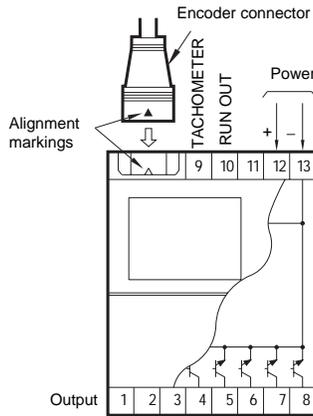


Connections

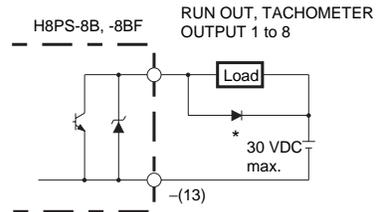
H8PS-8B



H8PS-8BF



Output Stage Circuit Diagram

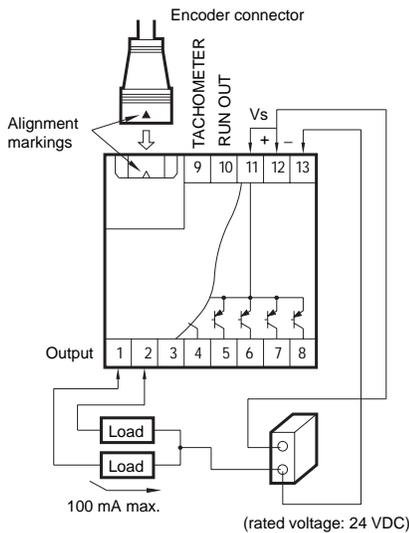


* When using an inductive load, connect a reverse surge-absorbing diode.

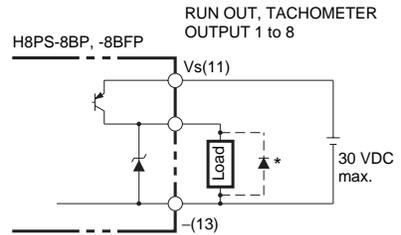
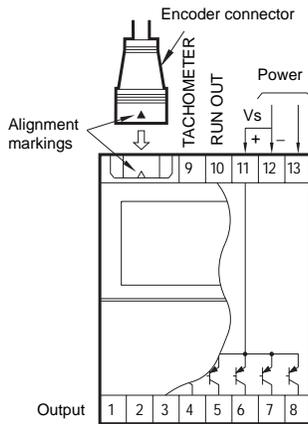
	RUN OUT OUTPUT 1 to 8	TACHOMETER
Output method	NPN open collector	NPN open collector
Dielectric method	30 V	30 V
Rated current	100 mA	30 mA
Residual voltage	2 V max.	0.5 V max.
Leak current	100 μ A max.	5 μ A max.

* Note that internal circuit damage can result from a short circuit in the load.

H8PS-8BP



H8PS-8BFP



* When using an inductive load, connect a reverse surge-absorbing diode.

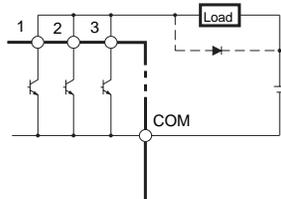
	RUN OUT OUTPUT 1 to 8	TACHOMETER
Output method	PNP open collector	PNP open collector
Dielectric method	30 V	30 V
Rated current	100 mA	30 mA
Residual voltage	2 V max.	2 V max.
Leak current	100 μ A max.	100 μ A max.

* Note that internal circuit damage can result from a short circuit in the load.

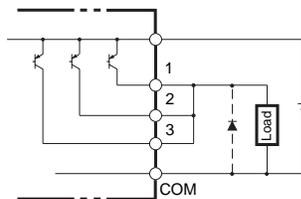
■ MULTIPLE OUTPUTS

Multiple outputs (OUTPUT 1 to 8) can be connected to operate a load as shown below.

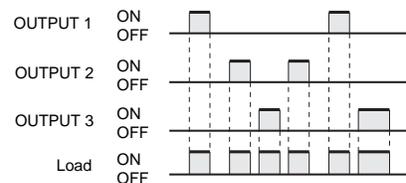
H8PS-8B, -8BF



H8PS-8B, -8BFP



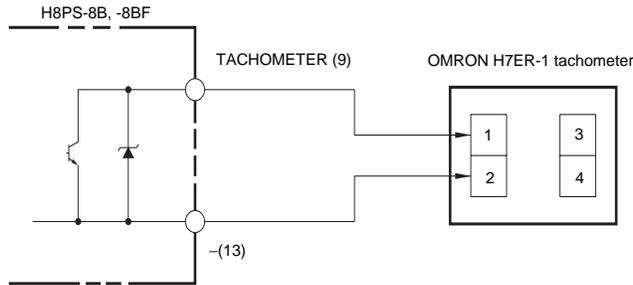
Timing chart



CONNECTION EXAMPLES

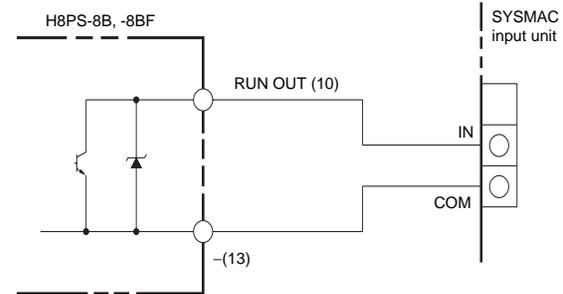
Example of the TACHOMETER connection

Since the rotational output consists of 60 pulses per revolution, select an appropriate rpm meter.



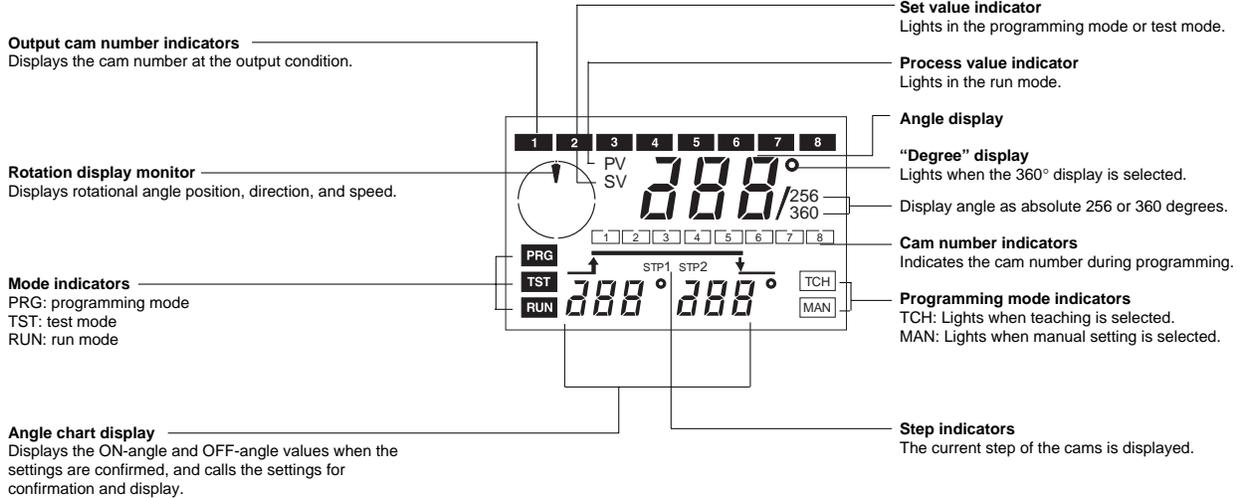
Example of RUN OUT connection

The output is on during run and test modes and can be used as a status signal by connecting to the input unit of a programmable controller (SYSMAC) or similar device.

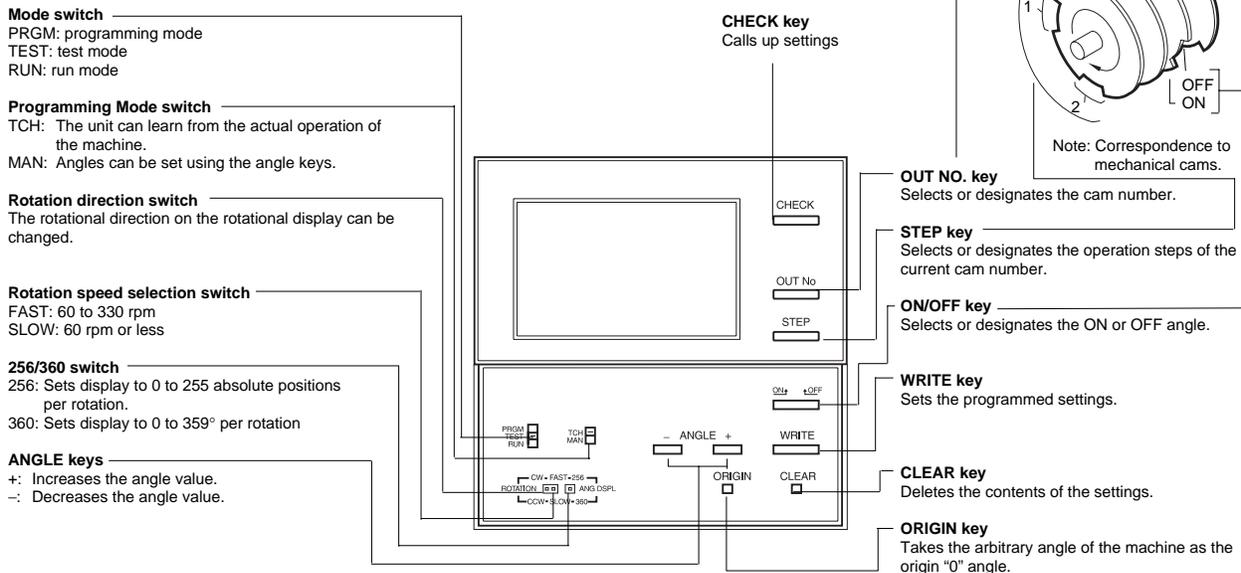


Nomenclature

DISPLAY

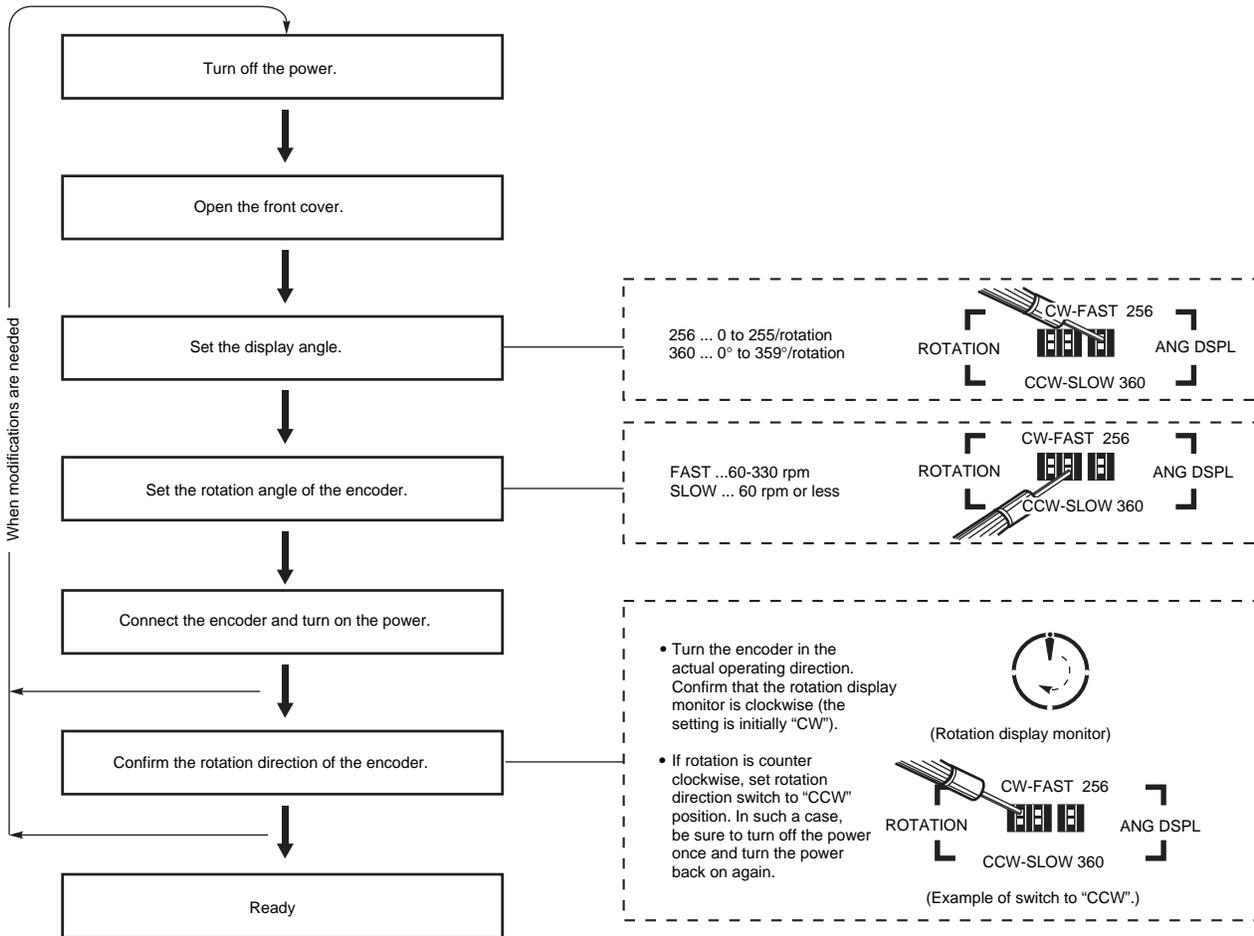


OPERATIONS



Programming

INITIALIZING



Precautions

■ ERROR DISPLAYS AND CANCELLING

When an error occurs, perform the following cancellation operation.

(When the following errors occur, all outputs turn off except for the Tachometer output.)

Display	Description	Cancellation method
	<ul style="list-style-type: none"> Set origin data error 	<ul style="list-style-type: none"> Reset the origin in the programming mode and return to the previous mode.
	<ul style="list-style-type: none"> Memory error, when settings have been modified 	<ul style="list-style-type: none"> Switch to the programming mode and confirm all settings. After correcting any settings, return to the previous mode.
	<ul style="list-style-type: none"> Encoder input data error <ol style="list-style-type: none"> The encoder is malfunctioning or a connector is disconnected. The encoder rotation speed exceeds the response limit. The encoder output data became scrambled because of noise. A line to the encoder is cut. 	<ul style="list-style-type: none"> Switch to the programming mode and check the following items. Return to the previous mode after corrections. <ul style="list-style-type: none"> Encoder abnormality Faulty encoder connector contacts Encoder rotation speed and response speed settings Noise and surge protection

- After turning on the power, it takes approximately two seconds until normal operation.
- When the ON angle and OFF angle are the same value, no output occurs.

■ HANDLING

- Turn the operation power on or off all at once via a contact such as a switch or relay.
- Avoid operation in the following environments:
 - An ambient temperature below -10°C or above $+55^{\circ}\text{C}$.
 - Very dusty locations.
 - Very humid locations.
 - Locations where corrosive gases are generated.
 - Locations with heavy vibrations or impact.
 - Locations prone to water or oil.
 - Locations with direct sunlight.
- For operation in environments with much electrical noise generation, separate the encoder cords and the main unit of the H8PS from high-power cables that have noise or noise-generating sources.
- The external finish of the main unit is prone to organic solvents (thinner, benzene, etc.), strong alkali (ammonia, sodium hydroxide), and strong acid. Please avoid contact.
- Store the devices between -25°C and $+65^{\circ}\text{C}$. For storage below -10°C , power the unit up at room temperature after letting it stand for three hours.
- To perform dielectric testing, impulse-voltage testing, and insulation-resistance measuring between the electrical circuitry and the uncharged metal parts when the unit is mounted in a control panel, first disconnect the wiring of the unit from the circuitry. (This prevents degradation or damage of internal circuitry in the event that part of the control-panel equipment has faulty voltage resistance or faulty insulation. The test voltage might go to the power-supply terminals of the main unit.)
- The encoder consists of precision parts. Exercise care in handling, and make sure no excessive shock or pressure is applied to the encoder. Especially make sure that the encoder's rotating shaft receives no excessive force.
- The connections for the main unit connectors should have no undue stress applied. Wire cables accordingly.

Warning

- The H8PS has a built-in lithium battery. Be sure to dispose of the old H8PS properly, as lithium batteries are likely to explode if incinerated.
- Electrical Shock Hazard**
Never touch the input terminals of any H8PS cam positioner when power is being applied to the cam positioner.

Reference Data

■ ANGLE DATA TABLE

The H8PS uses an absolute encoder with 256 divisions per revolution. To assist with programming, displays and settings may be done by conversion to 360 degrees by a switch on the operation section. The following table shows the conversions.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0°	1°	3°	4°	6°	7°	8°	10°	11°	13°	14°	15°	17°	18°	20°	21°
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
23°	24°	25°	27°	28°	30°	31°	32°	34°	35°	37°	38°	39°	41°	42°	44°
32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
45°	46°	48°	49°	51°	52°	53°	55°	56°	58°	59°	60°	62°	63°	65°	66°
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
68°	69°	70°	72°	73°	75°	76°	77°	79°	80°	82°	83°	84°	86°	87°	89°
64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
90°	91°	93°	94°	96°	97°	98°	100°	101°	103°	104°	105°	107°	108°	110°	111°
80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
113°	114°	115°	117°	118°	120°	121°	122°	124°	125°	127°	128°	129°	131°	132°	134°
96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
135°	136°	138°	139°	141°	142°	143°	145°	146°	148°	149°	150°	152°	153°	155°	156°
112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
158°	159°	160°	162°	163°	165°	166°	167°	169°	170°	172°	173°	174°	176°	177°	179°
128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
180°	181°	183°	184°	186°	187°	188°	190°	191°	193°	194°	195°	197°	198°	200°	201°
144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
203°	204°	205°	207°	208°	210°	211°	212°	214°	215°	217°	218°	219°	221°	222°	224°
160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
225°	226°	228°	229°	231°	232°	233°	235°	236°	238°	239°	240°	242°	243°	245°	246°
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
248°	249°	250°	252°	253°	255°	256°	257°	259°	260°	262°	263°	264°	266°	267°	269°
192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
270°	271°	273°	274°	276°	277°	278°	280°	281°	283°	284°	285°	287°	288°	290°	291°
208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
293°	294°	295°	297°	298°	300°	301°	302°	304°	305°	307°	308°	309°	311°	312°	314°
224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
315°	316°	318°	319°	321°	322°	323°	325°	326°	328°	329°	330°	332°	333°	335°	336°
240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
338°	339°	340°	342°	343°	345°	346°	347°	349°	350°	352°	353°	354°	356°	357°	359°

How to Use the Table

0	1	—	256 display (encoder output data)
0°	1°	—	360° display (360° converted data)

NOTE: DIMENSIONS ARE IN MILLIMETERS. To convert millimeters to inches, divide by 25.4.

OMRON

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