KHA series
General Purpose
Dry Circuit to 5A
Multicontact
AC or DC Relay

File E22575
File LR15734

Features
- Miniature size from 2 pole to 4 pole.
- KHAU is produced on an automated line, while KHU is produced manually. Form, fit and function of the two versions are identical.
- KHS hermetically sealed version UL Approved for Class I Division 2 hazardous locations.
- Various applications include process control, photocopier, and data processing.
- Push-to-test and indicator options available.
- Various contact materials available for specific load requirements.

Contact Data @ 25°C
Arrangements: 2 Form C (DPDT), 4 Form C (4PDT).
Expected Life: 10 million operations, mechanical; 100,000 operations min. at rated loads. Ratings are based on tests of relays with ungrounded frames.
Initial Breakdown Voltage: 500V rms, 60 Hz., between open contacts. 1240V rms, 60 Hz., between all other elements.

Contact Ratings

<table>
<thead>
<tr>
<th>Contact Code</th>
<th>Material</th>
<th>Resistive Rating</th>
<th>Resilience Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>1</td>
<td>Silver</td>
<td>100mΩ @ 12VAC/12VDC</td>
<td>3A @ 120VAC/28VDC</td>
</tr>
<tr>
<td></td>
<td>Silver-cadmium</td>
<td>500mΩ @ 12VAC/12VDC</td>
<td>5A @ 120VAC/28VDC</td>
</tr>
<tr>
<td>2*</td>
<td>Oxide</td>
<td>10mΩ @ 12VAC/12VDC</td>
<td>2A @ 120VAC/28VDC</td>
</tr>
<tr>
<td>3</td>
<td>Gold-silver-nickel</td>
<td>Dry circuit</td>
<td>1A @ 120VAC/28VDC</td>
</tr>
<tr>
<td>6</td>
<td>Bifurcated cross bar, gold overlay silver</td>
<td>50mΩ @ 12VAC/12VDC</td>
<td>3A @ 120VAC/28VDC</td>
</tr>
<tr>
<td>8</td>
<td>Gold diffused silver</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Relays should only carry a maximum of 15 amps continuously for all poles combined.

KHS Contact Ratings
Class I Division II Hazardous Location:
5A@28VDC/120VAC
UL 508 (Industrial Control):
3A@28VDC/120VAC; 1/10 HP @ 120VAC.

Coil Data @ 25°C
Voltage: From 6 to 120VDC, and 6 to 240VAC, 50/60 Hz.
Nom. Power: DC coils - 0.9 watt; 0.5 watt minimum operate @ 25°C.
AC coils - 1.2 VA; 0.55 VA minimum operate @ 25°C.
Max. Power: DC coils - 2.0 watts @ 25°C.
Duty Cycle: Continuous.
Initial Breakdown Voltage: 500V rms, 60 Hz.

Coil Data

<table>
<thead>
<tr>
<th>Nominal Voltage</th>
<th>Resistance in Ohms ±10% @ 25°C</th>
<th>Nominal Inductance in Henrys</th>
<th>Resistance in Ohms ±15%</th>
<th>Nominal AC Current in mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>32</td>
<td>.072</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>40</td>
<td>.08</td>
<td>10.5</td>
<td>200</td>
</tr>
<tr>
<td>12</td>
<td>160</td>
<td>.28</td>
<td>43</td>
<td>100</td>
</tr>
<tr>
<td>24</td>
<td>650</td>
<td>1.0</td>
<td>160</td>
<td>52</td>
</tr>
<tr>
<td>48</td>
<td>2.600</td>
<td>4.5</td>
<td>668</td>
<td>25</td>
</tr>
<tr>
<td>110*</td>
<td>11,000</td>
<td>17.0</td>
<td>3,900</td>
<td>11.0</td>
</tr>
<tr>
<td>120*</td>
<td>—</td>
<td>—</td>
<td>12,000</td>
<td>6.0</td>
</tr>
</tbody>
</table>

*Note: For 220 and 240VDC, use series dropping 5W resistor of 11,000Ω.

Operate Data @ 25°C
Must-Operate Voltage: DC: 75% of nominal voltage.
AC: 85% of nominal voltage.
Operate Time: 13 milliseconds typical @ nominal voltage (excluding bounce).
Release Time: 6 milliseconds typical @ nominal voltage (excluding bounce).

Environmental Data
Temperature Range: -45°C to +70°C operate.
-60°C to +130°C storage.

Mechanical Data
Mountings: #3-48 stud, sockets with printed circuit or solder terminals, or bracket plate with #6-32 threaded stud.
Termination: Printed circuit or solder/socket terminals.
Printed circuit terminals are available for KHS on a special order basis.
Enclosures: See Ordering Information table.
Weight: 1.6 oz. approx. (45g).
Ordering Information

1. Basic Series: (See Note 1)

2. Type:
   - E = Printed circuit terminals, nylon dust cover, contacts rated opposite polarity (UL & CSA).
   - S = Solder terminals, hermetically sealed steel case (UL & CSA). Note: Do not ground KHS frame without consulting factory for load levels. (Order as KHS, not KHAS.)
   - U = Solder terminals, clear polycarbonate dust cover, contacts rated same polarity (UL & CSA).

3. Contact Arrangement:
   - 11 = 2 Form C (DPDT)
   - 17 = 4 Form C (4PDT)

4. Operating Coil:
   - A = AC
   - D = DC

5. Mounting and Termination:
   - 1 = Socket mount, solder terminals on S, U types; printed circuit terminals on E types.

6. Contact Material:

<table>
<thead>
<tr>
<th>Relay Type</th>
<th>E</th>
<th>S</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Codes</td>
<td>1, 2, 3, 6, 8</td>
<td>1*, 2*, 3</td>
<td>1, 2, 6, 8</td>
</tr>
</tbody>
</table>

*UL Rated 1/10 HP, 3A, 120VAC when used with mounting & termination 1.
1 = Silver.
3 = Gold-silver-nickel.
8 = Gold diffused silver.
2 = Silver-cadmium oxide.
6 = Bifurcated crossbar, gold overlay silver.

7. Options Available:

<table>
<thead>
<tr>
<th>Relay Type</th>
<th>E</th>
<th>S</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Codes</td>
<td>B (DPDT only)</td>
<td>None</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
</tr>
</tbody>
</table>

B = Push to test button.
N = Neon indicator. Only available with 120VAC or 110VDC coils. Not available with mounting & termination 4 or 8.
H = Neon indicator and push to test button. Only available with 120VAC or DC coils. Not available with mounting & termination 4 or 8.
L = LED indicator. Only available with 6-48VDC coils.
M = LED indicator and push-to-test button. Only available with 6-48VDC coils.

8. Coil Voltage:
   - 6, 12, 24, 48, 120, 240**VAC
   - 6, 12, 24, 48, 110VDC

   **240VAC coil is not available on KHS type relays.

Note 1: Some KHA models available in KH construction. Specify KH instead of KHA.

Stock Items - The following items are normally maintained in stock for immediate delivery.

<table>
<thead>
<tr>
<th>KHAE-17D12-24</th>
<th>KHAU-17D11-24</th>
<th>KHS-17D11-48</th>
</tr>
</thead>
<tbody>
<tr>
<td>KHAU-11A11-120</td>
<td>KHAU-17D11-120</td>
<td>KHAU-17D11-120</td>
</tr>
<tr>
<td>KHAU-11D11-24</td>
<td>KHAU-17D11-110</td>
<td>KHS-17D12-12</td>
</tr>
<tr>
<td>KHAU-17A11-12</td>
<td>KHAU-17D12-12</td>
<td>KHS-17D12-24</td>
</tr>
<tr>
<td>KHAU-17A11-12</td>
<td>KHAU-17D12-24</td>
<td>KHAU-17D12-12</td>
</tr>
<tr>
<td>KHAU-17A11-120</td>
<td>KHAU-17D12-48</td>
<td>KHS-17D11-12</td>
</tr>
<tr>
<td>KHAU-17A12-12</td>
<td>KHAU-17D16-12</td>
<td>KHS-17D11-12</td>
</tr>
<tr>
<td>KHAU-17A13-120</td>
<td>KHAU-17D16-24</td>
<td>KHAU-17D11-12</td>
</tr>
<tr>
<td>KHAU-17A16-24</td>
<td>KHS-17A11-24</td>
<td>KHAU-17D11-24</td>
</tr>
<tr>
<td>KHAU-17A16-120</td>
<td>KHS-17A11-120</td>
<td>KHS-17A12-120</td>
</tr>
<tr>
<td>KHAU-17A16-120</td>
<td>KHS-17A12-120</td>
<td>KHS-17D11-12</td>
</tr>
<tr>
<td>KHAU-17D11-6</td>
<td>KHS-17D11-12</td>
<td>KHS-17D11-24</td>
</tr>
</tbody>
</table>
**Outline Dimensions**

**Mounting Code 1 - KHAU only.**

2 & 4 Pole

![Diagram of Mounting Code 1 - KHAU only.](image)

PC terminal models have rivet, not stud. Max. seated height in 276006 socket is 1.37” (34.8mm).

**Mounting Code 1 - KHS only.**

2 & 4 Pole

![Diagram of Mounting Code 1 - KHS only.](image)

Class 1 Div. 2 Group A, B, C & D Hazards

**Wiring Diagrams (Bottom Views)**

2 Pole

![Diagram of Wiring Diagrams (2 Pole)](image)

4 Pole

![Diagram of Wiring Diagrams (4 Pole)](image)

+ = Polarity for LED indicator.

**PC Board Layout (Bottom View)**

![Diagram of PC Board Layout (Bottom View)](image)

For KHAE Relays with PC terminals and sockets with PC terminals.
Sockets For KHA And KHS Series

All sockets are normally maintained in stock for immediate delivery.
For KHAU, KHAX, KHS Relays.
Relays with solder terminals are required for use with sockets.

Socket Description

<table>
<thead>
<tr>
<th>Industrial Part No.</th>
<th>No. of Poles</th>
<th>Terminal and Length</th>
<th>Grounding Provision</th>
<th>Socket Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>27E006*</td>
<td>4</td>
<td>Solder .375&quot; (9.53mm)</td>
<td>Yes</td>
<td>Nylon</td>
</tr>
<tr>
<td>27E007*</td>
<td>4</td>
<td>P.C. .218&quot; (5.54mm)</td>
<td>Yes</td>
<td>Nylon</td>
</tr>
<tr>
<td>27E023* 27E220*</td>
<td>2</td>
<td>Screw</td>
<td>No</td>
<td>Polyamide</td>
</tr>
<tr>
<td>27E166** 27E894**</td>
<td>4</td>
<td>Screw</td>
<td>Yes</td>
<td>Glass-filled</td>
</tr>
<tr>
<td>20C217 20C297</td>
<td></td>
<td>Relay Hold Down Spring Hold Down Spring</td>
<td>(use with 27E166 &amp; 27E894)</td>
<td></td>
</tr>
</tbody>
</table>

Pierced Solder Terminals

- **.629** 
- **.105** (2.67) 
- **.52** (1.32 ± 0.25) 

Screw Terminal Socket 27E166
Relays with solder terminals are required for use with screw terminal sockets.

Screw Terminal DIN Rail, Snap-Mount Socket 27E894
(Use with mounting track 24A110)

Mounting Strip 37D633

- **.629** (15.98) 
- **.132** (33.60) 
- **.138** (35.26) 
- **.090 R.** (2.29) 

37D633 will mount eight solder terminal sockets in one length of aluminum strip measuring 10.97" x 2.25" x .062 (278.6 x 57.15 x 1.57)

Recommended Chassis Cutouts For Mounting Sockets

Recommended Chassis Thickness .031 (.79) to .062 (1.57)
Socket punch Greenlee part 5015115.0, Type 731R available from Greenlee Tool Co., Rockford, Illinois. (4-pole)

Printed Circuit Terminals With Grounding Lug

Without Grounding Lug

Caution: Printed circuit sockets are manufactured with ‘floating’ (Loose) terminals. This permits them to align with holes in the circuit board and with the relay terminals. During the mounting and soldering of the socket, vertical float should be eliminated and the terminals seated on the board. (This may be accomplished by inserting a dummy relay in the socket.) Failure to eliminate float may cause fracture of the solder joint or separation of the copper conductor from the printed circuit board when a relay is inserted in the socket after soldering.

Hold Down Spring 20C217

Tyco Electronics Corporation - P&B, Winston-Salem, NC 27102

Specifications and availability subject to change without notice.