

HG2S CC Pendant

Mobile teaching pendant designed with safety concepts
3-position enabling switch is a standard provision on the back.

- 256-color 5.7-inch LCD screen for touch switch and display
- CC switches and mechanical switches combined with touch switches on the LCD screen make up ideal HMI equipment.
- High-performance CPU ensures stress-free quick response.
- The grip is made of elastomer to prevent the CC pendant from slipping out of hand.
- IP65 water- and dust-proof structure
- The screen display and operation can be easily designed using WindO/I-NV2.
- UL (UL508), c-UL (CSA C22.2 No. 14) listed, IEC/EN 60950, IEC/EN 60204-1 compliant
- EMC (IEC/EN 61000-6-4, IEC/EN 61131-2) compliant



- C-UL listed only for HG2S with emergency stop switch (red button).
 Not c-UL listed for HG2S with stop switch (yellow/gray button).



HG2S

Without Mechanical Switch

CC Switch	LCD	Host I/F	Part No.
With CC Switch	Color	RS232C	HG2S-SS62BH-A3②
		RS485/422	HG2S-SS62YH-A3②
	Mono-chrome	RS232C	HG2S-SB62BH-A3②
		RS485/422	HG2S-SB62YH-A3②
Without CC Switch	Color	RS232C	HG2S-SS32BH-A3②
		RS485/422	HG2S-SS32YH-A3②
	Mono-chrome	RS232C	HG2S-SB32BH-A3②
		RS485/422	HG2S-SB32YH-A3②

- Above part numbers are for a 3m cable. When a 5m or 10m cable is required, replace "3" at the end with "5" or "10" respectively.
- In place of ②, specify a code for stop switch (gray button) or emergency stop switch (red button): N (gray), Blank (red)
- Each HG2S unit is supplied with one HG9Z-PS2 hand strap and one HG9Z-PK2 mounting bracket.

With Mechanical Switch

CC Switch	LCD	Host I/F	Part No.
With CC Switch	Color	RS232C	HG2S-SS62BH-S①-②③
		RS485/422	HG2S-SS62YH-S①-②③
	Mono-chrome	RS232C	HG2S-SB62BH-S①-②③
		RS485/422	HG2S-SB62YH-S①-②③
Without CC Switch	Color	RS232C	HG2S-SS32BH-S①-②③
		RS485/422	HG2S-SS32YH-S①-②③
	Mono-chrome	RS232C	HG2S-SB32BH-S①-②③
		RS485/422	HG2S-SB32YH-S①-②③

- In place of ①, specify a cable length code: 3 (3m), 5 (5m), 10 (10m)
- In place of ②, specify a code for stop switch (gray button) or emergency stop switch (red button): N (gray), R (red)
- In place of ③, a file number controlled by IDEC enters to specify mechanical switches and their layout. For specifying mechanical switches, use the HG2S specification sheet on page 1496.
- Each HG2S unit is supplied with one HG9Z-PS2 hand strap and one HG9Z-PK2 mounting bracket.

Options

Name	Part No.	Description	Package Quantity
Maintenance Cable	HG9Z-XCM22	D-sub 9-pin female connector to connect to computer (2m long) (Note)	1
User Communication Cable	FC2A-KP1C	For connecting the HG2S serial interface 2 port (RS232C) to a serial printer; not equipped with a connector for connecting the printer	1
Protective Sheet	HG9Z-PE1	Dustproof protective sheet for CC switches	1
Wrist Strap	HG9Z-PS1		1
Hand Strap	HG9Z-PS2	Supplied with HG2S	1
Neck Strap	HG9Z-PS3		1
Mounting Bracket	HG9Z-PK2	Supplied with HG2S	1
Application Software Automation Organizer	SW1A-W1C	Includes WindO/I-NV2 (English/Japanese/Chinese) on CD. PDF files of English/Japanese manuals are also stored on the CD.	1
User's Manual	HG9Y-B1119	English	1

Note: Computer link cable 4C (FC2A-KC4C) for IDEC's MicroSmart, OpenNet Controller and Micro³C is also applicable.

HG2S Configuration Examples

Various ø16mm L6 series control units can be mounted, such as pushbuttons, illuminated pushbuttons, selector switches, and key selector switches.

Example 1



- CC Switches**
6 × 2 columns (right/left)
- Mechanical Switches**
E-stop switch: 1
Round pushbutton: 2
Enabling switch: 1

Example 2



- CC Switches**
6 × 2 columns (right/left)
- Mechanical Switches**
E-stop switch: 1
Round pushbutton: 2
Square pushbutton: 5
Key switch: 1
Enabling switch: 1

Example 3



- CC Switches**
6 × 2 columns (right/left)
- Mechanical Switches**
E-stop switch: 1
Round pushbutton: 2
Illuminated pushbutton: 6
Enabling switch: 1

HG2S CC Pendant

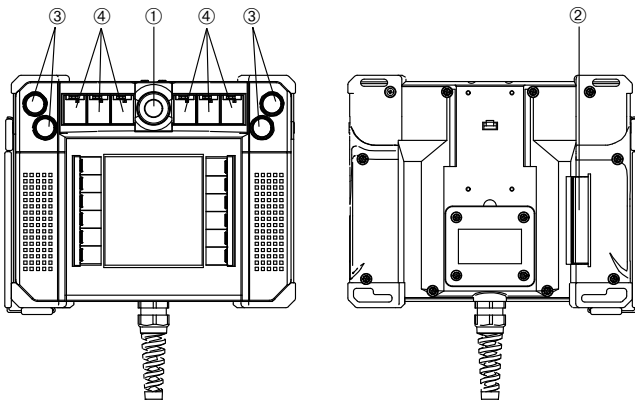
General Specifications

Rated Power Voltage	24V DC
Power Voltage Range	21.6 to 26.4V DC
Power Consumption	10W maximum
Power Inrush Current	30A maximum
Allowable Momentary Power Interruption	10 ms minimum
Dielectric Strength	500V AC, 10 mA, 1 minute between power and FG terminals
Insulation Resistance	10 MΩ minimum between power and FG terminals (500V DC megger)
Operating Temperature	0 to +40°C (no freezing)
Operating Humidity	20 to 85% RH (no condensation)
Storage Temperature	-20 to +60°C (no freezing)
Storage Humidity	20 to 85% RH (no condensation)
Vibration Resistance (damage limits)	10 to 55 Hz acceleration 9.8 m/s ² 2 hours per axis on each of three mutually perpendicular axes
Shock Resistance (damage limits)	98 m/s ² , 11 ms, 5 shocks on each of three mutually perpendicular axes
Noise Immunity	Fast transient/burst test, common mode: Level 3, power terminals: ±2 kV, communication line: ±1 kV (IEC/EN 61000-4-4)
Electrostatic Discharge	ESD-3 (RH-1), Level 3, (contact ±6 kV, aerial ±8 kV) (IEC/EN 61000-4-2)
Corrosion Immunity	Atmosphere free from corrosive gasses
Mounting	Hand-held or hang on hook with mounting bracket
Degree of Protection	IP65 (CC switch: IP20, except connector)
Cable Length	3m (standard), 10m maximum
Dimensions (mm)	228W × 186H × 57D
Weight (approx.)	1200g (except cable)

Operation Specifications

Switch Type	Touch Screen	CC Switch
Switching Element	Resistive membrane	Resistive membrane
Resolution	16 × 12 (CC switch: 10 × 12)	6 × 2 columns (right/left)
Operating Force	0.2 to 0.8N	2.5 to 5N
Mechanical Life	1,000,000 operations	
Acknowledge Sound	Electronic buzzer	
Multiple Operations	Possible to press two switching areas simultaneously	
① Stop/E-stop Switch	HA1E, 1 switch, 2NC contacts, Contact rating 24V DC, 1A	
② Enabling Switch	HE1B, 2 switches, OFF-ON-OFF contact, Contact rating 24V DC, 50 mA	
③ Round Switch	L6 series round pushbuttons, 4 switches maximum 1NO or 2NO contacts, Contact rating 24V DC, 50 mA	
④ Square Switch	L6 series square pushbuttons or illuminated pushbuttons, 6 switches maximum 1NO or 2NO contacts, Contact rating 24V DC, 50 mA	

Mechanical Switch Layout



Display Specifications

Model	Color	Monochrome	
LCD	5.7" color STN	5.7" monochrome STN	
Display Color	256 colors	2 colors	
Effective Display Area	118.2W × 89.4H mm		
Display Resolution	320W × 240H pixels		
Contrast Adjustment	Possible using the front touch screen		
Backlight	Cold-cathode tube (Note)		
Backlight Life	40,000 hours nominal		
Backlight Control	Automatic OFF		
Backlight Replacement	Replaceable at IDEC factory		
Display Character Size	1/4 size	8 × 8 pixels	JIS 8-bit code ISO 8859-1 (west European) ANSI 1251 (central European)
	1/2 size	8 × 16 pixels	
		16 × 32 pixels	
		24 × 48 pixels 32 × 64 pixels	
	Full size	16 × 16 pixels	JIS 1st/2nd level, Simplified Chinese, Traditional Chinese, Korean
Double size	32 × 32 pixels	JIS first level characters	
Quantity of Characters (Touch screen on CC Switch Type)	1/4 size	40 characters × 30 lines (27 × 30)	
	1/2 size	40 characters × 15 lines (27 × 15)	
	Full size	20 characters × 15 lines (13 × 15)	
	Double size	10 characters × 7 lines (6 × 7)	
Character Magnification	0.5, 1, 2, 3, 4, and 8 vertically and horizontally		
Character Attribute	Blink (1 or 0.5 sec period), reverse, bold, shadowed		
Graphics Type	Straight line, polyline, polygon, rectangle, circle, ellipse, arc, pie, equilateral polygons (3, 4, 5, 6, 8), paint, bitmap image		
Window Display	3 popup screens + 1 system screen		

Note: The time until the surface brightness reduces by half.

Interface Specifications

RS232C	Electrical Characteristics	EIA RS232C compliant	
	Transmission Speed	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps	
	Synchronization	Asynchronous	
	Communication Method	Half or full duplex	
	Control System	Hardware control or none	
	Connector	D-sub 37-pin connector (JAE's DC-37-PF-N)	
RS485 (422)	Electrical Characteristics	EIA RS485 (422) compliant	
	Transmission Speed	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps	
	Synchronization	Asynchronous	
	Communication Method	Half or full duplex	
	Control System	Hardware control or none	
	Connector	D-sub 37-pin connector (JAE's DC-37-PF-N)	
External I/O	Input	Input Points	4
		Rated Voltage	12 to 24V DC (allowable range 10 to 28V DC)
		Isolation Method	Photocoupler
		Input Resistance/Current	Approx. 3.9 kΩ / approx. 6 mA (input voltage 24V DC)
	Output	Input Signal Level	ON voltage: 8V min., OFF voltage: 4V max.
		Output Points	3 (including 1 point for RUN output)
		Load Voltage	12 to 24V DC (allowable range 10 to 28V DC)
		Isolation Method	Photocoupler
		Output Signal	NPN open collector
		Output ON Voltage	1.6V maximum
Output Current	50 mA max. per point, 200 mA total		
Connector	D-sub 37-pin connector (JAE's DC-37-PF-N)		
Maintenance Communication	Electrical Characteristics	EIA RS232C compliant	
	Transmission Speed	9600, 19200, 38400, 57600, 115200 bps	
	Synchronization	Asynchronous	
	Comm. Method	Half duplex, proprietary protocol	
Connector	Mini DIN 8-pin connector		
O/I Link Communication	Electrical Characteristics	EIA RS485 compliant	
	Transmission Speed	38400, 57600, 115200 bps	
	Synchronization	Asynchronous	
	Comm. Method	Half duplex, proprietary protocol	
Connector	D-sub 37-pin connector (JAE's DC-37-PF-N)		

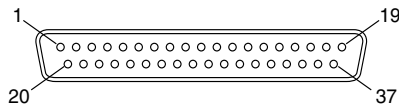
- Flush Silhouette
- Switches & Pilot Lights
- Display Lights
- LED Illumination Units
- Display Units
- Safety Products
- Terminal Blocks
- Comm. Terminals
- AS-Interface
- Relays & Timers
- Sockets
- Circuit Protectors
- Power Supplies
- PLCs & SmartRelay
- Operator Interfaces
- Sensors
- Control Stations
- Explosion Protection
- References

HG2S CC Pendant

Operation Specifications

Screen Types	Base screen, popup screen, system screen
No. of Screens	Base screen: 3000 max., popup screen: 3015 max.
User Memory	2 MB
Parts	Bit Button, Word Button, Goto Screen Button, Key Button, Print Button, Keypad, Selector Switch, Potentiometer, Numerical Input, Character Input, Pilot Lamp, Picture Display, Message Display, Message Switching Display, Alarm List Display, Alarm Log Display, Numerical Display, Bar Graph, Trend Chart, Pie Chart, Meter, Calendar, Bit Write Command, Word Write Command, Goto Screen Command, Timer, Print Command, Screen Print
Calendar	Year, Month, Day, Hour, Min., Sec., Day of Week ±30 sec per month (at 25°C)
Power Failure Backup	Backup data: Calendar, log data, keep internal relay, keep internal register Backup duration: 1 month (at 25°C) after full charging for two days

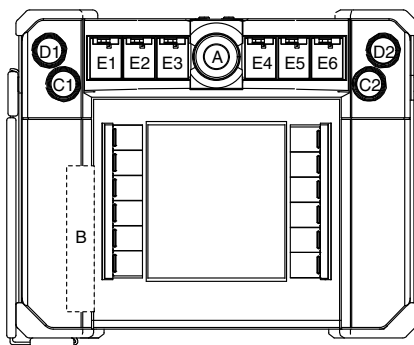
Connector Pin Assignment



Power Supply and Mechanical Switch Contact

Pin No.	Name	Function
1	FG	Frame ground
2	(unused)	
3	A1	A1 stop/E-stop switch (NC contact)
4		
5	A2	A2 stop/E-stop switch (NC contact)
6		
7	24V DC +	Power supply 24V DC +
8	24V DC +	Power supply 24V DC +
9	24V DC -	Power supply 24V DC -
10	24V DC -	Power supply 24V DC -
20	B1	B1 enabling switch
21		
22	B2	B2 enabling switch
23		
24	D1 NO1	D1 contact 1
25	D2 NO1	D2 contact 1
26	C1 NO1	C1 contact 1
27	C2 NO1	C2 contact 1
28	SW COM	C1, C2, D1, D2 common

Switches E1 through E6 are expansion I/Os of the HG2S internal circuit and are not assigned to connector pins.



RS232C

Pin No.	Name	Function
1	FG	Frame ground
29	SG	Signal ground
30	SD1	Send data
31	(reserved)	—
32	RD1	Receive data
33	(reserved)	—
34	RS	Request to send
35	NC	—
36	CS	Clear to send
37	NC	—

RS485/RS422

Pin No.	RS485		RS422	
	Name	Function	Name	Function
1	FG	Frame ground	FG	Frame ground
29	SG	Signal ground	SG	Signal ground
30	SDA	Send data A	SD+	Send data +
31	SDB	Send data B	SD-	Send data -
32	RDA	Receive data A	RD+	Receive data +
33	RDB	Receive data B	RD-	Receive data -
34	—	—	RS+	Request to send +
35	—	—	RS-	Request to send -
36	—	—	CS+	Clear to send +
37	—	—	CS-	Clear to send -

When using RS422 communication on the RS485/422 type HG2S, open the rear lid and change the communication switch settings. O/I link communication uses RS485.

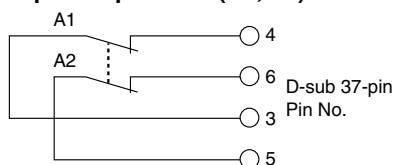
I/O

Pin No.	Name	Function
11	I/O+	External I/O power +
12	I/O-	External I/O power -
13	Y0	External output 0
14	Y1	External output 1
15	O RUN	Run output
16	X0	External input 0
17	X1	External input 1
18	X2	External input 2
19	X3	External input 3

The run output remains on whether the HG2S is running or not, and turns off when a system error occurs in the HG2S.

Contact Configuration

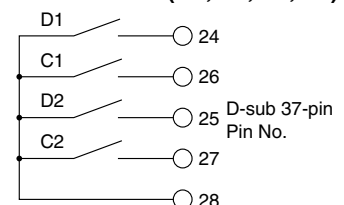
① Stop/E-stop Switch (A1, A2)



② Enabling Switch (B1, B2)

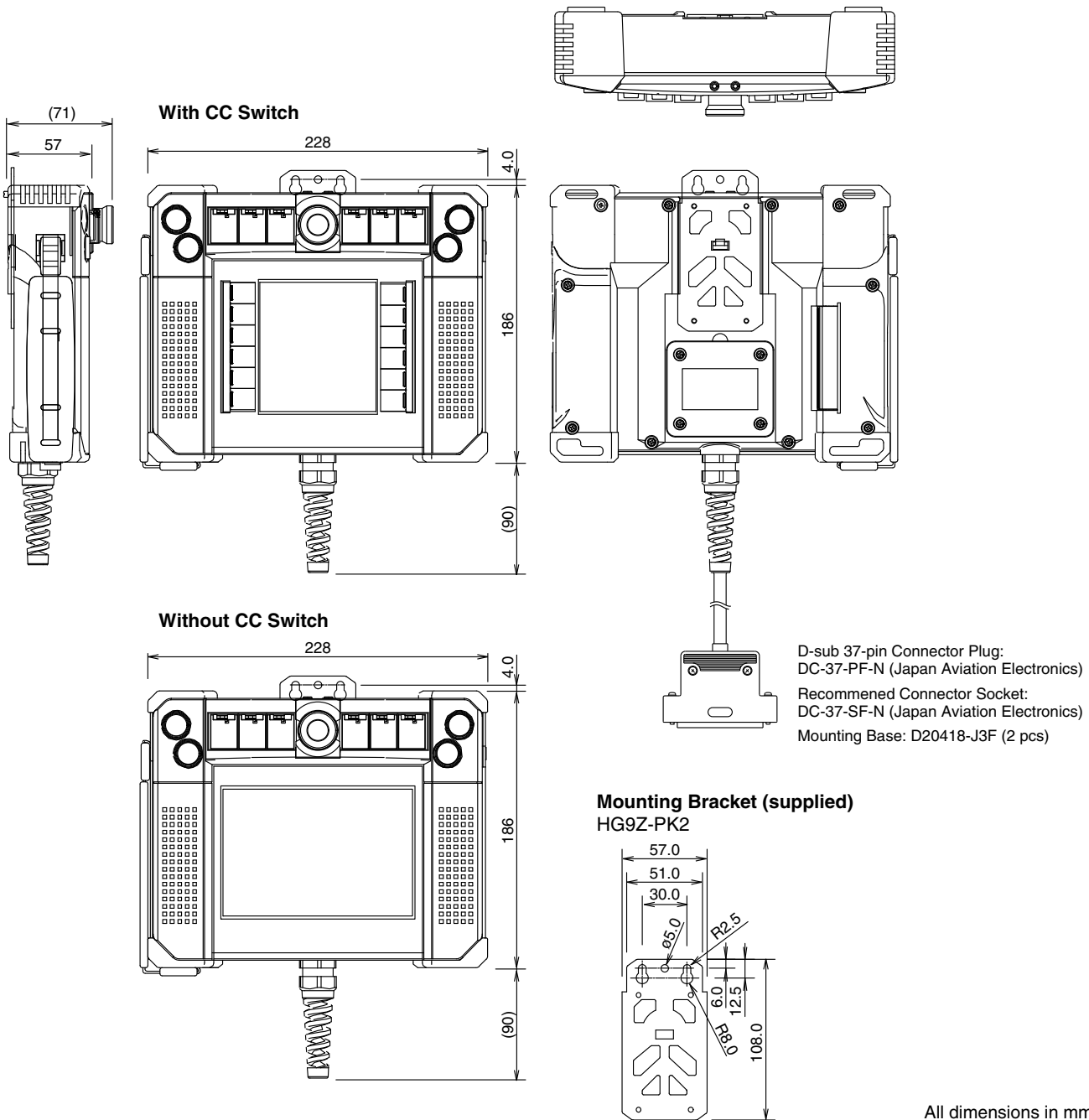


③ Round Switch (C1, C2, D1, D2)



HG2S CC Pendant

Dimensions



All dimensions in mm.

⚠ Safety Precautions

- Turn off the power to the HG2S before starting installation, removal, wiring, maintenance, and inspection of the HG2S. Failure to turn power off may cause electrical shock or fire hazard.
 - Special expertise is required to install, wire, configure, and operate the HG2S. People without such expertise must not use the HG2S.
 - The HG2S uses an LCD (liquid crystal display) as a display device. The liquid inside the LCD is harmful to the skin. If the LCD is broken and the liquid attaches to your skin or clothes, wash the liquid off using soap, and consult a doctor immediately.
 - Connect the emergency stop switch (direct opening action type, red button) or the stop switch (direct opening action type, gray button) to an emergency stop circuit secured on a machine in accordance with ISO 13850 / EN 418.
- Do not configure an emergency stop circuit using the touch switches on the HG2S. If the HG2S internal circuit should fail, a serious injury or equipment damage may be caused.
- When using the HG2S with an emergency stop switch, secure the HS2S cable to the machine so that the cable cannot be disconnected easily.
 - Connect the emergency stop switch or the stop switch and the enabling switch on the HG2S to function as either a category 0 or category 1 stop in accordance with IEC/EN 60204-1.
 - When the HG2S cable can be easily disconnected from the machine, use the HG2S with a stop switch so that the operator can easily notice that the HG2S is not an emergency stop device which always functions.

Flush Silhouette
Switches & Pilot Lights
Display Lights
LED Illumination Units
Display Units
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Comm. Terminals
AS-Interface
Relays & Timers
Sockets
Circuit Protectors
Power Supplies
PLCs & SmartRelay
Operator Interfaces
Sensors
Control Stations
Explosion Protection
References

HG2S CC Pendant Specification Sheet

Use this sheet to specify detailed layout of optional switches and other provisions of the HG2S CC pendant.

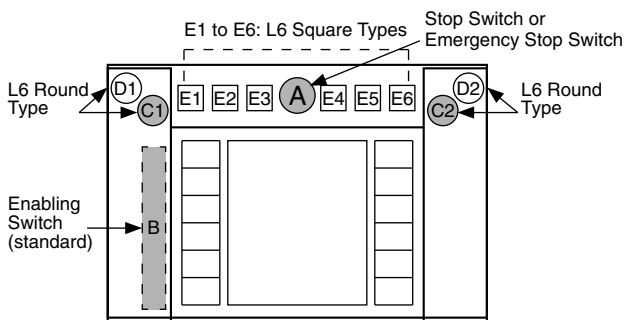
User Information

Company		Department	
Person in Charge		Email	
Address			
Phone No.		Remarks	

Product Information

Part No.	HG2S-S <input type="text"/> <input type="text"/> 2 <input type="text"/> H-S <input type="text"/> - <input type="text"/>				
	Specify codes in place of ①, ②, ③, ④, and ⑤. ① Screen color: S (color), B (monochrome) ② LCD: 6 (w/CC switch), 3 (w/o CC switch) ③ Host interface: B (RS232C), Y (RS485/422) ④ Cable length: 3 (3m), 5 (5m), 10 (10m) ⑤ Stop switch color: N (gray stop switch), R (red emergency stop switch)				
Application				Host	
Quantity		Delivery		Record No. (for IDEC)	

Mechanical Switch Selection



Select a switch for position A.

Switch Position	Switch (button color)	
A	<input type="checkbox"/> Stop Switch (gray)	<input type="checkbox"/> Emergency Stop Switch (red)

For switch positions C1, C2, D1, D2, and E1 to E6, specify type code, color code, and contact.

C1, C2, D1, and D2 (L6 series, round switches)

Switch Position	Type	Color	Contact (1NO, 2NO) (Note 1)
C1			
D1			

The total of contacts C1 and D1 can be 2NO maximum.

C2			
D2			

The total of contacts C2 and D2 can be 2NO maximum.

E1 to E6 (L6 series, square switches)

Switch Position	Type	Color	Switch Guard	Contact (1NO, 2NO) (Note 1)
E1			<input type="checkbox"/> Yes <input type="checkbox"/> No	
E2			<input type="checkbox"/> Yes <input type="checkbox"/> No	
E3			<input type="checkbox"/> Yes <input type="checkbox"/> No	
E4			<input type="checkbox"/> Yes <input type="checkbox"/> No	
E5			<input type="checkbox"/> Yes <input type="checkbox"/> No	
E6			<input type="checkbox"/> Yes <input type="checkbox"/> No	

While the total of contacts E1, E2, and E3 can be 4NO max., only one switch can use 2NO.

While the total of contacts E4, E5, and E6 can be 4NO max., only one switch can use 2NO.

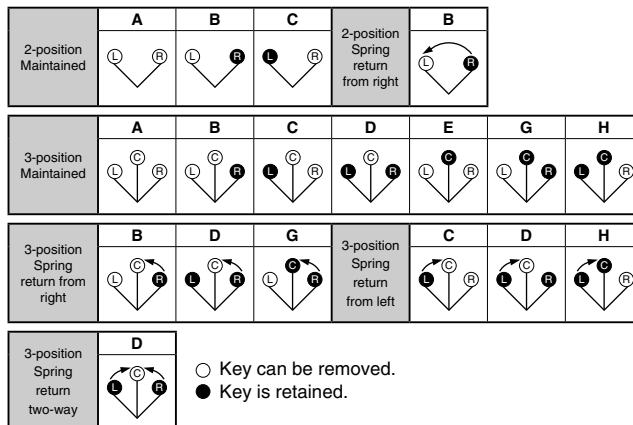
Note 1: Only NO contacts are used in selector and key selector switches.

Type Code

L6 Control Unit (σ16) which can be used as mechanical switches		For positions C and D (round)	For position E (square)
Illuminated Pushbutton (LED, Gold Contact, 5V DC)	Momentary	—	S11
	Maintained	—	S12
Pushbutton (Gold Contact)	Momentary	R21 (L) (Note 2)	S21 (L) (Note 2)
	Maintained	R22 (L) (Note 2)	S22 (L) (Note 2)
Pilot Light (LED, 5V DC)		—	S31
Selector Switch (Gold Contact)	2-position	Maintained	R41
		Spring return from right	R42
	3-position	Maintained	R43
		Spring return from right	R44
		Spring return from left	R45
		Spring return two-way	R46
Key Selector Switch (Gold Contact)	2-position	Maintained	R51_ (Note 3)
		Spring return from right	R52_ (Note 3)
	3-position	Maintained	R53_ (Note 3)
		Spring return from right	R54_ (Note 3)
		Spring return from left	R55_ (Note 3)
		Spring return two-way	R56_ (Note 3)
Dummy Unit		R91	S91

Note 2: Specify "L" when illuminated lens is required for pushbutton switch.

Note 3: When ordering key selector switches, specify the code of key removal positions (see below).



Color Code

(Not necessary for selector and key selector switches)

Illuminated pushbutton and pilot light

A (amber), G (green), R (red), W (white), Y (yellow)

Non-illuminated pushbutton

B (black), G (green), R (red), S (blue), W (white), Y (yellow)

Operating Instructions

When installing and wiring the HG2S or when designing a control panel including connection to the host device, observe the following instructions to make sure of safety of the personnel and performance of the HG2S.

1. Installation Location

In consideration of the safety and HG2S performance, avoid installing the HG2S in the following locations:

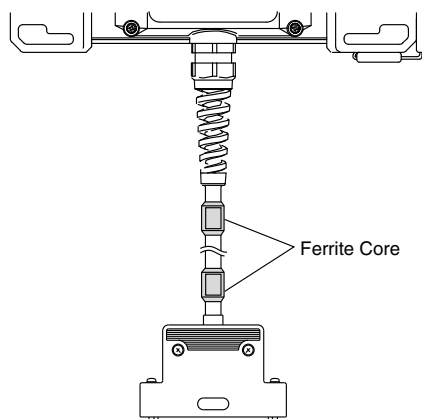
- Where dust, briny air, or iron particles exist in quantity
- Where oil or chemical splashes exist
- Where direct sunlight falls on the HG2S
- Where a corrosive gas or flammable gas exists
- Where the HG2S is subjected to vibrations or shocks
- Where dew condensation occurs due to rapid temperature change

2. Operating Environment

- Install the HG2S in such a way that it will not be exposed to the heat generated by other equipment.
- If there is no need to operate the HG2S, mount it onto a wall or a stand. Use the attached mounting bracket for wall mounting.
- Do not apply force to the D-sub connector directly.

3. Wiring

- Do not install the HG2S near high-voltage devices or arc-generating equipment, such as electromagnetic contactors and no-fuse breakers.
- Keep a minimum of 200 mm from motor lines.
- Make the power connection to the HG2S as short as possible.
- Separate the connection lines for motor devices from power lines for I/O devices connected to the HG2S.
- For connection with host devices, various cables are available for each HG unit. Select a correct cable for the HG2S and host device.
- When making a cable for connecting the HG2S to a host, use the recommended connector and applicable wire. When the maximum cable length is defined, observe the maximum cable length.
- For power connection to the HG2S, twist the wires together and make the connection between the power supply and the D-sub connector as short as possible.
- The stop switches and emergency stop switches consist of two NO contacts each. The enabling switches also consist of two poles of OFF-ON-OFF contacts. All these switches can be wired so that two input points can monitor each other. Since two poles of contacts are separated, note that there may be a slight time difference when the two poles operate. When wiring the enabling switches using two inputs to monitor the two poles of contacts with each other, design the sequence program in consideration of the time difference in contact operation of the two poles.
- When using the HG2S in environments where the HG2S is subjected to interference or noises, attach ferrite cores to both ends or to either end of the cable.



4. Operability and Maintenance

- Perform maintenance and inspection periodically to ensure the best performance.
- The touch screen surface and CC switch lens are easily damaged. Do not scratch or press strongly on the surfaces using hard tools.
- To wipe off smears on the lens and screen surfaces, use a soft cloth dampened with the following solvents.
 - Neutral detergent (squeeze the cloth tightly)
 - Alcoholic solvents
 Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
- The HG2S housing is made of plastic. Do not drop or strike the HG2S against hard objects, otherwise the housing will be damaged.
- To prevent the HG2S from falling, hold the HG2S through the hand strap during operation. Or, use the optional wrist or neck strap.
- The touch screen is made of glass. Do not strike a hard object or exert an excessive force on the touch screen, otherwise the touch screen may be damaged.
- The D-sub connector on the cable end is not IP65 water/dustproof type. Take this into consideration when installing the HG2S.
- Do not exert an excessive force, twist or pull on the cable, otherwise the cable may be broken.
- Do not use the HG2S in the vicinity of fire or sparks of a welding machine.

Flush Silhouette

Switches & Pilot Lights

Display Lights

LED Illumination Units

Display Units

Safety Products

Terminal Blocks

Comm. Terminals

AS-Interface

Relays & Timers

Sockets

Circuit Protectors

Power Supplies

PLCs & SmartRelay

Operator Interfaces

Sensors

Control Stations

Explosion Protection

References