

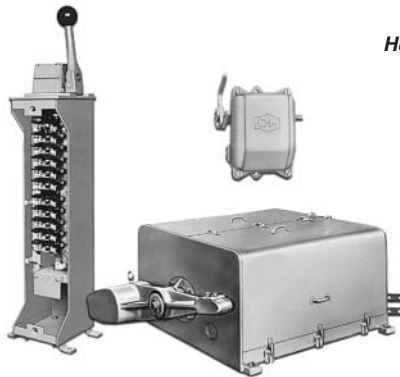
Crane Control

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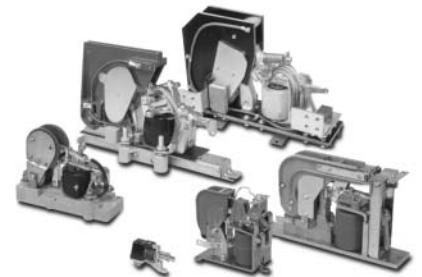
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Heavy-Duty Brakes



Master and Limit Switch Family



Contactors and Relays

Product Description

The Type F Master Switch is a cam operated, vertical type control circuit master. Straight line operation of the handle is achieved by means of a right angle bevel gear assembly. A maximum of 16 circuits and 6 speed positions are available in the step type master. A maximum of 6 circuits and a directly coupled potentiometer are available in the stepless master. Master switches are furnished with a positive mechanical stop located in the operating head of the switch. Masters are available both as open devices for benchboard mounting, and NEMA 3 enclosed for wall or floor mounting. The joystick master provides for concurrent operation of two control motions with one operating handle.

Mounting brackets are screwed to the bottom of the case for floor type mounting. Tapped holes are provided on the rear of the case which may be used for relocating the mounting brackets for wall mounting.

Features

- Floor mounted, desk mounted and benchboard mounted versions.
- 6, 12 and 16 circuit versions.
- Spring return, off-point latch speed point detents, and handle pushbutton options available.
- Contacts rated 1.1 amperes inductive break at 250 Vdc, 10 amperes continuous.
- Stepless and step-type versions.
- Single motion and joystick.

Technical Data and Specifications

- Voltage: 250 V maximum.
- Current Rating:
 - Make:
 - dc, 30 amperes
 - Carry:
 - dc, 10 amperes
 - 115 Vac, 30 ampere make — 8 ampere break
 - Interrupt:
 - 115 Vdc inductive, 2.2 amperes
 - 230 Vdc inductive, 1.1 amperes
- Stepless Units:
 - Potentiometer or resolver unit
- Circuits:
 - 6, 12 or 16 circuit versions available
- Manual Operation.

Standards and Certifications

- OSHA 1910.179.
- NEMA ICS3-442.14.
- NEMA ICS2-125.21.02.
- CMAA 70-5.7.

Renewal Parts

Table 32. Type F Master Switch

Part Description	Part Number
Contact Block, Complete	86-2601
Stationary Contact	23-3439
Movable Contact	23-3344
Contact Kit	6-202

Note: For prices, refer to Eaton's parts distributor or call factory.

Dimensions

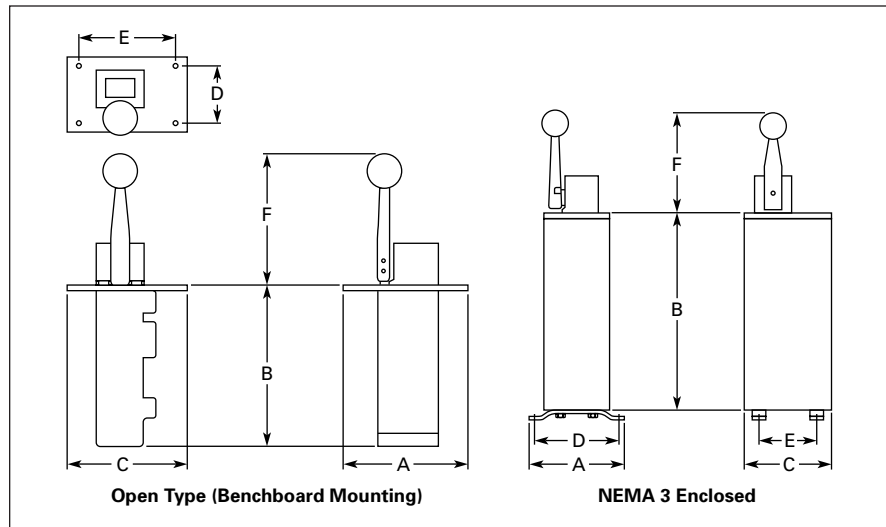


Figure 12. Approximate Dimensions in Inches (mm)

Note: Dimensions shown are approximate and are not to be used for construction purposes.

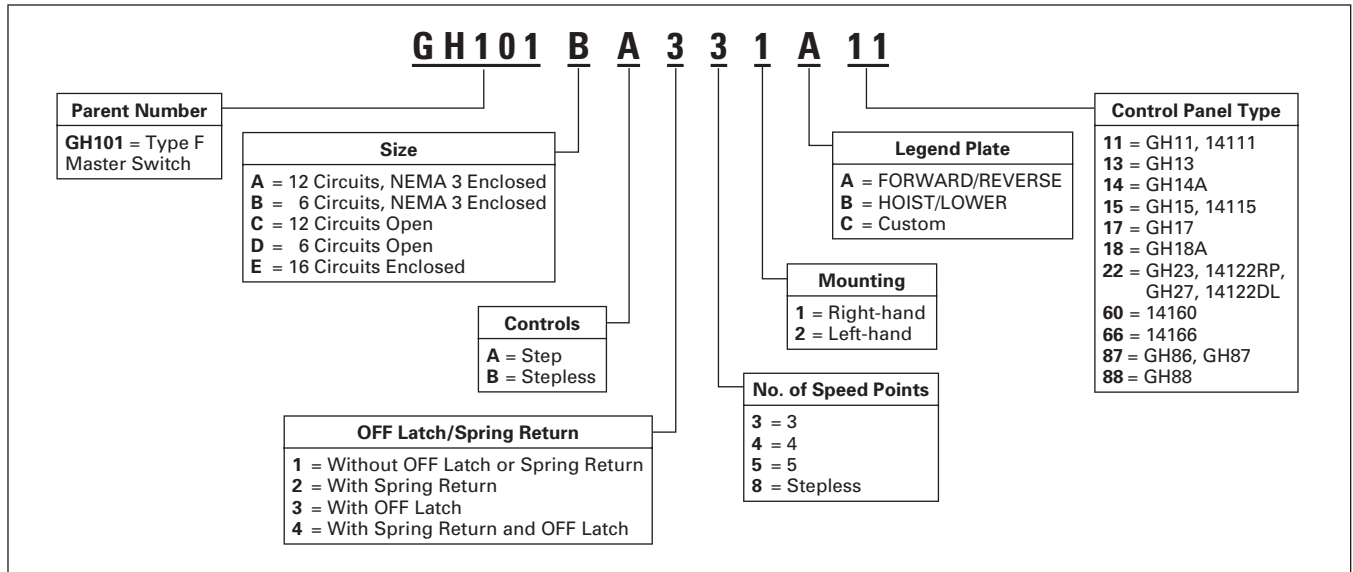
Table 33. Approximate Dimensions and Shipping Weights

Type	Number of Circuits	Dimensions in Inches (mm)			Mounting		F	Ship. Wt. Lbs. (kg)
		Wide A	High B	Deep C	D	E		
NEMA 3 Enclosed								
Single Motion	6	6.88 (175)	15 (381)	6.62 (168)	6.0 (152)	4.62 (117)	7.94 (202)	34 (15)
	12	6.88 (175)	21.25 (540)	6.62 (168)	6.0 (152)	4.62 (117)	7.92 (202)	38 (17)
	16	6.88 (175)	25.5 (648)	6.62 (168)	6.0 (152)	4.62 (117)	7.94 (202)	44 (20)
Joystick	12	12 (305)	21.25 (540)	6.62 (168)	11 (279)	4.62(117)	12.5 (318)	50 (23)
Open Type (Benchboard Mounting)								
Open Motion	6	5 (127)	11.5 (292)	6.62 (168)	4 (102)	5.75 (146)	7.94 (202)	23 (10)
	12	5 (127)	18 (457)	6.62 (168)	4 (102)	5.75 (146)	7.94 (202)	25 (11)
Joystick	12	8 (203)	18 (457)	10 (254)	7.25 (184)	9 (229)	12.5 (318)	40 (18)

Note: The installation and use of Cutler-Hammer products by Eaton Corporation should be in accordance with the provisions of the U.S. National Electrical Code and/or other local codes or industry standards that are pertinent to the particular end use. Installation or use not in accordance with these codes and standards could be hazardous to personnel and/or equipment.

Catalog Number Selection — Standard Assembled Switches

Table 34. Assembled Switches Catalog Numbering System



Product Selection — Standard Switches for Use with Cutler-Hammer Control Panels

When Ordering Specify

- Complete GH101 Catalog Number, *OR*
- Complete description of master switch, including each contact closure sequence, *OR*
- Reference to previous Cutler-Hammer Catalog Number or factory serial number.

Table 35. Type GH101 Master Switches for Present Standard Eaton’s Cutler-Hammer Crane Controllers ①

Application	Controller Type Number	Number of Speeds Each Direction	NEMA 3 Enclosed					
			With OFF Latch		With Spring Return		Without OFF Latch or Spring Return	
			Catalog Number	*	Catalog Number	*	Catalog Number	*
GH11, 14111		5	GH101AA351A11		GH101AA251A11		GH101AA151A11	
GH15, 14115		5	GH101AA351B15		GH101AA251B15		GH101AA151B15	
GH23, 14122RP		3	GH101BA331A22		GH101BA231A22		GH101BA131A22	
		4	GH101BA341A22		GH101BA241A22		GH101BA141A22	
GH27, 14122DL		3	GH101BA331B22		GH101BA231B22		GH101BA131B22	
		4	GH101AA341B22		GH101AA241B22		GH101AA141B22	
14160		3	GH101BA331A60		GH101BA231A60		GH101BA131A60	
		5	GH101AA351A60		GH101AA251A60		GH101AA151A60	
14166		5	GH101AA351B66		GH101AA251B66		GH101AA151B66	
GH13		5	GH101AA351A13		GH101AA251A13		GH101AA151A13	
GH17		5	GH101AA351B17		GH101AA251B17		GH101AA151B17	
GH86, GH87		Stepless	GH101AB381A87		GH101AB281A87		GH101AB181A87	
GH88		Stepless	GH101AB381B88		GH101AB281B88		GH101AB181B88	
GH14A		5	GH101AA351A14		GH101AA251A14		GH101AA151A14	
GH18A		5	GH101AA351B18		GH101AA251B18		GH101AA151B18	

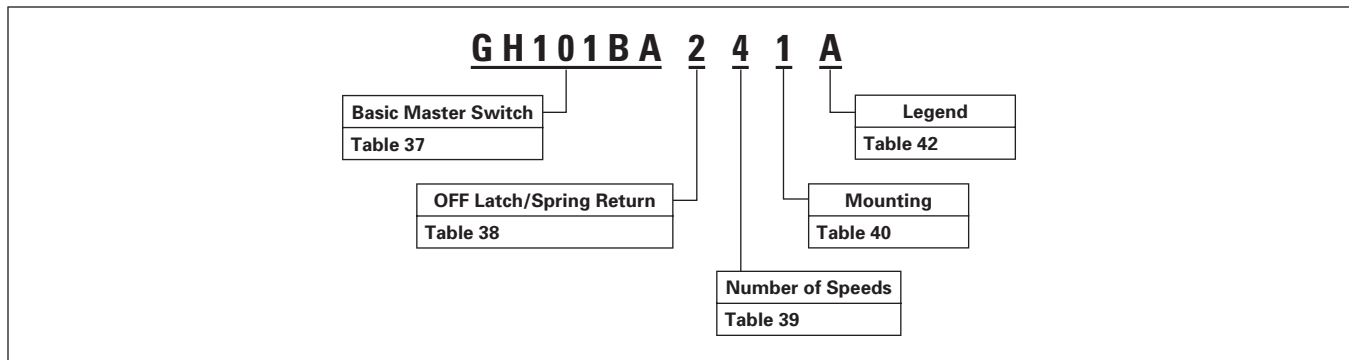
① All Catalog Number listings are for right-hand mounting — NEMA Std. ICS3-442.14. For left-hand mounting, change 10th digit from “1” to “2”. Example: GH101BA332A11.

Discount Symbol 18CD-2

* Consult Sales Office for Pricing

Catalog Number Selection — Custom Switches

Table 36. Custom Switches Catalog Numbering System



Note: Include description of contact closure sequence. Use worksheet on **Page 26** to describe contact sequence.

Product Selection — Custom Switches

When Ordering Specify

- Basic master switch Catalog Number and price from **Table 37**.
- Off latch or spring return from **Table 38**. Add Code Suffix Number to basic Catalog Number.
- Number of speeds from **Table 39**. Add Code Suffix Number to Catalog Number.
- Select right- or left-hand mounting from **Table 40**. Add Code Suffix Number to composite Catalog Number.
- Provide description of contact closure sequence as detailed in **Table 41**. Use Worksheet on **Page 26** to describe contact sequence, or provide closure sequence diagram.
- Determine legend plate required. See **Table 42**. Add Code Suffix Letter to basic Catalog Number.
- See example on **Page 27**.



Open Type Single Motion Stepless Master Switch, 6 Circuit, Left-Hand Mounting



NEMA 3 Enclosed Step-Type Single Motion Master Switch, 12 Circuits, Left-Hand Mounting



NEMA 3 Enclosed Joystick Master Switch, Stepless, 6 Circuits for Each Motion

Type F Master Switches — GH101

Table 37. Basic Master Switch

Construction	Maximum Number of Circuits per Motion	Master Switch Type											
		Step Type					Stepless Type ①						
		Single Motion				Joystick		Single Motion				Joystick	
		Standard		With Handle Pushbutton				Standard		With Handle Pushbutton			
Catalog Number	*	Catalog Number	*	Catalog Number	*	Catalog Number	*	Catalog Number	*	Catalog Number	*		
Open Type	6 12	GH101DA GH101CA		GH101DC GH101CC		GH101DE GH101CE		— GH101CB		— GH101CD		— GH101CF	
NEMA 3 Enclosed	6 12 16	GH101BA GH101AA GH101EA		GH101BC GH101AC GH101EC		GH101BE GH101AE —		— GH101AB —		— GH101AD —		— GH101AF —	

① All stepless master switches require 12 circuit frame. They include a standard 4 watt, 1500 ohm potentiometer. Induction units are also available. Consult factory for details.

Table 38. OFF Latch or Spring Return Selection ②

Description	Code Suffix	Adder *
Without OFF latch, without spring return	1	
With spring return	2	
With OFF position latch	3	
With spring return and OFF position latch	4	
With reduced tension spring return	5	

② OFF position latch and left-hand mounting not available for joystick masters.

Table 39. Number of Speeds (Each Direction)

Description	Code Suffix	Adder *
3 Speed	3	
4 Speed	4	
5 Speed	5	
6 Speed	6	
Stepless	8	
Stepless with float option	9	
Non-symmetrical (specify)	0	

Table 40. Right- or Left-Hand Mounting ③④

Description	Code Suffix	Adder *
Right-hand mounting	1	
Left-hand mounting	2	

③ OFF position latch and left-hand mounting not available for joystick masters.

④ Mounting refers to which side of the operating head the lever is on. Left-hand mounting (shown above) has the lever closest to the left-hand side of the operator, i.e., on the right side of the head.

Table 41. Contact Closure Sequence

Provide description of contact closure sequencing using Worksheet on Page 26 or advise reference to previous Cutler-Hammer Catalog Number or factory serial number. Example: GH101DA331A with 5 circuit units per diagram sketch at right.	Fwd → □ ← Rev * * * * * * * * * * *
Adder per circuit *	

Table 42. Legend Plate Requirement

Description	Code Suffix	Adder *
FORWARD — REVERSE	A	
HOIST — LOWER	B	
All others (specify on order)	C	

Diagram Worksheet for Special Master Switches

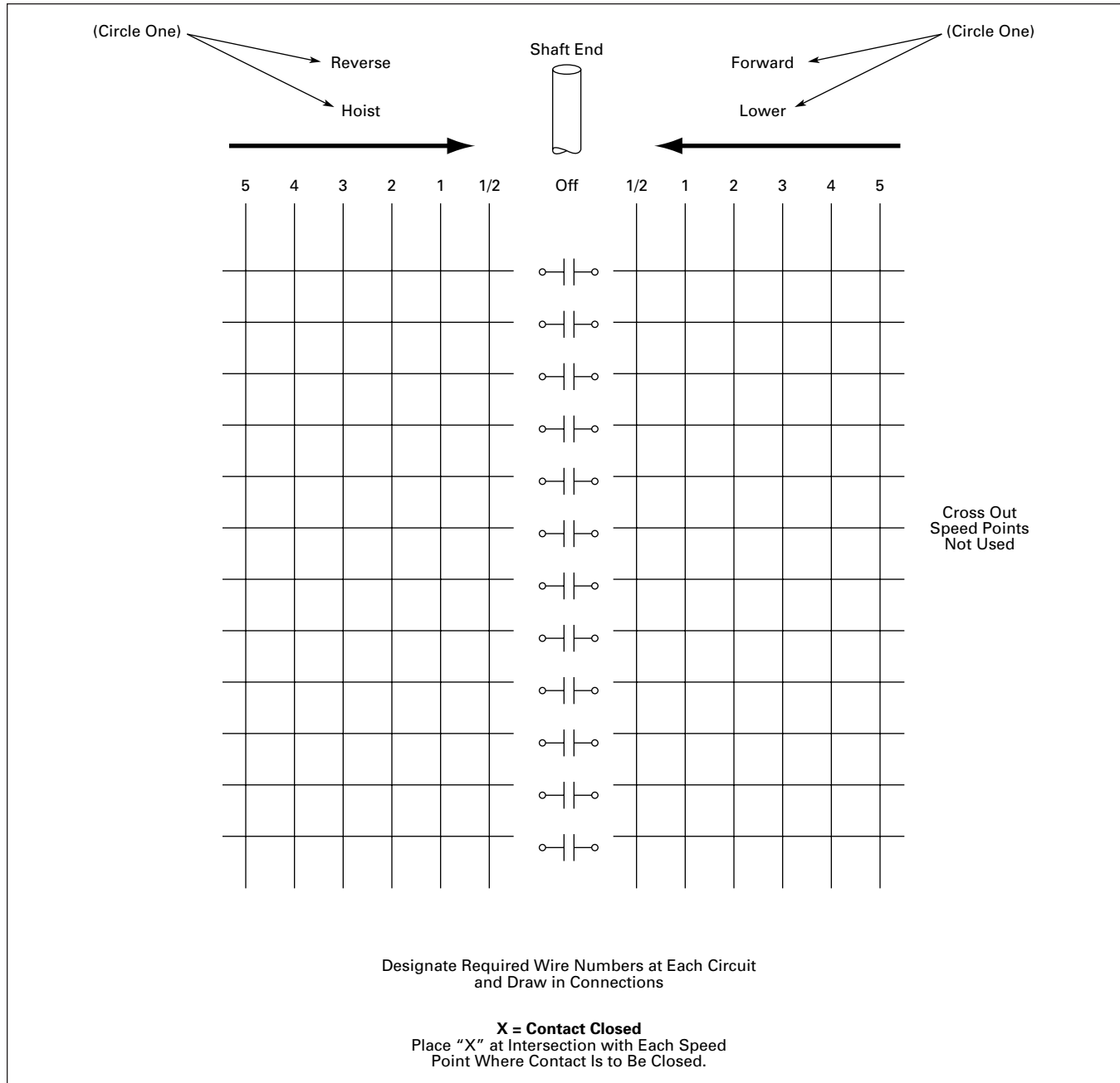


Figure 13. Contact Closure Sequence Diagram Worksheet

Custom Switch Ordering Example

To order/price a custom Type F Master Switch like the one illustrated at the right — NEMA 3 enclosed, 6 circuit spring return switch with cam arrangement as shown in **Table 41** on **Page 25** — proceed as follows: (Referenced tables will be found on **Page 25**.)

Table 43. Custom Switch Ordering Example

Description	Catalog Number	*
1. Select basic switch from Table 37 — NEMA 3 enclosed, 6 circuit maximum, step type.	GH101BA	
2. For spring return, add Suffix Code 2 from Table 38 to Catalog Number.	GH101BA2	
3. The contact sequence chart in Table 41 shows 3 speed points. Table 39 says that 3 speed points adds a Suffix Code 3 to the Catalog Number. The cams are symmetrical, 3 speeds in each direction.	GH101BA23	
4. For right-hand operation (lever closest to operator's right-hand), add Suffix Code 1 from Table 40 .	GH101BA231	
5. Per sketch in Table 41 , switch uses a total of 5 contacts.		
6. For FORWARD-REVERSE legend plate on top of enclosure (per sketch in Table 41), add Suffix Code A from Table 42 to Catalog Number.	GH101BA231A	
	Total	



*NEMA 3 Enclosed
6 Circuit Step Type Switch
Right-Hand Operation*

Cross-Reference to Previous Products

Table 44. Type F Master Switch Cross-Reference to Previous Products

With Off Latch		With Spring Return	
Old	New	Old	New
14951H117	GH101BA331A11	14951W13	GH101BA231A11
14951H123	GH101AA351A66	14951W14	GH101BA231A60
14951H127	GH101BA331A22	14951W15	GH101AA251A11
14951H129	GH101BA341A22	14951W16	GH101AA251A60
14951H131	GH101BA331B22	14951W17	GH101AA251B15
14951H133	GH101AA341B22	14951W18	GH101AA251A66
14951H139	GH101AA351B15	14951W29	GH101BA231B22
14951H141	GH101AA351A11	14951W30	GH101BA241B22
14951H177	GH101BA341B22	14951W31	GH101BA231A22
14951H181	GH101AA351B15	14951W32	GH101BA241A22
14951H185	GH101AA351A11	—	—
14951W10	GH101BA331A60	—	—
14951W11	GH101AA351A60	—	—

Discount Symbol **18CD-2**

* Consult Sales Office for Pricing