EATON | Cutler-Hammer

WARNING

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. TURN THE BREAKER HANDLE TO THE OFF POSITION REGARDLESS OF THE REMOTE CONTACT POSITION WHEN SERVICING EQUIPMENT. SEVERE PERSONAL INJURY, DEATH, AND/OR SUBSTANTIAL PROPERTY DAMAGE CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH THE TASK, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES.

EATON OR EATON'S CUTLER-HAMMER IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.

The user is cautioned to observe all recommendations, warnings, and cautions relating to the safety of personnel and equipment, as well as, all general and local health and safety laws, codes, and procedures.

The recommendations and information contained herein are based on Cutler-Hammer experience and judgement, but should not be considered to be all-inclusive or covering every application or circumstance which may arise. If any questions arise, contact Cutler-Hammer for further information or instructions.

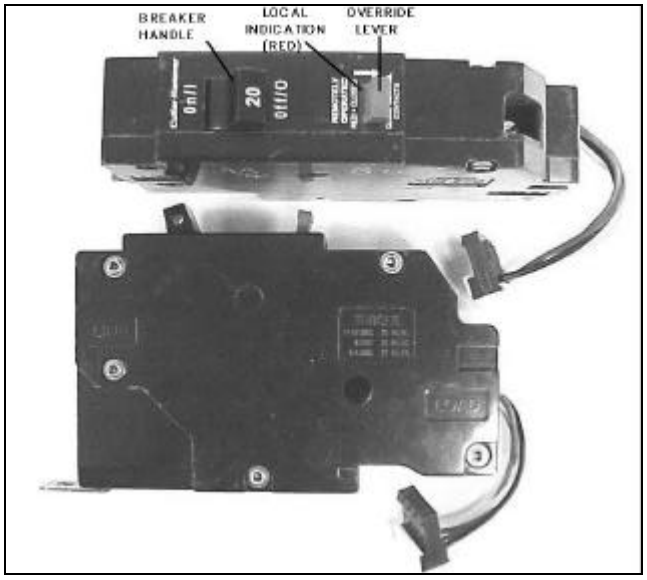

Fig. 1. Eaton's *Cutler-Hammer Type GHQ & GHQR Latching remotely operated circuit breaker.*

Basic features of the breaker include:
- One pole, 277 V~
- Two pole, 480Y/277 V~
- 14,000 amps RMS interrupting
- Integral solenoid controlled contacts in series with a thermal-magnetic circuit breaker.

All units are High Intensity Discharge (HID) rated, additionally the 15 and 20 amperes are also Switching Duty (SWD) rated.

The GHQRP and GHQRSP carry the same series ratings as the Type GHQ and Type GHBS circuit breakers.

UL and NEC require Class 2 and Class 3 wiring to be secured at least ¼" from Class 1 wiring.

For normal operation, the breaker handle must be in the ON position. Once the remote harness is connected to the electrical controller, the breaker's controllable contacts are operated by supplying 24 V AC/DC to the blue wire. Open the contacts by momentarily grounding the black wire. Close the contacts by momentarily grounding the red wire. Continuous grounding of a close or an open circuit is not permissible and will cause permanent damage to the control solenoid. Do not pulse the red and black wires simultaneously.

For manual operation, the override lever closes the operator contact. The operator contact can only be reopened by a remote signal. The override lever shows a red indication when the remote contacts are closed. (See Fig 1.)

Two internally-mounted auxiliary switches indicate status. These switches are connected in series. If both the remote and the breaker handles are closed/ON, the yellow wire will report the input voltage supplied from the blue wire. If either is open/OFF, no voltage potential will be present from the yellow wire. THE EXTERNAL LOAD CURRENT ON THE YELLOW WIRE MUST NOT EXCEED 0.5 AMPERES.

The breaker's thermal/magnetic mechanism is of Eaton's Cutler-Hammer Quicklag design. The breaker handle will move to the center position indicating that it has tripped. The controlled contacts work independently from the breaker contacts. Opening and closing the remotely operated contacts with the breaker in the off or tripped position will not supply load power.

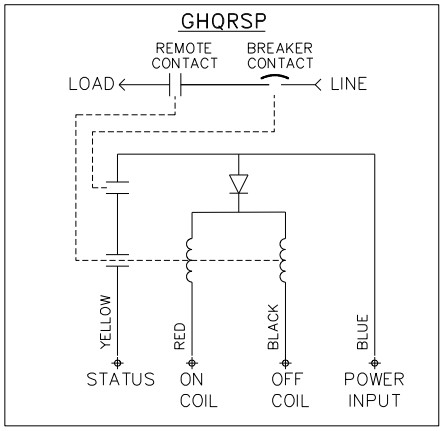

Fig. 2. *Control circuit for the GHQRSP.*

Solenoid Operating Data
- Power requirements: 24V AC/DC (20.4V min – 30V max)
  - Controlled signal: +AC/DC 8 ms minimum with zero cross, 300 ms maximum
  - AC: 1.3 cycles minimum, 18 cycles or 300ms maximum
  - DC: 8 ms minimum, 300 ms maximum
  - Maximum duty cycle of 6 OPEN/CLOSE cycles per minute.
- Current draw: open 1 amp, close ¾ amp
- Blue wire: Power input (see power requirements)
- Black wire: Remote opening
- Red wire: Remote closing
- Yellow: Feedback status from power input, Max 0.50 amp draw.

Circuit breakers are listed in accordance with Underwriters Laboratories, Inc. UL489 and Canadian Standards Association CSA22.2.

Solenoid Operator — Remote Controlled Latching for Type GHBS, GBHS and GHQRSP Breakers

GHBS — 1-Pole

Product Description

The GHBS, GBHS and GHQRSP circuit breakers are bolt-on branch circuit breakers designed for use in panelboards. In addition to providing conventional branch circuit protection, they include a unique solenoid-operated mechanism that provides for efficient breaker pulse-on and pulse-off operation when used with a suitable controller like the Cutler-Hammer Pow-R-Command lighting control system.

Features, Benefits and Functions

- Bolt-on line-side terminal.
- Cable connected load-side terminal.
- Status switch. Remote status and breaker status available from internal auxiliary switches.
- Bi-metal assembly for thermal overload protection.
- Fast acting short circuit protection.
- Arc-runner and arc-chute assembly for fast acting arc extinction.
- Three-position breaker handle: OFF, TRIP (Center), ON.
- Visual indication of the remotely operated contact's position (open, closed or trip).
- Remote override handle permits manual switching when control power is lost.
- 15 and 20 ampere breakers SWD (switching duty) rated.
- 15 and 20 ampere breakers HID rated for HID (High intensity discharge) lighting.
- All models HACR rated.
- Series rated with various Eaton Cutler-Hammer main circuit breakers.

Solenoid Operating Data

- Power requirements: 24 Vac/dc (20.4 V minimum – 30 V maximum)
  - Controlled signal: +ac/dc 8 ms minimum with zero cross, 300 ms maximum
  - ac: 1.3 cycles minimum, 18 cycles or 300 ms maximum
  - dc: 8 ms minimum, 300 ms maximum
  - Maximum duty cycle of 6 OPEN/CLOSE cycles per minute
- Current draw: open 1 ampere, close 3/4 ampere.
- Blue wire: power input (see power requirements).
- Black wire: remote opening.
- Red wire: remote closing.
- Yellow wire: feedback status from power input, maximum 0.50 ampere draw.

Operation

Mechanism manually operated by external handle allowing ON, OFF and RESET operation. Handle assumes a center TRIP position after performing protective response.

Operating/Application Data

- Ambient temperature: 0 to 40°C.
- Frequency: 48 – 62 Hz.
- Humidity: 0 to 95% noncondensing.

Table 11-27. Terminal Type

Circuit Breaker Type	Circuit Breaker Amperes	Screw Head Type	Terminal	
			Type	Range
GHQRSP	15 – 20	Slotted	Clamp	#14 – #4 AWG

Table 11-28. Dimensions per Pole in Inches (mm)

Circuit Breaker Type	Width	Height ①	Length ②
GHQRSP	1.00 (25.4)	4.63 (117.6)	2.81 (71.4)

① Excluding line terminal.
② Excluding handle.

Wiring Diagram

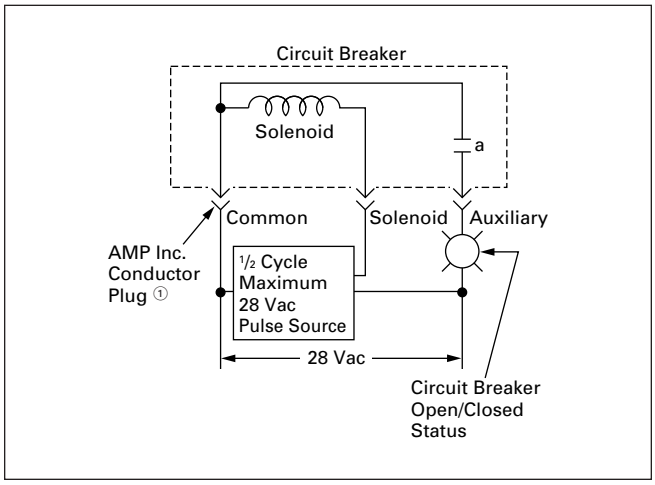

Figure 11-11. Typical Single-Pole Circuit Breaker Schematic Diagram for GHBS and GBHS Breakers

① Purchase separate AMP Inc. conductor plug #640426-3.

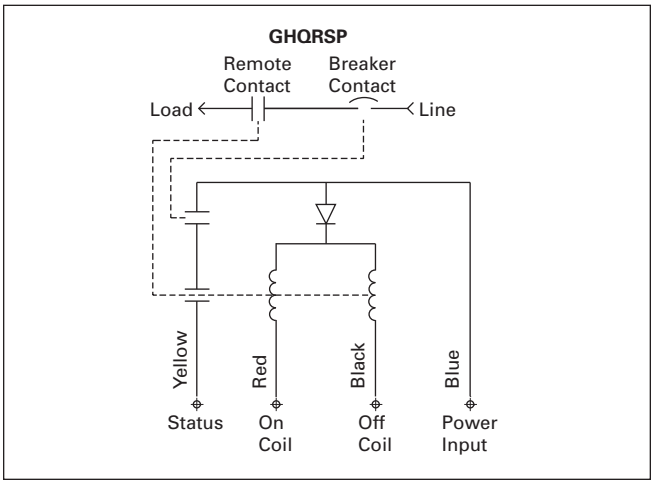

Figure 11-12. Typical Single-Pole Circuit Breaker Schematic Diagram for GHQRSP Breaker

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Product Selection

Table 11-29. GHBS UL 489 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)					
	Ampere Rating ②	Volts ac (50/60 Hz)			Catalog Number	Price U.S. $
		120	240	277/480		
1	15	65,000	—	14,000	**GHBS1015D**	
1	20	65,000	—	14,000	**GHBS1020D**	
1	30	65,000	—	14,000	**GHBS1030D**	
2	15	—	65,000	14,000	**GHBS2015D**	
2	20	—	65,000	14,000	**GHBS2020D**	
2	30	—	65,000	14,000	**GHBS2030D**	

② Continuous current rating at 40°C.

Table 11-30. GBHS CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)			
	Ampere Rating ③	Volts ac (50/60 Hz)	Catalog Number	Price U.S. $
		347/600		
1	15	10,000	**GBHS1015D**	
1	20	10,000	**GBHS1020D**	
2	15	10,000	**GBHS2015D**	
2	20	10,000	**GBHS2020D**	

③ Continuous current rating at 40°C.

Note: Not UL listed.

Table 11-31. GHQRSP UL 489 and CSA 22.2 Interrupting Ratings

Number of Poles	Interrupting Capacity (Symmetrical Amperes)					Catalog Number ④	Price U.S. $
	Ampere Rating ⑤	Volts ac (50/60 Hz)					
		120	120/240	277	480Y/277		
1	15	65,000	65,000	14,000	14,000	**GHQRSP1015**	
1	20	65,000	65,000	14,000	14,000	**GHQRSP1020**	
1	30	65,000	65,000	14,000	14,000	**GHQRSP1030** ⑥	
2	15	65,000	65,000	14,000	14,000	**GHQRSP2015**	
2	20	65,000	65,000	14,000	14,000	**GHQRSP2020**	
2	30	65,000	65,000	14,000	14,000	**GHQRSP2030** ⑥	

④ All UL listed circuit breakers are HID (high intensity discharge) rated.

⑤ Continuous current rating at 40°C.

⑥ Available late 2005.

Discount Symbol **CB-1**