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You can read the recommendations in the user guide, the technical guide or the installation guide for OMRON H8PS. You'll find the answers to all your questions on the OMRON H8PS in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual OMRON H8PS
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OMRON

**Cam Positioner
H8PS**

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments. Refer to *Warranty and Application Considerations* (pages 30), and *Safety Precautions* (pages 17 and 18).

This Compact Cam Positioner, Popular for its Ease-of-use, Now Comes with Even Better Functions.

- Compact 8-, 16-, and 32-output Models available that are 1/4-DIN size at 96 x 96 mm.
- High-speed operation at 1,600 r/min and high-precision settings to 0.5° ensure widespread application.
- Highly visible display with backlit negative transmissive LCD.
- Advance angle compensation function to compensate for output delays.
- Bank function for multi-product production (8 banks). (H8PS-16/A/32 models.)

Features

Models with 8, 16, or 32 Outputs
The lineup includes Models with 32 outputs in a compact 1/4-DIN size. Using the optional Parallel Input Adapter (Y92-C-30) enables expanding to up to 64 outputs for one encoder to support anything from a simple positioning application to a large-scale system.

8-output Models

16-output Models

32-output Models

Simple Programming
The programming method is designed based on a one key-one action concept for settings that could not be simpler. Both initial settings and factory adjustments are effort-free.

Large, Backlit Negative LCDs
Large LCDs, red for the process value and green for set values, show a wealth of operation information, making operating status visible at a glance.

**High Speed Up To 1,600 r/min
High Precision Up To 0.5° (at 720 Resolution)**
High-speed, high-precision applications can be easily handled and productivity increased.

Bank Function for Multi-product Production
Up to eight different programs can be registered in advance to enable fast and easy switching between products (16/32-output Models only).

USB Communications for Easy Setting from a Computer
Optional Support Software can be used to enable programming from a personal computer via USB communications. Programs can be easily copied, saved, printed, and much more.

Speed Display and Speed Alarm Output
Both the speed (rotations/minutes) and present angular position can be displayed at the same time. Alarm outputs can be produced for both upper and lower speed limits.

Advance Angle Compensation Function to Compensate for Output Delays
The advance angle compensation (ADV) function automatically advances the ON/OFF angle of outputs in proportion to machine (encoder) speed to compensate for the delay in timing of ON/OFF operation. ADV values can be set individually for 7 cam outputs.

Pulse Output for Timing Control
The number of pulses per rotation and the pulse output start angle can be set to enable operations like adjusting timing with a PLC or outputting to a rotation meter.

Cam Positioner H8PS 1



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Manual abstract:

· Advance angle compensation function to compensate for output delays. · Bank function for multi-product production (8 banks). (H8PS-16@/-32@ models.) Features Models with 8, 16, or 32 Outputs The lineup includes Models with 32 outputs in a compact 1/4-DIN size. Using the optional Parallel Input Adapter (Y92C-30) enables expanding to up to 64 outputs for one encoder to support anything from a simple positioning application to a large-scale system. 8-output Models 16-output Models 32-output Models Speed Display and Speed Alarm Output Both the speed (rotations/minutes) and present angular position can be displayed at the same time. Alarm outputs can be produced for both upper and lower speed limits. 1 2 7 RUN Present angular position Speed CAM STEP Error Speed Upper limit s 96 mm Switchable 96 mm 1 2 7 RUN Simple Programming The programming method is designed based on a one key-one action concept for settings that could not be simpler. Both initial settings and factory adjustments are effort-free. CAM STEP Lower limit Upper limit alarm output Lower limit alarm output Speed Present angular position Large, Backlit Negative LCDs Large LCDs, red for the process value and green for set values, show a wealth of operation information, making operating status visible at a glance.

Advance Angle Compensation Function to Compensate for Output Delays The advance angle compensation (ADV) function automatically advances the ON/OFF angle of outputs in proportion to machine (encoder) speed to compensate for the delay in timing of ON/OFF operation. ADV values can be set individually for 7 cam outputs. Cam program settings 100° 180° High Speed Up To 1,600 r/min High Precision Up To 0.5° (at 720 Resolution) High-speed, high-precision applications can be easily handled and productivity increased. 8° compensation At high-speed (400 r/min) 92° 172° Bank Function for Multi-product Production Up to eight different programs can be registered in advance to enable fast and easy switching between products (16/32-output Models only).

Pulse Output for Timing Control The number of pulses per rotation and the pulse output start angle can be set to enable operations like adjusting timing with a PLC or outputting to a rotation meter. PLC USB Communications for Easy Setting from a Computer Optional Support Software can be used to enable programming from a personal computer via USB communications. Programs can be easily copied, saved, printed, and much more. Pulse output Rotation meter Cam Positioner H8PS 1 Model Number Structure Model Number Legend H8PS-@@@ 1234 1. Number of outputs 8: 8 outputs 16: 16 outputs 32: 32 outputs 2.

Panel language B: English 3. Mounting method None: Flush mounting F: Surface mounting/ track mounting 4. Output configuration None: NPN transistor output P: PNP transistor output Ordering Information List of Models Cam Positioner Number of outputs 8 outputs Mounting method Flush mounting Surface mounting/ track mounting 16 outputs Flush mounting Surface mounting/ track mounting 32 outputs Flush mounting Surface mounting/ track mounting Output configuration NPN transistor output PNP transistor output NPN transistor output PNP transistor output NPN transistor output PNP transistor output NPN transistor output PNP transistor output PNP transistor output PNP transistor output PNP transistor output Yes Bank function No H8PS-8B H8PS-8BP H8PS-8BF H8PS-8BFP H8PS-16B H8PS-16BP H8PS-16BF H8PS-16BFP H8PS-32B H8PS-32BP H8PS-32BF H8PS-32BFP Model Dedicated Absolute Encoder Type Economy Standard 256 256 360 720 Rigid 256 360 720 2m Resolution Cable length 2m 1m 2m Model E6CP-AG5C-C 256 2M E6C3-AG5C-C 256 1M E6C3-AG5C-C 256 2M E6C3-AG5C-C 360 2M E6C3-AG5C-C 720 2M E6F-AG5C-C 256 2M E6F-AG5C-C 360 2M E6F-AG5C-C 720 2M Accessories (Order Separately) Name Discrete Wire Output Cable Connector-type Output Cable Support Software USB Cable Shaft Coupling for the E6CP Shaft Coupling for the E6C3 Shaft Coupling for the E6F Extension Cable (See note.) Parallel Input Adapter Protective Cover Watertight Cover Track Mounting Base Mounting Track 2m 2m CD-ROM A miniB, 2 m Axis: 6 mm dia. Axis: 8 mm dia. Axis: 10 mm dia. 5 m (same for E6CP, E6C3, and E6F) Two Units can operate in parallel. -----50 cm x 7.3 mm (l x t) 1 m x 7.3 mm (l x t) 1 m x 16 mm (l x t) End Plate Spacer ----Specification Model Y92S-41-200 E5ZE-CBL200 H8PS-SOFT-V1 Y92S-40 E69-C06B E69-C08B E69-C10B E69-DF5 Y92C-30 Y92A-96B Y92A-96N Y92F-91 PFP-50N PFP-100N PFP-100N2 PFP-M PFP-S Note: Ask your OMRON representative about the availability of non-standard lengths.

2 Cam Positioner H8PS Specifications Ratings Item Rated supply voltage Operating voltage range Mounting method Power consumption Inputs Encoder input External Input inputs signals Input type 24 VDC 85% to 110% of rated supply voltage Flush mounting Surface mounting, track mounting Flush mounting Surface mounting, track mounting H8PS-@B H8PS-@BF H8PS-@BP H8PS-@BFP Approx. 4.5 W at 26.4 VDC for 8-output models Approx. 6.0 W at 26.4 VDC for 16-/32-output models Connections to a dedicated absolute encoder 8-output Models: None 16-/32-output Models: Bank inputs 1/2/4, origin input, start input No voltage inputs: ON impedance: 1 k max. (Leakage current: approx. 2 mA at 0) ON residual voltage: 2 V max., OFF impedance: 100 k min.

, Applied voltage: 30 VDC max. Minimum input signal width: 20 ms NPN open-collector transistor outputs 30 VDC max., 100 mA max. (Do not exceed 1.6 A total for all cam outputs and the RUN output.

), residual voltage: 2 VDC max. NPN open-collector transistor output 30 VDC max., 30 mA max., residual voltage: 0.5 VDC max.

PNP open-collector transistor outputs 30 VDC max. (26.4 VDC for 16-/32-output Models), 100 mA max. (Do not exceed 1.6 A total for all cam outputs and the RUN output.), residual voltage: 2 VDC max. PNP open-collector transistor output 30 VDC max. (26.4 VDC for 16-/32-output Models) 30 mA max., residual voltage: 2 VDC max.

Outputs Cam outputs RUN output Pulse output Number of outputs 8-output Models: 8 cam outputs, 1 RUN output, 1 pulse output 16-output Models: 16 cam outputs, 1 RUN output, 1 pulse output 32-output Models: 32 cam outputs, 1 RUN output, 1 pulse output 8 banks (for 16-/32-output Models only) 7-segment, negative transmissive LCD (Main Display: 11 mm (red), Sub-display: 5.5 mm (green)) EEPROM (overwrites: 100000 times min.) that can store data for 10 years min. Number of banks Display method Memory backup method Ambient operating temperature Storage temperature Ambient humidity Degree of protection Case color -10 to 55°C (with no icing or condensation) -25 to 65°C (with no icing or condensation) 25% to 85% Panel surface: IP40, Rear case: IP20 Light gray (Munsell 5Y7/1) Cam Positioner H8PS 3 Characteristics Setting unit Number of steps Inputs Encoder input 0.



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5° increments at a resolution of 720, 1° increments at a resolution of 256 or 360 (See note 1.) Up to 10 steps can be set for each cam to turn the output ON/OFF 10 times. (See note 2.) Connections to a dedicated absolute encoder · Response rotation speed (in Run/Test Mode) 1600 r/min max. at a resolution of 256 or 360 (1200 r/min max. if ADV function is set for 4 or more cams) (See notes 3 and 4.)

) 800 r/min max. at a resolution of 720 (600 r/min max. if ADV function is set for 4 or more cams) · Includes error data detection 256/360 resolution 100 m max. at 330 r/min or less 52 m max. at 331 to 1200 r/min (331 to 900 r/min if ADV function is set for 4 or more cams) 12 m max. at 1201 to 1600 r/min (901 to 1200 r/min if ADV function is set for 4 or more cams) 720 resolution 100 m max. at 330 r/min or less 52 m max. at 331 to 600 r/min (331 to 450 r/min if ADV function is set for 4 or more cams) 12 m max. at 601 to 800 r/min (451 to 600 r/min if ADV function is set for 4 or more cams) 0.3 ms max.

100 M min. (at 500 VDC) between current-carrying terminals and exposed non-current-carrying metal parts, between all current-carrying parts and the USB connector 1000 VAC, 50/60 Hz for 1 min between current-carrying terminals and exposed non-current-carrying metal parts 500 VAC, 50/60 Hz for 1 min between current-carrying section and USB connector, and between current-carrying terminals and non-current-carrying metal part of output connector 1 kV between power terminals 1.5 kV between current-carrying terminals and exposed non-current-carrying metal parts Encoder cable extension distance Output response time Insulation resistance Dielectric strength Impulse withstand voltage Noise immunity Static immunity Vibration resistance Shock resistance Destruction Malfunction Destruction Malfunction ±480 V between power terminals, ±600 V between input terminals Square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) 8 kV (malfunction), 15 kV (destruction) 10 to 55 Hz with 0.75-mm single amplitude each in 3 directions for 2 hours each 10 to 55 Hz with 0.5-mm single amplitude each in 3 directions for 10 minutes each 300 m/s² 3 times each in 6 directions 200 m/s² 3 times each in 6 directions cULus (Listing): UL508/CSA C22.2 No. 14 EN61326 EN55011 Group1 Class A EN61326 EN61000-4-2: 4 kV contact discharge 8 kV air discharge Immunity RF-interference: EN61000-4-3: 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) 10 V/m (Pulse-modulated, 900 MHz ±5 MHz) Immunity Conducted Disturbance EN61000-4-6: 10 V (0.15 to 80 MHz) Immunity Burst: EN61000-4-4: 2 kV for power-line 1 kV for I/O signal-line Immunity Surge: EN61000-4-5: 1 kV line to line (power line) 2 kV line to ground (power line) Approx. 300 g (Cam Positioner main unit only) (EMI) Emission Enclosure: (EMS) Immunity ESD: Approved safety standards EMC Weight Note: 1. 2.

3. 4. Cam output precision, however, is 2° max. for Encoder with 256 resolution (P/R). Although 32-output Models can have 10 steps set for any one output, there must be no more than 160 steps total set for all cam outputs. The maximum is 1000 r/min when an E6CP-AG5C-C Encoder is connected. ADV stands for Advance Angle Compensation. 4 Cam Positioner H8PS Functions Item Encoder rotation direction switching Encoder origin designation H8PS-8@ H8PS-16@ H8PS-32@ Encoder data can be set with a DIP switch to forward (CW) or reverse (CCW) direction. The present display angular position can be set to 0° (origin) by using the The present display angular position can be set to 0° (origin) by origin input terminal or the ORIGIN Key on the front panel. pressing the ORIGIN Key on the Note: All banks use the same origin.

front panel. Converts the Absolute Encoder value display from 256 divisions/revolution to 360°/revolution. Graphically displays the Encoder rotational angular position. Sets the cam output ON/OFF angle based on actual machine (Encoder) operation. Outputs a preset number of pulses per Encoder rotation. It also sets the pulse output start angle. Displays both the present angular position and the number of Encoder revolutions (speed) in Run Mode. Switches back and forth between the main display showing the present angular position with the sub-display showing the speed and the main display showing the speed with the sub-display showing the present angular position. --Enables the entire cam program to be changed at one time by switching banks (0 to 7). The bank that is running can be switched using the bank input terminal or the BANK Key on the front panel.

Also enables programs to be copied between banks. Angle display switch Rotation display monitor Teaching function Pulse output Switching the angle and speed displays Bank function Advance angle compensation Automatically advances the ON/OFF angle of cam outputs in proportion to machine (encoder) speed to (ADV) function compensate for the delay in timing of ON/OFF operation. ADV values can be set individually for 7 cam outputs. Speed alarm output All protection function Cam protection function Step number limit Output prohibit A specified cam output can be used as an Encoder speed alarm output. The 16 18 20 Output Cable 1 Wiring Table Outputs Cam 1 Cam 2 Cam 3 Cam 4 Cam 5 Cam 6 Cam 7 Cam 8 COM Vs Connector pin No. 20 18 16 14 12 10 8 6 4 2 Outputs Cam 9 Cam 10 Cam 11 Cam 12 Cam 13 Cam 14 Cam 15 Cam 16 COM Vs Connector pin No. 19 17 15 13 11 9 7 5 3 1 Output Cable 2 Wiring Table Outputs Cam 17 Cam 18 Cam 19 Cam 20 Cam 21 Cam 22 Cam 23 Cam 24 COM Vs Connector pin No. 20 18 16 14 12 10 8 6 4 2 Outputs Cam 25 Cam 26 Cam 27 Cam 28 Cam 29 Cam 30 Cam 31 Cam 32 COM Vs Connector pin No. 19 17 15 13 11 9 7 5 3 1 Using Connector-Terminal Block Conversion Units H8PS-16@/-32@ Cam 12 Cam 11 Cam 10 Cam 15 Cam 13 Cam 14 Cam 28 Cam 16 Cam 31 (CN1) Output Cable 1 (CN2) Output Cable 2 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 Cam 2 Cam 1 Cam 4 Cam 3 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 Cam 20 Cam 23 Cam 24 Cam 22 Cam 21 Cam 19 Cam 18 Cam 17 Vs COM Vs Cam 7 XW2D-20G6 Connector-Terminal Block Conversion Unit (Order Separately) Cam 8 Cam 6 Cam 5 COM Cam 32 Cam 30 Cam Positioner H8PS Cam 29 Cam 27 Cam 26 COM Vs COM Cam 25 Cam 9 E5ZE-CBL200 Connector-type Output Cable (Order Separately) Terminal Arrangement of the XW2D-20G6 Connector-Terminal Block Conversion Unit Output Cable 1 Output Cable 2 Vs 7 2. Y92S-41-200 Discrete Wire Output Cable (Order Separately) Connections H8PS-16@/-32@ Output Cable 1 Wiring Table Outputs Cable color Orange Gray White Yellow Pink Orange Gray White Yellow Pink Marks Marking color Black Black Black Black Black Black Black Black Black Outputs Cam 9 Cam 10 Cam 11 Cam 12 Cam 13 Cam 14 Cam 15 Cam 16 COM Vs Cable color Orange Gray White Yellow Pink Orange Gray White Yellow Pink Marks Marking color Red Red Red Red Red Red Red Red Red Red Y92S-41-200 Discrete Wire Output Cable (Order Separately) Cam 1 Cam 2 (CN1) (CN2) Cam 3 Cam 4 Cam 5 Cam 6 Cam 7 Cam 8 COM Vs Output Cable 1 Output Cable 2 Output Cable 2 Wiring Table Outputs Cam 17 Cam 18 Cam 19 Cam 20 Cam 21 Cam 22 Cam 23 Cam 24 COM Vs Cable color Orange Gray White Yellow Pink Orange Gray White Yellow Pink Marks Marking color Black Black Black Black Black Black Black Black Black Outputs Cam 25 Cam 26 Cam 27 Cam 28 Cam 29 Cam 30 Cam 31 Cam 32 COM Vs Cable color Orange Gray White Yellow Pink Orange Gray White Yellow Pink Marks Marking color Red Red Red Red Red Red Red Red Red Red 8 Cam Positioner H8PS Input Connections Only the Encoder inputs are connected with 8-output Models.



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The inputs are no-voltage (short-circuit or open) inputs. No-voltage Inputs Open Collector PLC, sensor, etc. Contact Input Voltage-output sensors can also be connected. Connection Examples Sensor, etc. Bank 1 Bank 2 Bank 1 Bank 2 Bank 4 Bank 4 Origin Origin COM COM Start Start Bank 1 Bank 2 Bank 4 Origin 10 11 COM H8PS-16@ H8PS-32@ 6 7 8 9 10 11 H8PS-16@ H8PS-32@ 6 7 8 9 10 11 Note: Operates when the transistor turns ON. Note: Operates when the contact turns ON. H8PS-16@ H8PS-32@ 6 7 8 9 Note: Operates when the transistor turns ON. No-voltage Input Signal Levels No-contact inputs Short-circuit level for transistor ON · Residual voltage: 2 V max. · Impedance when ON: 1 k max. (The leakage current is approx.

2 mA when the impedance is 0 .) Open level for transistor OFF · Impedance when OFF: 100 k min. Contact inputs Use a contact that can adequately switch 2 mA at 5 V. Note: Use a maximum DC power supply of 30 V. Output Connections Note: Internal circuit damage may result from a short circuit in the load. NPN Output Models Outputs Load PNP Output Models Vs (See note.) Outputs Load (See note.) COM/(-) Note: Always connect a diode to absorb counter-electromotive force when connecting an inductive load. COM/(-) Note: Always connect a diode to absorb counter-electromotive force when connecting an inductive load. Item Output method Dielectric strength Rated current Residual voltage Leakage current Cam outputs, RUN output NPN open collector 30 VDC 100 mA (See note.

) 2 VDC max. 100 µA max. Pulse output Item Output method Dielectric strength Cam outputs, RUN output PNP open collector Pulse output 30 mA 0.5 VDC max. 5 µA max. Rated current Residual voltage Leakage current 8-output Models: 30 VDC 16-/32-output Models: 26.4 VDC 100 mA (See note.) 2 VDC max. 100 µA max. 30 mA Note: Do not exceed 1.

6 A total for all cam outputs and the RUN output. Note: Do not exceed 1.6 A total for all cam outputs and the RUN output. Cam Positioner H8PS Start 9 Operating Mode Functions The H8PS Cam Positioner receives angle signal inputs from the Dedicated Absolute Encoder and outputs the preset ON/OFF angles as cam outputs. Program Examples 1. H8PS-8@ (8-output Models) Cam output (cam number) 1 2 Step 0 ON angle 45° 0° OFF angle 90° 90° ON angle 135° 135° Step 1 OFF angle 225° 180° --ON angle 270° --Step 9 OFF angle 315° 8 0° 90° 45° 225° 90° 135° 270° 180° 225° 285° 270° 315° 0° 45° 315° 345° Cam output 1 Step 0 Step 1 Step 9 Cam output 2 Step 0 Step 1 Step 1 Step 9 Cam output 8 Step 0 (ON/OFF ratio 1:1) Pulse output (See note 1.) Outputs a preset number of pulses per Encoder rotation. (Default setting: 60 pulses/revolution) Note 1: The number of pulses per Encoder rotation and the pulse output start angle can be set. Note 2: With counterclockwise rotation (359°, 358° ..

.1°, 0°), step 0 for cam output 1 turns ON at 89° and OFF at 44° at in the diagram. RUN output ON during Run or Test Mode. OFF when an error occurs. 2. H8PS-16@ /-32@ (16-/32-output Models) Cam Program (Bank No. 7) Cam Program (Bank No. 2) Cam Program (Bank No. 1) Cam Program (Bank No. 0) Cam output (cam number) 1 2 Step 0 ON angle 45° 0° OFF angle 90° 90° Step 1 ON angle 135° 135° OFF angle 225° 180° Step 9 ON angle 270° --OFF angle 315° --- 32 90° 225° 270° 285° 315° 345° 0° 45° 90° 135° 180° 225° 270° 315° 0° 45° Cam output 1 Step 0 Step 1 Step 9 Cam output 2 Step 0 Step 1 Step 1 Step 9 Cam output 32 Step 0 (ON/OFF ratio 1:1) Pulse output (See note 1.

) Outputs a preset number of pulses per Encoder rotation. (Default setting: 60 pulses/revolution) RUN output ON during Run or Test Mode. OFF when an error occurs. Start input (See note 2.) Note 1: The number of pulses per Encoder rotation and the pulse output start angle can be set. Note 2: Be sure to turn ON the start input in Run and Test modes. Otherwise, there will be no outputs (output prohibited), including the cam outputs, pulse output, and RUN output. Note 3: With counterclockwise rotation (359°, 358° ...

1°, 0°), step 0 for cam output 1 turns ON at 89° and OFF at 44° in the diagram. Note: The entire cam program can be changed at one time with 16- and 32-output Models with the bank function (banks 0 to 7). For details on the procedure for switching banks, refer to page 28. 10 Cam Positioner H8PS Nomenclature Displays 8-output Models (1) Cam output indicators (2) PV/SV indicator 1 2 3 4 5 6 7 8 PRG TST RUN Display Details (8) All protect indication (9) Mode indicator (10) Main display No. Display color (1) (2) Red Description Orange Lit while cam outputs are ON. PV: Lit while the present angular position or speed is displayed in main display. SV: Lit while the setting value is displayed in main display. (4) Rotation display monitor (11) Unit indication (12) 256 indication (13) Unit indication (14) Sub-display (3) (4) (5) (6) (7) (8) Orange Lit while the start input is ON in Run or Test Mode. Not lit when an error occurs. Orange Displays Encoder present angular position, direction, and speed guidelines.

Green Green Green Displays the bank number that is running in Run or Test Mode and the bank number selected in Programming Mode. Displays the cam number for the angle setting displayed on subdisplay. Displays the step number for the angle setting displayed on subdisplay. (6) Cam No. display (7) Step No.

display CAM STEP (15) ON/OFF indication (16) ADV indication 16-/32-output Models (1) Cam output indicators (2) PV/SV indicator (3) Start input indication (4) Rotation display monitor (5) Bank No. display (6) Cam No. display (7) Step No. display CAM STEP 1 11 21 31 2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 22 23 24 25 26 27 28 29 30 32 PRG TST RUN Orange Lit while the All Protection function is enabled. Orange The indicator for the selected mode is lit.

PRG: Programming Mode TST: Test Mode RUN: Run Mode Displays the present angular position or the speed and settings being made. Displays units for the angle or the speed displayed on main display. Lit while using an Encoder with a resolution of 256 if 256° display is selected. Displays units for the angle or the speed displayed on sub-display. Displays the speed or the ON/OFF angle settings. Indicates whether main display displays the ON or OFF angle setting. Lit while setting the Advance Angle Compensation (ADV) Function. (8) All protect indication (9) Mode indicator (10) Main display (11) Unit indication (12) 256 indication (13) Unit indication (14) Sub-display (15) ON/OFF indication (16) ADV indication (9) (10) Red (11) Red (12) Red (13) Green (14) Green (15) Green (16) Green Operation Keys 8-output Models CHECK Operation Key Details No.



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1 Description Displays program details in Run Mode. Selects the cam number with Selects the step number with Selects the bank number.

Selects the ON angle, or OFF angle Writes the set data to memory. Changes the angle or other setting value with Keys. Keys. Keys. 1. CHECK key CAM 2 3
2. CAM keys STEP 4 5 6 7 3. STEP keys 11. ADV key 12. Mode switch 13.

Programming mode switch 14. Rotation direction switch 15. Encoder resolution switch PRGM TEST RUN CW 1234 ON OFF 3 4 PLS/R ANG DSPL CAM
STEP ADV TCH MAN ANGLE ON OFF 8 5. ON/OFF key WRITE Connects the Cam Positioner to a personal computer via USB cable (order separately) for
programming with the Support Software (order separately). Moves to the screen for clearing settings Designates the current angle of the machine (Encoder)
as the origin (0°).

Programming or Test Mode: Press to shift to the ADV function setting screen. Programming Mode: Press and hold at least 3 s to shift to the Function Setting
Mode. Run Mode: Press and hold at least 5 s to enable/disable the All Protection function. Switches modes. Programming Mode (PRGM): Used to write cam
programs, set the ADV function, etc.

Test Mode (TEST): Used to modify settings while the Encoder is running. Run Mode (RUN): Used for normal operation and to check the cam program. Select
the method used for programming cams. Teaching: ON/OFF Angles can be set based on actual machine (Encoder) operation. Manual: ANGLE Keys can be
used to set ON/OFF angles. Sets the H8PS rotation direction (rotation display monitor, etc.) to the machine (Encoder) rotation direction. Sets the resolution
of the connected Encoder. Also sets the unit for angle display when using an Encoder with a resolution of 256. 9 6.

WRITE key ON ON ON OFF OFF ON OFF OFF 10 11 256 256 360 720 256 360 360 360 ORIGIN CLEAR 7. ANGLE keys 9. CLEAR key 10. ORIGIN key
CCW DO NOT USE. 16-/32-output Models CHECK 12 1. CHECK key CAM 2. CAM keys STEP 13 3. STEP keys 11. ADV key 12. Mode switch 13.

Programming mode switch 14. Rotation direction switch 15. Encoder resolution switch PRGM TEST RUN CW 1234 ON OFF 3 4 PLS/R ANG DSPL CAM
STEP 4. BANK key ADV BANK ANGLE ON OFF 14 15 TCH MAN WRITE 5. ON/OFF key 6.

WRITE key ON ON ON OFF OFF ON OFF OFF 256 256 360 720 256 360 360 360 ORIGIN CLEAR 7. ANGLE keys 8. USB connector 9. CLEAR key 10.
ORIGIN key CCW DO NOT USE.

Cam Positioner H8PS 11 Dimensions Note: All units are in millimeters unless otherwise indicated. Main Unit Cam Positioners Flush Mounting Models
H8PS-8B@ (8-output Models) 15.2 21.6 M3.5 terminal screw Panel Cutout (according to DIN 43700) 92 +0.8 0 (14.6) 96 12 52.9 46 92 +0.8 0 96 91.8 × 91.

8 Note: Mounting panel thickness must be 1 to 5 mm. Flush mounting 14.6 52.9 H8PS-16B@ (16-output Models) H8PS-32B@ (32-output Models) (14.6) 96
12 52.9 46 96 91.8 × 91.8 11 dia. Mounting screws (2 included) (M4 x 12) Mounting bracket (included) 52.3 + Mounting panel (1 to 5 mm) M3.

5 terminal screw 21.6 15.2 Note: An 8-output Model is shown in the above diagrams. The Encoder is connected from the bottom with 16-/32-output Models.
Mounting holes 81.

8±0.2 Surface Mounting Models H8PS-8BF@ (8-output Models) Terminal cover M3.5 terminal screw 96 (60.6) 58 46 22.9 115.

2±0.3 96 91.8 × 91.8 121.2 Four, M4 tap holes 90 16 (60.6) 58 46 Surface Mounting 60.6 Track Mounting 74.4 (See note 1.) H8PS-16BF@ (16-output
Models) H8PS-32BF@ (32-output Models) 96 16 96 91.8 × 91.

8 DIN Track DIN Track Mounting Base Y92F-91 (Order Separately) 121.2 16 16 90 22.9 M3.5 terminal screw Terminal cover Note: 1. These dimensions vary
with the kind of DIN track (reference value). 2. An 8-output Model is shown in the above diagrams. The Encoder is connected from the bottom with 16-/
32-output Models. 12 Cam Positioner H8PS Encoder Connecting Direction H8PS-8B@ H8PS-8BF@ Encoder Encoder H8PS-16B@ H8PS-32B@
H8PS-16BF@ H8PS-32BF@ Output cable Output cable Encoder Encoder Accessories (Order Separately) Parallel Input Adapters Y92C-30 This Adapter
enables two H8PS Cam Positioners to share signals from an Encoder. · Panel Surface Mounting Front M4 screw (included) 74±1 36 Two, M4 tap holes ·
Panel Back Mounting Connected to the H8PS.

Connected to the H8PS. Back M4 nut (included) M4 screw (included) Y92C-30 74±1 From the Dedicated Absolute Encoder Two, 4.3 dia. holes 36 Use the
cable marked with a triangle when connecting only one H8PS Cam Positioner to the Parallel Input Adapter. 9 47 40.

4 1,030 6.5 15 37 8.5 dia. 17 dia. 89 60 24 26 R6.

5 36 14 dia. 11.3 Cam Positioner H8PS 13 Accessories (Order Separately) Watertight Cover Y92A-96N CHECK CAM Panel Cutout 21.9 Cover dimensions
(2) 92 +0.8 0 STEP CAM STEP 131.7 92 +0.8 0 Y92A-9 6N 69.3 Use for flush mounting when waterproofing is required. The Y96A-96N conforms to IP66
and 115.6 29.

4 NEMA4 (for indoor use) standards for waterproofing. The operating environment may cause the waterproof packing to deteriorate, shrink, or harden.
Therefore, it is recommended that the packing be replaced regularly. Protective Cover Y92A-96B A hardened Y92A-96B Protective Cover is available. Use it
for the following: · To protect the front panel from dust and dirt. · To prevents the set value from being altered due to accidental contact with the keys or
switches. DIN Track Mounting Base Y92F-91 CHECK CAM STEP CAM STEP Discrete Wire Output Cable Y92S-41-200 Cable length: 2 m Connector-type
Output Cable E5ZE-CBL200 Cable length: 2 m USB Cable Y92S-40 Cable length: 2 m Mounting Track PFP-100N PFP-50N PFP-100N2 7.3±0.15 4.5 35±0.

3 27±0.15 4.5 35±0.3 27 15 25 10 25 25 25 15 (5)* 1 10 1,000 (500)* * The numbers in parentheses () are dimensions for the PFP-50N. 24 16 29.

2 15 25 10 25 1,000 25 10 25 15 1 1.5 End Plate PFP-M M4 x 8 pan-head screw 10 6.2 1.8 Spacer PFP-S 5 16 12 1 35.5 35.

3 1.8 44.3 34.8 50 11.5 10 M4 spring washer 1.3 4.8 16.5 14 Cam Positioner H8PS E6CP-A/E6C3-A/E6F-A Rotary Encoders (Absolute) · Combining this
Encoder with an H8PS Cam Positioner enables high-precision detection of the operation timing of various automatic machines. · The E6CP-A is a low-cost,
money-saving Encoder. · The standard E6C3-A is well suited to environments subject to water and oil.

· The standard E6F-A is a rigid type that is compatible with high shaft-tolerance applications as well as environments subject to water and oil. Note: Refer to
the relevant datasheet for details. Ratings and Characteristics Item Current consumption 70 mA max. (See note 1.) Resolution (pulses per rotation) Output
code Output capacity 256 (8-bit) Gray binary Applied voltage: 28 VDC max.



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Sink current: 16 mA max. Residual voltage: 0.4 V max. (sink current at 16 mA) Negative logic (H = 0, L = 1) Within $\pm 1^\circ$ Clockwise (viewed from the shaft) for output code increment Applied voltage: 30 VDC max. Sink current: 35 mA max.

Residual voltage: 0.4 V max. (sink current at 35 mA) 256 (8-bit), 360 (9-bit), or 720 (10-bit) E6CP-AG5C-C E6C3-AG5C-C 60 mA max. E6F-AG5C-C Rated supply voltage 12 VDC -10% to 24 VDC +15%, ripple (p-p) 5% max. Output configuration NPN open-collector output Logic Accuracy Rotation direction Rise and fall times of 1.

0 μ s max. (control output voltage: 16 V; load 1.0 μ s max. (control output voltage: 5 V; load resistance: 1 k; output cord: 2 m max.) resistance: 1 k; output cord: 2 m max.

) output Starting torque Moment of inertia Shaft-load tolerance Radial Thrust 0.98 m N-m max. 1×10^{-6} kg-m² max. 30 N 20 N 1000 r/min 10 m N-m max. (at room temperature), 30 m N-m max. (at low temperature) 2.3×10^{-6} kg-m² max. 80 N 50 N 5000 r/min 9.8 m N-m max. (at room temperature), 14.7 m N-m max. (at low temperature) 1.5×10^{-6} kg-m² max. 120 N Max. permissible rotation Storage temperature Ambient humidity Degree of protection Ambient temperature -10 to 55°C (with no icing) -10 to 70°C (with no icing) -25 to 80°C (with no icing) IEC standard IP65 (JEM standard IP65f) (See IEC standard IP65 (JEM standard IP65f) note 2.) -25 to 85°C (with no icing) 35% to 85% (with no condensation) IEC standard IP50 Insulation resistance 20 M min. (at 500 VDC) between charged parts and the case Dielectric strength Vibration resistance 500 VAC, 50/60 Hz for 1 min between charged parts and the case Destruction: Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hr 10 to 500 Hz, 2-mm double amplitude, 150 m/ each in X, Y, and Z directions s² 3 times each in X, Y, and Z directions, 11min sweep time Destruction: 1000 m/s² 3 times each in X, Y, and Z directions Approx. 200 g (with 2-m cord) --Approx. 300 g (with 1-m cord) F058 Approx.

500 g (with 2-m cord) E283 Destruction: 10 to 500 Hz, 1.5-mm double amplitude 3 times each in X, Y, and Z directions, 11-min sweep time Shock resistance Weight Datasheet Cat. No. Note: 1. The following inrush currents flow when the power is turned ON. E6CP-AG5C-C: Approx. 8 A (time: approx. 0.3 ms), E6C3-AG5C-C: Approx. 6 A (time: approx. 0.8 ms), E6F-AG5C-C: Approx. 9 A (time: approx. 5 μ s) 2. JEM1030: Applicable as of 1991 Cam Positioner H8PS 15 Dimensions Note: All units are in millimeters unless otherwise indicated. E6CP-AG5C-C 45° 45° 10 8 5 3 50 1 0 56 dia. 25 -0.2 dia. 50 dia. 6 -0.008 dia. -0.020 Note: Order the E69-C06B Coupling separately. Accessory Mounting Bracket (Included) 5.5 dia. holes 2 Four, M4 holes (depth: 10) 38 dia. Note 1: Round, vinyl-insulated cord with 10 cores (external dia.: 6, cross-sectional area: 0.18 mm², insulation: 1.0 mm dia.), standard length: 2 m Note 2: Connector to the H8PS Cam Positioner. 2,000 (See note 1.) (See note 2.) 16.9 dia. 40 37 Bracket Mounting Diagram Panel 120° (18) 16 9 25 dia. Two, C1 8 16 3.1 +0.1 0 120° 120° (5.1) 68±0.2 dia. Three, M5 E6C3-AG5C-C (58) D cut: Phase-Z position (range: $\pm 15^\circ$) 40±0.1 dia. 120° ±0.1 +0 8 -0.018 dia. 20 (15) 10 5 1 38 12 dia. 30 +0 -0.021 1 dia. 50 dia.

Three, M4 holes (depth: 5) 120°±0.1 10 6 8.8 6 37 Note: Order the E69-C08B Coupling separately. Round, shielded vinyl-insulated cord with 12 cores (oil-resistant) (external dia.: 6, cross-sectional area: 0.2 mm², insulation: 1.1 mm dia.), standard length: 1 m or 2 m E6F-AG5C-C Four, M3 holes (depth: 6) 24 dia. 48 dia. 20 15 3 5 (85) 60 3 54 dia. 0 60 dia. 40 -0.025 dia. 1 0 10 -0.015 dia.

Note: Order the E69-C10B Coupling separately. 17 Bearings Note 1: Round, shielded vinyl-insulated cord with 12 cores (external dia.: 6, cross-sectional area: 0.2 mm², insulation: 1.1 mm dia.), standard length: 2 m Note 2: Connector to the H8PS Cam Positioner 14 max. 42.5 (See note 1.) (See note 2.) 16.9 dia. Accessory Mounting Bracket (included) 5.5 dia. holes 2 2,000 37 Bracket Mounting Diagram Panel 120° (18) 16 9 120° 120° 40 dia. 8 Two, C1 16 3.

1+0.1 0 (5.1) 72±0.2 dia. Three, M5 16 Cam Positioner H8PS Accessories (Order Separately) E69-C06B Shaft Coupling (for the E6CP) 22 5.5 2.8 (11) (16.4) 5.5 Four, M3 Hexagon 2.8 socket-head setscrews 3.

5 E69-C08B Shaft Coupling (for the E6C3) 23.6 6.8 6.8 Four, M4 Hexagon 3.5 socket-head setscrews E69-C10B Shaft Coupling (for the E6F) 26.2 7.1 3.6 (12) (19) 7.1 3.6 Four, M4 Hexagon socket-head setscrews 6H8 dia.

15 dia. 8H8 dia. 8H8 dia. 19 dia. 10H8 dia. 22 dia. Note: The material is fiber-glass-reinforced polybutylene terephthalate resin (PBT). E69-DF5 Extension Cable 16.9 dia. Note: The material is fiber-glass-reinforced polybutylene terephthalate resin (PBT).

34.6 5,000 37 Note: The material is fiber-glass-reinforced polybutylene terephthalate resin (PBT). 16.9 dia. (See note 1.) (See note 2.) (See note 3.) Note 1: E6F-AG5C-C, E6CP-AG5C-C, and E6C3-AG5C-C Connectors for the H8PS. Note 2: 6-dia., 12-core shielded cord (cross-sectional area: 0.2 mm², insulation: 1.1 mm dia.), standard length: 5 m Note 3: Connected to the H8PS Cam Positioner. Note: Refer to "Characteristics" on page 4 for the maximum cable length. Safety Precautions (Encoder) Precautions for Correct Use · Do not subject the E6CP Encoder to oil or water. · The Encoder consists of high-precision components. Handle it with utmost care and do not drop it, otherwise malfunctioning may result. · When connecting the shaft of the Encoder with a chain timing belt or gear, connect the chain timing belt or gear with the shaft via a bearing or coupling as shown in the following diagram. Chain sprocket Bearings Coupling Rotary Encoder Mounting Procedure 1 Insert the shaft into the Coupling. Do not secure the Coupling and shaft with screws at this time.

2 Secure the Encoder. Refer to the table for the maximum insertion lengths of the shaft into the Coupling. 3 Secure the Coupling. Coupling E69-C06B E69-C08B E69-C10B Maximum insertion length 5.5 mm 6.8 mm 7.1 mm · If the decentering or declination value exceeds the tolerance, an excessive load imposed on the shaft may damage or shorten the life of the Encoder. · Do not place excessive loads on the shaft if the shaft is connected to a gear. · The tightening torque must not exceed the value given in the table at the right when the Rotary Encoder is mounted with screws. · Do not pull wires with a force greater than 29.

4 N while the Rotary Encoder is secured and wired. Rotary Encoder Coupling E69-C06B E69-C08B E69-C10B Tightening torque 0.25 N-m 0.44 N-m 0.44 N-m 4 Connect the power and I/O lines.



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Be sure to turn OFF the Encoder before connecting the lines. 5 Turn ON the power and check the outputs. Fastening plate 29.4 N max. Cord · Do not subject the shaft to shock.

Therefore, do not strike the shaft or coupling with a hammer when inserting the shaft into the coupling. · Make sure there is no foreign matter in the Connector before connecting it to the Encoder. Cam Positioner H8PS 17 Safety Precautions (Cam Positioner) !CAUTION Tighten terminal screws to a torque of 0.80 N·m so that they do not become loose. Minor fires or malfunction may occasionally occur.

For 16- and 32-output Models, leave the protective label attached to the H8PS when wiring. Removing the label before wiring may occasionally result in fire if foreign matter enters the Unit. Remove the label after the completion of wiring to ensure proper heat dissipation. Leaving the label attached may occasionally result in fire. Do not disassemble, modify, or repair the H8PS or touch any of the internal parts.

Otherwise, minor electric shock, fire, or malfunction may occasionally occur. Do not allow metal fragments, lead wire scraps, or chips from processing during installation to fall inside the H8PS. Otherwise, minor electric shock, fire, or malfunction may occasionally occur. Do not touch the terminals when power is being supplied. For Surface-mounting H8PS, always connect the terminal cover for after completing wiring. Otherwise, minor injury due to electric shock may occasionally occur. Precautions for Safe Use Observe the following items to ensure the safe use of this product. Environmental Precautions · Store the H8PS within specified ratings. If the H8PS has been stored at temperatures -10°C or lower, let it stand for 3 hours or longer at room temperature before turning ON the power supply. · Use the H8PS within the specified ratings for operating temperature and humidity.

· Do not operate the H8PS in locations subject to sudden or extreme changes in temperature, or locations where high humidity may result in condensation. · Do not use the H8PS in locations subject to vibrations or shock. Extended use in such locations may result in damage due to stress. · Do not use the H8PS in locations subject to excessive dust, corrosive gas, or direct sunlight. · Install the H8PS well away from any sources of static electricity, such as pipes transporting molding materials, powders, or liquids. · The H8PS is not waterproof or oil resistant. Do not use it in locations subject to water or oil. · The life expectancy of internal components may be reduced if the H8PS is mounted side-by-side. · Do not use organic solvents (such as paint thinner or benzene), strong alkaline, or strong acids because they will damage the external finish. Usage Precautions · Install a switch or circuit breaker that allows the operator to immediately turn OFF the power, and label it to clearly indicate its function.

· Pay careful attention to polarity to avoid wrong connections when wiring terminals. · Do not connect more than two crimp terminals to the same terminal. · Use the specified wires for wiring. Applicable Wires AWG24 to AWG18 (cross-sectional area of 0.208 to 0.

832 mm²) Solid or twisted wires of copper · Do not connect loads that exceed the rated output current. The output elements may be destroyed, possibly resulting in shortcircuit or open-circuit faults. · Always connect a diode to protect against counterelectromotive force when using an inductive load. @@ · Use the specified cables to connect outputs. @@ Doing so may result in malfunction due to noise.

Separate the input lines from highvoltage lines. @@@@ Set the system to allow leeway in the timing of input signals. Approx. @@ Refer to the Operation Manual (Cat. No. @@@@) Be sure to use a power supply with sufficient capacity. · EEPROM is used as memory when the power is interrupted. The write life of the EEPROM is 100000 writes. @@@@ · Connect all negative (-) terminals, COM terminals, and Vs terminals. · When using the Y92C-30 Parallel Input Adapter for parallel operation, do not connect more than two H8PS Cam Positioners to the same Encoder.

Input status Unstable Accepted Unstable Not accepted · When using 16-/32-output Modules, the operation timing of the outputs will be as shown below in relation to the ON/OFF timing of the start input. Refer to Bank Functions (F7/F8/F9) on page 29 when switching banks. ON Start input OFF 225 ms max. Output OFF 225 ms max. Output possible Output OFF Cam outputs RUN output Refer to the following manual for precautions in using the Cam Positioner and other information required for operation: H8PS Cam Positioner Operation Manual (Cat. No. Z199) Cam Positioner H8PS 19 Operating Procedures Flow of Operation Initial Settings Setting Resolution and Rotation Direction The Encoder resolution and rotation direction is set on a DIP switch. For details on the setting methods, refer to page 21. The Encoder is mounted to the machine and the origin for operation is determined. For details on the setting methods, refer to page 21.

Setting the Origin Setting Functions Advanced Parameters can be set in Function Setting Mode to perform more advanced operations. function For details, refer to page 26 Advanced Functions. Programming Cams (Programming Mode) Setting ON/OFF Angles There are three methods that can be used to set or change ON/OFF angles (i.e., cam programming).

· Using the ANGLE Keys (Manual Mode) · Actually turning the Encoder (Teaching Mode) · Setting from personal computer using Support Software (order separately) For details on the setting methods, refer to pages 22 to 23. Advanced Advance angle compensation (ADV) function can be set if required. function For details on the setting methods, refer to page 27. Setting the ADV Function Checking Timing (Test Mode) The machine is operated and outputs are actually made to check the timing of operation. If the timing of operation is not correct, it can be changed.

For details, refer to page 23. Operation is started. For details, refer to page 24. The ON/OFF angles that have been set can be checked. For details, refer to page 24. Deletes settings. There are two methods that can be used to delete settings. · Clearing all programs (deletes all programming) · Clearing individual steps, cams, and banks For details, refer to page 25. Operation (Run Mode) Checking ON/OFF Angle Settings Clearing Settings Settings for Basic Functions Changing the Mode PRG TST RUN PRG TST RUN PRG TST RUN Programming Mode PRG Programming Mode Used to write cam programs, set the advance angle compensation function, etc. All outputs will remain OFF.

Changed with the mode switch. Test Mode Used to write cam programs, set the advance angle compensation function, and perform other operations while actually turning ON outputs to confirm operation timing.



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This mode is also used to adjust settings during operation. Test Mode TST Changed with the mode switch. Run Mode RUN Run Mode Key 5 s min. ON/OFF Key 1 s min. ADV Used for normal operation. Settings, such as writing cam programs and setting the advance angle compensation function, cannot be performed. All Protection Disables all keys and switches. will light when the all protection function is enabled.

Refer to page 24. Switching the Angle and Speed Display Main Display: Angle Sub-display: Speed Main Display: Speed Sub-display: Angle Refer to page 24. 20 Cam Positioner H8PS Setting Resolution and Rotation Direction One of three resolutions can be selected for the Encoder connected to the H8PS: 256, 360, or 720. The resolution and display angle are set here. Setting the Origin The origin of the Cam Positioner is set to match the origin of the machine (Encoder).

The same origin is used for all banks. (The bank function is supported only for 16-/32-output models.) Example: Setting the Present Angular Position of 150° to 0° Turn OFF the power supply. Set the display angle and the Encoder resolution. Open the front cover at the lower part of the H8PS and set pins 3 and 4 on the DIP switch.

Change the mode. Set the programming mode switch. Mode PRG TST RUN Set the mode switch to PRGM. Set the programming mode switch to TCH. Programming mode TCH MAN CW 1234 ON OFF 3 ON ON OFF OFF 4 ON OFF ON OFF Display Resolution angle 256 256 360 720 256 360 360 360 (See note 2.) Set the machine to its origin. Turn the machine (Encoder) to the position of the desired origin (150° in this example). PRG CCW Not used. Note 1: Default settings are shown in reverse type. Note 2: When using an Encoder with a resolution of 256, displaying 360° directly is not possible.

The H8PS thus provides a convenient setting that enables converting the display and settings to 360° when using an Encoder with a resolution of 256. When using a 360° display, however, some angles will not be displayed. Check the rotation direction of the machine (Encoder). Turn ON the power supply. Turn the Encoder in the actual direction of operation and confirm that the rotation display monitor turns clockwise. If the monitor turns counterclockwise, turn OFF the power supply and change pin 1 on the DIP switch to CCW. CAM STEP Specify the origin. Press the ORIGIN Key. (See note.) In approx.

1 s, the present angular position display will change to 0° and the previous display will return. PRG CW (See note.) Rotation Display Monitor 1234 3 ON ON OFF OFF 4 ON OFF ON OFF Resolution Display angle ON OFF 256 256 360 720 256 360 360 360 CCW Not used. CAM STEP Note: Default setting. Note: With 16-/32-output models, the origin input from the terminal block can be turned ON to specify the origin.

Connect the machine (Encoder) and turn ON the power supply. End of preparations. Note: Changes to DIP switch settings are enabled when the power is turned ON. End Cam Positioner H8PS 21 Setting ON/OFF Angles in Manual Mode ON/OFF angles can be set manually using the ANGLE Keys on the front of the Cam Positioner. Example: Setting Step 1 of Cam No.

2 to Turn ON at 28° and Turn OFF at 51° Setting ON/OFF Angles in Teaching Mode ON/OFF angles can be set based on actual machine (Encoder) operation. Example: Setting the ON/OFF Angles by Teaching Step 2 of Cam No. 3 Change the mode. Set the programming mode switch. Mode PRGM TEST RUN Set the mode switch to PRGM. Change the mode. Set the programming mode switch to MAN. Set the mode switch to PRGM. Set the programming mode switch. Programming mode TCH MAN Set the programming mode switch to TCH.

Programming mode TCH MAN Mode PRGM TEST RUN Set the bank No. Banks can be specified only for 16-/32-output models. · Press the BANK Key to specify the bank number and then press the WRITE Key. Set the bank No. Banks can be specified only for 16-/32-output models. Set the cam and step No. · Press the CAM Keys · Press the STEP Keys to specify cam No. 2. to specify step No. 1.

· Press the BANK Key to specify the bank number and then press the WRITE Key. Set the cam and step No. · Press the CAM Keys · Press the STEP Keys to specify cam No. 3. to specify step No.

2. PRG TST CAM STEP CAM STEP Set the ON angle. · Press the ON OFF Key to flash the "ON" . · Press the ANGLE Keys to set an angle of 28 and then press the WRITE Key. PRG Set the ON angle.

· Press the ON OFF Key to flash the "ON" . · Turn the machine (Encoder) to the desired ON angle. (195° in this example) · Press the WRITE Key. TST CAM STEP Set the OFF angle. · Press the ON OFF Key to flash the "OFF" . · Press the ANGLE Keys to set an angle of 51 and then press the WRITE Key. PRG CAM STEP Set the OFF angle. · Press the ON OFF Key to flash the "OFF" . · Turn the machine (Encoder) to the desired OFF angle. (278° in this example) · Press the WRITE Key.

TST CAM STEP End Note: Pressing the or Key continually will automatically increment or decrement the value. Pressing the other key during automatic increment or decrement will increase the speed. CAM STEP End 22 Cam Positioner H8PS Setting ON/OFF Angles Using Support Software With 16-/32-output models, programs can be uploaded or downloaded easily with the optional Support Software (H8PS-SOFTV1) by connecting a personal computer to the Cam Positioner using the optional Y92S-40 USB cable. Checking Timing (Test Mode) Testing Operation Operation can be tested to check operation timing. · Set the mode switch to TEST. Mode PRGM TEST RUN Support Software Functions Writing cam programs Setting functions Editing, saving, and printing programs Displaying and printing cam program operation charts Simple simulations of programs Applicable OS: Windows 98, 2000, ME, or XP · Operate the Encoder and check the timing of operation. 1 2 7 TST Refer to the user's manual for the Support Software for details. Present angular position ON/OFF angle setting CAM STEP · If the timing is not correct, change the ON/OFF angle settings. The settings can be changed in Test Mode. Note: 1.

Outputs will turn ON and OFF in Test Mode. Confirm system safety before switching to Test Mode. 2. With 16-/32-output model, be sure to turn ON the start input. Outputs are not turned ON unless the start input is turned ON.

Cam Positioner H8PS 23 Operation (Run Mode) Starting Operation · Set the mode switch to RUN to start operation. Mode PRGM TEST RUN All Protection Function The all protection function locks the H8PS in Run Mode and prohibits any changes to settings.



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It can be used to prevent incorrect or unauthorized operation. If the ADV Key is pressed for at least 5 s in Run Mode, the All Protection indicator will light on the display and all keys and switches will be disabled. If the mode switch is changed to Programming or Test Mode while protection is enabled, the All Protection indicator will flash to indicate that settings cannot be changed.

If a setting on the DIP switch is changed while protection is enabled, the All Protection indicator will flash when the power supply is turned ON to indicate that settings cannot be changed. All Protection Function Disabled (Normal Operation) 1 2 4 5 6 RUN 1 2 7 RUN Start input indication (See note.) Present angular position Speed (r/min) CAM STEP Note: For 16/32-output models, be sure that the start input is ON and that the start input indicator is lit. Outputs (including the cam, pulse, and run outputs) will not function if the start input is OFF. The 8-output models do not have a start input. Switching the Angle and Speed Displays · Press the ON OFF Key for at least 1 s in Run Mode to reverse the display positions of the present angular position and speed (r/min) between main display and sub-display. 1 2 7 RUN CAM STEP Press the ADV Key for 5 s min. All Protection Function Enabled 1 2 4 5 6 All protection indication Present angular position on main display RUN Speed (r/min) on sub-display Press the ON OFF Key for 1 s min. CAM STEP Checking ON/OFF Angle Settings 1 2 7 RUN Speed (r/min) on main display Present angular position on sub-display · During Run Mode, the CAM Keys and STEP Keys can be used to check the ON/OFF angle settings for any step. Also, the CHECK Key can be pressed to check the ON/OFF angle settings in order for all steps starting from cam 1.

If there is no key operation for 10 s or longer during the checking operation, the previous display will be resumed. 24 Cam Positioner H8PS Clearing Settings Clearing All Programs The all clear function can be used to delete all cam programs, the settings for advance angle compensation function, and all other settings. All settings in the Function Setting Mode will be returned to their default settings. Mode PRGM TEST RUN Clearing Individual Steps, Cams, and Banks ON/OFF angle settings can be deleted by step, by cam, or by bank. If settings are deleted by cam, the settings for the advance angle compensation (ADV) function will not be deleted. If settings are deleted by bank, the settings for the ADV function will also be deleted. Settings in the Function Setting Mode will not be deleted. Mode PRGM TEST RUN Set the mode switch to PRGM or TEST. Set the mode switch to PRGM or TEST. Initial Display PRG Initial Display PRG CAM STEP CAM STEP Press the CLEAR Key for 3 s min.

Press the CLEAR Key. PRG Confirm that clr flashes on the display. Screens for Individually Clearing Items PRG CAM STEP Deleting Settings by Step Press the STEP Keys to specify the step to be deleted. Press the WRITE Key. CLEAR Key PRG CAM STEP PRG After the completion of all clear processing, the screen displays end for approximately one second and then resume the previously displayed screen.

If the CLEAR Key is pressed again before pressing the WRITE Key, the settings will not be deleted and the previous display will be resumed. Deleting Settings by Cams Press the CAM Keys to specify the cam to be deleted. CAM STEP PRG Deleting Settings by Banks Press the BANK Key to specify the bank to be deleted. CAM STEP Press the WRITE Key. CLEAR Key.

PRG After the completion of all clear processing, the screen displays end for approximately one second and then resume the previously displayed screen. If the CLEAR Key is pressed again before pressing the WRITE Key, the settings will not be deleted and the previous display will be resumed. Cam Positioner H8PS 25 Advanced Functions Set the advanced functions as required to perform more advanced operation. Outlines of the advanced functions are provided on the following pages. For details, refer to the Operation Manual (Cat. No. Z199). Mode Transitions The values in parentheses are the default settings. PRGM TEST RUN PRGM TEST RUN PRGM TEST RUN ADV Key 3 s min. Programming Mode PRG Function Setting Mode Refer to pages 28 to 30.

: No. of pulse outputs [60] ADV Key Changed with the mode switch. Test Mode TST : Pulse output start angle [0°] Changed with the mode switch. Run Mode RUN ADV Key : Speed alarm upper limit [---] ADV Key : Speed alarm lower limit [---] ADV Key ADV Key 5 s min. ADV Key ON/OFF Key 1 s min. : Step number limit [---] (See note 1.) ADV Key : Cam protection [None] All Protection Disables all keys and switches. will light when the all protection function is enabled. Refer to page 24. Switching the Angle and Speed Display Main Display: Angle Sub-display: Speed Main Display: Speed Sub-display: Angle Refer to page 24.

ADV Key Setting the ADV Function Advance angle compensation (ADV) function automatically advances the ON/OFF angle of outputs in proportion to the machine (Encoder) speed. : Bank enable/disable [Disable] ADV Key : Bank switching method [Bank inputs] (See note 2.) ADV Key : Bank copy (See note 2.) ADV Key : E24 detection enable/disable [Enable] ADV Key Shaded items above are not displayed for 8-output models. Note 1: The default setting is for 10 steps for all cams.

Note 2: Not displayed when F7 is disabled. 26 Cam Positioner H8PS Advance Angle Compensation (ADV) Function The advance angle compensation function automatically advances the ON/OFF angle of cam outputs in proportion to machine (encoder) speed. As the speed of the machine increases, the system can be affected by the delay in outputs. If the ADV function is used, the output delay caused by higher speeds is automatically compensated. As shown in the following diagram, ADV function is used to linearly compensate outputs according to the speed based on the ADV value setting for a specific speed. ADV value Example: Setting the ADV Value to 2° at 100 r/min for Cam 4 1. Set the mode switch to PRGM or TEST. 2. Set cam number 4 with the CAM Keys . (See note.) 3. Press the ADV Key to move to the ADV function setting display and confirm that "ADV" is displayed. Setting Display TST 4. Set the speed to 100 with the ANGLE Keys and then press the WRITE Key. 2° Amount of angle compensation CAM STEP TST 0 100 Speed (r/min) 5.

Set the ADV value to 2 with the ANGLE Keys . Note: The maximum amount of angle compensation is 360°. Cam program setting 100° 180° CAM STEP 8° advance angle compensation At high speed (400r/min) 92° 172° TST Example: ADV Value Set to 2° at 100 r/min ADV value can be set independently for cams 1 to 7 (7 total). For the ADV function, the speed and the amount of angle compensation are set.



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If "-" is displayed for any setting, the ADV function is disabled. The setting ranges are given in the following table. Encoder Resolution Display angle 256 256 360 720 256 360 ---- " - - - ", 1 to 1,600 " - - - ", 1 to 1,600 " - - - ", 1 to 1,600 " - - - ", 1 to 800 " - - - ", 0 to 255 " - - - ", 0 to 359 " - - - ", 0 to 359 " - - - ", 0 to 359.5 Speed ADV value 6. Press the WRITE Key to write the settings to memory. CAM STEP 7.

Press the ADV Key after finishing setting the ADV function. The previous display in Programming or Test Mode will be resumed. Note: If the bank function is being used, set the bank number before setting the cam number. Note: Default settings are shown in reverse type. The maximum response speed will decrease as shown in the following table when ADV values are set for 4 cams or more.

Number of cams with ADV settings 0 to 3 4 to 7 Encoder resolution 256/360 720 256/360 720 Max. response speed 1,600r/min 800r/min 1,200r/min 600r/min
Note: Even if the ADV value is set to 0°, the cam must be included in the number of cams with ADV settings. Cam Positioner H8PS 27 Pulse Output (f1/f2) Outputs a preset number of pulses per Encoder rotation. Pulses are output at a 1:1 ON/OFF ratio and pulse output can be started from a specified angle. Operation for 9 Output Pulses and a Start Angle of 0° 1 0° 2 3 90° Output start angle 4 5 180° 6 7 270° 8 9 0° Speed Alarm Outputs (f3/f4) Specific cam outputs can be used as Encoder speed alarm outputs.

Alarms can be output for upper and lower speed limits. Speed Upper limit SV Lower limit SV Upper Limit Alarm Output Lower Limit Alarm Output Operation for 9 Output Pulses and a Start Angle of 10° 1 0° 10° 2 3 90° Output start angle 4 5 180° 6 7 270° 8 9 0° Number of Output Pulses (f1) Select the number of pulses per rotation from the following table. Encoder resolution 256 360 720 Settable number of pulses 1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 30, 36, 45, 60, 90 1, 2, 3, 4, 5, 6, 9, 10, 12, 15, 18, 20, 30, 36, 45, 60, 90, 180 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 40, 45, 60, 72, 90, 120, 180, 360 The speed alarm outputs are assigned to cam outputs as shown in the following table. The speed alarms are set to "-" for the default settings, i.e., the normal cam outputs are enabled. If a speed alarm is set to any value but "-", the normal cam output for the corresponding cam number will be disabled. Upper Limit Alarm Output H8PS-8@ (8 outputs) Cam 7 H8PS-16@ (16 outputs) Cam 15 H8PS-32@ (32 outputs) Cam 31 Lower Limit Alarm Output Cam 8 Cam 16 Cam 32 The setting ranges for the upper and lower limits speed alarm are given in the following table. Encoder resolution Speed " - - - " or 0 to 1,600 r/min " - - - " or 0 to 800 r/min Note: Default settings are shown in reverse type. Example: Setting 90 Pulses per Rotation The number of pulses is set using the F1 menu in the Function Setting Mode.

Setting Display PRG 256, 360 720 Note: Default settings are shown in reverse type. Speed Alarm Upper Limit (f3) Example: Setting the Upper Limit Set Value to 700 r/min for a 16output Model Set the number of pulses with the ANGLE Keys and then press the WRITE Key. The upper limit set value is set using the F3 menu in the Function Setting Mode. Upper Limit Setting Display CAM STEP PRG Pulse Output Start Angle (f2) The setting ranges are given in the following table. Encoder Resolution 256 256 360 720 Display angle 256 360 ----0 to 255° 0 to 359° (See note 2.) 0 to 359° 0 to 359.5° Start angle CAM STEP Set the upper limit set value to 700 with the ANGLE Keys and then press the WRITE Key. (See note.) Note: If banks are being used, the bank number must be set. Speed Alarm Lower Limit (f4) Example: Setting the Lower Limit Set Value to 20 r/min for a 16output Model The lower limit set value is set using the F4 menu in the Function Setting Mode.

Lower Limit Setting Display PRG Note: 1. Default settings are shown in reverse type. 2. The output accuracy is 2° maximum, so not all angles can be set. Example: Setting the Pulse Output Start Angle to 100° The starting angle for pulse outputs is set using the F2 menu in the Function Setting Mode. Setting Display PRG Set the upper limit set value to 20 with the ANGLE Keys and then press the WRITE Key. Set the pulse output start angle to 100 with the ANGLE Keys and then press the WRITE Key. CAM STEP Note: If banks are being used, the bank number must be set. CAM STEP 28 Cam Positioner H8PS Step Number Limit (f5) With the H8PS, up to 10 steps can be set to turn the output ON/OFF 10 times for each cam. The number of steps that can be set, however, can be restricted to prevent programming from being added through operating mistakes.

Settings can be made for all cams at once or each cam individually. The default setting for the Step Number Limit is 10 steps for all cams. Example: Limiting the Number of Steps to 2 for All Cams Collectively. The maximum number of steps to be set is set using the F5 menu in the Function Setting Mode. Display for Collective Settings PRG Bank Functions (f7/f8/f9) The bank function is supported by 16-/32-output models. Banks enable changing the entire cam program at once by switching bank numbers (0 to 7). Cam Program (Bank No. 7) Cam Program (Bank No. 2) Cam Program (Bank No. 1) Cam Program (Bank No.

0) Step 0 Step 1 Control output (cam number) ON angle OFF angle ON angle OFF angle 1 2 45° 0° 90° 90° 135° 135° 225° 180° Step 9 ON angle OFF angle 270° --315° --- Set the cam number to a with the CAM Keys and set the maximum number of steps to 2 with the Angle Keys . Press the WRITE Key to write the setting to memory. CAM STEP 32 90° 225° 270° 285° 315° 345° In Run Mode or Test Mode, the start input must be turned OFF and ON as shown in the following diagram in order to change banks. Control the start input when changing banks. Bank specification Start ON input OFF Bank 0 T4 Bank 1 Bank 2 The cam number can be set to a on the setting display to set all cams at once. If the number of steps is displayed as "-" when the cam number is a, the collective settings for all cams are disabled. Example: Limiting the Number of Steps to 1 for Cam 3. The maximum number of steps to be set is set using the F5 menu in the Function Setting Mode. Display for Individual Settings PRG T2 Bank 0 T1 T2 Bank 1 T3 Bank 2 Operation ON RUN output OFF Unstable region (outputs OFF) T1: 225 ms max. T2: 400 ms max. T3: 20 ms min. T4: 20 ms min. Set the cam number to 3 with the CAM Keys and set the maximum number of steps to 1 with the Angle Keys . Press the WRITE Key to write the setting to memory.



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